



An Agricultural Product E-Business System: Case of Khat E-business in Kenya

Solomon Mwanjele MWAGHA, Hilda Kangai Ntong' Ondu

Abstract—With the consistent increase in level of economic constrains which was as a result of the rapidly increasing travelling costs in Kenya among others, businessmen are eager to come up with various ways to curb financial problems. The night travel ban had really caused a tactic problem to business men in Kenya. People used to travel during the night, perform their activities during the day and go back again over night. The development of (Agribusiness Products E-businesses System) APEBS enabled the Miraa business agents to carry out their business activities effectively and efficiently any time regardless of the rules implemented in the country. The study was approached through the following methods: requirements definition, selection of vendors, demonstrations and reviews, Implementation of the system, users and technical staff training, establishment of support processes and system maintenance. The study resulted to a web application linked to a database for data storage and processing. The product management system and the data security system for the e-business portal were developed in selected web programming languages. These involved PHP, HTML, CSS, JavaScript and JQuery. In order to build the product, merchant and customer database, the researcher used Wamp Server with the MySQL Database Manager package. The APEBS application has a public view where members were able to access information about business agents, different types of the product and their availability in a central database. Clients could also order products online, make payments using PayPal, and receive feedback via email. The APEBS also has a private view for use by administrators who were responsible for updating the records of the members, generating account reports and maintaining the system as a whole.

Keywords— e-business, agribusiness, Khat, miraa, e-commerce

I. INTRODUCTION

Khat is a herbal product consisting of leaves and shoots of the shrub *Catha edulis* [4]. It is cultivated primarily in East Africa and the Arabian Peninsula, harvested and then chewed to obtain a stimulant effect. As a medicine, khat leaf is used for depression, fatigue, obesity, stomach ulcers, and male infertility. It is also used to lower the need for food and sleep,

decrease sexual desires, and increase aggression. The World Health Organization (WHO) lists khat as a drug that creates “dependence” in people, meaning it produces a continuing desire to keep using it [12]. In Kenya the local name for Khat is Miraa which is a major economic activity that boosts the economy of Meru County and the country at large. This led to their improved standards of living. However, selling and buying of miraa had really been a problem to the individuals involved. Problems arise due to differences in geographical locations which affected the travelling costs, time and also labour. The clients had to travel all along or send their representatives to Meru to purchase or survey the different types of miraa available. This proved to be a hard and tiresome business. Besides, it was very costly. This study sought to know the methods and e-business used in miraa agricultural businesses, the impact of e-businesses application to miraa businessmen and the acceptance of APEBS to users. Besides, the other question to be answered was whether performance of the developed e-business could be evaluated in relation to the currently used systems in miraa business. The main aims of carrying out this research was to come up with an application (APEBS) that improved on miraa sales, offered better services to customers and maintained their loyalty and satisfaction. Other objectives included: investigating methods and e-business applications which were currently being used in miraa agricultural businesses, developing an e-business application to improve the existing methods and systems currently being used in miraa businesses, testing the usability of the e-business system and evaluating the performance of the APEB

II. LITERATURE REVIEW

Miraa is a large green shrub that grows at high altitudes in the region extending from eastern to southern Africa, as well as on the Arabian Peninsula. Originating from Ethiopia. Miraa now also grows in Somalia, Kenya, Malawi, Uganda, Tanzania, the Congo, Zambia, Zimbabwe, Afghanistan, Yemen and Madagascar. Miraa goes by numerous names [1]. (Including: khat, qat, chat, qaadka, kusessalalin, tohai, tschat, Abyssinian, African tea, African salad and brown cows). International trade in khat has grown steadily since the early 1990s, following the flows of East African and Yemeni diaspora communities around the globe. Farmers in Ethiopia [6] and Kenya [7] earn more growing khat for export than they would from other cash crops, while the trade provides employment and often substantial rewards for many along national and transitional trade networks [3]. In 2010, Her Majesty's Revenue and Customs (HMRC) [20] established the import value of fresh

miraa originating from Kenya to be \$35.000 per box (5.5kg), fresh khat originating from Ethiopia to be \$35.00 per box(9kg),and dried khat originating from Ethiopia/Yemen to be \$40.00 per box(9kg) [20]. Miraa business is facing a lot of problems in different countries. The United Kingdom's decision to ban importation of khat has elicited strong condemnation from farmers and traders especially in Meru County [8]. The chain of distribution for Miraa is lengthy. It starts with the real Miraa farmers who own the land on which they have planted Miraa trees. With time the farmer runs out of money before the lease expires and goes to the same or new middlemen for more money against extension of the lease or new lease above the existing one. Current e-business models that can work for miraa business include: Business-To-consumer (B2C) which is the direct sale of products through electronic storefronts or electronic malls, usually designed around an electronic catalog format and/or auctions. The concept of retailing and e-tailing implies the sale of goods and/or services to individual customers [18]. Consumer-To-Consumer (C2C) involves business with no middle business people. The most notable examples are Web-based auction and classifieds sites. Most large venues for such models (for example, eBay and Classifieds2000) are quickly permeated by consumers who participate so actively and regularly that they become small businesses for them

III. METHODOLOGY

The research was based on Igembe constituency which is the prominent miraa growing constituency in the county. Participants in the study were recruited by dividing the community into different groups considering several issues .These include: Khat users and non khat users, men and women, different age groups (but no one under the age of sixteen), People with various places of birth (in Meru) and 'clan affiliations'; and People included in the import or selling of khat. Thus, the approach to sampling was a purposive one. The chosen method of recruitment to the study was the most suitable for the purpose of achieving a substantial number of interviewees from different sections of the population. Primary data sources of data included questionnaires, Interviews and Observations whereas secondary sources included the Internet and books. There were three main strands of data collection in this research: The completion of in-depth interviews by the mentioned groups, structured questionnaire and Focus groups with the PAIs (Privileged Access Interviewer) at the beginning and conclusion of fieldwork. Data obtained from the questionnaires and the interview schedules was organized, analysed, coded and presented using descriptive statistics including frequency tables, percentages and charts. The best tool employed for the analysis of the collected data was MS Excel, this was because the data mostly involved numerical data of which excel is qualified to perform all calculations and at the same time present the data in different type of representation that can be easily understood i.e. pie charts, Bar Graphs, line graphs.

A. System Design

The researcher adopted the data flow diagram (DFD) to represent the flow of data through the system. With the preliminary step used to create an overview of the system, DFD clearly elaborates the system. DFD do visualize the data processing that is, it showed what kinds of input and output from the system. compliance to electronic requirements that facilitate the concurrent or later production of electronic products. Margins, column widths, line spacing, and type styles are built-in; examples of the type styles are provided throughout this document and are identified in italic type, within parentheses, following the example. Some components, such as multi-leveled equations, graphics, and tables are not prescribed, although the various table text styles are provided. The formatter will need to create these components, incorporating the applicable criteria that follow.

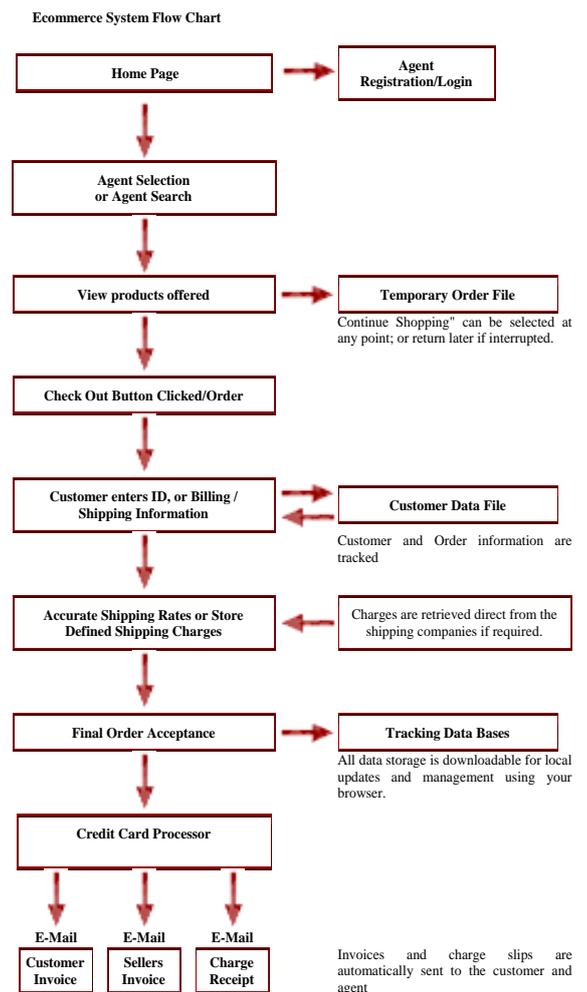


Figure 1: E-commerce Flow Chart

The product management system and the data security system for the e-business portal were developed in selected web programming languages. These involved PHP, HTML, CSS, JavaScript and JQuery. The website was coded in PHP as it provided excellent connectivity to databases and was a very

versatile language. In order to build the product, merchant and customer database, the researcher used Wamp Server with the MySQL Database Manager package.

B. Assumptions

In this research, several assumptions were made. These included: The interviewees provided correct and accurate information, the authorities in charge allowed permission to collect required data, due to the use of prototyping model, it was assumed that the users cooperated in examining the system; the selected study sample gave the appropriate representation of the county in terms of the miraa sales made and any other information needed.

C. Limitations of the Study Methodology

A first limitation involved the nature of trust. A specific usability aspect might have a great influence on trust on one person, while having a limited influence on another person. Due to privacy issues, conducting a direct customer approach was difficult or even impossible. Second, as some e-business Web sites contain hundreds (or even thousands) of Web pages, it was impossible to investigate all single pages. Another challenge was designing system for a developing county. Since this project was directed towards Meru, a developing country, one realized that the users were not as computer literate as one might expect. This was a problem since they were the end users of the project. This was also a problem when designing the content management system since the people responsible for updating the web portal had minimal computer education background. Thus, the content management system was designed in such a way that it required minimal human intervention. The database held the banking information of the buyer and the seller. This meant that security was an issue since data should not be sent to unintended recipients or accessed by unauthorized users.

IV. RESULTS

The community members were asked the methods implemented in miraa business. Of the total respondents the highest percentage was 25% who indicated that direct selling and buying from the farm was the most implemented. 45% supported buying from agents and 30% claimed that selling and buying in the market place was being implemented. None of them used online buying and selling before.



Figure 1: various methods used by miraa business people.

The results showed that most people supported the development of the proposed system. Therefore, the researcher was motivated to start up with the system development.

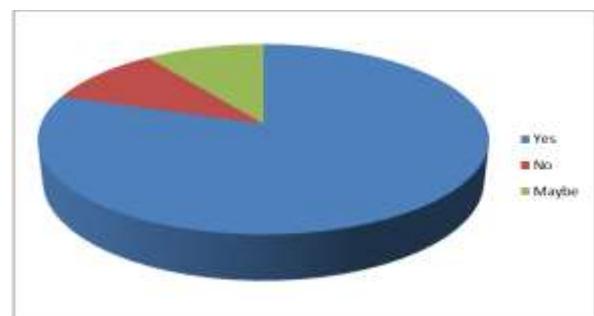


Figure 1: Views of respondents concerning the impacts of the proposed system

Several respondents gave their views concerning the use of electronic payments.

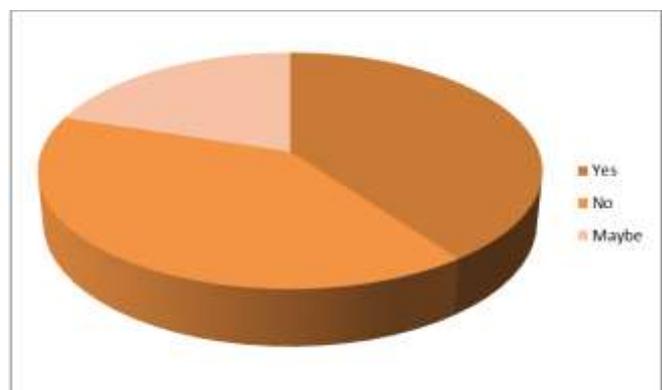


Figure 1: Respondents trust on electronic payments

Generally, the results obtained from both interviews and questionnaires showed that there was a need and full support for the development of the proposed system.

Database Schema

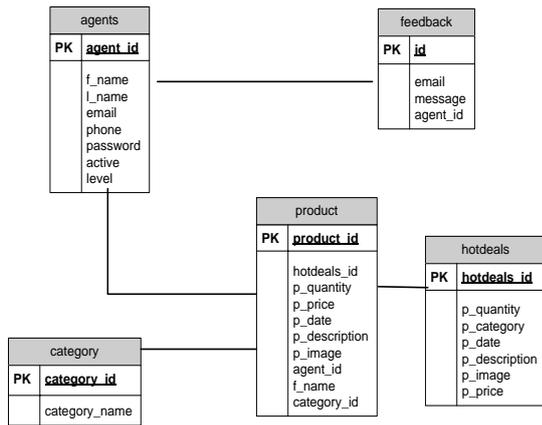


Figure 1: Database schema

Use Case Diagram

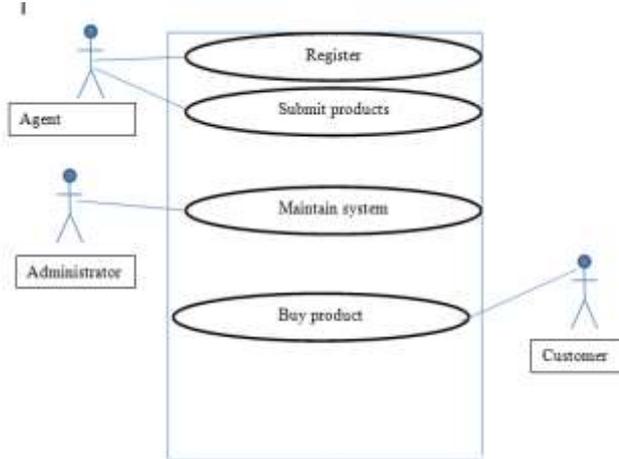


Figure 1: Use case Diagram

System Architecture Design

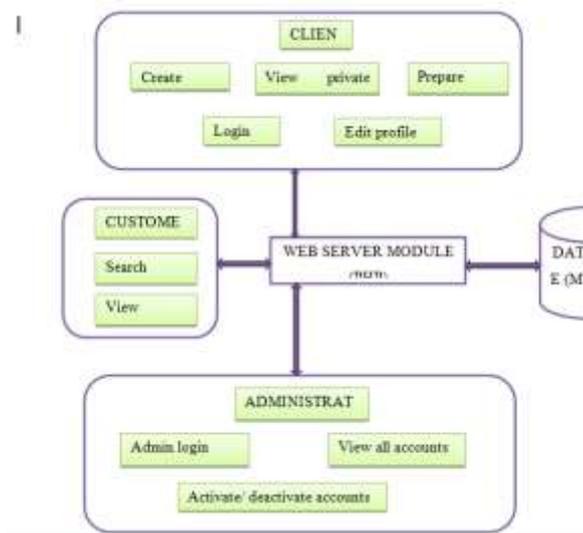


Figure 1: System architecture Design

A. Evaluation of the Application

On the system output, 30 users among the 50 users involved accepted the accuracy of the system and 19 of them were excellently satisfied by its accuracy .A 90 per cent of users were satisfied by the completeness of the system. They proved that the system was simple and easy to use. 40 out of 50 users were satisfied by the instruction clarity of the user interface of the system. Similarly, 99 per cent of users were satisfied by its message quality, appropriateness, message clarity, ease of use and also they positively commended its error prevention.2 per cent of the users involved were not satisfied with the system’s user interface. Besides, 98 per cent of the users involved commended the short training time needed to make the user conversant with the system. This was due to the simplicity and effectiveness of the system.

SYSTEM OUTPUT		Unsatisfactory	Acceptable	Excellent
1	Accuracy	1	30	19
2	Completeness	0	30	19
3	Ease of use	0	24	25
4	Timeliness	5	35	9
USER INTERFACE				
5	Instruction clarity	2	40	7
6	Message quality	2	43	4
7	Appropriateness	0	19	30
8	Message clarity	2	20	28
9	Ease of use	0	29	21
10	Error prevention	0	5	45
TRAINING				
16	Completeness	0	40	10
17	Appropriateness	0	15	35
18	Schedule	0	46	4

Table 1: Evaluation Results

V.CONCLUSION AND RECOMMENDATIONS

On researcher’s view, Implementation of APEBS was very profitable to Meru County, Kenya as a whole and to other great miraa users across the world. Further, it was economical to Miraa customers in cutting down travelling cost, labour and time. On its implementation, they had not to travel or employ agents to source for the product; exposed people to the global world through frequent use of the internet which might enable them learn better methods of production, new marketing trends, new customers and their location leading to increased business, created job opportunities to computer literate individuals. Many ICT training centres were mushrooming all over the country, and many people had been taught basic computer skills but not all could be absorbed by the existed industries and companies, and out of the database created, generation of reports was not a tedious process anymore as the system produced reports as desired by the user. It is recommended that further research should be done to improve such a system, especially by integrating better and more stable ways of connecting with interviewees.

REFERENCE

- [1] Sawair F.A., Al-Mutwakel A. Al-Eryani K., Al-Surhy A., Maruyama S., Cheng J., Al-Sharabi A., Saku T. (2007) High relative frequency of oral squamous cell carcinoma in Yemen: Qat and tobacco chewing as its aetiological background. *International Journal of Environmental Health Research* 17(3): 185 – 195.
- [2] Stevenson M., Fitzgerald J. & Banwell, C. (1993) An assessment of the health and social effects of khat consumption in the Australian community, particularly ethnic communities from the horn of Africa. Report to the Commonwealth Department of Health and Human Services. University of Melbourne.
- [3] Stevenson M., Fitzgerald J. & Banwell, C. (1996) Chewing as a Social Act: Cultural Displacement and Khat Consumption in the East African Communities of Melbourne. *Drug and Alcohol Review* 15: 73-82.
- [4] Anderson, Margaret McLennan; 2010, D., Beckerleg S., Hailu, D., Klein A. (2007) *The Khat controversy: stimulating the debate on drugs*. Berg: Oxford.
- [5] Kennedy, J.G. Teague, J., Rokaw W., & Cooney, E., (1983) A medical evaluation of the use of qat in North Yemen. *Social Science & Medicine*, 17(12): 783-793.
- [6] Gebissa, E. (2008) Scourge of life or an economic lifeline? Public discourses on khat (*Catha edulis*) in Ethiopia. *Substance Use & Misuse*. Special Issue: Khat: Use, users and unresolved issues. 43(6): 784-802.
- [7] Carrier, N. (2005a) The need for speed: contrasting timeframes in the social life of Kenyan miraa. *Africa* 75(4): 539-558.
- [8] Carrier, N. (2005b) "Miraa is cool": the cultural importance of miraa (khat) for Tigania and Igembe youth in Kenya. *Journal of African Cultural Studies* 17(2): 201-218.
- [9] Carrier, N.L. (2008) Is Miraa a Drug?: Categorizing Kenyan Khat. *Substance Use & Misuse*, 43(6): 803-818.
- [10] Numan N. Exploration of adverse psychological symptoms in Yemeni khat users by the Symptoms Checklist-90 (SCL-90). *Addiction* 2004;99:61-65.
- [11] Nencini P, Ahmed AM, Elmi AS. Subjective effects of khat chewing in humans. *Drug Alcohol Depend* 1983;18:97-105.
- [12] Nencini P, Ahmed AM, Amiconi G, Elmi AS. Tolerance develops to sympathetic effects of khat in humans. *Pharmacology* 1984;28:150-154.
- [13] Alem, A., Kebede, D. & Kullgren G. (1999) The prevalence and socio-demographic correlates of khat chewing in Butajira, Ethiopia. *Acta Psychiatrica Scandinavica*. 100 (S397): 84-91.
- [14] Nutt, D., King, L.A. Saulsbury, W., Blakemore, C. (2007) Development of a rational scale to assess the harm of drugs of potential misuse. *Lancet*, 369: 1047–53.
- [15] Advisory Council on the Misuse of Drugs (ACMD) UK Home office report on Khat.<http://drugs.homeoffice.gov.uk/publication-search/acmd/khat-report-2005/>Retrieved on 20-02-09.
- [16] The Australian Drug Foundation (ADF) and WebMD fact sheet (http://www.druginfo.adf.org.au/druginfo/fact_sheets/khat_sheets/khat.html)
- [17] Stevenson M., Fitzgerald J. & Banwell, C. (1996) Chewing as a Social Act: Cultural Displacement and Khat Consumption in the East African Communities of Melbourne. *Drug and Alcohol Review* 15: 73-82.
- [18] Cassanelli, L. V. (1986), Turban et al., 2005 'Qat: Changes in the Production and Consumption of a Quasilegal Commodity in Northeast Africa'. In *The Social Life of Things: Commodities in Cultural Perspective*, Appadurai, A. (ed). Cambridge: Cambridge University Press.
- [19] E-Business – Technology and Networks by Teodora Bakardjieva Prof. Dr., Varna Free University.
- [20] HMRC Accounts 2009-2010: Her Majesty's Revenue and Customs, 20 July 2010, retrieved 18 December 2010