

# Mobile instant messaging – the “killer application” for e(m)government in Africa?

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**Abstract:** As a communications device, cell phones have changed the African landscape and are proliferating rapidly throughout the continent. As the devices become increasingly powerful and sophisticated, they open up new opportunities for services. Whilst most of these are commercial or entertainment-based in nature, there may be unique possibilities for mobile government-to-citizen type services. In South Africa a mobile instant messaging platform, MXit, is starting to overtake SMS-type textual interactions between young people. The Meraka Institute, as part of its MobilED initiative in South Africa, has developed a mobile tutoring application which uses the MXit service to provide mathematics support to learners. The service links learners to tutors via a text-based call centre-like interface. Although the focus of the project is on mobile learning, the potential is far-reaching across many different domains. This paper examines the possibilities for mobile instant messaging call centres as a mechanism to provide affordable and accessible government information to the youth in Africa.

**Keywords:** egovernment, mgovernment, mobile, mobile instant messaging, call centre, SMS, MXit, MobilED, government-to-citizen

## 1 . Introduction

The United Nations Secretary General, Kofi Annan, on World Telecommunications Day, May 17, 2004, told the world: “Today, many people could not imagine daily life without the use of increasingly sophisticated information and communication technologies (ICTs), from television and radio to the mobile telephone and the Internet. Yet for millions of people in the world's poorest countries, there remains a digital divide excluding them from the benefits of ICTs” [1].

Africa faces many practical problems in its race towards digital inclusion, such as a severe lack of infrastructure and resources. Most of the existing telecommunications infrastructure in Africa cannot reach the bulk of the population, with 50 percent of the available lines concentrated in the capital cities, where only about 10 percent of the population lives. In more than 15 countries in Africa, over 70 percent of the lines are still located in the largest city [2]. Generally the level of technology penetration in Africa is low compared to developed countries, primarily because the general population cannot afford it [3].

However, the advent of mobile and wireless technologies is rapidly changing this, and the cell phone, in particular, is set to have a major role in the stimulation of the information society in developing countries. According to the International

Telecommunications Union, Africa's mobile cellular growth rate has been the highest of any region over the past 5 years, averaging close to 60% year on year [6]. The total number of cell phone subscribers continent-wide at the end of the first quarter of 2007 was 208 million [4]. The economic and social benefits of cell phones are evident at all levels of society and the penetration rate of cell phones is significant, especially given the fact that access is often shared [5].

Thus cell phones can be seen to be the most important networked knowledge exchange technology used in Africa today. From a developing country perspective, features such as limited or no dependence on permanent electricity supply, easy maintenance, easy to use audio and text interfaces, affordability and accessibility are the most important considerations for using cell phones as potential information and communication technology (ICT) tools [5].

Cell phones are also becoming increasingly powerful computers, with built-in advanced multimedia facilities. It is interesting to note that today's high-end cell phones have the computing power of a mid-1990s PC— while consuming only one one-hundredth of the energy. Even the simplest, voice-only phones have more complex and powerful chips than the 1969 on-board computer that landed a spaceship on the moon [13]. A cell phone can be seen as a PC in the pocket.

Egovernment, defined broadly, is the use of ICT to promote more efficient and effective government, facilitate more accessible government services, allow greater public access to information, and make government more accountable to citizens [9]. In the developed world, mobile government (mgovernment) is seen as the inevitable evolution of egovernment and encompasses the provision of services using mobile technologies such as personal digital assistants, laptops and cell phones [10]. Given the importance of the cell phone in Africa, its reach into all segments of society and its power as a computing device, the possibility exists of using this tool to provide government services to those who have no access to traditional ICT infrastructure. There is an opportunity to leapfrog directly to mgovernment by using the cell phone to provide government-to-citizen (G2C) type services in many innovative ways.

This paper examines the possible use of a tool such as mobile instant messaging (MIM) to provide an instant-messaging call centre-like facility to citizens, particularly the youth, as a potential paradigm shift in G2C service provision.

## **2 . Mobile Instant Messaging**

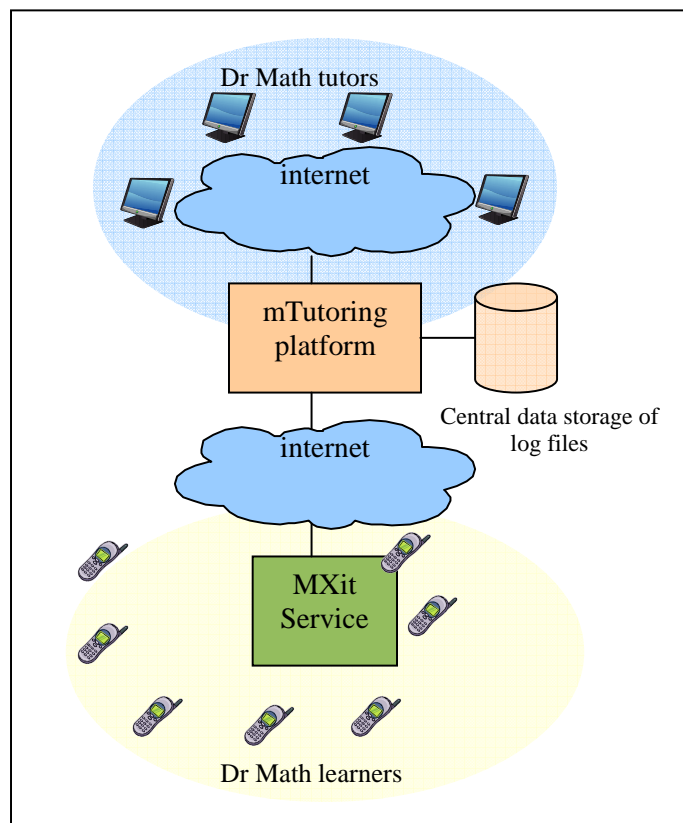
In South Africa, one of the phenomenal success stories of in providing services via cell phones, has been the MXit service. MXit is proprietary mobile instant messaging (MIM) software of MXit Lifestyle (Pty) Ltd which is based in Stellenbosch, South Africa [7]. The MXit software runs on cell phones and enables participants to instantly send text messages to each other. It is often compared to SMS; however, one of the major differences between sending an SMS and using MXit is the cost. Messages sent using MXit cost approximately 1 or 2 cents. An SMS, however, typically costs about 80 cents. This has resulted in a huge uptake of the service in the country, with more than 5 million users and growing exponentially [8]. The service offers one-to-one chat options as well as many-to-many chatroom facilities.

The Meraka Institute has pioneered an tutoring platform to support learners with their mathematics homework, using MXit. The service is know as *Dr Math*. Learners can use MXit on their cell phones to ask questions. These questions are routed to the first available tutor who is online during specified hours to help provide guidance in working out the mathematics problems [11].

Since initially the MXit software could chat with other instant messaging systems, an account was set up at jabber.org. This enabled the tutor to use a traditional computer with a standard keyboard in order to respond to queries from various learners. However, as the popularity of the service increased, it became impossible for one tutor to manage all the interactions. At the same time, MXit disallowed access from other chat engines. It was then decided to develop a platform that:

- allows multiple distributed tutors working from any computer connected to the internet to respond to the growing number of queries;
- automatically distributes the learner “load” amongst the available tutors;
- provides some automatic, basic information that the learners can request themselves, instead of talking to a “live” tutor (such as formulae, definitions, etc);
- hides the phone number of the learner from the tutor (this is shown automatically by the MXit platform and there were concerns that this could potentially be a security risk); and
- centralises the log files of the interactions between tutors and learners in a secure environment.

A schematic of the service is shown below:



*Figure 1: Dr Math mTutoring platform on MXit*

This new platform, written in Java, has been in operation for about 7 months and has been very successful, with the number of users growing from 20 (at one school) to more than 3000 (spread around the country). Various additional improvements to the platform are now being planned.

This mTutoring platform has added potential outside the mobile learning space where it is currently being used. It provides a powerful realtime interactive information service that is cheap, accessible and popular amongst the youth. A local NGO in South Africa, involved in providing telephonic support to abused and vulnerable children, is currently investigating the use of this platform in addition to its current call centre environment.

### 3 . MIM call centre concept

The concept, as applied to G2C service provision, is best described by using a scenario-based approach.

*Mathabo is 16 and needs to find out how to apply for an ID document. She already uses an instant messaging application on her cell phone to chat to her friends. She has seen a poster advertising a facility called government.help.me available via her cell phone. She types this in as a new “buddy” on her buddy list, selects it and is immediately connected to an operator. The discussion goes as follows:*

(14:30:32) speedy: hw do i get an id  
(14:30:46) gov: how old r u  
(14:31:06) speedy: 16  
(14:32:08) gov: do u have a brth cert  
(14:32:41) speedy: y  
(14:32:55) gov: where are u  
(14:33:41) speedy: mamelodi  
(14:34:16) gov: u need 2 take yr birth cert with – type ?home.affairs mamelodi to get details of offices and hours of operation  
(14:35:02) speedy: tx

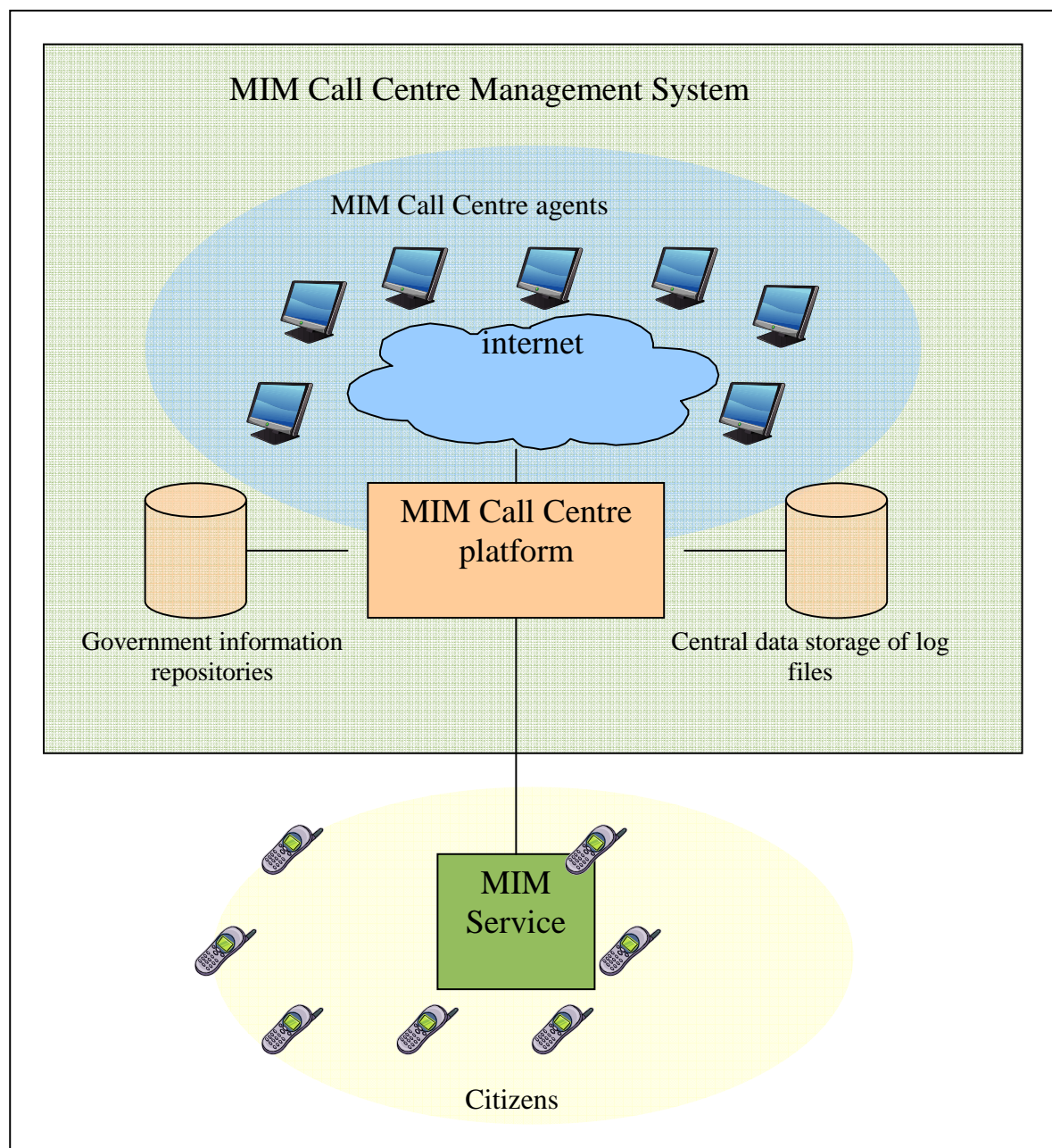
*Mathabo types in the command ?home.affairs mamelodi and is presented with a list of Home Affairs offices, with their operating hours.*

After a few minutes, using an interaction mechanism that costs a fraction of a cent, Mathabo has basically all the information she needs in her quest to get an ID document. A voice-based telephone call would have been much more expensive. In addition, she has a record of the information on her phone and can scroll back at any time to refresh her memory. The “call centre” would also have access to the log files of the interaction which can be stored on a central server (also at a fraction of the cost of audio recordings which need significantly more disk space).

Although this mode of communication may seem awkward to the older generation who are unused to SMS-type language, the popularity of services such as MXit attest to the fact that the younger generation feel comfortable with this type of interaction (and often prefer it). The reality is that in sub-Saharan Africa today, about 80% of the population is under 30 years old [11] and are the primary users of SMS and MIM services. It is also important to note that the mobile call centre agent will be in a position to adjust to the type of interaction used by the caller (i.e. “normal” spelling and language vs “SMS” language). Although the service example is shown in English, there is no reason why separate services can't be made available in various other African languages as well (as was the case with Dr Math, which was made available in both Afrikaans and isiZulu).

Whilst the above example may seem a bit simplistic, the *Math on Mxit* project has shown that complex mathematical concepts can be described with relative ease using a MIM environment. The assumption can therefore be made that a MIM platform for government information should also work as well.

The basic MIM call centre platform could consist of components as shown in Figure 2 below:



*Figure 2: Possible MIM Call Centre platform for Africa*

## **4. Conclusions**

In summary, this kind of platform would work well in a G2C information provision environment in Africa because of the following factors:

- Affordability - Cost to the user – the only costs incurred are for the data (currently at between R1 - R2 per mb);
- Affordability - Cost to the service provider (e.g. government) – investment in call centres are significant, in terms of the cost of infrastructure as well as the call centre software. Although there will be infrastructure and hardware costs in a MIM solution, since it is a virtual environment it will not be as expensive as investing in physical call centre infrastructure;
- Accessibility – the cell phone penetration rate is high and rising rapidly;
- Infrastructure – cell phone infrastructure is expanding rapidly in Africa, orders of magnitude faster than traditional telecommunications infrastructure;
- Usability – SMS and MIM-type applications are very easy to use and do not need any kind of training (no cell phone literacy training is required as is the case with PCs, for example);
- Mobility – the cell phone is a mobile device which means access from anywhere at anytime;
- Language – it would be easy to make identical services available in various languages in Africa;
- Distributed services – MIM call centre operators could be distributed across the country;
- Information storage – once information has been provided/downloaded to the cell phone, it is available as a record until removed by the user; and
- Service expansion – the basic platform described here could be augmented in many ways (e.g. providing multimedia information via the platform in addition to text).

Currently many call centres use instant messaging as part of the service (such as alerts to and between the call centre agents themselves). As far as using an instant messaging platform (whether mobile- or computer-based) for the call centre, there doesn't seem to be an example of this in use anywhere in the world. This an opportunity for Africa to once more be at the forefront of innovation in the mobile world.

Government is in a prime position to learn from commercial service providers in the mobile field and to apply best practice. This is an opportunity for Africa to be truly innovative in terms of using a new technology in a novel way – to enable a paradigm shift by using what has become the people's device (the cell phone), linked with a well-known service model (call centre) in a way (MIM) that is unique to Africa.

## **5. References**

- [1] United Nations (2004) “Secretary-General, Marking World Telecommunication Day, Says Affordable Technologies Can Be Effective Engines of Social, Material Change,” [www.un.org/News/Press/docs/2004/sgsm9294.doc.htm](http://www.un.org/News/Press/docs/2004/sgsm9294.doc.htm)

- [2] Jensen M (2002). The African Internet: A Status Report. [Online]. At <http://www3.sn.apc.org/africa/afstat.htm>. Accessed: 15 December 2006
- [3] Beute N (2004). Bringing Computers and the Internet to Schools in Disadvantaged Areas in South Africa. [Online]. At <http://www.citte.ac.za>. Accessed: 15 December 2006.
- [4] gsmworld.com, Retrieved 2 October 2007
- [5] Vodafone Policy Paper Series. Moving the Debate Forward. Number 2, March 2005.
- [6] ITU report (2006). [online]. What's the state of ICT access around the world? <http://www.itu.int/newsroom/wtdc/2006/stats/index.html>, Retrieved 12 October 2007.
- [7] <http://www.mxit.co.za>
- [8] <http://www.bizcommunity.com/Article/196/78/17027.html>. MXit reaches 4.8 million milestone. 10 August 2007.
- [9] The Working Group on E-Government in the Developing World, "Roadmap for E-government in the Developing World, 10 Questions E-Government Leaders Should Ask Themselves", April 2002.
- [10] <http://www.mgovernment.org/>
- [11] Butgereit, L (2007). Math on MXit: Using MXit as a Medium for Mathematics Education, INNOVATE Conference, Pretoria, March 2007.
- [12] Ogbu, O, Mihyo, P. (2000). "African Youth on the Information Highway", <http://www.idrc.ca/openebooks/259-7/>.
- [13] Prensky, M. (2005). What can you learn from a cell phone? Innovate online magazine. (<http://www.innovateonline.info/>)