

Cost Sharing and Revenue Management System: Siyakhula Living Lab (SLL) Case Study

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Abstract-The services provided by the use of dynamic Information and Communication Technology tools have influenced the lives of people in various ways. These include better communication platforms such as the Internet where services like e-learning, ecommerce and e-banking amongst others are done.

The majority of the rural communities remain digitally marginalized. The advent of wireless technologies such as VSAT, WiMAX and WiFi has brought hope for the extension of digital life to the marginalized communities. A lot of financial resources are being channelled towards the setting up of satellite ICT4D projects as they set a favorable starting point for the provision of other developmental initiatives. The capital ensured by the sponsors in the developmental stages of ICT4D projects intensifies the move by many to embrace the projects. However, when these projects have been completed the ownership is transferred to the targeted users. The shortage of resources in these areas has led to projects failure. This paper describes the conceptual design of a cost sharing and revenue management system for the Siyakhula Living Lab to help manage and generate revenue for its sustainability.

Index terms: Cost sharing, Billing schemes, Revenue Management, Sustainability.

I. INTRODUCTION

The Siyakhula Living Lab, distributed multipurpose ICT application centre is currently at a developmental stage, drawing its technical and financial support from Telkom Centre of Excellence in Developmental E-commerce at the University of Fort Hare in partnership with Rhodes University [1]. The four year period of research by students from the above named universities has yielded services such as e-government, e-commerce, e-health, computer literacy training-learning, printing, internet services and VOIP. This service platform rests on an infrastructure of wireless technologies such as VSAT, for backhaul link to the Internet and WiMAX for local loop backbone connecting four schools, and there is a project underway that seeks to deploy WiFi hotspots to each school [1].

The Siyakhula Living Lab is operating with support from the local community and the student researchers from the aforementioned universities. The capital and operational cost have so far been handled by the sponsors, a gesture that has influenced the sprouting of other such projects across marginalized parts of South Africa [2]. These ICT4D projects are perceived as development enablers with potential to alleviate poverty [5]. Members of communities where such projects are undertaken are encouraged to take an active role during and after the development of the projects as they are the eventual owners of the projects. It is the community that has to carry the operational cost of the project so as to keep it running. Since the main problem faced by rural communities is low income, the project might face some potential problems like failing to pay for Internet and electricity bills. Therefore, proactive measures to counter such setbacks must be put in place for the sustainability of the SLL. This project seeks to develop and deploy a system to manage such potential threats to the SLL.

II. BACKGROUND INFORMATION AND RELATED WORK

This project is a continuation of a revenue management system project, which was developed by one of the student researchers in 2007, but was not deployed [2]. The existing revenue system was developed using Open Source software such as a RADIUS server, Chillispot, Phpmyprepaid and Hotcakes. Open source software was used because it is freely available and cheap to maintain.

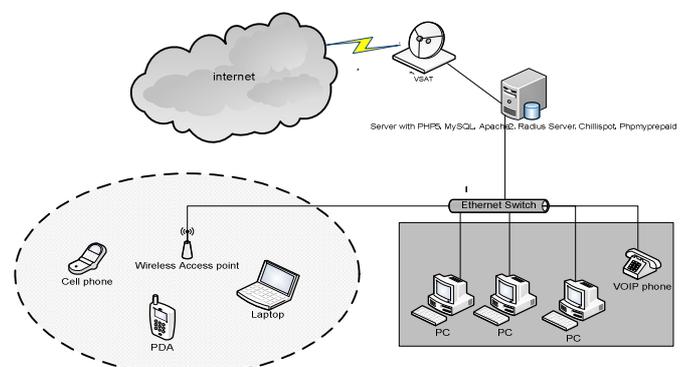


Figure 1: Revenue Management Network Architecture. Adapted from [2]

Figure 1 above shows the current network setup for the revenue management system. The server contains the accounting and billing modules. When system users try

to connect to the network, either through wired connection or wireless, they are redirected to the login page to capture their login credentials. Chillispot, the captive portal, takes care of that. The credentials are checked against the database in the server before permission to the network is granted. In the event that the user exists, then permission is granted, else denied [2, 5].

III. SYSTEM DEVELOPMENT

Payment for resources is not necessarily fair when it is based on resource usage, different contexts and communities have differing notions of fairness. In the context of SLL with its diverse social and economic limitations, modularized cost management system with pluggable billing module interface will be developed. This will involve the inclusion of the user profiles in the system to capture relevant information, as depicted in the diagram below, so as to determine what is fair to use to bill the users of the network system [7].

Firstly the existing revenue management project will be deployed on the SLL site. This will be followed by development of aforesaid pluggable billing modules with various billing matrices so as to add flexibility to the billing system.

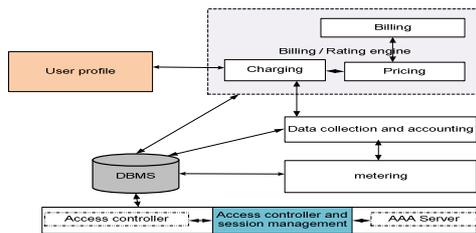


Figure 2: Depicts an Example of Billing System Architecture. Adapted from [6].

The system will cater for cases like peoples' income, number of dependants, livestock, and level of education amongst others. For instance if a father of four, surfs the internet for thirty minutes while earning a thousand Rand per month, then he will be charged less than someone with one child and earns five thousand Rand per month for the same period on the network. This ensures that people with little resources feel included in the system. This is not restricted to internet surfing, as it might seem, but to other services such as doing business on the network platform. For instance, if someone uses the network for marketing and selling the products online then that person stands a chance of being charged less than those that choose to do their business through other methods.

IV. WORK DONE AND FUTURE WORK

The relevant hardware and software requirements have been identified. A survey into various billing schemes will be conducted so as to build a system that is flexible

enough to add different metrics and to incorporate those different matrices into developing new billing schemes. This will be done after the deployment of the existing revenue management system on the SLL site.

V. CONCLUSION

This paper explained the steps that the researcher will follow to develop and deploy a cost sharing and revenue management system for the SLL. It highlights the need for the management of the network revenue generated. A brief overview of relevant technology to be used is given together with a brief description of the system. Lastly, it covered work done so far and the future work.

VI. REFERENCES

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VII. BIBLIOGRAPHY

Sikhumbuzo Ngwenya is a first year masters student at the university of Fort hare. He holds an honours degree in computer science and a bachelors degree in mathematics and computer science. His research interests are His research interests are Networking, Knowledge Systems, Web Computing and ICT4D projects.