GREATER REACH: WEB 2.0
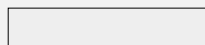
Trasicio Mahianyu Maina
CT100/G/0271
School of Computing and Information Technology
BSc. Information Technology

143 -10300

DECLARATION

Abstract

With the tremendous growth of the internet and increased reach, one would naively be tempted to assume that the developments would reflect on the education sector in Kenya. Reality on the ground however is quite a contradiction. Information technology absorption, in production supply, and impacting thereof, of academic information in Kenyan schools has consistently remained below poor. Precisely, most students in Kenyan schools, both in primary school and secondary school lack basic computer literacy and thereby remain oblivious of and shut out of the World Wide Web

It is a saddening state of affairs to note that the Kenyan education sector continues to graduate students out of high school with such illiteracy despite demand for the knowledge of IT in the current world. But while students graduate with this apparent irrational ignorance, it is more appalling to note that their teachers are just as ignorant. Most school are under a management that either is unaware, ignorant, or non-appreciating of information technology.

The government of Kenya has proposed to integrate information technology in the country's education sector. Also, the current administration, through a political manifesto, aims to equip schools with IT infrastructure (E.g. laptops for students). It is safe to argue that the time for a revolutionary change in the education sector has arrived. It is from this foregoing that I am inclined to write a sample website customized for a high school. With it, a school can present itself to the world. In my humble view, though late, this is a first step for an academic institution seeking to name its place in the global community.

This page is intentionally left blank

Dedication

This work is dedicated to my parents, Mr and Mrs Maina, whose seemingly unbounded love and support still amaze me, despite the fact that they've been there for me all this time (twenty-one years now).

Table of Contents

List of figures/tables

Abbreviations

IT	Information Technology.
ICT	Information and Communication Technology
WCAG	Web Content Accessibility guidelines
CSS	Cascading Style Sheet
HTML	Hypertext Mark-up Language
DBMS	Database Management System

Background

The advent of Web 2.0 brought about radical changes in the way we view and use the internet. With its implementation, users could now interact with webpages. They could leave messages, register with the said websites, discuss with other users on the website and leave feedback on the webpage.

I believe that the current innovations in web services create both opportunities and risks for organizations. People are increasingly gathering in online communities of like-minded individuals, and there is an urgent, growing need to nurture these communities.

The organizations that succeed and leverage this social momentum will increase loyalty, brand value and visibility. Those who fail to do so, will be stuck merely watching as their communities self-organize wherever the community wants to - probably out of sight, out of mind and out of the influence of the organization.

To succeed, organizations need a way to converge content management and social community features.

Current system

The prospective organization is limited or lacks any presence on the internet. New student intakes are advertised on local radio stations and public flyers. This greatly reduces the audience reached because:

i) Radio adverts are expensive. This means only a few can be done for a given intake. Also, the choice of radio station taken cannot guarantee the target audience will be reached.

ii) Flyers require personal contact with the prospective clients (audience). Therefore, casual labour has to be hired to distribute the flyers. The said labourers are to a large extent unreliable in their ability to deliver.

Despite them being costly, they may not really place a lot of effort in reaching a large number of the population.

From the foregoing, the institution is limited in its reach. This implies that the students acquired for a given intake are not of diverse background. Also, due to the limitation of reach in the prospective audience, the school is forced to lower their entry marks. It can therefore be urged that the institution is not living up to its full potential.

Aside from student intakes, tendering is advertised in the local dailies which due to the cost incurred is only limited to one advertisement. This obviously reduces the pool of competence to pick from.

Opening dates for school terms also are required to be notified in the students' report card. This brings complications in case the institution needs, in the course of a closure/holiday, to revise the opening dates.

In this system, a halted tender only brings about issues of incompetency and dissatisfaction from the school's community.

Proposed system

The new website will be a single platform offering access to the institution's diverse services. The goal being to transform the organization hence breaking down silos between programs. Currently it lacks the capability to offer students, volunteers, donors, and potential partners an integrated menu of up-to-date opportunities across the entire organization. Convenient online access to the school's full spectrum of services, not only during recruitment and/or intake but throughout a stakeholder' engagement, will ensure that everyone is more familiar with the organization as a whole and make it easier for internal and external users to navigate between programs.

The new website will be a valuable tool for delivering program services such as:

- ❖ Students and employers participating in our programs will be able to view calendars, access FAQs, and contact their job coaches and liaisons
- ❖ Program coordinators can publicize upcoming events and post information on resources, deadlines, and other important college and financial aid information
- ❖ Community Engagement staff can post information on community events, and work with our communications director to translate our online contacts into concrete engagement with students
- ❖ Members of our new Alumni Network will be able to use the site as an online hub

The front page of the site will house an updated calendar of education events and volunteer opportunities. It will spotlight a different student each week, and it will also house a scrolling newsfeed that will contain photos and stories of SCHOOL DISTRICT activities, national education news, and posts from our new blog, which will launch with the site. It is expected that the website will become the first place residents go when they want to learn about:

- ❖ An independent perspective on the Public school
- ❖ Student achievement data
- ❖ School events and deadlines
- ❖ Career training and work opportunities
- ❖ College access and financial aid
- ❖ Volunteering with students
- ❖ Donating to the district or to individual schools and programs
- ❖ Learning about the latest education trends and initiatives
- ❖ Organizing education advocacy groups and campaigns

Finally, the organization's website is to be accompanied by Facebook and Twitter accounts to build a community of people who recognize their stake in the school. This adds audience reached by integrating social advertising through these platforms.

Objectives

The new site will be a powerful tool to facilitate greater engagement between community members and the public education system. Our goal is to build a vibrant and diverse online community by meeting the specific needs of key audiences:

- ❖ Potential and current volunteers
  As per the proposed website, these can only addressed by means of being notified on the webpage. Lack of an advert will thus imply the lack of any such vacancy. However as more target audience (hence the technical feasibility), so should the website be modified to allow online application of the said vacancies.
- ❖ Corporate, foundation, and individual donors
  The vast availability of content regarding the school will be tailored to attract prospective donor into the various activities of the school.
- ❖ Students, alumni, parents, and staff
  Introduction of new academic and co-curriculum disciplines in the school will be published on the website. This is for the benefit of parents and students. In addition, alumni and staff activities will be published to the extent that it does not infringe on anyone's privacy.
- ❖ Community reach
  The website is expected to maintain content that is helpful to the community while maintaining these attributes:
    i) Transparency
    ii) Respect to cultural, lingual and religious diversity of the community
    iii) Respect to the community's norms and accepted ethics, and
    iv) Educative approach to various users without discrimination.

Research questions/ hypothesis

In collecting relevant data about the prospect of a website for this school, secondary sources were favoured for the following, but not limited to reasons;

i)   Established corporate backed data exists within the public domain and is supported by key industry players in ICT.

ii)   It reduces on time and other costs in the collection of data.

iii)   The wide spectrum in which relevant data in secondary sources is to be found gives a huge range for the researcher to work with.

As such, data was has been compiled as extracted from various research papers on the basis of these research questions;

a) How many people access the internet per month in Kenya?

This obviously is necessary to indicate the size of the population out of which we achieve our target audience given that the website is largely built around publicity and public relations. It is important we establish the figure in order to be aware of the full potential of the project.

b) Which is the most active age-group in the usage of internet in Kenya?

This will be able to justify the content of the webpage. Naturally, the website content will be tailored to meet and appease the prospective contractors, students, and teachers. That said, there is still a need to establish the modesty of the content used in this site to reflect on the majority users.

c) How much time does the average Kenyan spend on the internet?

Should our content be lengthy and detailed to suit a population that spends a lot of its time online? If the population spends a minimised amount of time on the internet, it is wise to give brief and straight-forward information. This captures their attention with the minimal time they spend on our site while feeding them with information about the school.

Kenya's Internet Usage Statistics

Population (2015) 45,925,301

Country Area: 581,787 sq. km

Capital City: Nairobi - population 3,476,632 (2012)

31,985,048 Internet users on Sept 15, 2015

69.6% penetration, per CAK.

5,300,000 Facebook users on June 30/16

1.0 Internet Usage Statistics, Source: http://www.internetworldstats.com/africa.htm#ke

The Internet first became available in Kenya during 1993. Full Internet access was established in 1995. The African Regional Centre for Computing (ARCC), an NGO based in Nairobi, Kenya, became the first provider of web-based Internet service. The first commercial ISP, Formnet began operating in 1995. Soon competition increased with the entry of three other ISPs. All the ISPs would lease analogue or digital data lines from Kenya to the US to access the Internet backbone.

Since many people in Kenya do not have fixed phone lines, computers, or electricity, internet shops, known as cyber cafes, provide access to internet and email, mainly in the major towns. A major factor that may have influenced the use of ICT positively in Kenya is the use of the English language. English is the official language in Kenya, and Information Technology (IT) services are largely based in English, so this has been an advantage.

These figures are attributed to increased affordability of Internet services as provided by ISPs which has seen the price of browsing the Internet become more affordable. The growth of E-commerce has also led to increased usage of the internet with Kenyans taking up online shopping. Kenyans have also used the internet for utility services such as online reading of newspapers and online banking services.

As seen in these figures, there is a tremendously huge market to be tapped into online. For organizations seeking to secure a future in the corporate space in Kenya, it is vital to have their presence felt online. This calls for the existence of a legitimate business website owned and manned by the institution.

INTERFACE DESIGN & USER EXPERIENCE

During the design process I have paid special attention to web accessibility and usability standards, making the web design easy to read and comprehend by all visitors (humans and search engines). I make this possible by separating content, presentation and interaction elements, creating valid and clean HTML and CSS code according to the W3C's Web Content Accessibility guidelines (WCAG).

Using Visual Studio Web Developer Compatibility testing tools, I tracked any cross browser issues and fixed them before the presentation of the final prototype. This means that the website design will be compatible with the most popular browsers in use: Firefox, Internet Explorer, Safari, Opera and Chrome.

NODES AND THEMES

I design content as sets of nodes, or self-contained chunks of information.

- ❖ Each node includes a title, a body, and links to that body's type, authors, and publication metadata.
- ❖ Nodes are organized into collections that can be sorted, updated and published as site navigation menus available to all or specific user groups.
- ❖ I have tried as much as possible, within reasonable constraints, to implement CSS classes to take full advantage of OOP principles of code re-usability and modularity.
- ❖ I have ensured that the webpage is rendered in blocks to enhance a thematic presentation to the end user.

```css
/* tell the browser to render HTML 5 elements as block */
article, aside, figure, footer, header, hgroup, nav, section
{
    display: block;
}
```

USER MANAGEMENT

The website administrator can configure the website with the roles and permissions that correspond to the way the organization works.

DATA MANAGEMENT

The website has a simplified database whose sole intention to acquire feedback from the end user. Using PHP and MySQL, contact details are taken from the wilful user and a brief comment. The data is stored in a database accessible to the website administrator.

Conceptual framework

This framework covers a large number of factors that need to be considered when localizing a website such as Usability, Country profile, User profile, and Business nature of the websites.

Country Profile

The country profile takes into account language, religion, and culture which is defined as a system of shared meanings that form a framework for problem solving and behaviour in everyday life. Meaning is assigned during communication based on the beliefs, values, and attitudes of the collective group.

Data format barriers also need to be overcome, when designing for different cultures.

For example, in this website the following localization has been made:

• Long Date Formats: Kenyans use the British date format. I.e. DAY/MONTH/YEAR.

• Currency Formats: The official currency is the Kenyan Shilling (KSh). As such, the website uses it as the default currency.

• Number Formats: The numbering format taught in Kenyan schools, hence used by majority of Kenyans, is the British format. Figures are represented as x,xxx.xx.

Internationalization

According to Nielsen [Nielsen, 1999], Internationalization refers to having a single design that can be used worldwide. It is the process and philosophy of making software/website portable to other locales. For successful localization, products/website must be technically and culturally neutral. Effective Internationalization reduces the time and resources required for localization. In other words, Internationalization abstracts out local details, localization specifies those details for a particular locale.

However, it is not practical to achieve the local target audience and maintain a high level of internationalization. From this foregoing therefore, a compromise has been made with the assumption that most users understand English (UK). This, however, is a well-informed compromise seeing that the most popular Search Engines (Google, Bing) provide website translation based on the user's location.

Usability

Usability refers to the organization of information on the site and the method by which the user is able to move through the sections of websites and effective web use. Block rendering of the website has been used to ensure precise display to the end user. The information content is according to the local or native language. As pointed out earlier, the website is written in English -Kenya's official language. Many users are also concerned with the performance of the website. As such, JavaScript has been deployed to enable faster page loading. Also only essential graphical enhancements have been made to the website.

Definition of operational terms

1. Cascading Style Sheets (CSS)

A style sheet language used for describing the presentation of a document written in a mark-up language. Although most often used to set the visual style of web pages and user interfaces written in HTML and XHTML, the language can be applied to any XML document, including plain XML, SVG and XUL, and is applicable to rendering in speech, or on other media

2. HTML.

Hypertext Mark-up Language, a standardized system for tagging text files to achieve font, colour, graphic, and hyperlink effects on World Wide Web pages.

3. JavaScript.

An object-oriented computer programming language commonly used to create interactive effects within web browsers.

CHAPTER TWO: LITERATURE REVIEW

Introduction

There are numerous websites dedicated to and owned by high schools. All of them seem to serve a similar purpose;

    i)   Give information concerning admission dates and requirements
    ii)   Place the institution's contact details in public view
    iii)   Offer information pertaining to the institutions activities
    iv)   Make invitations to members of the public to participate in community projects initiated by the institution
    v)   Declare procurements and tendering activities within the institution

This maps clearly with the website henceforth designed for this institution. It aims at providing information to members of the public on areas of interest to the community while offering a platform to the community in which they can interact with the institution.

Related literature review
ST HANNAH'S SCHOOL

This is a private school offering the 8-4-4 system of education. The high schools also offer Aviation as an examinable subject in collaboration with Wilson Airport, as well as Home Science.

The school caters for children aged 18 months to 18 years. St Hannah's comprises an Early Learning Centre (play group, baby class, nursery and pre-unit), a mixed primary school, a boy's high school and girl's high school in separate campuses. There are optional boarding facilities from Class 4 and mandatory boarding for both high schools.

The school has a website providing details of the institution to members of the public. It also offers admission forms to prospective students while outlining admission requirements and the school's rules and regulations.

The site has an interactive search portal that enables users to find content on the site with much ease and simplicity.

The website http://sthannahs.com/Home, has a simple interface that is easy to navigate and has minimal media content to enhance page loading.
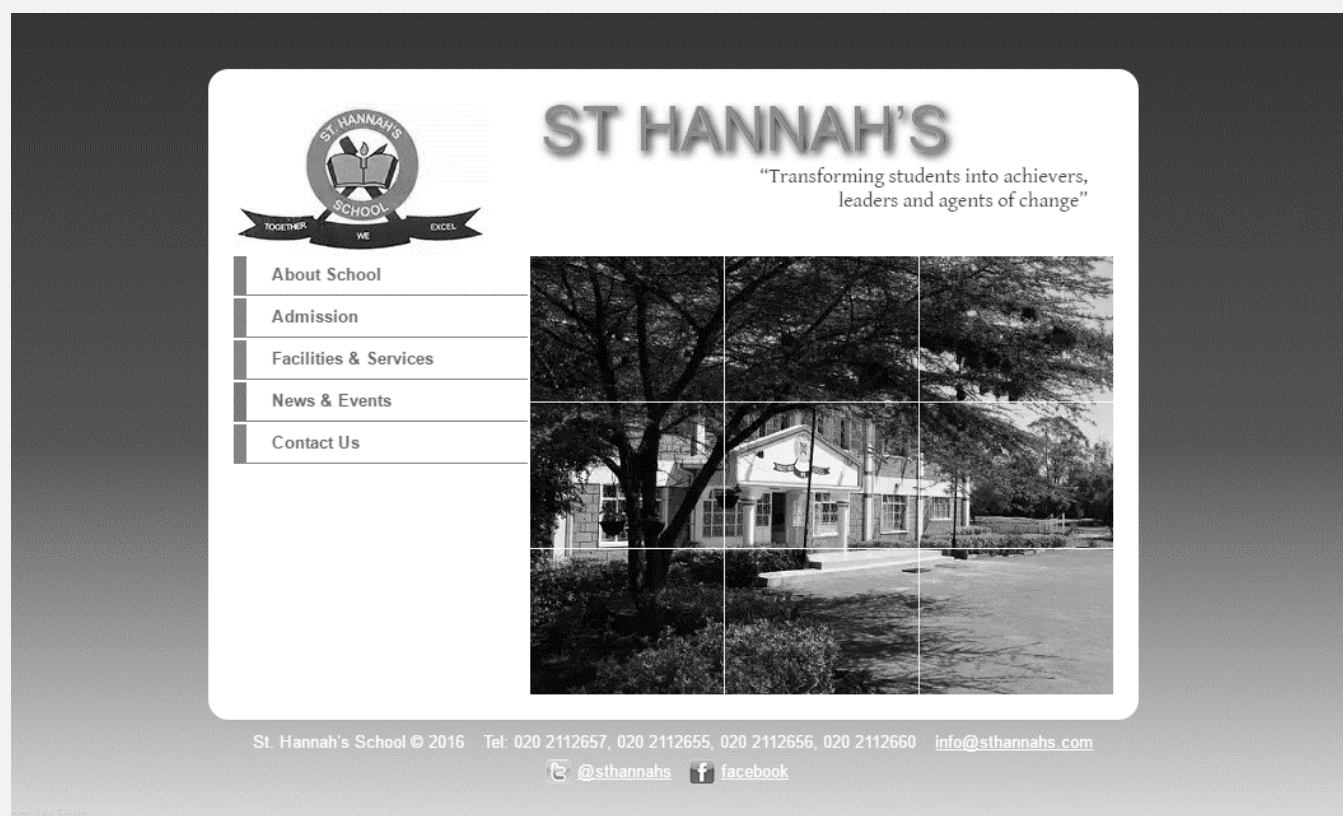
CHAPTER THREE: SYSTEM ANALYSIS

Feasibility study
Technical Feasibility

The technical aspects for the development of the proposed project are well within the project team's capabilities to produce such a product. The project team has experience in all aspects of the technology to be used; the World Wide Web (web) and a database program, Microsoft Access.

The scope of this project encompasses both web and database development. The use of the proposed technology has little risk. As stated I am is familiar with the tools to be used. The software to be used has been in use for several years and has been updated periodically. It has been proven and is widely used in both commercial and personal projects/applications.

Essentially the project scope will not exceed the capabilities of the technology used. The ever present constraint that seems present in every project is time. This constraint is also present in this project, however our team leader during this phase of the project, Linda J. Sampson, has developed a project schedule that is realistic which provides for the completion of the project on time. The size of the project team is also seen as a constraint. Since projects are not assigned unlimited resources and personnel it is very important to assess a project's scope when determining the amount of resources that are needed. In this project the scope is not beyond the resources that our team possesses. Given the size of this project and the fact that the team meets at least twice a week to discuss the project we feel that the project can be completed on time as specified. Given our frequent contact, our familiarity with the technology to be used and a solid project schedule, we are able to assess risks to the project quickly and effectively deal with them.

The risk in financial terms in using the stated technology is nil. All the project application software is provided at no cost to Emerald Webs. The time to construct the project is also being provided at no cost to Emerald Webs.

Data collection

For this website, the following data is fetched from the end user;

   i)   Name of the user.
   ii)   Email address of the user.
   iii)   Comments/Suggestions from the user.

The data is stored into a database named *users* within the table *feed*. The table has the following attributes;

   i)   Id <Primary Key>
   ii)   Name
   iii)   Email
   iv)   Comments

All of these are taken from the end user via a HTML web form. *Id* is automatically assigned by the DBMS. This attribute will be useful in sorting the data in the database for simplified administration. It is not visible to the end-user.

Due to the wide use of PHP in database aware web designs, it has been chosen over ASP.NET to ease maintenance of the website.

Also PHP promises security by ensuring that all transactions are processed from the server (and none from the client) hence providing a safe environment for the existence of the website.

MySQL has been preferred to handle the database due to its robust nature and ability to handle many users at a single instance. Also, it provides simple query language which is handy for the website administrator while extracting data.
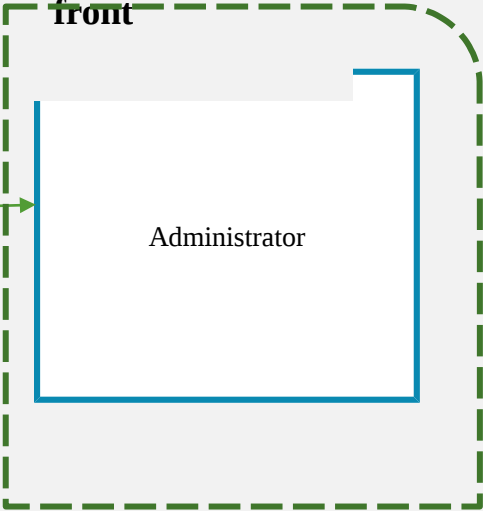
MySQL is open source and free which also counts in reducing the overall cost of the website design and maintenance.

End User Interface
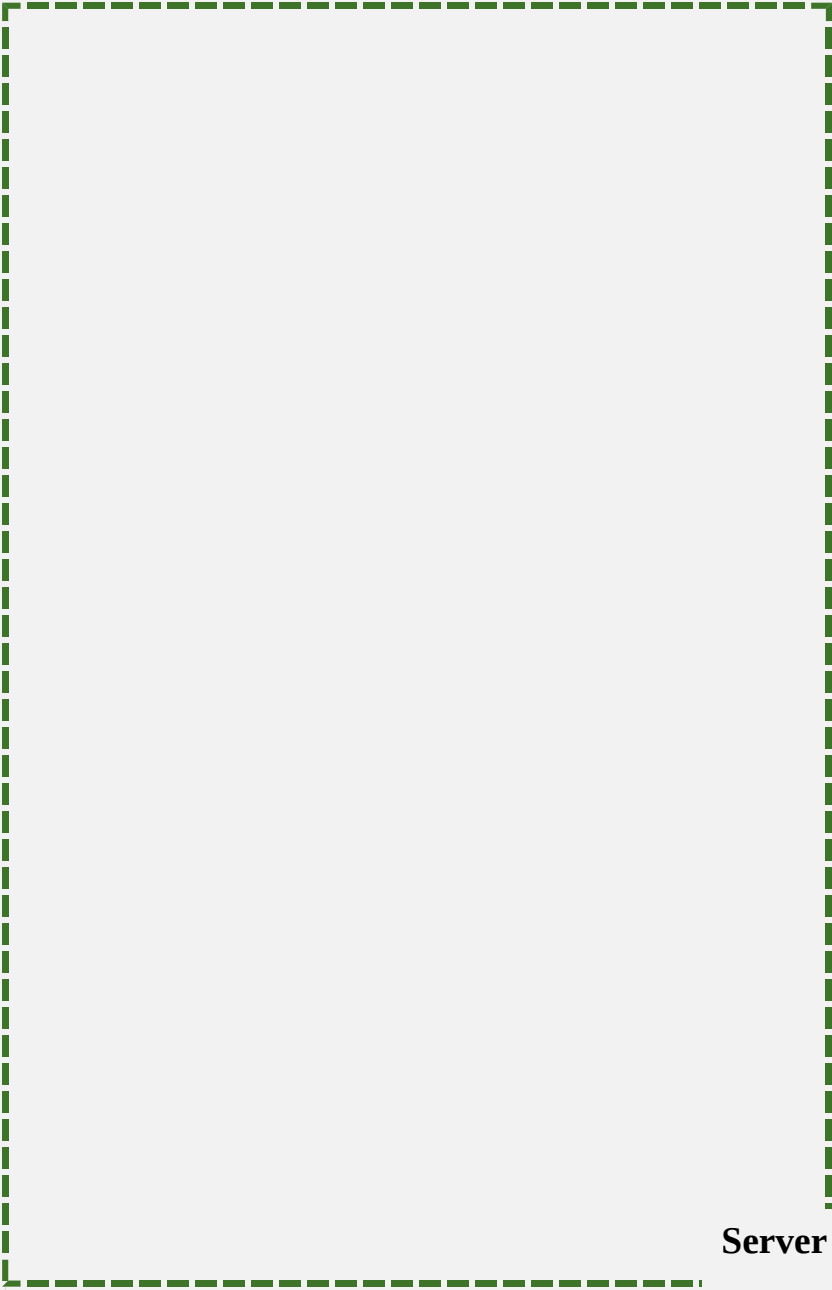
Administrative front

Administrator

Server End

osite Data Management