

Exploring User-Driven Telephony Services in an Information and Communication Technology for Development Context

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Abstract - It is evident that Information and Communication Technology (ICT) is widely used in rural communities. Today we easily get connected and communicate with the rest of the world through communication technologies such as the Internet and telephones. An Interactive Voice Response (IVR) system is one of the tools which are used by small and large organizations for communication purposes. This system helps clients of the organization to acquire information without physically visiting the organization. The goal of this research is to develop a framework with IVR components which will allow one to develop an IVR system.

Index Terms – Government, ICT developments, IVR system and rural communities.

I. INTRODUCTION

An Interactive Voice Response (IVR) system is a technology that manages voice calls from telephone caller using a computer system [1]. The caller invokes the system by dialing a number (e.g. an extension), and then the system responds to the caller by a pre-recorded voice describing menu options and further gives directions to the caller. The caller is then expected to choose an option by pressing a button that is associated with the voice prompt [2]. The figure 1 shows how the IVR system works.

IVR system is a technology that is widely used by telecommunication companies and other organizations for communication purpose to collect and acquire information. Organizations which have deployed an IVR system find it very useful, cost-effective and time saving [3].

II. THE RESEARCH LOCATION

Dwesa-Cwebe community is situated at the wild coast of former homeland of Transkei in Eastern Cape of South Africa. Dwesa and Cwebe are two different areas, though they are collectively known as Dwesa-Cwebe. These rural areas are separated by the Mbashe River and fall under Mbashe

municipality which belongs to the Amathole region based in East London [4].

III. RESEARCH CONTEXT

The problem that is addressed by this research is the lack of information and communication technology developments in rural communities such Dwesa-Cwebe. This research will form part of the on-going ICT developments infrastructures in Dwesa-Cwebe community which belongs under the umbrella of the Siyakhula Living Lab (SLL) project [4] [5]. Under this umbrella, there are other ICTs platforms which are already deployed and implemented in this community. These platforms include e- Government, e-Commerce and a complete running network. There are other projects which are on pipe-line, undertaken within the SLL project (i.e. e-health, e-Judiciary and reward based module for an e-commerce platform). These platforms are web-based services; therefore there is a need to develop an audio-based application to facilitate the ICT infrastructure within the SLL project.

The main aim of the research is to develop a framework for users in marginalized communities to be able to create audio (in this case IVR-based) services. To this end various compatible IVR components will be developed. These components will provide flexibility, allowing one to develop a complete IVR system for his purpose. These components will be reliable, available and easy to use. In addition, the system will also be useful even to the disadvantageous community members who are computer illiterate to access information telephonically.

IV. METHODOLOGY AND DESIGN

This section briefly describes the possible way in which this research can be conducted and also discusses the system tools. These tools are Asterisk, SIP protocol, extensions or asterisk gateway interface (AGI) script and IP phones. Asterisk software is widely implemented in Private Branch Exchange (PBX) environment. It provides a service which includes voice features such as conference calling, voice mail and IVR (voice prompts).

Session Internet Protocol (SIP) protocol is used for communication between IP phones and the Asterisk PBX.

In designing the dial plans for the IVR system, the author intends using extensions or asterisk gateway scripts (AGI). These tools will provide information to Asterisk on how to handle each and every call that will take place in the system.

V. IVR SERVICES

An IVR system offers important features such as capturing the touch-tone or voice responses by caller and different responses to the caller based on the events that occurs in real time [7].

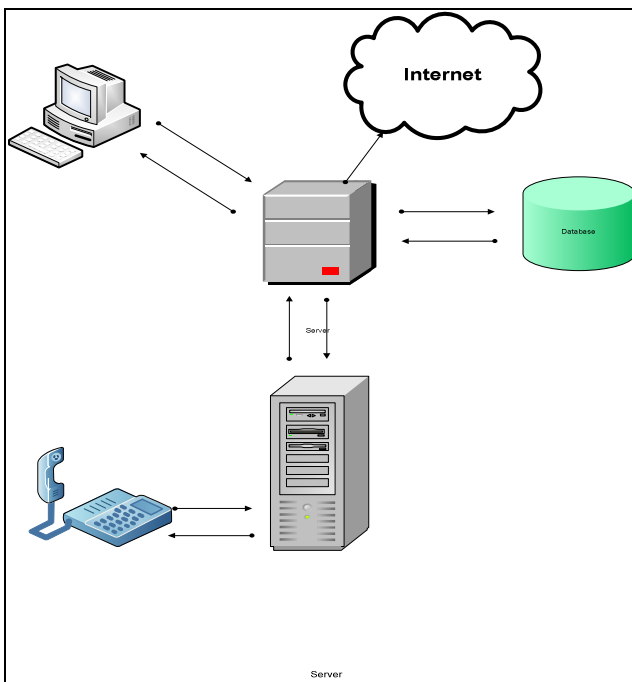


Figure 1

The figure above shows the architect of the IVR system. The IVR system provides special ability to interact with various systems in collecting and presenting information back to the caller [7]. This system has also ability to allow one to access information same as web browser using speech recognition technology [7].

VI. WORK DONE AND FUTURE WORK

The work done so far by the author is literature review of an audio based service (i.e. IVR). The author is currently setting up the machine that will provide the platform for the development of this framework. An installation and the configurations of Asterisk has already commence and the author is current exploring and familiarizing himself with

the relevant tools and technologies.

VII. CONCLUSION

The ICT developing infrastructures which undertaken within the SLL project are improving the disadvantageous Dweas-Cwebe rural community of South Africa. This rural community is experiencing a lack of ICTs infrastructures therefore, the SLL project is contributing to combact the lack of the ICTs infrudtructures in at this rural community. The SLL is targeting to make these ICTs infrastructures to be always available and be affordable to the rural communities.

After a completion of an IVR system, Dwesa community will be able to access information and develop their IVR systems at low or no cost.

VIII. REFERENCES

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