

**MOBILE APPLICATION FOR EFFICIENT SEARCH FOR DOMESTIC APPLIANCE
TECHNICIAN.
(A CASE STUDY OF MOMBASA COUNTY)**

ELLY KITOTO NANDI

BTIT/037J/2013

EMAIL: ellynandi@gmail.com

TEL: 0717702504

SUPERVISOR: MR. KENNEDY

HADULLO (ICI Lecturer TUM)

EMAIL: khadullo@gmail.com

TEL: 0727762822

ABSTRACT

Machines operators and electronic devices users struggle to find technicians. The purpose of the project was to design and develop a mobile application that would allow customers to find contacts and view the services offered by technicians so as to address the problem of finding electronic devices and appliances technicians. Because of the ubiquitous nature of mobile computing, the app would enable users to easily find a technician at their comfort with limited efforts. The targeted users are machine/appliance operators. The mobile application was developed through Rapid Application Development methodology (RAD) using cross-platform mobile application framework known as phonegap. Phonegap is a framework used to create cross-platform mobile web application using standard web technologies like HTML, CSS

and JavaScript and it also gives the developer access to the native application API for the particular platform and access to the vendor app stores. Once this application has been implemented it is expected to facilitate the search of appliance technicians for machine operators in Mombasa County.

Background Information

The use of desktop computers is declining over the years as many users increasingly move to mobile and tablet devices. There is a growing demand in the development of mobile applications that are good enough to meet the needs of the ever growing tech savvy consumers. However as pointed out by Lutes (2012) who is an expert in teaching cross-platform mobile application development, it is difficult to cope up with change that is constant and whose pace is fast when it comes to developing mobile applications. There are three major options

available for mobile development: first option is to use platform-specific developer tools another option is to create web applications using HTML/JQuery and CSS. The final option is to use RAD tools to create platform-neutral web-based applications (Agrawal and Gill, 2013). The native app that is those applications developed with platform-specific tools have the advantage of using the features available for the specific platforms therefore they are very robust (Lutes, 2012) Web apps require internet to operate however, their user interface is optimized for mobile devices and they work like native apps though they do not require installation. There is another category that is the final option which uses a platform neutral web based application known as hybrid approach. It is written using the web app technologies, CSS, HTML, JavaScript and PHP but compiled for installation and made available in the various vendor store (Lutes, 2012).

Each of the development approach have their own advantages and disadvantages. The native app development approach is advantageous in terms of the features provided to the developer but it would be costly to develop an app for each of the individual platform considering the time and resource constraints. Mobile application

development requires planning. The most challenging part for the developer is deciding on the proper approach to use. The best approach is which it considers the resources constraints and the knowledge available for the application development (Huynh & Ghimire, 2015). Therefore for the project the hybrid development approach was chosen for two main reasons. The first is that it results to creation of a cross-platform mobile app and secondly the knowledge and tools for the development of the cross-platform mobile application are readily available. A hybrid application can be packaged and made available in the various stores of the vendors. Most of the tools used in hybrid development approach are open source and accessible.

In Kenya, mobile apps are used by many business and industries. Hotel and Bus industries use mobile apps for booking and reservations. There has been a growing demand for mobile applications as many business are now moving towards mobile computing, for instance the recent move made by the Royal Media Group (an organization that runs many of the local stations and channels in Kenya). They created a mobile app for their consumers where they can fully get the royal media services like listening to their favorite local radio stations among others. Banks are also

not left out in this era of mobile computing. Most of the top banks in Kenya like Kenya Commercial Bank (KCB), Equity bank and Cooperative Bank have mobile applications for their customers to improve their banking experience. As the market for mobile apps continue growing other organizations and companies are expected to join in and be part of the consumers of mobile apps.

Most of the people rely on the information displayed on bill boards, posters and published adverts when they need to find technicians. Normally, a user would have to manually look for the information by searching and reading posters and other publications or visiting the actual site or organization where the technician is based. Some electrical appliances like refrigerators, cookers, and television sets are not very portable and it's difficult to transfer them to another location for repair. This system was initiated so as to address the challenge. The mobile application is able to provide the contact information about technician, their specialization and information about the services that they offer. Users can then contact a particular technician and enquire about their services through the mobile application.

Problem Statement

Machines operators and electronic device users struggle to find technicians. Machines and other electronic devices are very useful however when these appliances breakdown or require maintenance, it's always hard to find a technician or someone specialized in handling the equipment. Many users have the knowledge on how to operate machines like printers, computers and other electronic devices but they are not adept in maintenance and repair issues. Users take a lot of time when looking for posters that have the technician's contacts. This system seeks to address the challenge by providing a mobile application that avails information about technicians to the users.

Objectives of the Study

General Objective

The general objective of the project was to design and develop a mobile application that allows customers to find contacts of technicians and enquire of their services.

Specific Objectives

The specific objectives of the system were:

- i. To investigate current mobile apps used for finding technicians with the view of getting requirements.

- ii. To design the mobile application through the Rapid Application Development methodology.
- iii. To develop a multi-platform mobile web application using the phonegap framework.
- iv. To test the application for user acceptance as well as system functionality.

Significance of the Project (Justification)

The mobile application has enabled customers (machine operators and electronic devices users) to find and enquire about technicians faster and easily thus reducing on cost of commuting and cut off any possible overhead expense that would be incurred.

Project Scope

Customers are able to register and login to their accounts, view a list of services offered by various technicians/professionals that best suits the task they want accomplished, enquire about the services offered by the technicians. Technicians can register and post their services via a website

Development Approach

Structured analysis approach is the development methodology used to develop

the system. Structured analysis approach represents the system in terms of data and processes that act upon the data. System development is organized into phases with deliverables and milestones to measure progress.

System Design

Systems design is the third of five phases in the systems development life cycle. It involves developing a physical design that meets the specifications described in the system requirements document. The tasks carried during system design include user interface design, data design, and system architecture. The deliverable for this phase is the system design specification.

Type of System Development Method

The system was developed using Rapid Application Development Methodology (RAD). RAD is a development approach that speeds up the development of the information system. End product of RAD is a functional information system. RAD relies heavily in prototyping and user involvement. The RAD process allows the user to examine the working model as soon as possible and recommend changes where necessary. Based on user input, the prototype is modified and the interactive process continues until the system is completely developed and the user

is satisfied. RAD has four phases (Garry B. Shelly & Rosenblatt, 2012).

and develop models and prototypes that represent all system processes, outputs, and

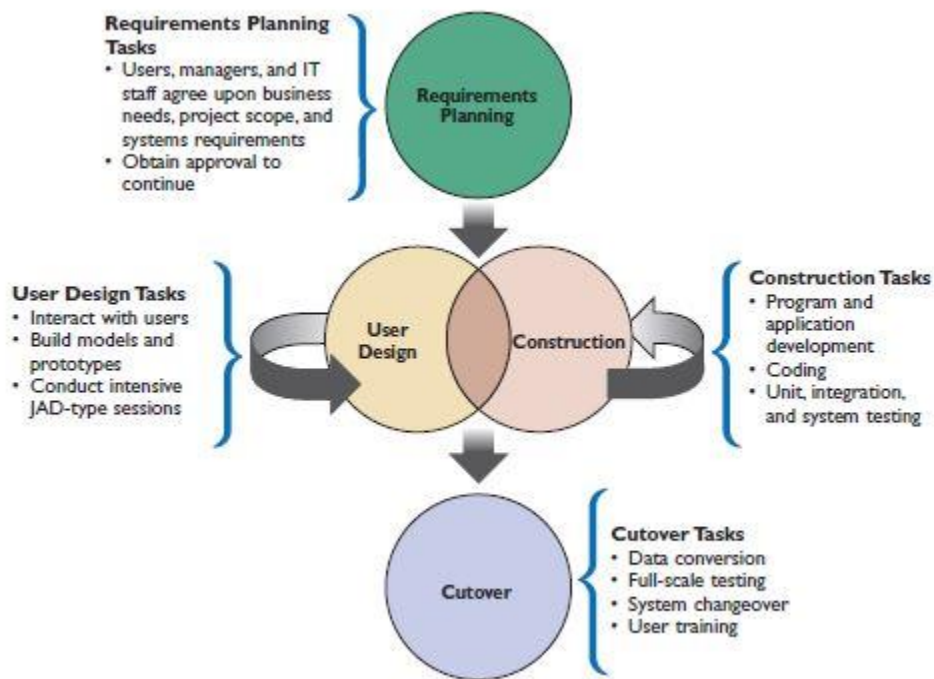


Figure 1. 1 RAD Activities and phases: source (System Analysis and Design 9th Edition by Garry B. Shelly and Garry J. Rosenblatt)

Phases and Activities of RAD

REQUIREMENTS PLANNING - The requirements planning phase combines elements of the systems planning and systems analysis phases of the SDLC. The requirements planning phase ends when there is an agreement on the key issues and authorization is given by the management to continue.

USER DESIGN - During the user design phase, users interact with systems analysts

inputs. User design is a continuous, interactive process that allows users to understand, modify, and eventually approve a working model of the system that meets their needs.

CONSTRUCTION - The construction phase focuses on program and application development tasks similar to the SDLC. In RAD, however, users continue to participate and still can suggest changes or improvements as actual screens or reports are developed.

CUTOVER - The cutover phase resembles the final tasks in the SDLC implementation phase, including data conversion, testing, changeover to the new system, and user

training. Compared with traditional methods, the entire process is compressed. As a result, the new system is built, delivered, and placed in operation much sooner.

Justification of Methodology

One primary advantage of RAD is that it allows faster development of information system with significant cost savings this is because user involvement in the system development is key.

Pros

- There is a quick initial reviews within the initial phases of development providing a clear information acquisition.
- RAD reduces development time of software development
- Integration from very beginning solves a lot of integration issues.
- More projects completed on time and within budget. By focusing on the development of incremental units the chances for catastrophic failures

Conclusion and summary

The first objective was to analyzing information about the various platforms available for users to get information about

technician contacts. This was made possible carrying out interview on the selected sample from the target population. Information derived from the interview was useful to formulate the user requirements. The second objective was to design the system. This was done through Rapid Application Development methodology using various modelling tools like EDRAW to model the functionality of the system. The third objective was to construct or develop the system. This was achieved through using web technologies like JavaScript, HTML and CSS. Choosing web technologies and in particular phonegap made it possible to develop a cross platform mobile application that can run across the modern phone operating systems thus providing a consistent experience for the users of the system. The functional requirements of the system were met as proven by the various tests. In conclusion all the specific objectives were met and the developed mobile application was able to provide a solution to finding technicians at the ease and comfort of the user through their mobile devices.

System Constraints

Some of the constraints for the mobile applications include: first, the application relies on the internet to operate. Users are required to have internet access to use the

system. Secondly, the system can only operate on smartphone devices and cannot function of feature phones.

Some of the future enhancements that can be added to the system in the future versions include: allowing the customers to rate the technicians, including a google map extension that would help the users know the location where the technicians are based.

REFERENCES

Agrawal, M., & Gill, G. (2013). Mobile application development strategy at Vology1. *Journal of Information Technology Education: Discussion Cases*, 2, Case Number 13. Retrieved February 19, 2015 from <http://www.jite.org/documents/DCVol02/DCv02TOC.pdf>

Cha, S.-H., & Yun, Y. (2013). Smartphone Application Development using HTML5-based Cross-Platform Framework, *Vol. 7 No. 4*.

Delia, L., Galdamez, N., Thomas, P., Corbalan, L., & Pesado, P. (2015). Multi-platform mobile application development analysis. *IEEE Softw*, 0–5.

Gangundi, R. (2010). *Smartphone Application Development Using Cross Platform Frameworks*.

Garry B. Shelly, & Rosenblatt, H. J. (2012). *Systems Analysis and Design Ninth Edition*

Future Enhancements and Recommendations

(9th ed.). Retrieved from www.cengage.com/ct/shellycashman

Hartmann, G., Stead, G., & DeGani, A. (2011). *Cross-Platform Mobile Development*.

Huynh, M., & Ghimire, P. (2015). Learning by Doing: How to Develop a Cross-Platform Web App, 14. Retrieved from <http://www.jite.org/documents/Vol14/JITEv14IIPp145-169Huynh1842.pdf>

Lutes, K. (2012). Cross-platform mobile app software development in the curriculum. *Journal of Issues in Informing Science and Information Technology (IISIT)*, 9, 115–124.

Salonen, J. (2016). *Booking method and system*. Google Patents. Retrieved from <https://www.google.com/patents/US9313161>