User Experience of Mobile Business Support Services for Rural Micro and Small Enterprises

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Abstract—*The penetration of mobile phones and technologies in developing countries has led to innovative developments of various mobile solutions. Rural micro and small enterprises find themselves in the midst of such developmental mobile initiatives and have shown to overcome many barriers. This potential however is contrasted by studies that show relative high dropout rate and non-use. Frustration with mobile technologies interaction is a major obstacle for effective use. The ease of use implies that both the service interaction and the user interface are properly designed. Providing usable mobile services is more complex: even though the ease of use is one important, it is not enough. Other aspects such as behavioural, social and emotional aspects of the users need to be taken into consideration. Hence this paper explores the power of user experience and explores how micro and small enterprises use mobile services. We further identify the missing gaps and propose a mobi-incubation solution for rural micro and small enterprises.*

1. Introduction

The potential and perceived benefits regarding innovative mobile phone usage for social and economic development is becoming enormous [1]. Many perceive mobile connectivity as a tool that helps to offset a lack of resources particularly in the developing countries by providing access to a range of services hence spurring development [2]. In rural areas in developing countries like South Africa, enthusiasm for Mobile for Development (M4D) has come in waves [3], many agree that mobile technology offer micro and small enterprises opportunities to deepen interactions with existing customers, replace travel, improve market information flows and productivity as well as increase Gross Domestic Product (GDP) [1, 4].

In South Africa, micro and small enterprises are estimated to account for approximately 38% of production and 71% of jobs [5, 6]. However, a recent Global Entrepreneurship Monitor (GEM) report indicates that South Africa is struggling in entrepreneurship. The GEM report further shows a drop

of 40% in the number of start-ups in 2009 as compared to 2008. Moreover, there is lack of entrepreneurial activity in rural areas as compared to urban areas [7]. Most reports consistently show this sector face a dichotomy of challenges including, a low level of overall training and education, lack of access to finance due to a difficult regulatory environment, infrastructural inadequacies, a lack of active markets and the lack of access phenomenon [1, 7, 8].

In an attempt to curb these problems several Information Technology for Development (ICT4D) innovative solutions have been proposed. Lately most solutions revolve around the mobile for development (M4D) solutions. This paper focuses on mobile business support services. Mobile business support services in this case refer to data and functionality that also has representation online, and may be available on a mobile device–referred to as a native application. The main purpose of these services is to support business activities [9]. The users of these services include micro and small enterprises (MSEs). It is important to note that the success and sustainability of these services is dependent on the end users. When users can use mobile services, it means that the services are easy to use. This brings us to user experience (also referred to as UX). Many researchers have identified that UX is essential for any product's success [10-12]. They also noted that UX has some challenges. The first challenge is user experience itself. Over the last decade, the study of user experience has increased explosively. It has been studied by psychologists, sociologists and philosophers. The irony is that researchers have not come to a consensus to what UX can be defined as [13].

This paper applied an explorative research methodology whereby we adopted inductive logic to study relevant literature available with an aim of describing and identifying the missing gaps in MSEs and UX, thereafter we proposed a mobi-Incubation solution for rural micro and small enterprises.

This paper starts off by discussing user experience and draws an understanding of mobile user experience (MUX). It then exemplifies how MSEs use mobile business support services, while identifying the current gaps in these services and MSEs challenges. Lastly it proposes a mobi-Incubation framework for rural micro and small enterprises and highlights the design implications to be considered when designing such solution.

2. User Experience

The goal of Human Computer Interaction (HCI) research has been the development of effective and efficient interactive products [10]. Many researchers focused on well known and widely accepted quality measures of products in task oriented settings with usability and utility emphasising the interactive product's ability to satisfy users' goals with ease. However, HCI has grown to accommodate a new generation of interactive software and electronic products that has come into market; hence HCI now encompasses a whole study of human endeavour and activity [10]. As a result there

has been a growing interest in "design for user experience -going beyond usability and utility" [11].

Despite the huge interest in UX, it is still a vague concept and different researchers view and define it from very different perspectives ranging from traditional usability to beauty, hedonic, affective or experiential aspects of technology use [14, 15]. Most user experience definitions in literature agree that user's internal state affects the user experience, so user experience is personal [13].

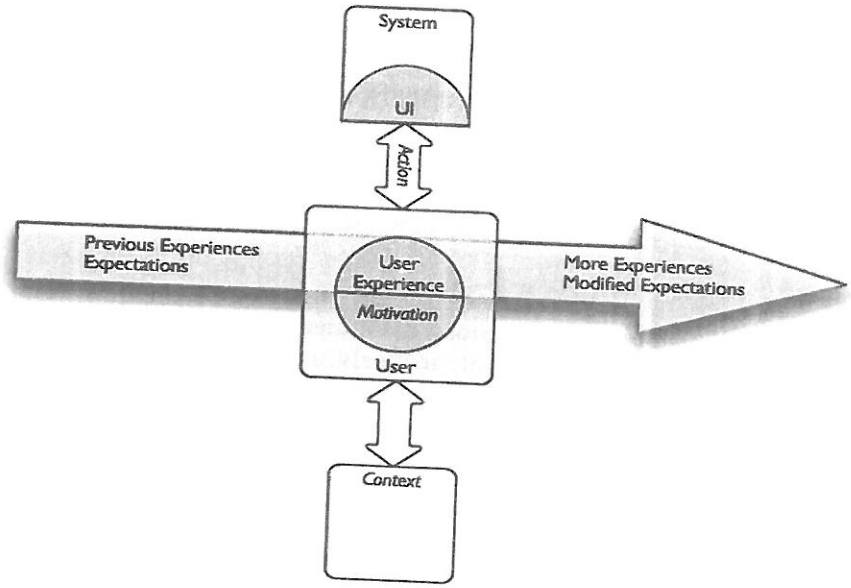

Fig. 1: The Personal Model of user Experience

Source: Wolfgang [16]

As can be seen in the figure1 above, the current user experience depends on the previous experiences, the user's motivation and the context of use while it influences the user's actions and the future experiences [17]. The user's previous experiences are then based on the expectations of how things work and their result are created [14]. This corresponds to the user's mental model and is present even before the interaction starts [18]. The whole interaction between the user and system happens in a dynamic context (for instance social, situational, locational etc) that influences and gets influenced by what the user does and experiences [13]. The user has a motivation, why the interaction must be initiated [18], and the goals that shall be reached by the actions. These actions are performed in an interaction with the user interface of the system, which manipulates the internal state of the system and influences the user's experience and cognitive process that develop the further plan of action [15, 19]. After this interaction, the user has gained impressions and then processes the experience, adding

them to the memories, adapting the future expectations, the mental model and the emotional attitude towards the system [18]. The natural personal view explains how user experience is shaped into the use over time and the highly subjective experience connected to the context [15]. From this discussion the authors mentioned described common factors that influence user experience being, user, content, and context. The questions remains how does one determine if there is a negative or positive user experience?

Roto [13] presents that a user gets negative experiences when the usage does not meet expectations. Positive experiences form when expectations are exceeded. User experiences are neutral when expectations are met but nor exceeded. In this paper we use the terms "negative" and "Positive" UX terms to refer to different user experience in relation to the user's expectations.

When it comes to mobile user experience, it brings forth added complications and dimensions due to the mobility of the interaction and the personal nature of the technology [19]. The following section examines the mobile user experience.

3. Mobile User Experience

Chittaro [20] cautions that if human computer interaction (HCI) aspects of mobile technologies are not properly addressed, users will not enthusiastically adopt mobile computing. This author further argues that mobile services will not be successful if we do not understand mobile users and design for their contexts.

Subramanya and Byung [21] focus their study in user experience on three dimensions namely device-related issues, communication-related issues and application related issues. Device-related issues deal with hardware features that would facilitate ease of use of the device and accessories. Communication-related issues focus on efforts to enrich interpersonal communication and application-related issues deal with mobile application interactions. The latter they identify as the most important layer and contributing directly to the user experience by compensating for underlying device and user constrains due to the mobility.

Botha et al. [22] explored the mobile user experience in a mlearning interaction and expanded Hassenzal and Tractinsky's components to include the following:

- *User:* the mobile user, mobile use;
- *System:* mobile device, mobile business practices, network affordances, mobile applications, mobile interaction;
- *Context:* mobile context

Having identified the factors that influence mobile user experience, the next section discusses mobile business support services and their users the MSES.

4. Mobile Business Support Services and MSEs

Shifting our focus to mobile business support services, these are data and functionality designed specifically for mobile use and can be accessed over a communication network. These services are aimed at assisting micro and small enterprises (MSEs) to run and manage their businesses. In most developing countries, MSEs constitute the vast majority of firms, generating a substantial share of both overall employment and output [7]. Given their significant economic role, one might expect MSE growth to drive overall increases in output and income levels [23, 24]. In many cases, however, their largest economic contribution appears to be one of maintaining—rather than generating new—employment and income for the poor [7, 23].

Most micro and small enterprises are informal, unproductive and they struggle to survive [7, 24]. Figure 2 below shows the phases in MSE development. GEM report by Mass and Herrington [23], shows that 75% of the start-up MSEs fail during the first 42 months of establishment.

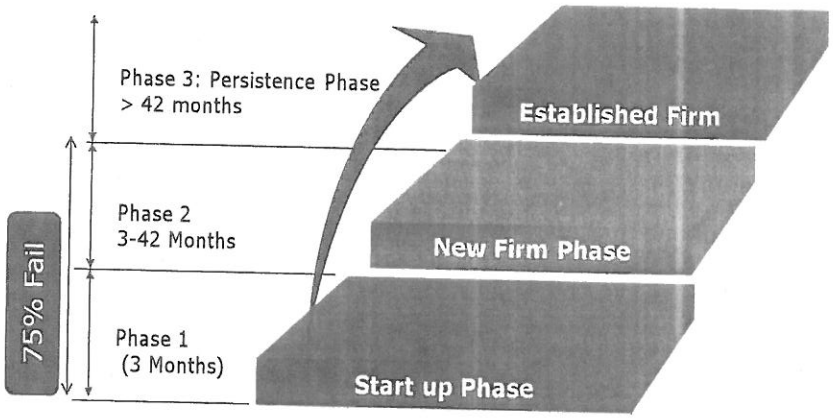

Fig. 2: Phases in MSE Development Interpretations of Mass and Herrington [23]

Most reports consistently show that the main issues facing contributing to MSE failure in South Africa are: a low level of overall training and education, lack of access to finance due to a difficult regulatory environment, infrastructural inadequacies, a lack of active markets and the lack of access phenomenon [1, 7, 8]. Nichter and Goldmark [25] grouped the challenges facing MSES into four broad categories: contextual factors related to the business environment, social or relational factors, firm characteristics, and individual entrepreneur characteristics. The funnel shape shown in figure 3 emphasizes that the factors range from broad (contextual) to narrow (related to the individual).

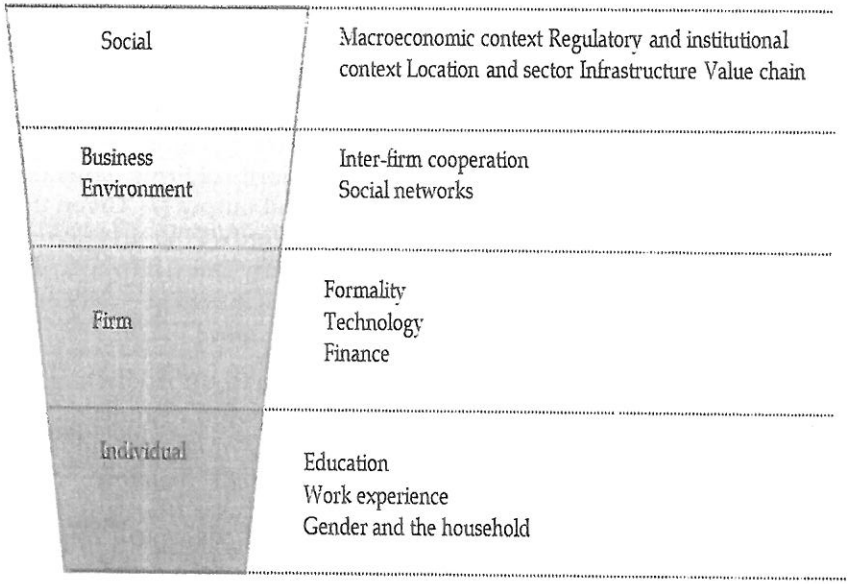

Fig. 3: Factors Affecting MSE Growth

Adapted from: Nichter and Goldmark [25]

Many researchers claim that the most common technology among MSE is the mobile phone [1, 2, 24, 26]. Recent studies indicate that MSEs in the developing world are using mobiles rather than landlines or other ICTs [1]. Of late, a small number of ventures (some by private companies, others by governments, or NGOs) have begun to explore what mobiles can do for farmers and MSEs, beyond voice calling and person-to-person SMS [2].

Donner and Escobari [27] reviewed mobile services for MSEs and found that there is relatively little evidence for the assertion that mobiles help people start new businesses. Only Samuel *et al.* [28] make this case, reporting that among a sample of MSEs in Egypt and South Africa, 26%-29% of businesses attributed their start to the availability of the mobile. Despite a dearth of new enterprises, the mobile is essential to the economic survival of those households [27]. Donner and Escobari further mapped the services to the value chain proposed by Porter [29], these authors found that one or two activities of the Porter's value chain. As such there is a gap in a sense that there are no mobile business support service(s) that enhance the nurturing process of micro and small enterprises by providing various business activities which assist them to grow. Therefore, there is a need to provide MSEs with appropriate services to nature hence increased sustainability and profitability.

The lack of mobile services that fully support the business activities brings forth a negative user experience. As such there is a need to investigate MSE needs in order to provide appropriate services which support their value chain. Furthermore, there is a gap in a sense that there are no known mobile business support service(s) that enhance the nurturing process of micro and small enterprises by providing various business activities which assist them to grow.

The crux of this paper is therefore motivated by the belief that the mobile phone has the potential to support business activities thus improving the sustainability of micro and small enterprises in developing countries. This idea however is dependent on the uptake of mobile business support services by MSE the end-users. New MSEs can take advantage of mobile business support services to grow and become successful.

5. Proposed Mobi-Incubation Solution

Many of the challenges discussed above are generic to South Africa, development in rural areas poses special challenges because of geographic isolation and sparse population [8, 30]. Local disadvantaged communities in rural locations lack access to entrepreneurship development [7], an issue that is recognised by many organisations and observers [23, 30, 31]. A recent study suggests that the evolution of peripheral rural regions within many development countries has been bleak and discouraging [32]. The report concluded that the main reason is the weak natural supply of entrepreneurs and firms. As a result of challenges inhibiting entrepreneurship government institutions, NGOs and private companies initiated the business incubation concept [30].

A business incubator may be defined as an organization that facilitates the process of creating successful new small business by providing them with a comprehensive and integrated range of services [33, 34]. They are geared towards stimulating a pipeline of entrepreneurs who would start businesses that would remain sustainable. In most cases business incubators are funded for a limited amount of time, and the incubator clients are aided for short periods of the incubator's lifetime. Services offered during the incubation may include specific types of office space, flexible lease terms, access to technology, financing, and technical assistance (such as marketing, legal, finance, HR, and other business development services) [34]. By providing entrepreneurs with these services, and enabling them to reduce their overhead costs by sharing facilities, business incubators are able to significantly improve the survival and growth prospects of new start-ups [33].

There are a number of incubation challenges unique to South Africa. Incubation theory designed for the developed industrial countries does not have the same application in South Africa [35]. The large geographical areas as one of the crucial differences and challenges to South Africa, individuals require access to support in remote and rural areas, but it is naturally not possible for Incubators to be established in each of these areas. In addition, a large proportion of the rural South African inhabitants have limited access

to education, live in poverty, and generally experience a low quality of life. Therefore, these communities provide a logical starting point for new innovative solutions. It is important to recognise that these disadvantaged rural communities have rather unique circumstances and characteristics, which are quite different from the average urban resident. However, as a result of the mindset of providing education programmes based on what's on offer, rather than what communities require, many business incubation programmes lack the capacity and skills to meet the training and development needs of the communities they service [35].

Having looked at the challenges that face micro and small enterprises and business incubation in rural context, this paper acknowledges that there is a need for using other technologies to facilitate the business incubation process. This study therefore explores the potential of using mobile phone as a tool to facilitate this process. The figure 4 demonstrates how mobile phones can be used to support micro and small enterprises in rural areas [36].

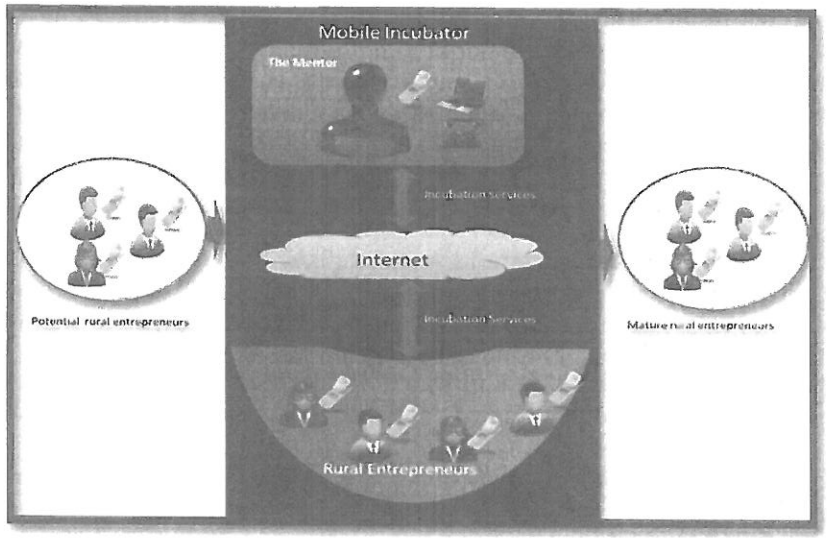

Fig. 4: The Concept of Mobi-Incubator

Source: Chelule *et al*, (2011)

Mobi-Incubation enables rural entrepreneurs to receive coaching and mentoring remotely via the internet, using a mobile phone which enables the mentoring, monitoring and guidance of entrepreneurs wherever they are located (Chelule *et al*, 2011). More importantly, the rural entrepreneurs are connected to a wide network of coaches and investors spreading the costs and exposing them to a wide range of expertise and experience. It is important to note that in this process a system needs to be developed to manage the mobi-Incubation process. This process requires careful attention to user experience elements. Hence the following section outlines the design implications to ensure positive user experience.

6. Design Implications

Based on these preliminary findings of exploratory study, we present the following set of design implications. These implications will be developed and iterated upon in the future.

- Micro and small enterprises require general business support services in order to assist them to smoothly run their business (Chelule et al 2011). These services may include an array of support such as entrepreneurial training and business development advice, as well as services concerning general business matters such as accounting, legal matters, advertising and financial assistance
- Micro and small enterprises often appeared to lack self-confidence to take individual initiative. Therefore Mentoring is necessary whereby will be coached and advised on various business related aspects such as investments, general support and life skills mentoring.
- Due to low education level it is necessary to provide technical support for rural entrepreneurs whenever needed.
- The mobi-Incubation solution should be easy, simplistic and culturally situated. The design should cater to illiterate, semi-literate and literate rural population
- The mobi-Incubation solution should facilitate sharing of knowledge between the micro and small enterprises.
- The mobi-Incubation solution should support synchronous as well as asynchronous modes of communication.

7. Future Work

This paper has presented the preliminary findings from an ongoing PhD study. The next phase of this study involves the development of the mobi-Incubation solution. This is a user experience study, we need to design and iteratively test mobi-Incubation solution that appropriately map the mental models of micro and small enterprises and take into consideration their diverse needs keeping in mind the low literacy levels and the context. We will further investigate the impact of the mobi-Incubation application with regards to UX. The primary goal of the research is to propose a user experience framework for mobi-Incubation in rural areas.

8. Conclusion

Rural micro and small enterprises play a vital role in the rural economy; they not only provide essential goods and services, but they also provide rural jobs. Most of these retailers are informal and they face array of challenges including: a low level of overall training and education, lack of access to finance due to a difficult regulatory environment, infrastructural inadequacies, a lack of active markets and the lack of access phenomenon. Many perceive mobile connectivity as a tool that

helps to offset a lack of resources particularly in the rural areas by providing access to a range of services hence spurring development. Rural population across the world is therefore considered a high potential emerging market. Mobile solutions potential however is contrasted by studies that show the relative high dropout rate and non-use. Frustration with mobile technology interactions is a major obstacle for the effective use. We propose that mobile technology be used during the business incubation process. To ensure sustainability of both micro and small enterprises and the growing economy, it is necessary to design and develop a mobi-Incubation application that aims to provide a seamless user experience in all aspects–content, context and user needs. Hopefully this will empower micro and small enterprises to build successful and sustainable business which will contribute to the economic growth of the country.

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