

## Chapter 4

# Convergence of Wireless Technologies in Consolidating E-Government Applications in Sub-Saharan Africa

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### ABSTRACT

*The convergence of wireless applications presents a greater hope for consolidating e-Government (ICT-enabled or online government) applications even in resource-constrained countries such as those in Africa. This chapter presents an exploratory study that aims at discussing the extent as to how convergence of wireless technologies from different vendors promises to contribute to the consolidation of e-Government applications in Sub-Saharan-Africa (SSA). This is done by reviewing the different adoption stages of ICT and e-Government in SSA. It looks at challenges facing adoption of wireless technologies (GSMs, Wireless Internet Access, satellite transmission, etc.) across all the socio-economic value chains in SSA. The chapter looks at Botswana and South Africa as case studies by bringing out the different interventions that have been done in the realm of facilitating a conducive environment for the convergence of different wireless technologies. Out of the analysis of legal, regulatory, market and spectrum policies affecting the adoption of wireless communications in SSAs, the chapter draws out recommendations on how to consolidate wireless communications to be adopted in different socio-economic setups (e.g. e-government, e-Health, e-Banking, etc.).*

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## INTRODUCTION

Wireless technologies (especially Internet-ready mobile phone technology) have seen higher adoption rates in the SSA region partly due to an escalation in the existence of Wireless Application Service Providers (WASPs) in SSA. This penetration has encouraged computing mobility which has encouraged spill-over applications to almost all the major sectors of the socio-economic hierarchy. One such e-application with great potential is the application of wireless technologies in the e-Government domain. Appropriate convergence of the different wireless technologies will enable increase access to information and public services in the framework of e-Government. As Africa's technological landscape has kept growing exponentially, it is important to take advantage of this growth and promote e-Government which will hopefully bring about responsive, transparent and accountable management of national resources.

Many literature sources that point to the fact that mobile technologies are growing at an alarming rate in Sub-Saharan Africa (SSA) (TRASA report, 2009; Bwalya, 2009; Touré, 2006; Graham et al., 2006; ITU Report, 2008). Telecommunication service providers in the SSA region have made Internet access possible through a multitude of Information and Communication Technology (ICT) devices such as personal digital assistants (PDAs), mobile phones etc. This means there is an increase in the number of people accessing the Internet making it possible for governments in SSA to consider implementing the e-Government governing model. In addition, e-Government can be a prerequisite to strategic initiatives avoiding rampant corruption and red-tape that characterizes most Africa's government organs and thwarts effectiveness of public service delivery systems (Bwalya, 2009). This chapter defines E-Government as the use of ICTs to provide interactive public services linking then government, citizens and businesses. E-Government enables transparent government processes ushering in improved

service delivery/transactions which encourage participatory governance where citizens and businesses are accorded the chance to interact effectively with government departments, organs and line ministries.

However, setting up a full-fledged e-Government interactive environment for SSA countries has been a huge challenge because of the different costs that come with its implementation. Before we look at the different challenges of e-Government implementation, let's briefly look at the different benefits of using e-Government.

The convergence of wireless technologies entails that different wireless ICT platforms cannot decode certain signals from a named source because of differences in IEEE standards. An example of this is that you can have a situation where WiFi (IEEE 802.11) can decode some signals from a source and WiMAX (IEEE 802.16) cannot decode the same signals that WiFi can. This may be because of protocol mismatch, different in synchronization and frequency bands. The figure below presents one context of convergence of wireless technologies where a WiFi device tries to join a WiMAX network and it can't decode the signals because the base station which encodes the said signal uses WiMAX-OFDM.

This convergence of wireless technologies can happen amongst many technologies such as GSM, CDMA, TDMA and iDEN or 1G, 2G, 2.5G, 3G to 4G in cellular phones. This convergence may also entail ability of mobile agents/devices to decode encoded signals on networks such as wireless LAN, MAN, sensor networks, RFID, and so forth.

Since, generally, even ordinary individuals now have access to Internet-enabled mobile phones; implementation of e-Government on mobile platforms has much promise for Africa. This is compounded in the understanding that the universality in the signal decoding capabilities of different mobile devices is key to global access of e-Government information and public services in ubiquitous environments. This form

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