Improvement of Farmers Market Information System to Connect with Some Social Stakeholders

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1 Introduction

Large portion of population in Tanzania live in rural areas and depend on crop farming as primary economic activity. Due to lack of market information, most of the farmers sell their crops to middlemen at exploited prices as a result they do not get enough profits. Technological solutions are needed to solve this problem.

Several mobile operators in Tanzania established USSD (Unstructured Supplementary Service Data) services (e.g., TIGO KILIMO [1]) to provide farmers with information about market prices of crops and connection to crop buyers through mobile phones. However these solutions are faced with several challenges including difficulty of using for rural illiterate farmers due to menu navigations and timeouts. Also they are not suitable for crop buyers who prefer Web service. Also little is known about effectiveness of mobile solutions in improving farmers' income in Tanzania.

In order to overcome challenges of USSD we propose the system in which farmers use SMS (Short Message Service) and buyers use SMS or Web to access market information.

In our previous work [2], we developed Web and mobile based system in which farmers request market price of crop through SMS and the system automatically replies farmers with price through SMS. This was the only core function.

In this paper we add system functions to connect farmers with buyers. Farmers use SMS to post crops for sale and access buyers' details. Buyers use SMS or Web to post buying requests and access farmers' crops for sale.

2 Developed System

Methodology: Firstly Questionnaire survey was conducted among stakeholders in Tanzania to collect user requirements for the system and then the system was developed by using Waterfall software development model.

System features: Required features by users include system availability, security and short response time.

System concept: Farmers use SMS and buyers use SMS or Web to request market information from the system. The system authenticates farmers and buyers and responds to their requests within short time.

System design: System was designed using 3-Tier architecture (Fig. 1). Stored procedures in MySQL together with OZEKI NG SMS GATEWAY [3], authenticate mobile users and automatically reply their requests through SMS. This ensures security, availability and short response time.

New functions: Farmers can post crops for sale (e.g., quantity, crop location and phone number) and request crop buyer details through SMS. System automatically replies farmer with SMS containing buyer details within short time (refer to Fig.2). The mean response time is 5 seconds.

Buyers use SMS or Web to request crops for sale and post buying requests. Web buyers can filter crops for sale by date posted, quantity and location. Web system uses Google Maps to show driving distance and time of crops for sale.
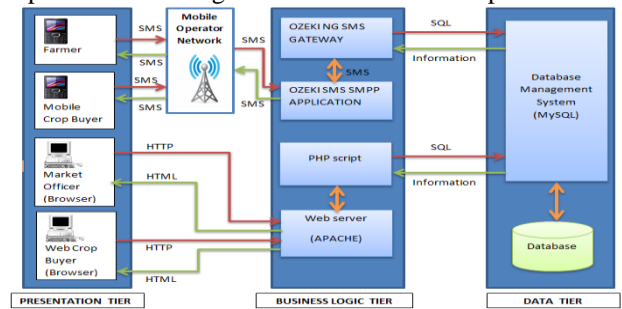

Fig. 1: System design based on 3-Tier architecture

Fig. 2: Farmer requesting crop buyer details.

3 Conclusion

We have finished system development. Farmers can access details of crop buyers within short time and be able to sell crops without middlemen and hence get improved income. Next step is deploying the system to farmers in Tanzania and evaluate its effectiveness in improving farmers' income.

Survey will be conducted in Tanzania to evaluate system usability. Experiments will be conducted to compare profits of farmers who use the system and those who don't use it. Finally data will be analyzed to determine if the system is effective in helping farmers get improved income.

References

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