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LEADERSHIP IN THE ELECTRONIC AGE: A BROAD INTER-DISCIPLINARY PRACTICE

The African Journal of Information and Communication

ISSUE 13 2013

Learning Information Networking Knowledge (LINK) Centre
Faculty of Humanities
University of the Witwatersrand, Johannesburg, South Africa



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EDITORIAL NOTE TO AJIC ISSUE 13

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Research on the evolution of the information age reveals that *leadership* is an important ingredient in endeavours to advance electronic communications. As the information age increases in complexity, the greatest challenge appears to lie in the area of leadership, a "curiously unformed" area of theory. This issue publishes articles covering two broad focus areas:

Section I presents a cluster of articles on the theme *Building the information society*, in which scholars research and consider the many facets of the information society, including dimensions of Internet diffusion in Rwanda, critical political theory of online searches, utility versus risk in mobile banking, electronic monitoring and compliance in corporate governance, and case notes on Internet access for senior citizens.

Section II presents a cluster of articles on the theme *Challenges of ICT policy and e-development leadership,* illustrating the complexities of policy network arrangements in Swaziland; policy failure in universal access and service in South Africa; and leadership disengagement in an e-tolls project.

The articles suggest the need for an extensive theorisation of the emerging information economy on the African continent and the related leadership issues. Common questions that arise from these pieces are: What constitutes leadership in the age of the Internet? How should theories of leadership be advanced or reinterpreted to be valuable to decisionmakers and policymakers in an Internet age? To what extent is leadership in the electronic communications era the same as or different from the previous "industrial" era? These and other issues are discussed in the guest editor's contribution, which draws on existing theory and on an analysis of articles included in this issue to offer ideas on a leadership ontology in the electronic age.

Articles published in this issue include work developed from conference papers presented at the *Sustainable e-government and e-business innovations for Africa* academic conference held at the University of Pretoria in October 2012, as well as unsolicited submissions, many built on postgraduate research. Articles are subject to an in-depth peer review and rigorous editorial process, following which they are posted online as they become publication-ready. Thus articles will be uploaded to the journal webpage on a regular basis and the final annual issue will be constituted when all review and editorial processes have been completed.

For this issue, guidance was taken from the Wharton Global Faculty Development Programme, University of Pennsylvania, held from 05 to 08 August 2013. This programme, conceptualised by Professor Harbir Singh, covered a range of topics intended to guide academics engaged in scholarly publishing, but also highlighted important issues for the consideration of journal editors, such as the challenges of building an extensive, high-powered peer review network. The broad guidance of the work of the National Scholarly Editors Forum led by the Academy of Science of South Africa is also noted.

LEADERSHIP FOR THE ELECTRONIC AGE: TOWARDS A DEVELOPMENT-ORIENTED, SOCIO-TECHNICAL ONTOLOGY OF LEADERSHIP

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ABSTRACT: The idea of an ontology of leadership for the electronic age raises "big questions" from the perspective of leadership as a broad interdisciplinary practice. This article aims to capture the current dilemma in leadership research and practice that Hackman and Wageman (2007) concluded is "curiously unformed". It aims to add a socio-technical voice, rarely heard in a fiercely behavioural school, even where global advances in ICT have tipped the scales towards reifying a more integrative view of leadership. It does not claim to present an integrated theory of leadership; rather, it seeks to elevate the socio-technical school within leadership theory and shift the discourse on leadership to be more inclusive of socio-technical thinking. The concept of "regional ontology", derived from Heidegger, to refer to "as lived" practices and experiences of a particular social group (in this case Africa), is extended to discuss a development-oriented ontology of leadership. This enables us to recognise that effective organisational leadership in Africa and other developing countries should be anchored in local values; encourage netrepreneurship, take into account opportunities afforded by mobile computing platforms and high diffusion of mobile applications; focus on ethical leadership engagement to spur e-particpation and e-democracy; and develop national and regional innovation systems to enable Africa and other developing regions to participate in global knowledge flows.

KEYWORDS:
Leadership, e-leadership, development-oriented ontology, network society, Africa

INTRODUCTION

This article addresses the gap in literature concerning a conceptualisation and problematisation of leadership that reinforces the mediating role of ICTs in the complex environment of organisations, the nature of the gap and the need to address it. There are broader questions pertaining to issues of leadership in the information society or digital economy; however these are not the subject of this article. The article discusses theories of organisational leadership and considers cases where leadership practices for the electronic age, or leadership failures, are evident in Africa. The author seeks to make a theoretical contribution by expanding the prism through which such e-leadership is viewed, from a narrow, behavioural perspective towards incorporating a socio-technical perspective, thereby creating a perspective of leadership for the electronic age as a broad interdisciplinary practice.

The contribution draws on an analysis of the broader literature, as well as on the limited but valuable data about the practices and ingredients in leadership for the electronic age, empirically derived from the contributions to this 2013 thematic issue of *The African Journal of Information and Communications* (AJIC). In other words, the contribution is built by structuring literature and empirical studies to argue for an agenda for leadership that encourages fostering an electronic age.

The paper is structured as follows: first, leadership trends are discussed from a complexity perspective, anchored within an understanding that the current era is characterised as digital. Secondly, the need for a development-oriented discourse on the theory and practice of e-leadership is motivated as a way to promote institutional and policy leadership in Africa. This is followed by a synthesis of a limited set of "approaches to e-leadership" arising in an African context. The analysis considers what some of the "big questions" are in e-leadership practice. Hence, three main constructs anchor this view of the nature of leadership, namely complexity in the global environment, the development-oriented context that informs an organising vision for e-leadership, and leadership as a strategic imperative (Avolio, Walumbwa & Weber, 2009).While possibly contributing to the continuing struggles by researchers towards an integrated and coherent theory of leadership (Day & Antonakis, 2012), contemplating the increasingly pervasive electronic environment can shift the leadership discourse to be more inclusive of socio-technical thinking. Researchers need to build on existing literature to evolve theories of leadership in the information age appropriate to the contextual dynamics and challenges of countries in Africa and other developing countries.

LEADERSHIP IN A COMPLEX ELECTRONIC ENVIRONMENT

The premise for this discussion is that Africa is part of a complex knowledge-based society characterised by a competitive landscape and driven by globalisation, technology, deregulation and democratisation (Halal & Taylor, 1999; Uhl-Bien, Marion, & McKelvey, 2007). This environment creates the need for innovation in societal and organisational leadership and in citizen participation, in both developed and developing countries. For example, the utilisation

of Internet infrastructure brought to Africa by technology enthusiasts (Ochara, 2012) resulted in initiatives by African governments to transform their economies in terms of ICT usage and thereby enter the mainstream of the global information economy (Britz, Lor, Coetzee & Bester, 2006). In the period after the World Summit on the Information Society in 2005, African governments promoted the Internet (except in conflict-ridden countries) even if access remains far from universal. Furthermore, in the ensuing years, a wide range of Internet-based innovations and e-services has evolved including mobile money and Internet-based access to knowledge.

Advanced ICT – the Internet, advanced analytical capabilities, cloud computing, e-services – requires new capacities for leading organisational and economic transformation. Concepts of leadership already incorporate ideas of complexity and change in knowledge-based environments due to the mediating role of ICT. The socio-technical and complexity perspectives enhance the behavioural understanding of leadership agents (Merali, 2004). Thus, while managerial and governance systems remain embedded in the thinking of the industrial era (Manville & Ober, 2003), ICT ushers in the opportunity to revisit leadership from a socio-technical perspective.

Organisational and societal sustainability in the current knowledge economy are premised on accumulation and sharing of knowledge assets, while leadership is seen as emergent (Uhl-Bien, Marion & McKelvey, 2007). Other conversations on leadership refer to "distributed" forms of leadership within a collective interactive dynamic (Gronn, 2002); reducing the influence of individuals as leaders while focusing attention on activities and events for organisational transformation (Lichtenstein, Uhl-Bien, Marion, Seers & Douglas, 2006); and leadership outcomes based on shared direction, alignment and mutual commitment (Drath et al, 2008). In effect, leadership theory has moved beyond seeing leaders as individuals towards distributed forms of action, recognising the influence of the knowledge-based context as playing a critical mediating role in leadership outcomes.

In order to motivate for the socio-technical as a critical construct within leadership discourse, and aid in situating leadership within the context of a technology-dominated society, it is acknowledged that there have been three major schools of thought used in explaining technology, especially ICT, and organisational change. The dominant one is the decision-making school, in which decision theorists embrace "systems rationalism" with the view that technology consists of structures designed to overcome human weaknesses inherent in decision-making processes (DeSanctis & Poole, 1994). They argue that when technology is applied in any social system, the outcome should be greater productivity, efficiency, effectiveness and satisfaction to the individual and to the organisation or system. The decision-making school focuses on "cognitive processes associated with rational decision making" following "a psychological approach" to the analysis of technology and change (DeSanctis & Poole, 1994). Technology is posited to be an

> exogenous force—a powerful driver of history having determinate impacts on organisational life, a variance logic that considers that technology has significant and predictable impacts on various human and organisational outcomes, such as governance structures, work routines, information flows, decision making, individual productivity and firm performance (Orlikowski, 2010, p. 129).

This rational view ignores the complexity and uncertainty of the knowledge society and is therefore too limited in its conceptualisation of organisational leadership.

The second school of thought is that the emergent perspective is associated with several theoretical views (institutional and integrative views) premised largely on critique of the "hard-line determinism" of the decision-making school and on the weaknesses of the institutionalist school. The institutional perspective recommends the view of technology as an opportunity for change, rather than merely looking at technology as a causal agent of change (Barley & Tolbert, 1997). The emphasis of the institutionalists is on the "social evolution of structures" within institutions (DeSanctis & Poole, 1994) and less on the structures within technology (such as hardware, software, decision-models, data). The integrative pundits charge decision theorists with "techno-centrism", a focus on the inherent power of technology while underplaying the social practices. The integrative school is also referred to as the social technology perspective (DeSanctis & Poole, 1994), or the social shaping of technology perspective (Williams, 1996). The socio-technical systems theory which falls within this school of thought contends that the impact of ICT is dependent on how well social and technological structures are optimised and that technology adoption should be interpreted as a process of organisational change. Emphasis is on how the interests and situated activities of stakeholders shape the meanings and use of technologies that they interact with (Ciborra & Lanzara, 1994; Heath & Luff, 2000). This approach implies that, ontologically, priority is ascribed to human beings. A contrary view is that the nature of interactions between technology's influences and human organisation is more complex than envisaged in the "interpretive" perspective, which underplays the role of technology in organisational change and leadership.

The underlying assumption of the two schools of thought, where the decision theorists ascribe ontological priority to technology while the emergent perspective ascribes ontological priority to humans, is the presumption that technology and humans are different and separate entities (Orlikowski, 2010). This is an ontology of separateness, yet the dominance of advanced information and communication technologies in the current knowledge-based society requires thinking of the two as joined up and that agency resides in both human beings and technology (Suchman, 2007). An ontology that recognises the inseparable nature of technology and human agency is referred to as "entanglement in practice", in which "contemporary forms of technology and organising are increasingly understood to be multiple, fluid, temporary, interconnected and dispersed" (Orlikowski, 2010, p. 137).

This third school of thought on "entanglements in practice" is considered appropriate to conceptualising various forms of organisational leadership under conditions where technology and humans intertwine. The "entanglements in practice" view leads us to consider emerging concepts of leadership such as e-leadership (Avolio, Kahai & Dodge, 2001; Hanna, 2007), digital leadership (Wilson, 2004) and "new" forms of network organising (Castells & Cardoso, 2005), which ascribe ontological priority concomitantly to human agency and to technology. Thus this article concurs with the view expressed by Avolio, Kahai and Dodge (2001, p. 617) who define e-leadership as "a social influence process mediated by advanced information technologies (AIT) to produce a change in attitudes, feelings, thinking, behaviour, and/or performance of individuals, groups, and/or organisations", but aims to take the discussion further. AIT is presented as a critical context for informing leadership conceptualisation and practice. They perceive that the AIT context forms part of the construct of leadership. While recognising that there are conceptual ambiguities in terms such as e-leadership, Gurr (2004) advances the notion that there are significant differences between traditional and technology-mediated environments to require a consideration of the concept of e-leadership. Annunzio (2001) positions e-leadership as possibly the critical "rhetoric of change" in organisations that can help bridge the gap between theory and practice. This emerging discourse realises that leadership theorisation operates beyond the behavioural perspective, where the social was ascribed ontological priority over the technical. Revisiting theories of organisational and policy leadership from a broad interdisciplinary perspective, understanding the complex dynamics at play, is thus occasioned by the ubiquitous nature of technology-mediated environments in organisational life.

With due regard to the theoretical perspective of "entanglement in practice", contemporary leadership theories are inadequate for the electronic age, since these theories are "too static, too macro, too e-political, too conceptually under-developed" (Wilson, 2004, p. 860) for the "complex, distributed, cross-sectoral dynamics that need to come into play in networked societies" (DasGupta, 2011).

In taking forward the discussion, this article moves beyond the theory of entanglement in practice to motivate for an ontology of development-oriented organisational and policy leadership practice for the electronic age.

CONCEPTUALISATION OF A LEADERSHIP VISION FOR THE ELECTRONIC AGE IN AFRICA

The term "regional ontology", derived from Heidegger (in the manner used by Sewchurran, Smith & Roode, 2010) to refer to "as lived" practices and experiences of a particular social group is further elaborated to consider a development-oriented ontology of organisational and policy leadership in the electronic age. The idea of regional ontology can be explained from Bourdieu's "theory of practice", which seeks to understand and explain actions of individuals and social groups, formed by their cultures, traditions and objective structures within a particular society (Rhynas, 2005). This article proposes discussion of an ontology of development-oriented leadership for the electronic age as a means of thinking about the "as-lived" experience and practice of e-leadership in African countries and in other developing countries, which share many of the same challenges. The discussion of African experience enables a focus on particular cases and voices, generally silent in discourses on leadership and e-leadership.

The current global discourse on e-leadership has already legitimised the relevance of this concept. However, the interpretation, legitimisation and mobilisation activities of the "organising vision" (Swanson & Ramiller, 2004) of e-leadership from an African perspective is muted. It is therefore important to inform leadership theory and practice by analysing trends influencing ideas and practices of leadership in technology-mediated organisations. African researchers and practitioners are reshaping organisations by writing their history and practice.

TRENDS DRIVING THE LEADERSHIP DISCOURSE IN AFRICA IN THE ELECTRONIC AGE

The emergence of a leadership ontology for the electronic age is not seen here as being unique to Africa, but as being motivated by a number of locally defined trends in the African context. The first trend relates to the increasing demand for ICT services and innovation, which has resulted in large national and continental investments in ICT infrastructures and services. Despite increased ICT investment, ICT and e-services project

failure is common, which points to possible leadership failure. Emerging nations are increasing their visibility as locations of ICT innovation, which was previously the preserve of developed countries. While cognisant of the digital and knowledge divides in Africa, it should be recognised that ICT-based innovation is becoming commonplace in Africa and other emerging economies and needs to be given attention in the emerging e-leadership discourse.

Another trend is the interest in e-leadership at organisational and policy levels as a basis for national information society development. The quest for realisation of millennium development goals centres attention on good developmental governance and ICT as a critical driver of education, health and information services. Thus, since the early 2000s several countries in Africa and the developing world have expressed their visions for good governance, partly hinged on an e-government paradigm (Ochara, 2012). Billions of dollars have been spent in trying to realise e-government goals. However, the question that begs an answer is: Has there been a transformation of public services as a result of governance being re-orientated towards the e-government paradigm? Furthermore, the emergence of e-business has found its space in the commercial domain (Ochara & Krauss, 2012). Virtual forms of organisation are commonplace, while bricks-and-mortar forms of organisation are being redefined, improved or obliterated. The emergence of e-government and e-business is generating organisational forms enabled by ICT requiring transformation of organisational structures and leadership. Organisational leadership in virtual or ICT-mediated organisations requires new competencies due to greater dispersion of organisational units, customers, suppliers and stakeholders, as well as a greater need for frequent communication enabled by ICT (Zaccaro & Horn, 2003).

The third trend, namely the ICT for development (ICT4D) trend, is particularly relevant to emerging economies in Africa. The development debate has gone through a major transition due to advancements in ICT, which enables easy generation and organisation of and access to information, with the attendant impact on socio-economic activities. The ICT-led development agenda has implications for the capacities of leaders in the African public and private sectors. The relevance of ICT4D in Africa can best be evaluated by linking it to issues of universal access and service, affordability and quality of mobile phone and Internet services (Ochara & Mawela, 2013). This trend is strongly related to policy initiatives and failures that influence the evolution of electronic communications infrastructure and availability of e-services in Africa. The mobile network, the largest information distribution platform globally, is the highest growth sector in electronic communications in Africa and is therefore a key influence on e-leadership in organisations at country level and on the continent. Furthermore, the increasing dependence of contemporary economies on broadband information infrastructures must be considered. The landing of multiple undersea cables such as the SEACOM and WACS submarine cable systems spells the end of the "dark continent" tag, as high-speed broadband becomes available to coastal cities and increasingly to towns, cities and countries far inland.

The persistent digital and knowledge divides, and the diversity of African contexts in which these exist, implies continued exclusion of communities (Bwalya, Du Plessis & Rensleigh, 2013), requiring organisational models and frameworks that can aid in resolving the social exclusion problems that persist. Leaders must therefore seek frameworks and models that can help resolve the digital knowledge divides and services.

THE ORGANISING VISION OF E-LEADERSHIP PRACTICE: A THEMATIC ANALYSIS

In the course of research on a development-oriented ontology of organisational leadership for the electronic age, it has become apparent that concepts and practices of e-leadership in Africa are nascent. Therefore, a brief thematic overview of research on e-leadership practice is presented. In line with Hanna's (2007) position, this can continue to "inspire and animate ICT investments and plans as well as ICT governance and business process transformation".

The organising vision (Swanson & Ramiller, 1997) is used as a structuring metaphor for the discussion that follows. An organising vision helps to embed innovative ideas through encouraging growth of the discourse in heterogeneous collectives comprising parties such as prospective adopters, technology vendors, consultants, industry pundits, journalists and academics (Swanson & Ramiller, 2004). In seeking to uncover how e-leadership, as a social artifact interwoven with the IT artifact, is becoming embedded in the African context, the organising vision provides a useful structuring device for shaping the diffusion of new ideas. An organising vision shapes an innovation's *purpose* through various interpretive activities. An organising vision's underlying *rationale* is shaped through various legitimisation activities. The organising vision helps *mobilise* the entrepreneurial and market forces to support the realisation of the innovation. Thus research can use inductive reasoning to consider the organising vision that explains the meaning of e-leadership, the motivation for its adoption and how these become legitimised in the context of African countries.

OBJECTIFICATION OF e-LEADERSHIP THROUGH INTERPRETATION AND LEGITIMISATION

Understanding e-leadership meanings in an African context raises questions of how to explain the meaning of e-leadership, as well as why e-leadership practices are being adopted. Review of literature points to the following normative pressures:

(i) The discourse of ICT4D and good governance and its influence on policies for socio-economic development. An analysis of the development discourse reveals the persistent belief that ICTs are enablers of development to the extent that they are viewed as resources that can be used to change people's lives (Teles & Joia, 2011). This belief has gained broader acceptance in the public sector through e-government initiatives, while from a commercial sector perspective, the various ICT policies of countries recognise the important value of e-commerce, e-learning, e-health and other ICT-related economic activities in poverty eradication (Table 1). This trend is observable in country-level poverty reduction strategies, and more importantly, in decision-making forums on the African continent, notably references to the importance of ICT in the Africa Health Strategy 2007 – 2015 (African Union, 2007).

(ii) The discourse of social sustainability, which requires citizen participation in governance and commerce enhanced by ICT, taking into account local traditions and empowering marginalised groups (Avgerou, 2008; Avgerou, 2010; Hayes & Westrup, 2012; Ochara & Mawela, 2013). Even in the face of the digital divide, many socially excluded groups in Africa have some form of Internet access through mobile technology, thus social sustainability can be fostered by e-government and e-commerce.

If we consider leadership as a "process of social influence, which maximises the efforts of others, towards achievement of a goal" (Kruse, 2013), then we see the interpretive and legitimisation efforts captured in the national ICT policies and the development of e-government and e-commerce strategies as a quest by organisations and national governments to realise the global trend towards information or digital societies. The focus of national ICT policies and e-government and e-business strategies can be understood from a political perspective, which De Ver (2009) recognises has rarely been considered in leadership studies inundated with conceptions from management and organisational science.

TABLE 1: LOCUS AND FOCUS OF ICT INITIATIVES IN AFRICA

Country	Locus	Defining logic
Botswana national ICT policy (IST-Africa, 2012)	Capacity building; e-government; digital content; universal access; e-health; increased ICT investment.	Capacity building; e-services
Egypt ICT sector policies (ARE-MCIT, 2013)	Local digital content; cloud computing; digital identity management; access to information and data; e-commerce; mobile applications development; tablet computer industry; open-source software; empowering people with disabilities.	Economic progress and development; e-participation
Kenya ICT master plan (Kenya ICT Board, 2013)	Enhanced public value: connected health; education; agriculture; youth, gender and vulnerable groups. Development of ICT businesses: technology innovation; business process outsourcing; digital economy. Strengthen ICT industry: driving real economic growth.	Socio-economic rationality; e-participation
Nigeria ICT policy (FMCT, 2012)	Convergence of ICT services; institutional strengthening; universal access; capacity building; ICT development; liberalisation of sector; ICT investment.	Transformation to a knowledge economy; legal rationality for ICT; economic development
Rwanda national ICT strategy and plan NICI - 2015 (RDB, 2011)	Skills development; private sector development; community development; e-government and cyber security.	Socio-economic development; professional development and e-participation

This overview of national ICT policy and strategy raises the following questions for future leadership research and practice: *How can organisational leaders in Africa increase the success of activities to embed ICTs in order to realise socio-economic development? What legal, ethical and moral frameworks apply in leadership to embed ICT in African contexts?*

LEGITIMISATION AND MOBILISATION OF e-LEADERSHIP IN AFRICA

Creating an organising vision for e-leadership can be established through communicating, rationalising and legitimising claims about its rationale that directs the thinking of a focal community on why it is being adopted. Swanson & Ramiller (1997) assert that the organisational vision legitimises a particular innovation by relating the innovation to some aspect of the organisation which is of current interest. Therefore, it is important to establish what the focal community (researchers, practitioners, policymakers) claims are regarding e-leadership and identify their interests.

Creating an organising vision also requires mobilisation activities, which serve to activate, motivate, and structure the entrepreneurial and market forces in support of the realisation of the innovation (Swanson & Ramiller, 1997, p.461). These mobilisation activities enable a particular idea to gain traction in the focal community as interested parties mobilise resources to further generate interest (Currie, 2004). Currie (2004) captures the effect of mobilisation activities by referring to "countless conferences, trade fairs and exhibitions" sponsored, by industry players and governments to generate widespread interest in the organising vision. Dobra (2012) asserts that there is a "nascent African individual who deploys strategies to mobilise material and symbolic power in order to act as an agent of change within the public sphere". The article adopts the analytical lens of the individual in an organisational environment. This enables an understanding of how and why entrepreneurs are creating innovations unique to the African reality, such as the mobile money transfer innovation M-Pesa. The particular legitimisation and mobilisation activities occurring on the African continent require writing up the African historiography as the basis for fostering an ontology of development-oriented e-leadership in Africa. ICT innovation in Africa is not simply coincidence, but the result of the intertwining of socio-technical activity and human endeavour. Fostering an e-leadership ontology that finds legitimacy in Africa requires inter-disciplinary research and advocacy.

LEGITIMISATION AND MOBILISATION THROUGH ENTREPRENEURIAL ACTIVITIES

Legitimisation is partially due to the demand-side pull of young people on the African continent, as evidenced by the mobile applications sector (Table 2 below).

TABLE 2: ENTREPRENEURIAL LEADERSHIP

Innovation	Focus	Aspect of leadership
M-Pesa	Mobile financial services application dubbed the "future of banking"	Economic relevance of applications indicative of organisational engagement in innovation
SliceBiz – Ghana	Venture capital funding for startups	Discovering hitherto unexplored niches providing economic relevance
PriceCheck South Africa	Retail price comparison application	Pioneering "useful … and technically sophisticated mobile applications" relates to economic rationality of entrepreneurship
MedAfrica – Kenya	A medical alert system for Africans seeking medical assistance	Strong social relevance motivated by economic rationality
mPedigree – Ghana	An SMS application for authenticating medical supplies by consumers	Strong social relevance motivated by economic rationality
Tough Jungle – Kenya	A web-based and mobile gaming application	Rooted in African social reality
MafutaGo – Uganda	A mobile application that directs motor vehicle drivers to petrol stations that offer the best price	Economic rationality in an African context where money is scarce
iROKOtv – Nigeria	An application that allows users to stream African movies	Cultural entrepreneurialism and leadership
M-Farm – Kenya; iCow – Kenya	An application that provides farmers with up-to-date information about the agricultural market and trends	Recognition that entrepreneurial opportunities exist in a country that is highly dependent on agriculture

LEADERSHIP AS A STRATEGIC IMPERATIVE: AN ACADEMIC RESEARCH AGENDA

From the perspective of a sociotechnical agenda of leadership, this article investigates a small selection of ideas from scholarly contributions. Naidoo (2013), in his analysis of the e-tolls project in South Africa, accentuates the pervasiveness of collective moral disengagement in decision-making by public managers. In his analysis, public managers involved in conceptualising and implementing public sector projects are seen as "masking their intentions; adopting euphemistic labelling; displacing and diffusing responsibility; downplaying negative consequences; making favourable comparisons; and disparaging and blaming opposing groups". This analysis points to the need for systematic, collective moral engagement strategies which include cementing public participation in public sector ICT projects, considered by other authors writing on the subject (Elnaghi, Alshawi & Missi 2007; Luk, 2009; Marche & McNiven, 2003; OECD, 2003).

The following is a schematic overview of scholarly articles in *The African Journal of Information and Communication* (2013), pertaining to issues in e-leadership:

TABLE 3: E-LEADERSHIP AND AFRICAN SCHOLARSHIP

Key Theme	Focus	Locus	Authors
Internet diffusion	Re-orienting diffusion	Policy and regulatory effectiveness	Mlay et al (2013)
Visibility of online knowledge	Social inequality, poverty, knowledge as a public good	Inaccessible knowledge about Africa	Czerniewicz & Wiens (2013)
Rational choice related to privacy issues	Risk-utility tradeoffs in mobile banking	Security risk is not a major deterrent in adoption	Ndlovu & Njenga (2013)
Electronic compliance monitoring	Good corporate governance	Maximising regulatory compliance using IT applications	Pretorius, Leonard & Strydom (2013)
Access to Internet for socially excluded groups	Ease of access	Relevance of ICT-based solutions to the elderly	Von Solms & De Lange (2013)
ICT policy process	How policy networks influence outcomes	Political interests and foreign intervention	Metfula & Chigona (2013)
Universal access and service	Access to telecommunications and related services	Policy and regulatory effectiveness	Lewis (2013)
Moral disengagement versus moral engagement	Employing systematic moral disengagement strategies for dubious public sector projects	A biased rationality, which is predominantly economic in nature	Naidoo (2013)

Discussing an information society perspective, Mlay et al (2013) direct researchers and policymakers to critically evaluate how Internet diffusion is fostered in African and other developing countries, as a basis for effective e-leadership. Czerniewicz and Wiens' (2013) contribution compels us to acknowledge why knowledge from and about Africa is invisible on the Internet, even where, as a public good, it behooves leaders to promote visibility. This work provides specificity to the claim of Chan, Kirsop & Arunachalam (2011) and Tandon et al. (2013) that if local content is not available online it may lead to the misguided notion that little, if any, knowledge substance is generated in the global south, and that the needs of African countries for research are therefore met by information donation from the north. The work of Mlay et al (2013) and Czerniewicz and Wiens (2013) makes the case for organisational leadership to seek approaches to making African knowledge visible via the Internet.

Njenga and Ndlovu (2013), while noting the enthusiasm in the uptake of mobile applications such as mobile banking in Africa, focus attention on the trade-off inherent in choices between risk and utility. The utility of mobile applications such as M-Pesa reduces consumer sensitivity to individual security and privacy risks, thereby placing a greater responsibility of leadership on service providers, legislators and regulators to ensure that their organisations provide an enabling environment for the adoption of mobile innovations.

The contribution by Pretorius, Leonard & Strydom (2013) focuses attention on how electronic means can be used to promote corporate governance and reduce leadership failure in the corporate world. The electronic monitoring, observation and compliance framework proposed in their contribution shows how human agency and technology intertwine at multiple levels to curb corporate corruption, fraud and misconduct in support of good corporate governance.

Von Solms and De Lange (2013) draw our attention to how the Internet can be used to support senior citizens, a constituency marginalised and socially excluded from the mainstream of African society and from digital access. The authors demonstrate the potential ease with which senior citizens can effectively and safely utilise Internet-based services. This is the foundation for a mobilisation initiative to empower socially excluded citizens, adding to the leadership agenda for the electronic age in Africa.

Contributing to a policy perspective, Metfula and Chigona (2013) present the experience of Swaziland in formulating ICT policy by investigating the composition, relationships, alliances, power structures, norms and bureaucracies that influence the policymaking process. Where ICT policymaking is dominated by political agendas and foreign intervention, local non-conformist policy actors are ignored and policy can express only the view of the dominant actors. Lewis (2013) draws the attention of the reader to a decade of failure in universal access policy and the pitfalls that exist for this area of policy leadership.

These analyses and analyses published elsewhere represent attempts to decipher and conceptualise how ICTs are influencing or should influence leadership. The ideas are neither exhaustive, nor representative, of the legitimisation and mobilisation claims for e-leadership, but they provide a foundation for engaging in the discourse of an emerging e-leadership philosophy and agenda on the African continent.

ONTOLOGY OF LEADERSHIP FOR THE ELECTRONIC AGE: INTRODUCING A SELECTION OF THE "BIG QUESTIONS" FOR AFRICA

How do we conceptualise an ontology of e-leadership applicable on the African continent drawing on the synthesis outlined above? From a continental perspective, defining leadership rationalities (Table 4) is not unique to Africa, but should find its place in African discourse about e-leadership in the 21st century. The synthesis and narrative presented in this section summarises ideas that can contribute to an ontology of e-leadership and poses "big questions" that are shaping future debate.

TABLE 4: ONTOLOGY OF DEVELOPMENT-ORIENTED LEADERSHIP FOR THE ELECTRONIC AGE

LOCUS / ASPECTS	Ethical and moral leadership	Entrepreneurial leadership	Leadership institutionalisation	Systems of innovation
What	Ethical and moral engagement	Netrepreneurship	Policy leadership based on local values and global integration	Research & development in "local" knowledge systems
How	e-Participation and e-democracy	Mobile innovations; training; incubation	Mainstreaming formal and informal organising forms; accepting counter-power of non-conformist actors; technocratic governance	Research and development; education
Where	National and local government	Local levels	Formal organising structures; local organising forms	Universities; R & D centres; leadership centres
Who	National and local government; business leaders; Individuals	Individuals and communities	National, regional and local structures	National fora of business, educational and civil society leadership; Presidency and line ministries
When	Continuous and evolutionary	Transformative and disruptive	Continuous and evolving	Disruptive and continuous
Why	Social sustainability	Socio-economic rationality	Legal and professional rationality	Focus on global and local knowledge flows

The loci of the development-oriented ontology proposed in Table 4 revolve around the need to exercise ethical and moral leadership; foster entrepreneurial leadership; institutionalise leadership practices and build systems to encourage innovation. These terminologies are used to anchor an e-leadership perspective noting various aspects (what, how, where, who, when, why). They are not (i) the only loci required to inform an e-leadership ontology, nor are they (ii) specific to Africa. However, these loci and aspects are weakly established in African countries and therefore serve to direct the attention of researchers and policymakers to their importance.

From the matrix of loci and aspects above, we note a range of intertwining human and technology issues. The rationale for ethical and moral engagement (*what*) is the social sustainability of ICT innovation for the development of African e-society (*why*). Current discourse on e-participation and e-democracy (*how*) is a quest to enable ethical and moral engagement in e-society projects, thus leadership practice must rise to the challenge of anchoring its practice from an ethical perspective. This requires leadership practice in the ICT-enabled domain to take into account various levels of governance (*where*), as well as stakeholders' interests with due consideration of socially

excluded groups (*who*). Institutionalising ethical leadership is a long-term process and is continuous and evolutionary (*when*). How all these loci and aspects can be realised is less clear and thus we pose the question: *How can ethical and moral engagement be realised in 21st century e-leadership practice?* This question is urgent, as the technological landscape and citizen agency are changing, yet organisational leadership is often unprepared for complexity as witnessed in the e-tolls case.

Another locus of the development-oriented ontology of e-leadership for Africa is anchored in entrepreneurial leadership (*what*), which can provide socio-economic justification for the increasing levels of investment in ICT (why). In Africa, the increasing penetration of ICT, especially mobile technologies, has seen increased entrepreneurial activity related to the provision of products and services of digital networks, or netrepreneurship (*what*). Africa faces daunting challenges, which often appear insurmountable to outside observers, yet the current generation of African entrepreneurs (*who*) are starting and maintaining enterprises that provide solutions to many of these challenges. A recent listing of young entrepreneurs under 30 surveyed by Forbes notes their contributions in solving problems in healthcare, electricity shortages, in waste management, real estate, and building virtual and physical communities, largely by relying on ICT (Nsehe, 2013). From a netrepreneurship perspective, these acts of enterprise creation are visible in the creation of Internet-based and mobile computing innovations (*how*) offering solutions relevant to local contexts in Africa (*where*). These solutions are transformative and disruptive (*when*) in nature, for instance, the introduction of M-Pesa in Kenya (Mbiti & Weil, 2011) transformed the nature of banking. Before M-Pesa, there were approximately three million banking customers, while currently, there are approximately 20 million customers using M-Pesa. Despite impressive efforts by individual netrepreneurs, employment creation and poverty reduction continues to perplex leaders, whether as policymakers or as organisational leaders. Thus the following questions arise: *How can netrepreneurial leadership be a foundation for addressing Africa's socio-economic problems? How can we better understand leadership through netrepreneurship*? The socio-economic rationale for acts of leadership is intricately linked to entrepreneurship (Vecchio, 2003), though future research must examine how netrepreneurship functions in 21st century knowledge-based organisations and economic sectors.

The third locus of the proposed development-oriented ontology, dubbed *leadership institutionalisation*, recognises that policy leadership (*what*) in Africa is weak. African policymaking requires mainstreaming of social organising forms based on evolutionary leadership taking into account the diversity of African values (how), and should be applied in local contexts (*where*), at various levels of governance (*who*). The rationale for attempting the institutionalisation of leadership is legal and professional rationality (*why*). Professional rationality emphasises the need for professionalism in public administration and leadership, while legal rationality focuses attention on the requirement for the actions of government to be legal (Zouridis & Thaens, 2003). The "big questions" that arise here are: *How can leadership practice ensure quality and relevance while building on African values? In what ways can professional and legal rationality be realised in the age of technocratic governance?*

The fourth locus of the proposed development-oriented ontology of e-leadership for Africa reifies the role of conceptualising a national system of innovation (NSI), and how such systems can effectively impact on the visibility of Africa on a global scale. Most systems of innovation recognised in policy documents in vaious African countries are misaligned with the needs and societal resources, as the operation of innovation systems depends on the fluidity of knowledge flows among enterprises, universities and research institutions (*who*). The analysis of Czerniewicz and Wiens (2013) illustrates that the online visibility of knowledge from Africa is minimal, and other studies have documented the dearth of meaningful content from other developing countries (Fuchs & Horak, 2008). Global knowledge flows influence competitiveness and progress of nations and regions (*why*). It can be argued that in order to increase the visibility of Africa's contribution to global knowledge flows, countries, regions and the continent must foster leadership of small systems of innovation where R&D efforts (*how*) are geared to encouraging output from traditional knowledge systems (*what*). Retrieving relevance from local knowledge systems is likely to be transforming and disruptive (*when*) to the usual flow of global knowledge but may help Africa establish its knowledge niches and shed, as previously stated, its "dark continent" tag. This requires leadership capabilities that appreciate the value residing within systems of innovation - formal or informal. We therefore pose the "big question": *What forms of organisational leadership can enable systems of innovation for Africa's competitiveness and development?*

CONCLUSION

The article brings together the following ideas: (i) complexity in the knowledge epoch requires a theory of entanglement in practice, meaning that technology and human agency are intertwined and inseparable; (ii) an organising vision of e-leadership for Africa requires interpretation, legitimisation and mobilisation; and (iii) leadership as a strategic imperative can be seen through a multiplicity of loci and aspects, of which the four loci and six aspects discussed above give a rich sense of the characteristics of leadership in e-society. Collectively, these three sets of ideas influence the construction of a development-oriented ontology of leadership that can become a powerful re-visioning of organisational and policy leadership on the African continent, in which the socio-technical perspective is interwoven with the behavioural perspective.

These ideas are tentative, particularly given the fact that only a limited set of scholarly articles were reviewed, mostly reflecting ideas gathered from southern and east African perspectives. These countries typically have small population sizes, low GDP and sometimes poorly developed electronic communications and Internet markets. However, these countries are sufficiently representative of sub-Saharan Africa to make the propositions that emanate from this article relevant to future enquiry on e-leadership.

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SECTION I

BUILDING THE INFORMATION SOCIETY



GLOBAL DIFFUSION OF THE INTERNET: THE INTERNET IN RWANDA

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ABSTRACT: The article uses the Global Diffusion of the Internet (GDI) framework to examine Internet diffusion in Rwanda along six dimensions: pervasiveness, geographical dispersion, sectoral absorption, connectivity infrastructure, organisational infrastructure, and sophistication of use. Internet access was launched in 1996, but it was only in 2004 that significant Internet penetration occurred, when the privatisation of Rwandatel to Terracom brought in new investments and technology and the ISP market was opened to competition. Access to the Internet grew to approximately 24% of the population in 2012 or 2.7 million subscribers. Internet growth is hampered by factors which include poor resource mobilisation, unrealistic implementation plans, shortage of qualified human resources, a miniscule private sector, low level of private sector involvement and low Internet usage awareness. Despite these challenges, Rwanda has attained Level 4 (pervasive) for pervasiveness, Level 3 (broad) for connectivity infrastructure, Level 2 (controlled) for organisational infrastructure, Level 3 (highly dispersed) for geographic dispersion, Level 3 (common) for sectoral absorption and Level 3 (transforming) for sophistication of use. This limited progress is due partly to the policy focus on addressing Internet access (Vision 2020), and financial support from multilateral and bilateral agencies. Further policy and regulatory action and heightened awareness of the Internet are required to translate the statistics for GDI into greater access.

KEYWORDS
Internet diffusion; GDI framework; ISPs; Rwanda

INTRODUCTION
In the early 1990s, when a transition was occurring in knowledge-based economies, Rwanda was engaged in a civil war that culminated in the 1994 genocide. These events impoverished the population and destroyed the country's fragile economic base. In 1996, the government of Rwanda (GoR) restored socio-political order and re-connected the country to the world through various means, including the Internet. Subsequently, the GoR embarked on political reforms to foster national reconciliation and citizen empowerment in political and development participation. However, political and media freedoms remain restricted (AfDB, OECD, UNDP & ECA, 2012).

The Internet was launched by the state-owned national telecommunications operator Rwandatel, with foreign aid. For many years, Rwandatel held a monopoly in the provision of Internet services, but opened up to limited competition with academic institutions and finally to open competition with private sector ISPs in 2004. International bandwidth and telecommunication charges were reduced and the first e-government project started in 2006. After nearly a decade of competition, about 24% of the population of 11.6 million have Internet access (Rwanda Ministry of Youth and ICT, 2012). Ngwenyama and Morawczynski (2009) assert that the level of ICT development impacts positively on the economic growth of a country. They view ICT as an enabling infrastructure to attract investors. The GoR recognised the importance of the Internet as a potential development enabler and incorporated it in its national strategic plan for development, (Ministry of Finance and Economic Planning, 2000). However, Internet growth appears to be hindered by a number of factors, including poor resource mobilisation, unrealistic implementation plans, shortage of qualified and experienced human resources, a miniscule private sector, low levels of private sector involvement, weak regulation of telecoms firms and low Internet usage awareness.

The purpose of this article is to examine the state of Internet diffusion in Rwanda and frame innovative ideas for measures to improve diffusion. An understanding of the determinants of the current Internet penetration in Rwanda will be useful to researchers wishing to conduct other national studies, by providing insights into the enabling factors and limitations that shape the state of the Internet in a particular country. The findings and measures will be beneficial to national governments and other stakeholders in efforts to increase Internet penetration. The article provides a background on the socio-economic context of the country, Vision 2020 and the telecoms sector. It presents the methodology used, the findings on the GDI dimensions, challenges and enabling factors.

SOCIO-ECONOMIC AND POLICY CONTEXT

The economy of Rwanda is characterised by its dependency on international donors in almost every sector. Rwanda's gross domestic product (GDP) was USD13.7 billion in 2012, per capita income was USD644, the annual growth rate was 8.8%, inflation was 5.7%, while public debt was 23.4% of GDP (Government of Rwanda, 2013; The Heritage Foundation, 2013). Rwanda has 123 000 small and medium enterprises (SMEs) which represent 98% of all businesses; 88% of these are informal businesses and therefore contribute only two percent of tax revenue. Most of the workforce (90.8%) is employed in the private sector (AfDB et al, 2012). Rwanda's challenges include low economic growth, limited natural resources, energy shortages, high population growth rate (2.75%), a high percentage of the population living below the poverty line (60%), heavy reliance on subsistence agriculture (90%), poor transportation linkage to other countries, and very limited investor interest.

As stated by Guerrieri, Luciana and Meliciani (2011) the decision to invest in ICT is highly dependent on the general business environment of the country. Due to reforms, Rwanda claimed to be the ninth easiest place to start a business and the sixth most competitive economy in Africa (Government of Rwanda, 2005), although these are moving indicators. In the past decade, Rwanda has improved its regulatory environment for business and is ranked the lead reformer in East Africa, third in sub-Saharan African and 45th in the World (AfDB et al, 2012). A special economic zone (SEZ) expected to attract sectoral investment, including ICT, was opened in the capital Kigali in 2012 (Rwirahira, 2012). According to Vision 2020, Rwanda is vying to become an African technology hub (Baldauf, 2007), hence government has implemented deliberate efforts to improve science and technology education and ICT skills, advance telecommunications infrastructure and promote high Internet access to facilitate this goal. Plans include Internet access at all administrative levels, all secondary schools and many primary schools, Internet services in rural areas and improved e-government.

Vision 2020 is a framework for the country's long-term development, indicating six priorities and three cross-cutting areas. Alongside the priorities of building a capable state, a knowledge-based economy, infrastructure development and regional economic integration, science technology and ICT form a cross-cutting focus. ICT policy was incorporated in the policy known as the National Information and Communication Infrastructure (NICI) Plans, part of Vision 2020. There were four successive NICI Plans: NICI I (2001-2005) placed priority on creating an enabling environment through establishing a legal and regulatory framework and liberalising the telecommunications market. NICI II (2006-2010) aimed at developing an enabling backbone infrastructure. This ushered in the introduction of the national fibre-optic backbone, community telecentres, the National Data Centre, the ICT Park and the Rwanda Communication Infrastructure Project (Rwanda Ministry of Youth and ICT, 2012). The NICI III Plan (2011-2015) focuses on services sector development, cyber security, private sector development, e-government, skills development and community development (Mayton, 2012). NICI IV (2016-2020) will focus on transformation to a knowledge-based economy by absorbing ICT into various social and economic sectors (Government of Rwanda, 2010). The NICI plans increased Internet access and service by improving ICT infrastructure, developing e-government and extending service to rural communities (Government of Rwanda, 2010).

ELECTRONIC COMMUNICATIONS NETWORKS IN RWANDA

Rwanda's telecommunications network dates back to 1930. Rwandatel was founded by government in 1993 to manage the telecommunications network and was the only telco licensed to operate in the country. Most of the telecommunications infrastructure was destroyed during the civil war, but was later rehabilitated and expanded. In 1996, Rwandatel launched Internet service and became the only ISP until 2004, when government privatised the fixed-line operator and liberalised the telecommunication sector. Internet penetration grew at a slow rate due to the monopoly of Rwandatel and dial-up access, while low disposable income of most of the population was an impediment to household computer ownership (Nsengiyumva & Stork, 2005). In 1999, the Kigali Institute of Science and Technology (KIST) and the National University of Rwanda (NUR) were awarded open licences to provide unlimited Internet services to their faculty, staff and students. The USAID Leland Initiative was instrumental in the initial introduction of the Internet, as well as in opening the market to the academic and research sectors.

In January 2002, the Rwanda Information Technology Authority (RITA) was established to facilitate national and sectoral ICT strategies and in 2003, the Rwanda Utilities Regulatory Agency (RURA) was established with authority over several market sectors including energy, transportation, communications and waste management. From a policy perspective, the founding of RITA and RURA was significant, because this led to the liberalisation of the telco sector. In July 2004, the Rwanda Internet Exchange Point (RINEX) was commissioned. The IXP plays a crucial role in Internet access and penetration as it enables ISPs to communicate directly and move traffic between them. According to Nsengiyumva and Stork (2005) "RINEX allows ISPs in Rwanda to exchange domestic Internet traffic without having to send data across multiple international hops". The total cost to Africa of using international bandwidth for national or regional data transfer has been estimated in the order of USD400 million each year (Brian & Rulinda, 2005). Notwithstanding this, Africa has had the fastest growth of Internet diffusion in the world (2 450%) with Rwanda having a growth rate of 8 900% between 2008 and 2010 (Government of Rwanda, 2010), illustrating demand against a very low initial subscriber base. IXPs lower the costs, decrease the latency and improve the quality of Internet services (Kende & Hurpy, 2012).

Rwanda is served by three submarine cable systems, SEACOM, the East African Cable System (EASSy) and The East African Marine System (TEAMS), bringing broadband services to towns such as Kigali, Butare, Huye, Rubavu, Rusizi, Musanze, Muhanga and Rwamagana, among others. As a result of high speed Internet via these cable systems, Rwanda was ranked fourth in Africa in March 2012 and 103rd globally, with an average download speed of 3.03Mbps (Kanyesigye, 2012). In 2011, the roll out of fibre optic cable covering 2 560km in all 30 districts of Rwanda was completed, marking an end to the first phase of the "National Backbone" ICT project (Buhura, 2011).

INTERNET MARKET STRUCTURE

Rwanda has had nine licensed ISPs, of which seven are operational. Table 1 shows the players:

TABLE 1: ISPS IN RWANDA, SEPTEMBER 2012

ISPs	Year licensed	Status	Company profile
New Artel	2004	Operational	Owned by GoR and targets the remote areas market, using a VSAT system to provide voice and Internet access.
MTN Rwandacell	2006	Operational	A South African company (partly owned by the Rwandan government).The first cellular provider operating a GSM mobile network (Itumanaho, 2012a).
ISPA	2006	Operational	ISPA provides Internet connectivity and IP solutions to corporate, small/medium businesses and home users.
Altech Stream Rwanda (ASR)	2007	Operational	The South African-owned telco is an application service provider (ASP) that offers IP-based solutions and related value-added services.
Rwandatel S.A.	2008	Non-operational	Declared bankrupt and assets sold to Airtel and Tigo in 2012.
Tigo Rwanda S.A.	2009	Operational	87.5% owned by Millicom International Cellular S.A.
4G Network Rwanda	2009	Non-operational	Established to offer 4G wireless broadband Internet services to companies and households in Kigali; part of the Afrimax Group with ISP operations in other African countries.
Broadband Systems Corporation (BSC) Rwanda	2010	Operational	Rwandan IT company providing advanced technology in fibre optics and data storage Internet solutions, launched on 1 June 2012.
Airtel Rwanda Ltd	2011	Operational	Owned by Indian company Bharti, the world's fifth biggest telco; planned investment of more than USD100 million over three years.

Source: RURA, June 2011

Over the two decades from 1993 to 2013, the fixed telecoms market saw the incumbent operator Rwandatel S.A. sold to Terracom in 2005. Terracom deployed fiber optic cable around the country to bring Internet and broadband services to more than 150 locations; however, due to failure to achieve licence obligations and failure to provide information, government reacquired Rwandatel in 2006 (Rwanda News Agency, n.d.) and sold it to LAP Green of Libya.[1] In 2008 Rwandatel ventured into the mobile market and was the first to introduce 3G networks. The company's mobile licence was rescinded by RURA on 5 April 2011 due to poor coverage, poor quality service and failure to make the planned investment targets. It continued to provide fixed telephony and Internet access (TeleGeography, 2011). Following UN sanctions on LAP Green, Rwandatel went bankrupt and its assets were sold to Airtel in May 2012 (Kanuma, 2012; Kwibuka, 2013), therefore the main operator today is MTN Rwandacell (RURA, 2012).

Rwanda has three mobile operators, namely MTN Rwandacell, Tigo (Rwanda) S.A. – Millicom and Bharti Airtel (RURA, 2012). According to RURA statistics, as at September 2012 MTN Rwandacell had the greater mobile subscriber market share (60.3%), followed by Tigo (32.8%) and Airtel Rwanda (6.9%) of the total subscriber base of 5 690 751 out of a total population of 11.6 million (Rwanda Ministry of Youth and ICT, 2012). In terms

1 LAP Green was a Libyan-owned company that fell under UN sanctions. Rwanda imposed a freeze on all LAP Green investments including Rwandatel (Rwanda News Agency, 2011).

of geographic and population coverage, MTN Rwandacell had 98.12% and 98.01% respectively, Tigo 78.95% and 98.83% respectively, and Airtel Rwanda 6% and 15% respectively. These figures account for subscribers who have more than one SIM-card (RURA, 2012).

VALUE OF THE GDI METHODOLODY

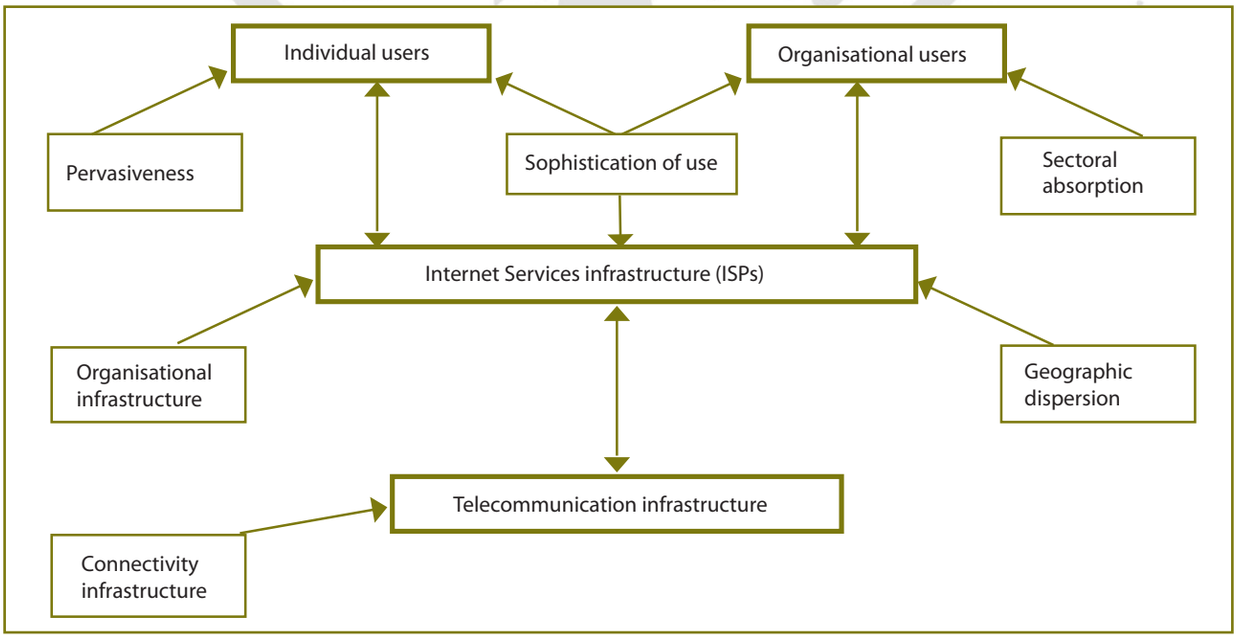
The researchers employed a qualitative research design using the Global Diffusion of the Internet (GDI) framework, a methodology described by Wolcott, Press, McHenry, Goodman and Foster (2001), to assess Internet diffusion in Rwanda. According to Lee (as cited in Muganda & Bankole, 2012), the qualitative approach allows examination of the rich organisational and political processes whereby a given set of information technology is instantiated and does not confine the analysis of data to any predetermined variables. The GDI methodology was selected because of the intricacies of the multifaceted telecommunications infrastructure development that takes place over a lengthy period of time, as is the case in Rwanda where the infrastructure has been progressively built since 1994. The framework is suitable for making country-wide assessments of the Internet as a collection of technologies (Wolcott et al, 2001) as was the case in this study.

Ojuloge and Awoleye (2012) developed a system of equations to explain the variability in the diffusion and adoption of the Internet technology, using Internet User (IU), as a function of Internet Host (IH), Telephone Density (TD), Investment in Telecommunication Infrastructure (ITI) and Gross Domestic Product per capita (GDP). Kolko, Wel and Spyrldakls (2003) used the Internet point survey, an instrument used to assess the state of Internet technology and its accessibility. Menkova (2004) used the number of Internet hosts per capita and the number of Internet users per capita to determine the diffusion of Internet in 72 countries. However, these methods do not indicate the various dimensions of Internet diffusion that the Wolcott framework helps to elucidate.

The GDI framework has been used in over 40 studies around the world, but has never before been applied to Rwanda. The framework examines Internet diffusion along six dimensions: pervasiveness, geographical dispersion, sectoral absorption, connectivity infrastructure, organisational infrastructure, and sophistication of use, presenting a rich and multifaceted view of the diffusion. These can broadly be categorised into two general facets: (i) the extent to which the Internet is used (connectivity, organisational infrastructure and sophistication of use) and (ii) range of usage (geographic dispersion, pervasiveness and sectoral absorption) (Akpan-Obong, Thomas, Samake & Mbarika, 2009).

For the reasons given above, the methodology was considered as the most suitable to apply to Rwanda. However, the framework criteria used to investigate the various dimensions proved very demanding in terms of collecting data on the current Internet structure. It often does not suffice to use only aggregated country-level analysis (Ruth & Choudhury, n.d.), which may give a skewed picture for those parts of Rwanda that experience a significant digital divide. Despite this, the authors conclude that the most detailed and tested aggregate approach to examining Internet diffusion in developing nations is the GDI framework. Figure 1 below presents the GDI framework of Wolcott et al (2001) showing the dimensions and the multiple facets that are to be considered.

FIGURE 1: CONSTITUENTS OF THE INTERNET TECHNOLOGY CLUSTER



Source: Wolcott et al (2001)

Data was elicited mainly from government agencies, policy documents, other studies, press reports, newspaper articles and Internet-based sources. Only secondary data was used because of the guarded nature of the GoR, making it very difficult for the respondents we contacted to freely give primary data. The data was analysed according to the dimensions of the framework and the results presented using a Kiviat diagram, a graphical method of displaying multivariate data in the form of a two-dimensional chart of three or more quantitative variables represented on axes starting from the same point.

GDI STUDIES IN OTHER DEVELOPING COUNTRIES

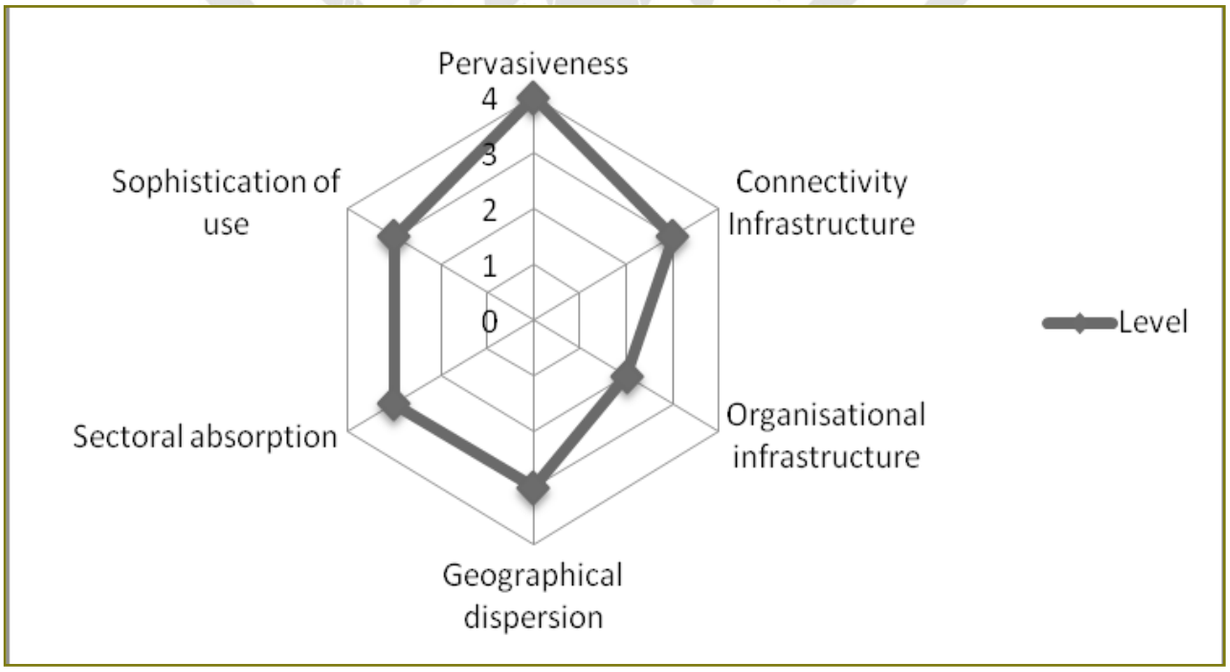
Beilock and Dimitrova (2003) adopted the framework to study the diffusion of the Internet in 105 countries. Internet diffusion has been studied in African countries, including Kenya, Uganda, Nigeria, Cameroon, and South Africa, using the GDI framework and associated methodology. The GDI studies have helped map the growth of the Internet in these countries and their policy recommendations have been factored into this article. The diffusion of the Internet in Kenya was reviewed by Muganda, Van Belle and Brown (2008) and the results indicated that less than 10% of the mostly urban population has access to the Internet. It showed that there was potential for further diffusion in sectors such as commerce, education, health and the public service. The study of Internet diffusion in the south (Brown, Collins, Maleka, Morrison, Muganda & Speight, 2007) found a relatively sophisticated ICT infrastructure, but limited Internet access for around 10% of the population. The potential for further development of the Internet in the education, health and commercial sectors and in the public service was noted. A study conducted by Muganda and Bankole (2012) found a significant role played by the government of Nigeria in encouraging the Internet as a means to contribute to the economic revival of Nigeria. The authors point out, however, that the government of Nigeria has been ineffective in its role as strategist, builder and integrator.

The role of government as a regulator, leader, builder and investor in development of national information infrastructure has been explicated (Muganda & Bankole, 2012; Muganda et al, 2008) and this research needs to be used to ensure growth of both ICT and the Internet. Wide geographical spread and development of Internet infrastructure alone does not guarantee faster diffusion (Brown et al, 2007).

FINDINGS: SIX DIMENSIONS OF INTERNET DIFFUSION

The results are presented using a Kiviat graph to show the levels reached by Rwanda for the various dimensions of the GDI framework. According to the results in Figure 2 below, Rwanda has attained Level 4 (pervasive) for pervasiveness, Level 3 (broad) for connectivity infrastructure, Level 2 (controlled) for organisational infrastructure, Level 3 (highly dispersed) for geographic dispersion, Level 3 (common) for sectoral absorption and Level 3 (transforming) for sophistication of use, with respect to Internet access and services. More detailed presentation and analysis of the dimensions are found in the discussion that follows.

FIGURE 2: KIVIAT GRAPH SHOWING THE GDI DIMENSIONS



DIMENSION 1: PERVASIVENESS

The pervasiveness measure is based on users per capita and the degree to which non-technicians are using the Internet (Muganda, Van Belle & Brown, 2008). In 2000, the number of Internet subscribers was around 1 000 and in 2002, with only 25 000 users, Rwanda was ranked 160th in total number of Internet users. Table 3 presents key ICT indicators for various years from the period 2004-2012.

TABLE 2: ICT INDICATORS, VARIOUS YEARS, 2004–2012

Year	2004	2005	2008	2009	2010	2011	2012
Telephone lines	22 972	23 903	16 852	33 451	39 664	38 901	Not available
Teledensity	0.27(1.6%)	0.30	14%	24.8%	34.38%	36.4%	Not available
Mobile subscribers	143 113	222 978	1 322 637	2 429 252	3 548 761	4 446 194	5 690 751
Telecommunications revenue (USDmillions)	57.5	57.8	Not available	Not available	Not available	82.4	134.5
Satellite dishes/antennas (VSAT)	452	490	Not available	Not available	Not available	Not available	Not available
Internet Service Providers (ISPs) – operational	2	2	6	6	7	6	10
Internet subscribers	2 875	2 949	8 483	147 837	1 233 422	909 634	2 778 939
Percentage of population using Internet	0.43	0.56	4.5	7.7	13	8	24
Internet bandwidth	512Kbps	1024Kbps	267Mbps	774Mbps	1 643Mbps	2 156Mbps	5 879Mbps

Source: RURA, 2009; RURA, 2011; RURA 2012, Rwanda Ministry of Youth and ICT, 2012

The chart indicates a significant growth in Internet subscribers between 2004 and 2012. There is a sharp increase from 2005 to 2010 with an 8.9% increase of Internet users between 2008 and 2010. A 2008 survey found that 86.5% of Internet users gain access at Internet cafes, and very low access exists at household level. In terms of frequency of Internet usage, 11% of Internet users accessed the Internet every day, 38% once a week, and 39% at least once a month (Gillwald & Stork, 2008). Rwanda continued to lag behind in Africa compared with Ghana, Kenya, Nigeria, Tunisia and South Africa (Calandro, Gillwald, Moyo & Stork, 2010). Mobile and Internet diffusion dropped in 2011, mainly as a consequence of RURA terminating Rwandatel's mobile license (The New Times, 2011a and 2011b) but rose sharply in 2012. This big leap can be attributed to the 75% decrease in Internet connection charges, due to the purchase of additional bandwidth from Uganda and Tanzania (Rwanda Ministry of Youth and ICT, 2012). Today, Rwanda's Internet penetration of 24% is higher than the average Internet penetration of 15.6% and Internet users of 7.0% in Africa (Internet World Stats, 2012).

Consequently, Rwanda has attained Level 4 (pervasive) with the ratio of Internet users per capita in the order of magnitude of at least one in ten (10% or greater). This conclusion may be crude, as one subscriber may have more than one user, for example a company employing 100 employees may be considered as one subscriber. A limitation of the data is that it is difficult to accurately obtain the number of Internet users because people access the Internet in different ways and many share Internet accounts (Wolcott et al, 2001).

TABLE 3: PERVASIVENESS OF THE INTERNET IN RWANDA

Level 0	Non-existent: The Internet does not exist in a viable form in this country. No computers with international IP connections are located within the country. There may be some Internet users in the country; however, they obtain a connection via an international telephone call to a foreign ISP.
Level 1	Embryonic: The ratio of users per capita is less than one in a thousand (less than 0.1%).
Level 2	Established: The ratio of Internet users per capita is at least one in a thousand (0.1% or greater).
Level 3	Common: The ratio of Internet users per capita is at least one in a hundred (1% or greater).
Level 4	Pervasive: The Internet is pervasive. The ratio of Internet users per capita is at least one in ten (10% or greater).

Source: Wolcott et al (2001)

DIMENSION 2: CONNECTIVITY INFRASTRUCTURE

The connectivity infrastructure dimension assesses the connectivity and access capacity of Internet infrastructure. It comprises the aggregate bandwidth of the domestic backbone(s) and of the international IP links, the number and type of interconnection exchanges, and the type and sophistication of local access methods being used (Wolcott et al, 2001).

(i) DOMESTIC BACKBONE FOR NARROWBAND AND BROADBAND COMMUNICATIONS

Internet infrastructure in Rwanda was initially deployed by Rwandatel. Following the implementation of the NICI-2005 plan, various companies were licensed to provide communication backbone network service including data, voice (fixed and mobile) and video services. Licences were awarded to MTN Rwandacell, Terracom Communications, Artel and the Rwandan Academic and Research Network (RAREN). In May 2011, the Rwanda Ministry of Youth and ICT announced plans to construct a countrywide broadband backbone infrastructure, interconnecting the 30 districts via fibre optic cable. The Kigali Metropolitan Network (which comprises 97 government sites, at least 227 sites for schools, hospitals, and police stations) was to be connected to the backbone. The roll-out conducted by EASSy covered 2 560km and was completed in the same year, marking an end to the first phase of the NICI 2015 National Backbone project (Buhura, 2011).

New Artel Communications installed a VSAT network covering 30 districts throughout the country, mostly in rural districts. By 2008, Artel had installed over 250 VSAT in rural areas (National Institute of Statistics of Rwanda, 2008). The RAREN project is ongoing and the NUR and KIST are interconnected by a 128Kbps link. They share local traffic through the RINEX. Furthermore, over 39 schools are interconnected via a broadband wireless network that is used for data and Internet traffic, including VoIP applications.

(ii) INTERNATIONAL LINKS

Rwanda has been actively cooperating with foreign carriers and telecommunication administrations such as the International Telecommunication Union (ITU), Akagera Basin, Intelsat, Belgacom, MCI (Vericon Communication), Telkom South Africa, Kenya Telecom, France Telecom and more recently, Tanzania Telecommunication Limited (TTCL) for connectivity. Four cross-border links between neighboring countries and the backbone network are implemented on cable and microwave. The system is currently used as a means of interaction between the East African member countries in management matters relating to international communication.

Rwanda has insufficient international bandwidth to promote broadband Internet access for the majority of companies and households. The landlocked nature of the country means that it relies on neighbouring countries for connectivity, thereby increasing connectivity costs. All international traffic to and from Rwanda travels via satellite. Table 5 below shows the distribution of the 5 879Mbps international bandwidth capacity among the operational ISPs.

TABLE 4: INTERNATIONAL LINKS, 2012

	MTN Rwandacell	Rwandatel	New Artel	Altech Stream	Tigo Rwanda	ISPA	BSC	Airtel Rwanda
Uplink	777Mbps	43Mbps		313Mbps	145Mbps	6Mbps	1 500Mbps	20Mbps
Downlink	777Mbps	148Mbps	155Mbps	322Mbps	145Mbps	8Mbps	1 500Mbps	20Mbps

Source: RURA, 2012

(iii) INTERNET EXCHANGES

The Rwanda Internet Exchange Point (RINEX) has enabled ISPs to conduct data transfer between local ISPs. RINEX has five members, namely Altech Stream Rwanda, Broadband Systems Corporation, MTN Rwandacell, New Artel and Rwandatel (Rugondihene, 2011). Rwanda has only one IXP, similar to Uganda and Kenya (Mulira, Kyeyune & Ndiwalana, 2010; Waema, Adeya & Ndung'u, 2010), while Tanzania has four (Materu-Behitsa & Diyamett, 2010).

(iv) ACCESS METHODS

From 1999, ISPs started to provide Internet access using VSAT systems. In 2004, Terracom launched wireless Internet access and by 2010 the country had approximately 40 operational broadband VSAT companies. Internet access is also available using 3G modems and at wireless hotspots. Rwanda has domestic backbone access speeds of about 300Mbps (Butera 2012a), international links of 1.244Gbps (Itumanaho, 2012b; Namata, 2012) with one internet exchange (RINEX) (RURA, 2012). Rwanda therefore falls under Level 3 (broad) connectivity infrastructure.

TABLE 5: CONNECTIVITY INFRASTRUCTURE OF THE INTERNET IN RWANDA

Levels	Domestic backbone	International links	Internet exchanges	Access methods
0: Non-existent	None	None	None	None
1: Thin	<= 2Mbps	<= 128Kbps	None	Modem
2: Expanded	> 2–200Mbps	> 128Kbps–45Mbps	1	Modem, 64Kbps leased lines
3: Broad	> 201Mbps–100Gbps	> 46Mbps–10 Gbps	More than 1; bilateral or open	Modem, 64Kbps leased lines
4: Extensive	> 100Gbps	> 10Gbps	Many; both bilateral and open	< 90% Modem, 64Kbps leased lines

DIMENSION 3: ORGANISATIONAL INFRASTRUCTURE

The organisational infrastructure dimension measures the strength of the Internet by assessing the level of competition and the existence of the organisations that support and promote the industry. This is on the assertion that the greater the competition, the more and better the services offered by ISPs and ASPs (Wolcott et al, 2001). Rwanda has made significant progress in opening up the telecommunications sector. Government sold 99% of its shares in the national telecommunications company Rwandatel to Terracom (Telecom Paper, 2005) and ushered in liberalisation in the sector. Rwandatel experienced competition from six mobile operators leading to mobile substitution effects.

Rwanda has seven operational ISPs (New Artel, ISPA, MTN Rwandacell, Altect Stream, Tigo Rwanda, Bharti Airtel and Value Data Rwanda) and one Internet Exchange point (RINEX) (RURA, 2011). The growing number of ISPs has led to improvement in services by lowering Internet costs and introducing new services such as mobile money transfer. However, a monopoly on international links still exists, with only one IXP (RINEX). The sector regulator, Rwanda Utilities Regulatory Association (RURA) plays a role in improving the quality of telecommunication services through the International Gateway Traffic Verification System (IGTVS), a system that allows the monitoring of the performance of the telecoms sector including traffic measurement, accurate billing, quality of service assessment, market surveillance, interconnection dispute resolution and fraud management. It is engaged in promoting efficiency and effectiveness and putting in place investment-friendly conditions and fair competition in the telco sector. Therefore Rwanda can be placed at Level 2 (controlled) for organisational structure.

TABLE 6: ORGANISATIONAL INFRASTRUCTURE OF THE INTERNET IN RWANDA

Level 0	None: Internet is not present in the country.
Level 1	Single: A single ISP has a monopoly in the Internet service provision market. The ISP is generally owned or significantly controlled by the government.
Level 2	Controlled: There are only a few ISPs and the market is closely controlled through high barriers to entry. All ISPs connect to the international Internet through a monopoly telecommunications service provider. The provision of domestic infrastructure is a monopoly.
Level 3	Competitive: The Internet market is competitive. There are many ISPs and low barriers to market entry. The provision of international links is a monopoly, but the provision of domestic infrastructure is open to competition and vice versa.
Level 4	Robust: There is a rich service provision infrastructure. There are many ISPs and low barriers to market entry. International links and domestic infrastructure are open to competition. There are collaborative organisations and arrangements such as public exchanges, industry associations and emergency response teams.

DIMENSION 4: GEOGRAPHIC DISPERSION

The geographic spread of the Internet can be estimated by investigating the Points of Presence (PoP) located in a geographic area. Rwanda is administratively divided into 30 districts, most of which are rural. The Internet was first established in the capital, Kigali, and later spread to other districts. Most ISPs are concentrated in Kigali but a few, like New Artel, focus on rural areas, where 94% of the population resides, providing Internet connectivity in all 30 districts.

The programmes to increase geographic dispersion include a community telecentre programme to establish 50 computers in each of the 30 districts, with one telecentre operational in each district; ICT buses or mobile telecentres (Odoobo, 2009); Rwanda Communication Infrastructure Project: a USD24 million World Bank-funded project to increase the reach of broadband networks, and lower international broadband connectivity prices (RURA, 2011); Kigali ICT Park, a multi-hectare technology development zone comprising 13 ICT companies (Odoobo, 2009); village phone operators(VPOs): a collaboration between MTN and Grameen Foundation where villagers rent phones earning a small profit, of which there are now over 5 000 VPOs (Grameen Foundation, n.d.).

TABLE 7: GEOGRAPHIC DISPERSION OF THE INTERNET IN RWANDA

Level 0	Non-existent: At this level the Internet does not exist in a viable form. There will be no computers with international IP connections. There may be some Internet users in the country, but they will obtain their connection via a telephone call to an ISP located outside the country.
Level 1	Single location: The ratio of Internet users will be less than one in a thousand. The growth of the Internet is still in its very early stages with only a few networks connected to an international IP network. The user community will be mainly technical people in the networking industry.
Level 2	Moderately dispersed: The number of Internet users will be at least one in a thousand. The user group will have moved out of the networking community.
Level 3	Highly dispersed: The number of Internet users will be at least one in a hundred. The necessary infrastructure will be established, but not on a wide scale.
Level 4	Nationwide: At this level the growth of the Internet will have diffused with Internet users in the ratio of one in ten. Internet access will be a common service.

The introduction of telecentres countrywide at least to district level implies a "highly dispersed" distribution level of the Internet. Despite the geographic spread, only 24% of the population, or approximately 24 in 100, accesses the Internet (RURA, 2012). Given the almost free nature of the service and high level of maintenance by the donor community, Rwanda has been propelled to Level 3 (highly dispersed Internet), though long-term sustainability will be a challenge.

DIMENSION 5: SECTORAL ABSORPTION

The sectoral absorption dimension evaluates the extent of adoption of the Internet in a number of economic sectors. According to the NICI Plans, the key sectors identified for Internet access are the education, governance, health, agriculture and finance sectors (Rwanda Ministry of Youth and ICT, 2012). The following initiatives were taken:

EDUCATION SECTOR

A ScanICT Baseline Survey Report (National Institute of Statistics of Rwanda, 2008) presented Internet access statistics for private and public schools in Rwanda including primary and secondary schools, teachers training colleges and technical/commercial/vocational institutions. However, the data is difficult to interpret. A more recent study indicates that by the end of 2012, 6.2% of primary schools, 18.5% of secondary schools and 100% of tertiary institutions were connected to the Internet - 463 out of 4 091 institutions, or 11.3% (Rwanda Ministry of Youth and ICT, 2012). Through the "One laptop per child" programme, 152 768 laptops had been deployed to more than 292 primary schools across the country. Other education initiatives include ICT teacher training, science and technology scholarships, SchoolNet to advance Internet connectivity, RwEdNet to connect institutions of higher learning to other institutions and research networks worldwide, and the Rwanda Education Commons, an education portal (Rwanda Ministry of Youth and ICT, 2012).

HEALTH SECTOR

According to the National Institute of Statistics of Rwanda (2008), 100% of public health institutions use computers, with only 24% of these institutions having access to the Internet while a meagre 9% have a website. In the private health sector, 100% of the institutions use computers with 42% using the Internet, but none has a website.

The NICI 2010 project promoted telemedicine with projects such as OpenMRS, an open source medical records system used to facilitate nationwide tracking of patient data; and TRACnet, a central repository of clinic health information to enable tele-treatment and mobile e-health (Rwanda Ministry of Youth and ICT, 2012).
Government and private sectors

TABLE 8: PERCENTAGE OF INSTITUTIONS WITH INTERNET ACCESS AND WEBSITES

	Public sector	Private sector	NGOs	UN system
Internet	87	69	97	100
Website	48	34.5	62	100

Source: (NICI-2015, 2010; National Institute of Statistics of Rwanda, 2008)

By 2010, 48% of the public sector and 34.5% of the private sector had a web presence (NICI-2015 Plan, 2010). Business process outsourcing (BPO) is on the increase mainly for IT industry help desk services, desktop management, data centre services and on the spot support services. Other accomplishments are online trade information portals, business incubators, online tax calculators, land administration and management information systems, credit reference bureaus, electronic case management systems, online banking and e-transaction regulatory systems, e-Soko (an online exchange platform for accessing agricultural markets via mobile devices) and Agricultural Management Information Systems (Rwanda Ministry of Youth and ICT, 2012). Government applies ICT in issuing national identity documents and driving licences, workflow management systems, e-Cabinet, financial management systems, e-Parliament, human resource management system, document tracking, e-tax, single e-window system, passenger clearing, and document tracking (Rwanda Ministry of Youth and ICT, 2012).

TABLE 9: SECTORAL ABSORPTION OF THE INTERNET

Sector	Percentage
Academic	11
Health	24 - public health institutions, 42 - private health institutions
Commercial	69
Public	87

Source: (Rwanda Ministry of Youth and ICT 2012)

The public sector has the highest percentage of Internet access and usage at 87% and the academic sector has the lowest at 11%. The high Internet usage in the public sector is mainly due to the mandatory government policy to allocate 5-10% of the budget to ICT development and use.

TABLE 10: ABSORPTION OF THE INTERNET BY SECTORS OF RWANDA'S ECONOMY

Sector	Minimal (1point)	Medium (2 points)	Great majority (3 points)
Academic (primary and secondary schools, universities)	>0-10% leased-line Internet connectivity	10-90% leased-line Internet connectivity	90% leased-line Internet connectivity
Commercial	>0-10% Internet servers	10-90% Internet servers	90% Internet servers
Health (hospitals and clinics)	>0-10% leased-line Internet connectivity	10-90% leased-line Internet connectivity	90% leased-line Internet connectivity
Public (top- and second-tier government entities)	>0-10% Internet servers	10-90% Internet servers	90% Internet servers

Key sectors in Rwanda have Internet connectivity between 11 and 87% (Table 10 above), attaining two (2) points (medium) (Table 11 below), according to the GDI framework. This gives a minimum sectoral point total of eight (8) for all the four sectors, hence a sectoral absorption rating of Level 3 (common) as seen in Table 12 below.

TABLE 11: SECTORAL ABSORPTION OF THE INTERNET IN RWANDA

Sectoral point total	Absorption dimension rating
0	Level 0: Non-existent
1-3	Level 1: Rare
4-6	Level 2: Moderate
7-9	Level 3: Common
10-12	Level 4: Widely used

DIMENSION 6: SOPHISTICATION OF USE

Sophistication of use entails an analysis of how many people use the Internet and how they use it (Wolcott et al, 2001). The Internet usage should be innovative (Muganda et al, 2008). Rwandan telecommunication companies are working to enable mobile money transfer. MTN Rwandacell introduced the service in 2011 and since then 260 000 subscribers have been registered by the different mobile operators (Butera, 2012b). More than 3.4 million mobile subscribers pay for utilities such as electricity and airtime via mobile phones (Government of Rwanda, 2005). Individuals can access broadcast programming on the Web and the adoption of social media like Facebook is on the increase. The President, Ministers and other public figures use social media to communicate with the population (Habumuremyi, 2011; Kagire & Kaitesi, 2012).

e-Commerce services include e-payments, the fertiliser voucher management system being used by 2.4 million farmers, video conferencing connecting 16 government agencies, national identity documentation registration with over 10 million citizens registered and driver licensing with 141 777 licences issued (Rwanda Ministry of Youth and ICT, 2012). Government has promoted ICT usage in the education sector with projects like the Education Management Information System (EMIS), the establishment of a national library network, and converting existing e-learning content to Kinyarwanda (Farrell, 2007). All businesses have to be registered electronically with the Rwanda Development Board (RDB) (Government of Rwanda, 2010) and, by 2012, 8.6% of businesses had been registered online with the Board (Rwanda Ministry of Youth and ICT, 2012).

The e-Soko system allows farmers to access markets through providing market analysis information using mobile phones. By 2012 over 54 000 e-Soko transactions had been made (Rwanda Ministry of Youth and ICT, 2012). The Civil Aviation Authority of Rwanda can track air traffic using the Air Traffic Management System to make informed decisions. Government uses the Imihigo participation and accountability system for projects used by local government and communities to set project goals and track progress. The National Data Center has installed a cloud computing platform to host applications and services (Rwanda Ministry of Youth and ICT, 2012).

TABLE 12: SOPHISTICATION OF USE OF THE INTERNET

Level 0	None: The Internet is not used, except by a very small fraction of the population that logs onto foreign services.
Level 1	Minimal: The user community struggles to employ the Internet in conventional mainstream applications.
Level 2	Conventional: The user community changes established practices somewhat in response to or in order to accommodate the technology, but few established processes are changed dramatically. The Internet is used as a substitute or straightforward enhancement for an existing process (eg, e-mail vs post). This is the first level at which we can say that the Internet has taken hold in a country.
Level 3	Transforming: The use of the Internet by certain segments of users results in new applications, or significant changes in existing processes and practices, although these innovations may not necessarily stretch the boundaries of the technology's capabilities.
Level 4	Innovating: Segments of the user community are discriminating and highly demanding. These segments regularly apply, or seek to apply, the Internet in innovative ways that push the capabilities of the technology. They play a significant role in driving state-of-the-art systems and have a mutually beneficial and synergistic relationship with developers.

With respect to the GDI framework, Rwanda is seen to be at Level 3 (transforming), noting the innovative ways in which people and institutions are using the Internet. Work on the NICI III (2015) plan, focusing on ICT skills development with the main aim of increasing innovation in ICT, may propel Rwanda to Level 4 upon completion of the Vision 2020 program.

CHALLENGES AND FACTORS TO ENABLE FUTURE INTERNET DIFFUSION

The rapid diffusion of the Internet in Rwanda can be attributed to government policy action, a focused national plan, financial support from international donor agencies (IDA) and liberalisation of the telecommunication sector. Notwithstanding the current level of diffusion, only 24% of the population have Internet access, thus greater effort is needed to promote the next phase of development of Internet access and usage if Rwanda is to move any closer towards becoming a knowledge-based society in any form.

The NICI 2005 plan encountered poor resource mobilisation (Dzidonu, 2005), which was acknowledged by government (GoR, 2010), hence civil service departments and public sector organisations are required to set aside 5 to 10% of their annual budgets for ICT budgets. However, this policy is difficult to implement due to budget constraints. The NICI 2005 Plan was estimated to require USD500 million, of which the GoR was to contribute 46% of the funds and the remaining 54% was to come from IDAs, NGOs, private sector and other sources. GoR has continuously funded the ICT initiative and solicited more funds from various bilateral and multilateral donors. This donor-driven approach has crippled the sectoral absorption of the Internet in Rwanda, because some donors dictate where the money should be invested, like the OpenMRS funded by International Development Research Centre.

Another notable challenge is the lack of expertise to implement ICT programmes (GoR, 2010; Nsengiyumva & Stork, 2005). Many agencies had difficulty in understanding their assigned plan activities (Dzidonu, 2005). The Achilles heel of the NICI strategy is the high turnover of experts involved in implementation. Due to the failure to retain necessary expertise, it is difficult for Rwanda to further improve the sophistication of use of the Internet, as most users are just adopters of current forms of usage and not initiators of new forms.

Some targets set in the NICI plans are unrealistic and tend to have a demotivating effect. Rwanda has an energy constraint - only 13% of the population have access to electricity and there are regular power outages (NICI-2015, 2010, Nsengiyumva & Stork, 2005). This impedes the geographic dispersion and pervasiveness of the Internet in many rural areas.

Moreover, the limitations of international bandwidth availability and the high cost of Internet access in Rwanda further contribute to this challenge of pervasiveness. A turnaround may be possible with the introduction of fibre optic cabling and wireless broadband (WIBRO). While VSAT coverage has been a suitable early solution, it is not a suitable long-term solution for high-speed bandwidth availability. Addressing the international bandwidth access and broadband requirements for future Internet access establishes new infrastructure requirements and a new hurdle for government and the private sector.

Rwanda's private sector, in particular the ICT sector, is very small. The GoR is working to grow the sector through projects like the Kigali ICT Park, which is expected to attract sectoral investment. This will improve the organisational infrastructure for new ICT companies, if the Park can offer high bandwidth availability. Another factor hindering sectoral absorption is that government departments continue to work in seclusion from each other rather than fostering e-government, as required by Vision 2020. The realisation of extensive e-government would be pivotal to future Internet diffusion.

CONCLUSION

This GDI study has expanded the knowledge of the global diffusion of the Internet by presenting a perspective of a mainly rural country that is making progress in Internet growth due to government propulsion and policies, while experiencing many limitations and challenges. Reviewing this work, other African governments, experts, donors and investors in the telecommunication and ICT sectors in the East African region and on the African continent can make informed decisions on how to employ their finances in similar contexts. The article is particularly significant for scholars and researchers of Internet diffusion in landlocked countries with small, mainly rural populations and low GDP per capita, such as Burundi, Burkina Faso, Lesotho, Swaziland and Zimbabwe.

The GDI study showed that Rwanda has seven ISPs with 2 778 939 (24%) people having access to the Internet. According to the dimensions of the diffusion framework, pervasiveness is at Level 4 (pervasive); geographical dispersion at Level 3 (highly dispersed); sectoral absorption is at Level 3 (common); connectivity infrastructure is at Level 3 (broad); organisational infrastructure is at Level 2 (controlled); and sophistication of use is at Level 3 (transforming). Rwanda was ranked among the top six developing countries that are most dynamic in ICT development and performance (Kanyesigye, 2013). The study enables the reader to consider diffusion with respect to six critical dimensions and thus to tailor policy, strategy and programmes in ways which can advance future access.

The Internet has been used as a vehicle for economic development in many countries. However, few have tried to deploy it as a means for moving from an agriculture- to knowledge-based economy. The diffusion of the Internet in Rwanda has not yet achieved the goals set for this transition. Impediments such as poor resource mobilisation, unrealistic implementation plans, shortage of qualified and experienced human resources, minuscule private sector, low level of private sector involvement, limited competitiveness in the telecommunication sector, limited broadband availability and low Internet awareness all present continued challenges for policy, regulation and investment in the next phase of Internet diffusion.

Enabling factors for Internet diffusion in Rwanda and states with similar socio-economic environments include a stronger push for sectoral absorption in the major economic sectors as well as governmental focus on Internet-enabled e-government.

FUTURE-ORIENTED POLICY AND REGULATION

A key focus of governments should be to attract investors in the telecommunication sector and promote competition in the provision of Internet services as proposed by Brown, Collins, Malik, Morrison, Muganda and Speight (2007). Competition among ISPs translates into lower Internet accessibility charges, thereby increasing the number of users (Andres, Cuberes, Diouf & Serebrisky, 2007). In addition, regulators such as RURA should regulate favourable terms of competition for telecoms operators and service providers in order to increase competition in the domestic infrastructure market, particularly to foster the broadband market, and encourage the formation of additional IXPs. These regulatory actions could propel the organisational infrastructure dimension to the next level. In the age of the Internet, effective policy and regulation are important elements in exercising leadership, in both Rwanda and other developing countries.

Furthermore, the GoR should tap into the advantage accruing from the country's unilingual setup. According to Andres et al (2007, p. 5) "Sharing a common language has a positive impact on the spread of Internet use". Speaking one language is beneficial for call centres, electronic government and raising awareness of Internet availability. Government departments should therefore commit resources to put extensive government content (education, health, other) online in the local language Kinyarwanda. In addition, they should give due consideration to the full range of services that can be offered through e-government channels, smart devices and telecentres. This will help increase the pervasiveness of the Internet.

Applications for mobile phones should be fostered, possibly through an innovation fund for mobile apps, extending value from mobile money transfers and mobile bills payment to include services such as mobile polling, marketing and many other m-services. The boom of Web 2.0 also presents an opportunity for Rwanda to increase its Internet diffusion, including access to social media at lower prices. More private and public sector entities such as tourism bodies, government departments and entertainment houses should also be persuaded to build their presence via social media applications to increase their use for leisure and business. This will further boost pervasiveness.

Attention to the dimensions of pervasiveness, geographical dispersion, sectoral absorption, connectivity infrastructure, organisational infrastructure, and sophistication of use are necessary for effective e-leadership.

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THE ONLINE VISIBILITY OF SOUTH AFRICAN KNOWLEDGE: SEARCHING FOR POVERTY ALLEVIATION

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ABSTRACT: This paper reports on an investigation into the online visibility of work undertaken in South Africa in the field of poverty alleviation. An experiment with Google searches was undertaken, motivated by concerns about the visibility of South African research and development work, particularly in a context where social inequality is extreme and poverty such a critical issue. Aware that much attention – through research and the practice of development work – is being paid to poverty alleviation[1], the authors set out to examine whether that work could be found easily, and what the nature of the search results would be. Significant sums of public money are invested in research, which should result in the production and dissemination of locally generated knowledge as a public good grounded in local realities. A great deal of national and international funding is also spent. Thus, research published online should inform and reflect on national and regional development practice, while contributing perspectives from the South to the global corpus of poverty research. Research to understand poverty and inform the design and targeting of poverty alleviation programmes needs to be freely available and actively shared in order for it to accumulate value. In this regard it is argued that there are exponentially beneficial linkages between research, scholarly publication and social development, which originate with local knowledge production and are amplified by the availability and discoverability of that research. Availability and discoverability add breadth and depth to the potential use, value and impact of the knowledge produced.

INTRODUCTION: THE RESEARCHER'S DILEMMA

Structural and chronic poverty are acknowledged to be at the heart of South Africa's problems (Du Toit, 2005), especially as it is a dramatically unequal society (Liebrandt, Woolard, Finne & Argent, 2010). The country has the most unequal income distribution in the world (Hodgson, 2012), with 68,1% of income accruing to the richest 20% and the poorest 10% receiving less than 0,57% (Development Indicators, 2011). Efforts to address poverty and its associated inequalities are an extremely serious matter for government. All nine provinces have poverty alleviation programmes, and a South African Government War on Poverty Campaign was initiated in 2008 (Mbeki, 2008). The non-government sector is very active in this area: there are over 85 000 non-profit organisations (NPOs) registered with the Department of Social Development (Mokomele-Mothibi, 2012), many of which are actively addressing a range of issues integral to poverty alleviation. One database, CharitySA, lists 139 charities (August 2012) dealing with poverty alleviation (see http://www.charitysa.co.za/) – there are, of course, many more.

Access to knowledge about the scholarly research and development activity on poverty alleviation being undertaken in the country is essential to numerous stakeholders. Organisations and individuals addressing poverty alleviation both within the country and beyond its borders need access to the latest research findings published in a variety of forms, including journal articles and conference proceedings, as well as non-traditional outputs such as commissioned reports and policy documents, popular outputs such as newspaper interviews, magazine articles and brochures and online media outputs such as blogs and video talks. Such access would be enlightening about work being done in this field and would provide opportunities to collaborate as well as demonstrate best practices to be emulated.

It is important that work conducted in local conditions is made publicly available so that researchers working in similar socio-economic conditions regionally and in the global South can share knowledge. Locally produced knowledge should be easily accessible to the community within which it is generated. It has been a particular challenge to access information produced in the Southern African region within the region itself. A study by Abrahams, Burke, Gray and Rens (2008) found that only 46% of survey respondents agreed that research output is accessible. Furthermore, only 10% did so without qualification while the remaining 90% said that ready accessibility is hampered by a number of constraints including the lack of institutional capacity to put content online (Abrahams et al, 2008: p. 28). This latter point is especially pertinent in a broader global context where open access is becoming a mainstream trend and scholarly content is more freely available online.

1 The authors are aware that there are different schools of thought and discourses in this area, including poverty alleviation, poverty reduction, poverty eradication, poverty and inequality and so on. At the same time, searchers are unlikely to use the exact terminology employed by writers and when work is described online it needs keywords to include the whole gamut of possible terminology. Also, for the purposes of this experiment only one phrase could be used.

If local content is not available online, it may lead, as Chan, Kirsop and Arunachalam (2011: p. 1) suggest, to "the misguided notion that little, if any, research of substance is generated in the global South, and that the needs of researchers in poor[er] countries are therefore met solely by information donation from the North".

The production and dissemination of research on poverty and related development issues is part of a complex web of global knowledge production and dissemination, characterised by inequalities, uneven participation and northern-dominated power relations. This is especially the case for South African university researchers who are faced with dual imperatives: to undertake and make available research that addresses local and context-specific concerns, while at the same time publishing in "high-impact" international journals that are unlikely to have an interest in these very issues. As the editor of one of these journals, *The Lancet*, admitted, "We editors seek a global status for our journals, but we shut out the experiences and practices of those living in poverty by our (unconscious) neglect. One group is advantaged while the other is marginalised" (Horton, 2003). Indeed, a study of four high-impact international social science journals found that these journals attracted authors from all over the world, but their empirical sites of study were largely in the US and Europe (Hamman, 2012). The South African government expects the higher education sector to take poverty and related development issues seriously, as evident in policy statements by government ministers, in university mission statements and in the social discourse concerning the role of universities in emerging economies (Gray, Trotter & Willmers, 2012), while for research financing purposes, it requires researchers to publish in high-impact international journals. This leaves researchers with the dilemma so succinctly summed up by Nyamnjoh (2010, p. 69) when he observed that "African scholars face a critical choice between sacrificing relevance for recognition, or recognition for relevance".

EXCAVATING ONLINE: THE GOOGLE SEARCH STUDY

The study of four identical Google searches on "poverty alleviation" was undertaken by the researchers during 2012, working with 20 individuals drawn from all continents. These searches were conducted through Google and Google Scholar, with one search including the term "South Africa" and the other search not specifying the term South Africa. The investigation looked only at the first screen of the search results.

The overarching interest of the study was in the visibility of South African resources (both work and outputs) in the search results. Specifically, the researchers wanted to find out whether South African research was visible when the term "South Africa" was not included. When the term "South Africa" was included or excluded, it would be possible to analyse:

- where the results came from, and the extent to which South African results appeared in the searches;
- which South African organisations, individuals or articles appeared, and what relevance this might have;
- the types of results, including the percentage of full-text results;
- the rankings of the results, and similarities and differences between the rankings;
- the similarities and differences between Google and Google Scholar results.

WHY GOOGLE SEARCHES?

There is substantial evidence of the use of search engines on the Internet as a widely used, indeed, primary mechanism for finding information (Waller, 2011), and Google's dominance among search engines is well established (Google has 80,9% of market share, according to StatOwl)[2]. As early as 2007, studies showed the prevalence of Google in academic use of the Internet across a range of disciplines (Nicholas, 2007). A more recent survey of those working in poverty alleviation in South Africa (mostly NGOs and government) reported that a general Internet search was the most common way to find poverty research, with 77% of respondents reporting doing so (De Satgé, 2012).

The researchers anticipated that search results obtained in this investigation would not be identical to each other, as they would be shaped by the Google search algorithm, particularly pertaining to personal history searches and geolocations, hence the decision for participants to be geographically dispersed. The researchers expected substantial overlap in the results and were keen to identify the similarities and differences in the search results.

The Google search algorithm is designed to rate web pages based on the number and importance of links that point to them, or as Google itself describes it, "to use the collective intelligence of the Web itself to determine which sites were more relevant" (Cutts, 2012). As explained by Levy (2010),

> first Google crawls the Web to collect the contents of every accessible site. This data is broken down into an index … a way of finding any page based on its content. Every time a user types a query, the index is combed for relevant pages, returning a list that commonly numbers in the hundreds of thousands, or millions.

2 16 August 2012, http://www.statowl.com/search_engine_market_share.php.

However, Google will change rankings and search results based on a user's Internet Protocol (IP) address or location, web history and recent searches (Brinkmann, 2009). Through the IP address, the geolocation APIs (application programming interfaces) give a web application the ability to obtain the geographical position of a user, and usually automatically provide country, region, city, postal / zip code, latitude, longitude and time zone (Jimenez & Santill, 2011).

Personalisation, the default in Google searches since 2009, is an important dimension of the algorithm and, together with geolocations, central to why results vary, with variances between results increasing as users deepen their profiles over time. As Simpson (2012) explains, there are two types of personalisation: individual personalisation will prioritise search results from sites a user has previously visited, while profile personalisation will match users with other users whose profiles and browsing histories are similar and connect a user to those sites.

The ranking of search results by Google is complex and receives ongoing attention and revision by Google, with PageRank, geolocation and personalisation being only three of the considerations. Other considerations include keywords in the web address, age of the page, and the freshness of information on the site. It is of note that the 2011 adjustment to the algorithm brought into play social networking recommendations, including Google's +1 and Facebook Likes (Aubuchon, 2012).

The researchers were also interested in Google Scholar, because this is a distinct, albeit overlapping, dataset from Google. As Walter (2011 p. 972) notes,

> Google Scholar gets its bibliographic records from three sources: (1) freely available web documents that 'look scholarly' in their content or format; (2) articles or documents supplied by Google Scholar's partner agencies: journal publishers, scholarly societies, database vendors, and academic institutions; (3) citations extracted from the reference lists of previously indexed documents.

Only records of the first type can be found through the regular Google interface.

The online searches were undertaken in the week of 16 May 2012. Respondents were identified through professional networks in the educational technology and development spheres, the aim being to obtain a spread of searches across every continent. They were located in South Africa, Australia, Brazil, Canada, Chile, El Salvador, France, India, Kenya, Lebanon, Malaysia, Nigeria, Taiwan, the United Kingdom and US. Two of the three respondents in South Africa were specifically selected for being outside of the main cities, in order to vary geolocation effect on the searches. Nine participants were from the academic sector, eight from the development sector and three from the information technology sector.

Participants were briefed on search process and then asked to submit results only from the first screen that came up after each search. While this was partly to reduce the onerous nature of the task, it was specifically because the researchers are aware that research has found that most Internet searchers do not go past the first screen. Simpson (2012) quotes Beitzel's (2007) extensive study which found that 79% of searchers do not go beyond the first results page, and King (2008) who provides corroboration for this finding.

Due to differing screen sizes, participants had different numbers of results, with an average of almost nine (8,96) search results over all searches. The lowest average of search results over all search topics was five and the highest was 10,75. The experiment had inevitable limitations. The researchers were not able to control and standardise each searcher's search conditions, and were therefore in authentic conditions rather than in artificially controlled ones. It would be useful to replicate the searches under more tightly constrained conditions.

FINDINGS: THE VISIBILITY OF SOUTH AFRICAN POVERTY RESEARCH ONLINE

The investigation sought to understand which countries produced research on poverty alleviation, which countries were reported on in the research, how localised the search results were, and what the subject matter of the results was. It further sought to understand how South Africa was represented in the search results.

SEARCH: POVERTY ALLEVIATION

The results of all the Google searches on "poverty alleviation" yielded zero responses for South Africa, illustrating a lack of country visibility. The three South African respondents' searches yielded no localised or country-specific results; rather, their results had hits for the following countries: Tanzania, Guyana, Pakistan, Nepal, India, China and The United Kingdom.

The Google Search for "poverty alleviation" yielded the most localised responses from Nigeria (83% of the Nigerian searcher's results); India (60% of the Indian searcher's results); Canada (40% of the Canadian searcher's results); and Malaysia (44% of the Malaysian searcher's results). It is difficult to ascertain the reasons for this. It may have been because the respondents had a variety of roles (including academic, administrator, lawyer and IT) and so their search histories would have differed substantially given the personalisation aspect of the Google search algorithm. While Google defaults to the country-specific version of the search engine (Simpson, 2012), it cannot be assumed that this is the reason that these searches were so local in their results while others were not.

The Google Scholar search for "poverty alleviation" produced no particular country specificity in terms of either where the results came from or which countries were featured. A range of countries appeared from every continent except South America (which most likely reflects the language of the search). African countries which appeared were Uganda, Zimbabwe, Cameroon and South Africa; while other countries were Indonesia, US, the United Kingdom, Bangladesh and India.

It is interesting that the Google Scholar search included a South African result while the Google search did not. Given Google Scholar's scholarly focus, the one local result was a journal article which only appeared once, interestingly in an open access journal. This article "Poverty: perspectives and educational implications", published in the *South African Journal of Education*, was located third out of ten in the search results for the academic in France. It is also of note because the French search results were the most distinctive and differentiated from the results from all other countries. As mentioned earlier, personalisation is a key aspect of the Google algorithm and this searcher was quite distinct, as an IT professional and a French speaker (although searching in English).

SEARCH: POVERTY ALLEVIATION SOUTH AFRICA

The Google search for "poverty alleviation South Africa" yielded significant visibility as all websites represented in search results for all respondents were either located in South Africa or contained South African content. The content was generated by five countries: South Africa (with 77% of the results) followed by Germany, the United Kingdom, France and Canada. Of the total of 173 hits for "poverty alleviation South Africa", 132 contained South Africa in the title of the article concerned.

All the Google Scholar "poverty alleviation South Africa" search results contain content from or about South Africa, with 80% of the results appearing to have been published within South Africa itself, while the other countries which appeared (ie those that had content about South Africa) were Australia, the United Kingdom, the Philippines and Germany. All articles represented had South Africa in the title of the article/book/citation. This is relevant as it shows how keywords in the title itself are more likely to be found (also a factor in the Google algorithm), so accurate descriptive titles are more useful (in terms of discoverability) than obscure ones.

Of the South African results, 16 were from universities, all of which were full text. There were five results from Rhodes University (three of which were from the Rhodes institutional repository), four from the University of Witwatersrand, three from the University of Pretoria, one from the University of Natal, one from the University of South Africa, one from the University of the Western Cape and one from the University of Cape Town. The 24% of non-university organisations included a research council (HSRC), three state structures and two civil society organisations (SALGA and Institute for Democracy in South Africa).

In terms of where the hits came from, the countries were Indonesia, the US, the United Kingdom, Bangladesh, India, Uganda, Zimbabwe, Cameroon and South Africa. Without further investigation, it is not possible to ascertain the exact reason for this. On one hand the high percentage of results with "South Africa" in the title from these countries would suggest that there is great deal of work being undertaken on poverty alleviation in those four "developed" countries. On the other hand, this might simply show that the publishers/producers of this content are especially proficient at ensuring that their content is online and discoverable there.

The results from South Africa included four articles from university institutional repositories and websites, including three from Rhodes University and one from University of Cape Town. Of the top five results, two of the five were listed in the Rhodes University institutional repository (both appeared in 16 of the 20 participants' search results). This is of note, given the important role that repositories have come to play in the open access space.

RESPONSE SCOPE AND TYPES OF RESULTS

FULL TEXT

Of the total number of unique responses, 48% were full-text responses, defined as a document that can be accessed in full directly from a site, or may require a registration or log-in ID, but does not require payment or a subscription. This includes academic journal articles as well as other scholarly outputs (for example, government documents, research reports), PowerPoint presentations, and journalistic articles. It is reasonable to assume that a searcher will focus their attention on those results which are immediately available as full text rather than try to gain access to the text by other means. Full-text results are clearly more convenient as they are simple click-throughs to the text itself, rather than references that require follow-up elsewhere. That convenience is a major motivator for researchers is borne out by research: using data from two multi-year user studies. Connaway, Dickey and Radford (2011) found that convenience is a situational criterion in people's choices and actions during all stages of the information-seeking process. They noted that "the concept of convenience can include their choice of an information source, their satisfaction with the source and its ease of use, and their time horizon in information seeking" (Connaway et al, 2011). While they found that the centrality of convenience was especially prevalent among the younger subjects, it held across all demographic categories – age, gender and academic role (Connaway et al, 2011).

SELF-ARCHIVING

The Google Scholar search "poverty alleviation South Africa" results included 18 articles, as well as two books. Of the 18 articles, four are located in institutional repositories or websites, with three being in the Rhodes University repository and one on a University of Cape Town website. Of these 18 articles, 10 are available as full text.

Eight of the nine journals in which the 18 articles are published appear on Sherpa Romeo, showing self-archiving which enables authors to make available their articles on their own websites or institutional repositories. Five of the journals are indexed by the Web of Science.

The only article which appeared in both the Google search and the Google Scholar search for "poverty alleviation South Africa" was "The importance of dry woodlands and forests in rural livelihoods" by Shackleton, Shackleton, Buiten & Bird (2007). Published in an Elsevier journal, *Forest Policy and Economics*, in 2007, this article is available on paid subscription at a cost to institutions of USD593 for 12 issues, or by online access to the single article for 24 hours at a cost of USD31,50. The version which appeared in the search results was not from the journal directly but was the version which was made available through the Rhodes University Institutional Repository from where it had been downloaded 2 356 times[3]. Of the referrals to the repository link, 65% were through search engines[4]. The article was also discoverable through Wikipedia - among the top 10 search results was one which led to Wikipedia, which then led to the article itself.

The university was able to make the article available according to the provisions outlined on Sherpa Romeo, the site where publishers' copyright and self-archiving policies are recorded. This is a Romeo Green Journal, which means that the author can legally archive a pre-print (pre-peer review) and a post-print (a final draft post refereeing), but not a publisher's PDF, in their institutional repository or on an institutional website. There is also an open-access publishing option for this journal, although it is not clear when this came into existence and it was probably not the case in 2007 when the article was archived in the institutional repository. The article charge for open-access publishing in this journal is USD3 000, which is extremely expensive, especially when foreign currency conversions are taken into account. This example of an often downloaded article which is widely downloaded and highly ranked provides a persuasive example of the effectiveness of self-archiving by universities, ie the green route in open access.

CITATIONS

Searching with the use of Google Scholar has some advantages over a Google search in that each of the Google Scholar results lists the number of citations for the scholarly paper, article or book. Through its "cited by" feature, Google Scholar provides access to abstracts of articles that have cited the article being viewed. Google's "cited by" feature presents a valuable innovation as compared to Scopus and ISI Web of Knowledge although, in a study limited to the biomedical field, the citation information found in Google Scholar has been found to be sometimes inadequate and less often updated (Falaga, 2007). The most cited document, "Fighting poverty with microcredit: Experience in Bangladesh", is a World Bank document, cited 535 times. The lone South African article on the first page was the least cited.

3 At the time of writing, 11 August 2012.

4 Statistics are available from the repository dashboard at http://eprints.ru.ac.za/414/, viewed 7 August 2012.

Table 1 shows the Google Scholar article results for "poverty alleviation South Africa" together with the number of times cited, as well as the number of duplications across the searches by participants in all geolocations. The article "Measuring poverty and deprivation in South Africa" was cited the most and is written by an academic from the University of Munich. The third most cited article, "Poverty, livelihood and class in rural South Africa", is co-authored by a non-South African academic from the University of Wisconsin and an academic from the University of KwaZulu-Natal. Interestingly the second most highly cited document, "Poverty and inequality in South Africa", is a presentation by Julian May of the Centre for Social and Development Studies, University of KwaZulu-Natal, not a journal article.

TABLE 1 : GOOGLE SCHOLAR "POVERTY ALLEVIATION SOUTH AFRICA" SCHOLARLY OUTPUTS, NUMBER OF TIMES CITED AND NUMBER OF DUPLICATIONS

Title of scholarly output	Number of times cited	Number of duplications
Measuring poverty and deprivation in South Africa	285	1
Poverty and inequality in South Africa	279	8
Poverty, livelihood and class in rural South Africa	267	2
Chronic poverty in South Africa: Incidence, causes and policies	171	16
The size and scope of the non-profit sector in South Africa	92	9
Links between the local trade in natural products, livelihoods and poverty alleviation in a semi-arid region of South Africa	54	16
Local economic development and urban poverty alleviation: The experience of post-apartheid South Africa	51	20
Pro-poor local economic development in South Africa: The role of pro-poor tourism	50	6
The importance of dry woodlands and forests in rural livelihoods and poverty alleviation in South Africa	47	16
The significance of the local trade in natural resource products for livelihoods and poverty alleviation in South Africa	47	15
Sectoral growth and poverty alleviation: a multiplier decomposition technique applied to South Africa	46	15
Local economic development in post-apartheid South Africa: A ten-year research review	35	1
Small enterprise development in post-apartheid South Africa: Gearing up for growth and poverty alleviation	30	5
Land reform and poverty alleviation in South Africa	28	13
Pro-poor local economic development in post-apartheid South Africa: The Johannesburg fashion district	23	6
Poverty alleviation and biodiversity conservation: A South African perspective	22	8
Microfinance and poverty alleviation in South Africa	22	3
The Child Support Grant in South Africa: A social policy for poverty alleviation?	21	2
Alternative foods and community-based development: Rooibos tea production in South Africa's West Coast mountains	20	4
Evolving local economic development policy and practice in South Africa with special reference to smaller urban centres	18	4
Connecting economic growth with poverty's LED challenge	18	2
Pastures of plenty? Land rights and community-based agriculture in Peddie, a former homeland town in South Africa	14	6
Setting the scene: Local economic development in southern Africa	10	4
Renewable energy technologies for poverty alleviation: Bio-diesel and solar-water heaters	3	5

The data in Table 1 shows that there is a wide range in the number of citations, ie highly cited articles do not necessarily appear in the search results for the majority of geolocations. It is interesting that the most highly cited article appeared in only one of the searches, that by the participant from Malaysia. The data makes it clear that there is no obvious connection between the number of citations and the number of times that the article concerned appears across the searches.

DUPLICATIONS AND SINGLE RESULTS

The Google search on "poverty alleviation" had a total of 33 sites represented in the search results. Of these, 15 sites appeared more than once and 18 of them only appeared once in any of the searches. The Google search on "poverty alleviation South Africa" has a total of 25 sites represented in the search results, of which seven appeared more than once and 18 of them appeared only once. The Google Scholar search on "poverty alleviation" had 15 sites represented in the search findings, of which nine appeared more than once and six appeared only once. As with the consistency of the content of results, so there was more similarity with the order of the results on Google Scholar, with four respondents' search results being identical in the Google Scholar "poverty alleviation" search. The others varied slightly in the order. The Google Scholar search on "poverty alleviation South Africa" had a total of 22 sites represented in the search findings, of which 20 appeared more than once, and two appeared only once.

THE RANKINGS OF THE RESULTS

Placement on search rankings is critical. Indeed they have become the raison d'être for an entire new set of activities – that of search engine optimisation – one which involves a delicate balance between the objectives of the search engines and the objectives of the content creators

The reason that rankings have become so important is because of the role that search engines now play in a digitally-mediated society – that of a surrogate expert. Simpson (2012) explains this crisply.

> When search engine results pages provide links to web pages and documents online, they imply that the target source is likely relevant to the enquirer's query. The results pages perform an additional function, however. By rank ordering the results, a further judgment is implied. When a link is ranked highly on the results page, it is implied that this is likely to be more relevant than those further down. In so far as one of the functions of a deep expert is to make a relevance judgment in orientating an enquirer to important sources of knowledge, not just relevant ones, search engines' decisions about which results to provide, in which rank order, is a quasi-fulfilment of the functions of a deep expert (p. 5).

There is therefore more at stake than simply convenience. A valuable study by Pan, Hembrooke, Joachims, Lorigo, Gay, and Granka (2007) powerfully illustrated that users trust higher ranking results even when those ranked lower are more relevant. Their eye-tracking experiment revealed that college student users have substantial trust in Google's ability to rank results by their true relevance to the query. When the participants selected a link to follow from Google's result pages, their decisions were strongly biased towards links higher in position even if the abstracts themselves were less relevant. While the participants reacted to artificially reduced retrieval quality by greater scrutiny, they failed to achieve the same success rate. As the authors note, this demonstrated trust in Google has implications for the search engine's tremendous potential influence on culture, society, and user traffic on the web.

In this study, we were interested in the rankings, ie the order in which results appeared, as well as how many results were duplicated across all the searches and how many appeared only once. We also wanted to know which results appeared the most often and how the results differed or were similar. What was noteworthy about the order of the results?

Table 2 shows the top five responses for the Google search "poverty alleviation".

TABLE 2: TOP FIVE RESPONSES FOR THE GOOGLE SEARCH POVERTY ALLEVIATION

Number of duplications	Title of website	Website
20	Poverty reduction	www.en.wikipedia.com
16	Poverty alleviation	www.povertyalleviation.org
12	Pakistan poverty alleviation fund	www.ppaf.org.pk/
12	Poverty alleviation overview	www.unep.org/ik/Pages.asp?id=Poverty%20Alleviation%20Overview
12	REPOA – research on poverty alleviation, Tanzania	www.repoa.or.tz/

In the Google Search "Poverty Alleviation" it is striking that in every case the top ranking was Wikipedia. The dominance of Wikipedia merits some attention, especially considering the scepticism with which it is generally considered by academics. Less than 20 years old (1995), Wikipedia was the first independent site to build a collaborative encyclopaedia using wiki-based technology. It is ranked as the sixth top website in the world (calculated by a combination of average daily visitors and page views over a one month period), and is South Africa's eighth top site (www.alexa.com). At the time of writing (August 2012), it had over four million English articles with a total of 22 million in 285 languages. Written by about 100 000 regularly active contributors, it has an estimated 365 million readers worldwide (according to Wikipedia itself).

The quality of its articles and the use of Wikipedia for educational and scholarly purposes has been contentious and the subject of significant amounts of research - a study in 2010 had scanned over 2 000 papers on these issues (Okoli, Mehdi, Mesgari, Nielsen & Lanamäki, 2010). The well-known 2005 study found, after a blind comparative test of 42 entries in the *Encyclopedia Britannica* and Wikipedia, that they were of comparable quality (Giles, 2005). A small, more recent study compared a sample of Wikipedia entries with those in four others – *Encyclopaedia Britannica* (English), *Enciclonet* (Spanish), *Mawsoah* and *Arab Encyclopaedia* (Arabic) – and found that Wikipedia fared well (Casebourne, Davies, Fernandes & Norman, 2012). A study which looked specifically at the ranking of Wikipedia articles in search engines found that respondents considered them satisfactory overall in terms of the quality of the articles (Lewandowski, 2010).

That Wikipedia is widely used is apparent not only from its rankings but also from surveys, such as those undertaken by the PEW Research Centre, whose last survey on this matter found that as at May 2010, 53% of American Internet users reported looking for information on Wikipedia (Zickuhr & Rainie, 2011). It is not clear whether these are users who search Wikipedia directly; if so, then the numbers are likely to be higher. In universities both students and academics use Wikipedia: 75% of academics and students reported doing so in a 2012 study (Knight & Peryke, 2012), with student use typically being confined to the initial stages of assessments (ibid) or checking facts and finding background information (Lim, 2009). Academics are willing to accept the student use of Wikipedia as a "research starter" (Henk, 2010) and admit to using it "though cautiously" themselves (ibid); indeed 70% of academics report using Wikipedia for background information for teaching purposes (ibid), and have been found across the disciplines to cite Wikipedia as a source of scholarly information in their own peer-reviewed research reports (Dooley, 2010). Wikipedia's citation rates in scholarly publications have been consistently increasing; it was cited 3 679 times in the Web of Science and Scopus databases between 2002 and 2011 (Park, 2011).

While the development sector per se has not been studied in terms of Wikipedia use, there have been studies of application in relevant sectors which address poverty issues, specifically health. One such study provided a careful and comparative study of Wikipedia's role as an information source for health and found that English Wikipedia is a prominent source of online health information compared to the other online health information providers studied (Laurent & Vickers, 2009). They noted in 2009 that 70% of junior physicians use Wikipedia in a given week (p. 476) and 50-70% of practising physicians use it as an information source in providing medical care.

The second most highly ranked results – after Wikipedia – were almost, but not quite, the same, with 18 of the 20 searches coming up with a US-based poverty alleviation consultancy (www.povertyalleviation.org). Based in Pennsylvania in the US (not in Africa), this is a seven-year-old consultancy organisation which appeared to have an inordinately high number of search results. Other than the exact match of the term, it is not possible to assess on what basis this organisation was ranked so highly in the search results, nor is there any way of speculating on what search engine optimisation strategies might have been employed to gain such a high ranking.

The two exceptions to this second result were from Nigeria and India, each of which had a more specifically local result, with the latter being another Wikipedia result, this one targeted at an Indian searcher/user. The Nigerian second result was both local and keyword perfect ("Poverty alleviation in Nigeria: Which way Nigeria?") and provided a link to a publication by a company which is a subsidiary of a British publisher with a focus on the Nigerian market. This probably reflects the care that professional publishers take to ensure the searchability of the titles that they publish, in order to increase reach and potential sales.

There were three respondents from Europe and their search results order was identical for the top three hits. There were four respondents from Australasia and their results varied more significantly than the others, specifically India's search results which were more India-specific in content (as noted previously). The other three respondents search results order was only similar for the top two results.

It is of interest that the top four search results of three of the four respondents from North America were identical in order. Two respondents – both from the North-East United States – had search results that were identical in terms of their order. The other American searches located in the Western United States varied slightly in order of search results but contained all the same sites. The Canadian participant's search results contained four out of ten results with Canadian content or sites from within Canada. However, search results did represent similarly in that the top two search results for the Canadian respondent were the same as for the fourth North American respondent and two results within search results were the same site as those of the other three North Americans. It was therefore of interest that of the respondents from North America and Canada, there were two sets of results in identical order, an unusual finding given the way search personalisation works, as their searching patterns would not have been identical. It is also noteworthy that there was such similarity within the North American results (with only small differences of order) demonstrating surprising homogeneity. It is also of interest that there were so many local results within the findings of the Canadian searcher, especially given that that this was not the case with the North Americans.

Of the participants from Africa, three were from South Africa and one from Kenya. The Kenya search results also reflected a Kenya bias with two of the ten search results being Kenya specific. Otherwise the order for the search results was only similar for the top two results. The three respondents from South Africa did not contain any South Africa-specific results. Their search results were not similar in order but did contain the same results in a differing order.

There was more of an even spread of results with the more specific search for "poverty alleviation South Africa". Of the three responses which appeared the most, only one led directly to a full text article: "Poverty alleviation strategies in South Africa: creating dignified living for women through social justice and development".

Finally, in the case of Google searches, there was one case where two searches were identical: these were the searchers from Taiwan and Lebanon. It is not possible to ascertain why this might be the case, especially as the two individuals had different roles in different sectors.

Aside from this case, Google searches showed more variety than Google Scholar. Table 11, showing the top five responses for the Google Scholar search on "poverty alleviation", shows much more consistency across the searches. Whereas in the Google searches only one result appeared across all the searches, in the Google Scholar search of "poverty alleviation" three results appeared across the board (although they did not appear in the same order in the different searches).

TABLE 3: GOOGLE SCHOLAR TOP FIVE RESPONSES FOR POVERTY ALLEVIATION

Number of duplications	Title of resource	URL
20	Workfare versus welfare: Incentive arguments for work requirements in poverty alleviation programs	http://www.jstor.org/stable/10.2307/2117613
20	Poverty alleviation and tropical forests – What scope for synergies?	http://are.berkeley.edu/6274EA45-C35C-48E2-A800-80532895767F/FinalDownload/DownloadId-FA12E5DD1BBE1B0B0826140AA72E5BEE/6274EA45-C35C-48E2-A800-80532895767F/~cmantinori/wunder2001.pdf
20	Food subsidies and poverty alleviation	http://www.jstor.org/stable/10.2307/2233909
19	Fighting poverty with microcredit: Experience in Bangladesh	http://www.cabdirect.org/abstracts/19991800156.html
18	Microenterprise finance: Is there a conflict between growth and poverty alleviation?	http://www.sciencedirect.com/science/article/pii/S0305750X98000217

Interestingly, when the term "South Africa" was added, one result appeared in all participants' search results, namely "Local economic development and urban poverty alleviation: The experience of post-apartheid South Africa" (1998). As noted earlier, there was generally more uniformity in the Google Scholar responses, thus three papers appeared 16 times. Two of these were from the Rhodes University repository: "Links between the local trade in natural products, livelihoods and poverty alleviation in a semi-arid region of South Africa" (2003) and "The importance of dry woodlands and forests in rural livelihoods and poverty alleviation in South Africa", and one was an article in an Elsevier journal: "Chronic poverty in South Africa: incidence, causes and policies" (2008). The tendency towards more consistent results across the board in Google Scholar is interesting and indicates that factors like personalisation and geolocation play less of a role in these searches, suggesting that these results are likely to be more objective.

CONCLUSION

In answer to the overarching question "How does South African research and practice fare in Google search results on 'poverty alleviation'?" the answer is that South African results are not visible when the term "South Africa" is not included. It is particularly noteworthy that the three South African participants' searches on Google for "poverty alleviation" yielded no South African results, even though participants from other countries got results from their own countries (up to 60% of their results were local). The Google Scholar search for "poverty alleviation" was only marginally better, with only one result from South Africa among the 15 distinct responses.

Those resources which do appear in the search listings from South Africa are substantially those hosted by institutional repositories and websites which professionally curate content to make them discoverable to search engines. This provides clear evidence of the benefits of policies and practices which give value to making research publicly accessible and backing these with the resources and time to properly curate online resources. The findings demonstrate the importance of acquiring the expertise to ensure that potential search terms appear in the title and that articles employ current approaches to metatagging. It is also of note that so many of the search results are available as full-text documents, suggesting that this is both an emergent norm and a growing expectation.

It is of note that the only South African journal article which appeared across the board in the different types of searches is an article which has been archived in the author's institutional repository. This highlights the effectiveness of self-archiving, known as "the green route" in open access publishing. The value of self-archiving is further borne out by the fact that almost all the papers which did appear originated from Romeo Green journals which support self-archiving, thus powerfully demonstrating the value of open access in boosting discoverability.

The findings also illustrate the ubiquity of Wikipedia in the search results and how it consistently ranks as the first result in a general search. This suggests that researchers could better exploit Wikipedia's unfailingly high search rankings by ensuring that it is a consistent source of reliable information.

Overall, at the most straightforward level this study makes explicit the relative invisibility via Google search of the South African research in an area critical to scholars, students, policymakers and civil society, both locally and globally. This speaks to several inter-related issues, including: what kind of knowledge production (both research and practice based) is being undertaken; if and how it is being shared; where it is being made available; the extent to which it is online; and the extent to which content is online in ways discoverable by search engines. It also speaks to issues of capacity and expertise and to issues of policy regarding knowledge dissemination and open access.

This invisibility is not an indicator of a paucity of local research and knowledge production, although academic research undertaken in universities suffers from the pressures experienced by researchers to publish in so-called international journals with little interest in local development issues. Knowledge production also takes place in settings beyond universities – it is undertaken by private-sector research institutes, produced by the work of non-government organisations and commissioned by national, provincial and local spheres of government. Ironically, government departments themselves commission research and evaluative studies which are often embargoed and, despite being funded with public money, are not conceptualised as public goods. In the state sector there are too many knowledge outputs that remain locked away and inaccessible, not least of which is the South African government's own website on the War on Poverty (http://www.waronpoverty.gov.za), which can only be accessed by registered users and provides no way for users to join the site.

The findings of this study reveal how poorly the immediate results of online searches surface relevant local results. They show at a practical level the problems of information retrieval and of content discoverability. At the same time, at a policy level they point to the lack of national policy to manage and make accessible publicly funded research, data and other knowledge outputs in the online space. This severely limits the potential value of research and development and questions the public benefit of all the investment in knowledge production and poverty alleviation activities if the knowledge gained and produced remains below the radar and undiscoverable. This in turn diminishes the contribution of local knowledge production to local, national, regional and international development and limits participation and impact in global networks and knowledge circulation systems. Internationally, scholarly communication and knowledge production systems have become inexorably open. Unless South African policy actively supports open access and the online visibility of local knowledge, the danger is that the invisibility demonstrated in this paper will deepen.

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ON RATIONAL CHOICE, RISK AND UTILITY IN MOBILE BANKING

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ABSTRACT: The diffusion of mobile banking technology offers an opportunity for analysis of the risk associated with the protection of information of banking clientele. There is emerging discourse with regard to clientele awareness of privacy issues. This article conceptualises banking clientele awareness of specific issues such as risk, security and information privacy policies. The key concern is the impact such awareness has on subscribers choosing to continue their use of mobile banking services. The article attempts to explain the utility/risk trade-off and how this affects the clients' willingness to continue subscribing to mobile banking services, using quantitative analysis and rational choice theory (RCT). Purposeful sampling targeted South African bank account-holders. Empirical results show that consumer willingness to continue to use mobile banking services is largely driven by the perceived utility of the service, while privacy risk is not a significant deterrent. This is an important finding in the context of banks encouraging consumers to use mobile banking systems, for the banks to achieve retail growth. This creates a greater responsibility for banks to manage consumer risk. The findings may be more broadly pertinent in the SADC region and on the African continent, where telecoms firms engaged in mobile banking services must also attend to issues of consumer risk; and where R&D investment in the field of information security is highly desirable.

KEYWORDS:
Mobile banking, privacy, risk, utility, rational choice theory

INTRODUCTION: THE PROBLEM OF RISK AND UTILITY IN MOBILE BANKING

Countries on the African continent have witnessed diffusion of advanced mobile devices such as smart phones and tablets in diverse economic segments, with mobile banking users being predicated as drivers for present and future retail banking revenues in South Africa (SouthAfrica.info, 2012) and elsewhere, such as Ghana (Essegbey & Frempong, 2011) and Kenya (Mishra & Bisht, 2013). This has come as a result of convergence between smart phones and banking technology. Notably, smart phones are increasingly becoming as powerful as laptops and desktops (Husted, Saidi & Gehani, 2011). Smart phones also have robust sensor platforms containing technologies such as global positioning systems (GPS), near field communications (NFC), wireless fidelity (Wi-Fi), Bluetooth and cellular capabilities (Husted et al, 2011). Because of their storage and transactional capabilities, smart phones and tablets have been vaults for large amounts of personal information, thereby exposing their owners to risk. The use of smart phones and tablets in mobile banking has attracted researchers and practitioners to understand the information security risk and to address concerns of privacy and the protection of banking clientele information. Of primary concern to researchers has been the goal of information protection and the discourse that addresses issues such as privacy, trust and information risk, because consumers are exposed to risk of third party information access during transactions (Shen, Huang, Chu & Hsu, 2010). Banks, financial service providers and banked clientele have all become aware of the reputational risk associated with breaches in personal information. It has therefore become imperative that banks put in place mechanisms to protect personal information from security breaches or improper access.

While banking clientele continue to derive and expect increased utility in mobile banking options, banks are increasingly concerned with information governance and issues such as security and privacy that address information risk. In an attempt to understand the underlying utility/risk tradeoff that banking clientele engage in, the authors use and extend the rational choice theory (RCT). In the information systems field of enquiry, RCT posits that consumers constantly engage in *making choices*, in which they compare the perceived utility against perceived risks of using a technology. The paper extends RCT by analysing the utility/risk trade-off *choice* of the banking clients in order to explain their willingness to continue subscribing to mobile banking services. The main research question therefore is: How does a bank client's rational perception regarding inherent utility and risk of mobile banking influence the choice to continue subscribing to a mobile banking service?

In exploring the question, the authors studied responses from mobile banking users in five provinces in South Africa. The findings and analysis may have broader applicability to mobile banking on the African continent, as the respondents come from a variety of income levels, genders, urban and peri-urban environments. In addressing the context and the question raised, the article is presented as follows: introduction of main theme and context; discussion of terminology related to information privacy and conceptual framework discussing rational choice theory (RCT); methodology and results. The penultimate sections revisit the conceptual model on the basis of the results obtained; followed by a discussion of what this means to theory and practice.

MOBILE BANKING, INFORMATION GOVERNANCE AND PRIVACY

Yoo, Lee and Rowley (2008) posit that mobile banking is "a coalescence of mobile technology and financial services, that surfaced after the dawn of the portable Internet and smart-chip-embedded handsets" (p. 120). Unlike Internet banking, which can mainly be established via a computer with an Internet connection, mobile banking only requires subscribers to be in possession of a mobile phone with at least GPRS functionality. Hu, Lee and Kou (2005) assert that "mobile services such as mobile commerce can only be conducted if all parties believe that there is adequate security" (p. 211). Accordingly, a viable security policy includes implementing effective security measures, identifying security risks, and educating users on the importance of security procedures.

Information governance is a methodology for providing controlled access to sensitive information while privacy relates to the disclosure and use of personal information. According to Huang, Shen, Yen and Chou (2011), factors such as privacy may impact a consumer's mobile banking utility. In practice, privacy is a key issue that affects the building of trust in mobile banking services. It is defined as the right of institutions, groups, or individuals to decide on the extent of disclosing their personal information (Solovo, Rotenberg & Schwartz, 2006; Cate, 1997).

GOVERNANCE AND PRIVACY IN DEVELOPED COUNTRIES

According to Giordano, (2010) governance and privacy have been converging, particularly in aspects such as regulatory frameworks. As an illustration, in the late 1990s the American Institute of Certified Public Accountants (AICPA) and the Canadian Institute of Chartered Accountants (CICA) jointly announced the formulation of an information governance framework for *web trust*. Web trust provided assurance in four primary areas, namely: (1) business practices and disclosure, (2) transaction integrity, (3) information protection and (4) information privacy (Huang et al, 2011). Another regulatory framework formulated in the United States, known as the Financial Services Modernization Act (FSMA), forbids financial institutions from sharing clients' personal information to non-affiliated third-party organisations unless permission is granted by the client (Shaw, 2001). Other assurance models, such as *Verisign*, focus on transaction integrity and information protection, while *TrustE* focuses only on information privacy. In addition to the *web trust* information governance framework, Table 1 below summarises examples of regulatory frameworks discussed that have had an impact on mobile banking practices in the US (Giordano, 2010).

TABLE 1: GOVERNANCE AND PRIVACY FRAMEWORKS

Assurance	Governance framework	Privacy frameworks
Business practices and disclosure, transaction integrity, protection and privacy	Web trust, Financial Services Modernization Act (FSMA), Sarbanes Oxley Act (SOX 404 and 409), Verisign	TrustE, HIPAA Security Rule, HIPAA Privacy Rule

According to Barman (2002) organisations should explicitly inform consumers why personal information is collected and how it will be utilised. As Barman (2002) notes, information disclosure rights are usually the preserve of consumers who must grant permission to organisations when these seek to use or to share personal information with third parties.

GOVERNANCE AND PRIVACY OF MOBILE BANKING IN AFRICA

Mobile banking governance and privacy cannot be removed from the wider aspects of general organisational risk and security (Elliot & Phillips, 2004). In fact, some of the shortcomings of mobile banking privacy issues have become beneficial to white-collar perpetrators of crime. Against the backdrop of white-collar crime, the continent through its banks and telecoms companies continues to provide mobile banking and mobile money transfer services that have increased utility for the clients they serve.

In South Africa, among the services currently in operation are Nedbank's *M-PESA*™, Standard Bank's *Instant Money*™, FNB's *eWallet*™ and ABSA's *CashSend*™. While the mobile banking model in South Africa is primarily bank-led, telecom companies have generally been drivers on the African continent for mobile banking services such as Kenya Safaricom's ground-breaking *M-pesa*™. Celpay is another telecom company driving mobile banking initiatives in Zambia, Democratic Republic of Congo and soon in Tanzania (Mishra & Bisht, 2013).

Besides Safaricom's *M-pesa*™, Chege & Wepukhulu (2013) allude to mobile banking services in Kenya that are third-party-led. These include Airtel's *Zap*™ (now Airtel money), and *yuCash*™. Banks in Kenya have also teamed up with telecom companies to offer mobile banking services. Orange Telkom has partnered with Equity bank to offer *Iko Pesa*™ and Family bank has teamed up with Safaricom to offer *Pesa Pap*™.

While developed countries have adopted governance and regulatory mechanisms for mobile banking initiatives, the situation is quite different in African countries. Mobile banking initiatives on the continent have been marked by differences in approach towards governance, security and privacy. In South Africa, for instance, the Protection of Personal Information (POPI) Act (passed by the National Assembly in 2013), has amplified this debate and concern. The Act sets out conditions on how information should be processed by institutions that handle personal information. The POPI Act also recognises "the right to privacy" and "includes a right to protection against the unlawful collection, retention, dissemination and use of personal information" (Korb, 2013). Moreover, most banking institutions abide by the stipulated codes of banking practice administered by the South African banking ombudsman. As part of the codes of banking practice, banks must assure their clients of confidentiality and privacy regardless of whether or not these clients maintain patronage with such banks (Korb, 2013).

In Kenya, Safaricom's entry into mobile banking through *M-pesa*™ was undertaken in the absence of legislation governing mobile payment systems, e-money, bank agents, consumer protection and anti-money laundering (CGAP, 2010). What followed from Kenya's *M-pesa*™ initiative was for legislators to initiate legislative changes that would accommodate regulatory requirements pertinent to mobile banking. These legislative initiatives included the 2009 amendment to the Banking Act 1991 to permit deposit-taking institutions to use agents. In addition, parliament passed the Anti-Money Laundering and Counter-Terrorism Financing Act 2009 (AML/CTF) (CGAP, 2010). At present, Kenya has no specific law or regulation that deals directly with issues of governance and privacy regarding e-money. As noted by CGAP (2010), the absence of any legal framework and the issuing of e-money by a licensed financial institution does not appear to raise issues with the Central Bank of Kenya (CBK).

In 2009, the Central Bank of Nigeria published its regulatory framework for mobile payment services that covered three specified models: bank focused, bank-led and third-party-led (Ayo & Ukpere, 2010). In sub-Saharan Africa, excluding South Africa, Nigeria is a leading light regarding mobile banking regulation (Ayo & Ukpere, 2010). Because of privacy and security concerns, analysts and stakeholders in Africa agree that there is a critical need to ensure that the mobile banking sector is well regulated (Ayo & Ukpere, 2010).

Across the continent, banks and governments must therefore address the potential threats to mobile banking, because of the need to protect the personal details and financial information of African consumers, which is critical to the success of mobile banking (McKnight, Choudhury & Kacmar, 2002). The playing field for mobile banking on the continent has not been comparable to South Africa's, where the country's tougher regulations have meant greater adherence to consumer protection against information security risks. In the absence of sound and clear regulatory frameworks that address privacy, security threats for African consumers are likely to be exacerbated.

There are three categories of security threats in mobile banking that are likely to affect mobile banking consumers on the African continent. These include disclosure threats (that border on privacy issues), integrity threats, and denial-of-service threats. Disclosure threats or violations of confidentiality occur when the message or information considered to be private is disclosed to a third party (Elliot & Phillips, 2004). Disclosure threats are further divided into eavesdropping, masquerading, traffic analysis, browsing, leakage, and inference. Integrity threats occur when the contents of a report, communication or message are copied, manipulated or altered by an interloper. Denial of service is established when there are attempts to make mobile resources unavailable to intended users. It is usually perpetrated by hostile computers overloading the target mobile resources with unsolicited requests. Scholarly literature portrays justifiable concern by consumers of traditional banking services as hesitant to embrace the more current and innovative mobile banking services (McKnight, Choudhury & Kacmar 2002).

Such concerns may be due to fear that banks and other financial institutions may not provide adequate assurance regarding protection of their personal details on mobile platforms. The uncertainty associated with privacy and security risk in mobile banking services, coupled with the innate attractiveness (utility) of mobile banking convenience results in situations where consumers engage in calculated trade-offs between the perceived utility and perceived risks of mobile technology.

APPLYING THE THEORY OF RATIONAL CHOICE

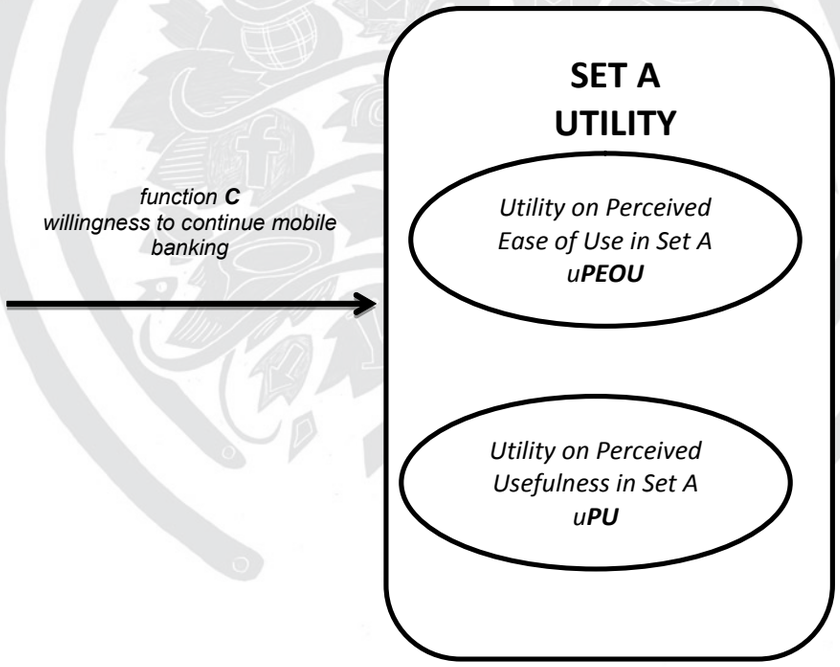
Rational choice theory (RCT) is an approach that seeks to explain choice by making certain assumptions about what motivates individual action (Bridge, 2009). RCT describes the choices (optimise/maximise utility) made by individuals as an optimisation and maximisation process. The assumption in the case of banked clientele deciding to subscribe to mobile banking services is that those individuals have certain preferences towards mobile services (utility) and that they act in a consistent way to get the most of what they require from those services (optimise/maximise utility). The hypothesis for this study is that in the process of maximising utility from mobile banking services, banking consumers are invariably willing to disclose personal information and forgo concerns regarding privacy and security whenever the perceived benefits (ie utility of ease of use, high network availability, etc) outweigh the perceived potential privacy risk.

A related concept to rational choice theory (RCT) is the technology acceptance model (TAM). While RCT attempts to share insights on the process of optimising and maximising utility of a technology, TAM provides insight on external variables that largely influence clientele's decision on whether or not personal information is at risk (Park, 2009). TAM is characterised by variables that are fundamental building blocks for RCT. These two variables are utility derived from *"Perceived Ease of Use"* **(uPEOU)** and *"Perceived Usefulness"* **(uPU)** of a technology (Legris, Ingham, & Collerette, 2003; Pai & Huang, 2011; Turner, Kitchenham, Brereton, Charters & Budgen, 2010). The utility of PEOU refers to the satisfaction a consumer gets by spending the least amount of effort to utilise a system or service. TAM hypothesises that the less effort taken to utilise a specific technology, the higher the utility and PEOU. The likelihood then is that the consumer will perceive the proposed technological service as beneficial. This will in turn influence the consumer's choice towards a specific technology or service (Venkatesh, 2000).

The second TAM factor, utility on PU, refers to whether or not the consumer believes that utilising mobile banking technology will increase the consumer's productivity. The higher the belief that the technology will improve productivity, the greater the PU, which in turn increases the chances that the consumer will be willing to risk security (*rational choice*) and disclosure of private information as a trade-off towards utilising the technology.

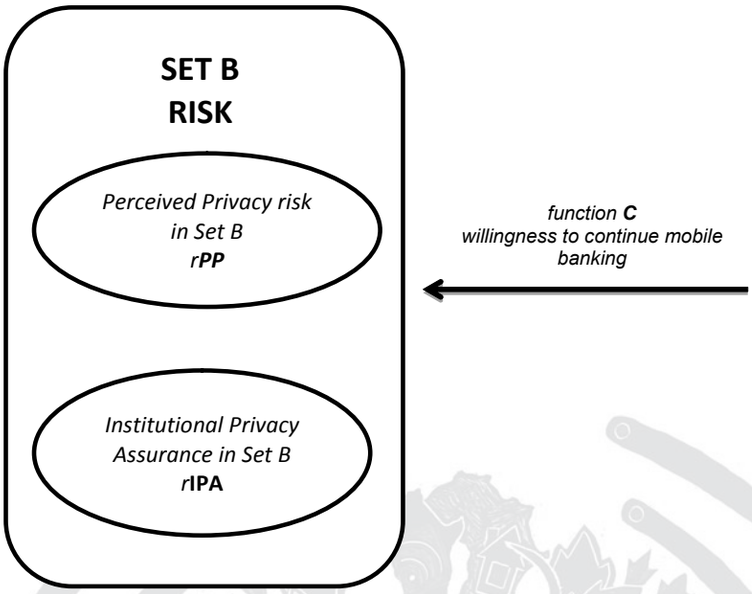
A key property of *rational choice* as explained in the previous discourse is attributed to what Miljkovic (2005) calls *consistency* of reason and is explained as follows: Consider a bank client's behaviour regarding what influences mobile banking *choice* (in Set A) by analysing subsets of the set A (influencing variables uPEOU and uPU), as described by a function C whose domain is the set of all subsets of A and whose range is the set A. This can be denoted by Figure 1 below.

FIGURE 1: UTILITY SET AND SUB-SET



From Figure 1, the element *choice* for Set A, *utility*, denoted as $C(A_1)$, is interpreted as the bank client's choice whenever she/he confronts the decision problem A. For every A, $C(A_1) \in A$. It is said that the (rational) client's behaviour function C satisfies the consistency condition if for all A1 u***PEOU*** $\subseteq A_2$ u***PU*** $\subseteq A$, if $C(A_2) \in A_1$ then $C(A_1, u\textbf{\textit{PEOU}}) = C(A_2, u\textbf{\textit{PU}})$. In other words, if the element chosen from the large set (A) is a member of the smaller set (A_1), then the decisionmaker chooses this element from the smaller set as well. The same reasoning can be applied on the choice regarding risk, with the element choice for Set B risk, denoted as $C(B_1)$ and is interpreted as the client's choice to take risk whenever confronted by a decision problem B. For every B, $C(B_1) \in B$. The set B could include sub-set B_1 *Perceived Privacy risk* (r**PP**) and B2, *Institutional Privacy Assurance* (r***IPA***) as other variables that influence choice C such that B_1 r**PP** $\subseteq B_2$ r**IPA** $\subseteq B$, if $C(B_2) \in B_1$ then $C(B_1, r\textbf{PP}) = C(B_2, r\textbf{IPA})$.This can be denoted by Figure 2 below.

FIGURE 2: RISK SET AND SUB SET



THE CONSTRUCTS

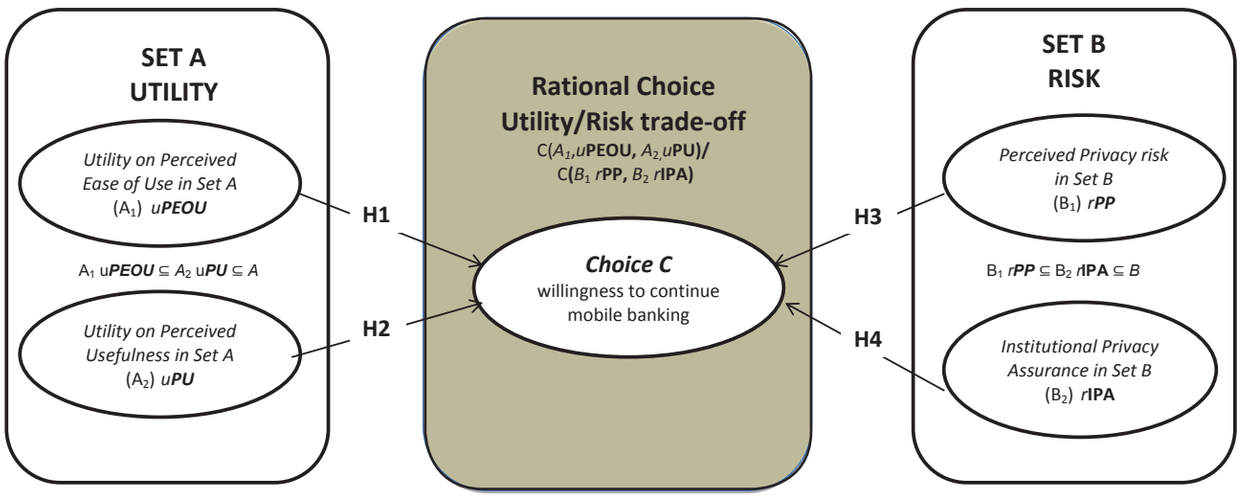
Based on the previous discussions, RCT identifies the choice C that a bank client makes regarding the utility/risk tradeoff, C(A_1,*u***PEOU**, A_2, *u***PU**)/ C(B_1 *r***PP**, B_2 *r***IPA**). The following constructs have been used to examine the risk/ utility tradeoff as follows;

- *Utility on Perceived Ease of Use* (*u***PEOU**)
- *Utility on Perceived Usefulness* (*u***PU**)
- *Institutional Privacy Assurance Risks* (*r***IPA**)
- *Perceived Privacy Risks* (*r***PP**)

On the basis of the above four variables, a framework for testing the utility/risk tradeoff can be developed using the following hypotheses:

H1: uPEOU will positively influence trusting intention, C.
H2: uPU will positively influence trusting intention, C.
H3: rPP will negatively influence trusting intention, C.
H4: rIPA will negatively influence trusting intention, C.

FIGURE 3: RATIONAL CHOICE CONCEPTUAL MODEL FOR UTILITY/ RISK TRADEOFF



The research work therefore set out to test the above framework regarding the *choice* C underlying C(A_1,u**PEOU**, A_2, u**PU**)/ C(B_1 r**PP**, B_2 r**IPA**) for a South African mobile banking consumer. The next section outlines the methodology and methods used to test the above hypotheses.

METHODOLOGY

This research was quantitative in approach as it sought to understand "how", not "why", consumers respond to choice. This enquiry is useful because it enables an understanding of why firms and governments should address issues of risk in mobile banking.

South Africa is appropriate as a study country because a survey of five provinces offers an opportunity to understand the choices of consumers in highly urbanised "city" environments and in more provincial environments. Thus the survey results reveal insights into a cross-section of mobile banking consumers. Three hundred and fifty questionnaires were distributed across seven cities in five provinces of South Africa. These cities were selected because of diversity in the banking clients' cultural, demographic and biographic characteristics. The provinces were KwaZulu-Natal, Gauteng, Mpumalanga, North West Province and Limpopo. Each province was allocated 50 questionnaires. Two hundred and nine questionnaires were completed successfully, a success rate of 59.7%.

Table 2 below provides a summary of the provinces that had the highest response rates to the questionnaire. The Zululand District of KwaZulu-Natal had the highest response rate (peri-urban), followed jointly by Gauteng's Sandton (city) and KwaZulu-Natal's Durban (city). Mpumalanga's White River is fourth (peri-urban), Gauteng's Auckland Park fifth (city), while North West's Kimberley (large town) and Limpopo's Polokwane (large town) are sixth and seventh respectively.

TABLE 2: SURVEY LOCATIONS

	Response rates from provinces			
	Location	Frequency	Valid %	Cumulative %
Valid	Zululand	46	22.0	22.0
	Sandton	39	18.7	40.7
	Durban	39	18.7	59.4
	White River	38	18.2	77.6
	Auckland Park	23	11.0	88.6
	Kimberley	14	6.7	95.3
	Polokwane	10	4.7	100.0
	Total	**209**	**100.0**	

The study surveyed respondents using a questionnaire based on a five-point Likert scale (see Appendix) that was developed to enable a rigorous understanding of consumer choice. The researcher statistically scrutinised *choice* and the decision process of a sample of mobile consumers who were already using basic features of smart phone applications such as online streaming of media content, social media and email and had started using mobile banking applications. To achieve this purpose, the questionnaires targeted users who had started using mobile banking applications. The quantitative research questions were relationship type questions, the aim being to investigate groups, associations or causal relationships between two or more variables. This particular study was aimed at examining the *choice* of actual consumers of a mobile banking service and its influence on their *willingness to continue* using mobile banking services.

For purposes of this research, purposive, non-probability sampling was chosen as the appropriate sampling method that best fits the requirements (Adler & Clark, 2008; Agarwal, 2005), see Table 3 below. The sample comprises bank clients of the four largest South African banks (FNB, ABSA, Nedbank, and Standard Bank). A filter question in the questionnaire was used to determine this.

TABLE 3. SAMPLING PROCESS

Sampling	Examples
Non-probability sampling	General profile of South Africans
Purposive sampling	Banking clients of South Africa

TABLE 4. RELIABILITY

Reliability statistics		
Construct	Cronbach's Alpha	Number of items
Perceived Ease of Use (uPEOU)	.796	15
Perceived Usefulness (uPU)	.825	15
Perceived Privacy Risks (rPP)	.900	18
Institutional Privacy Assurance (rIPA)	.930	20

The analysis was conducted by grouping all variables pertaining to constructs. The Cronbach's alpha for all constructs was greater than 0.7 which indicates that the instrument used to measure these constructs was consistent.

RESULTS AND DISCUSSION

It was imperative that the correct respondents were identified, hence a set of prerequisite questions were provided. 26.3% of respondents had been bank account holders in the previous five years, while the majority or 73.7% were bank account holders at the time of the survey. The composition of the study population of 209 was mainly in the age groups 21-49 years (76.6%), generically black[1] (86.1%), employed or self-employed (71.6%)

Hypothesis testing revealed the following:

UTILITY: PERCEIVED EASE OF USE AND PERCEIVED USEFULNESS

This section revisits the hypothesis **H1:** *u*PEOU and *u*PU will positively influence *choice C*. A correlation test was conducted in order to establish the relationship between the independent variables uPEOU/uPU *Perceived Ease of Use/ Perceived Usefulness*) and the dependent variable C (*Willingness to Continue Subscribing*). The purpose was to determine the *Pearson correlation coefficient* (two-tailed test) using SPSS. The SPSS output provided a matrix shown as Table 5 below.

TABLE 5: CORRELATION BETWEEN C AND UPEOU/UPU

		C	uPEOU	uPU
		Banking and file sharing	I have never experienced timeouts	Always operational
Banking and file sharing	Pearson correlation	1		
	Sig. (2-tailed)			
I have never experienced timeouts	Pearson correlation	.269**	1	
	Sig. (2-tailed)	.000		
Always operational	Pearson correlation	.144*	.614**	1
	Sig. (2-tailed)	.038	.000	
**Correlation is significant at the 0.01 level (2-tailed).				
b. Listwise N=209				

1 In South Africa, generically black means Black, Coloured and Indian/Asian.

Data analysis shows that *u*PEOU and *u*PU positively influence C with a Pearson correlation coefficient of *r* = **.269** and **.144** respectively. The Significance Value for *u*PEOU is less than **.001** (as indicated by the double asterisk (**) after the coefficient). The significance value shows that the probability of getting a correlation coefficient this big in a sample of 209 respondents if the null hypothesis were true is very low. Although we can state with certainty that *u*PEOU will positively influence C, since the significance is less than .001 we cannot state the same (with any certainty) with the variable PU which has a significance of **.038** that *u*PU is related to willingness to subscribe C.

We may reject the null hypothesis.

PERCEIVED PRIVACY RISK

This section revisits the hypothesis: **H3**- *r*PP (Perceived Privacy Risk) will negatively influence C. The SPSS output provided a matrix shown as **Table 6** below. Data analysis show that two constructs used for *r*PP are both negatively related to C (weak relationship) with a Person correlation coefficient of *r* = -**.204**** and **-.048** respectively.

TABLE 6: CORRELATION BETWEEN RPP AND C

		C	rPP	rPP
		Banking and file sharing	Mobile banking applications inform subscribers about ways of reinforcing security.	Mobile banking applications provide tips on security mechanisms' best practice.
Banking and file sharing	Pearson correlation	1		
	Sig. (2-tailed)			
Mobile banking applications inform subscribers about ways of reinforcing security.	Pearson correlation	-.204**	1	
	Sig. (2-tailed)	.003		
Mobile banking applications provide tips on security mechanisms' best practice.	Pearson correlation	-.048	.622**	1
	Sig. (2-tailed)	.490	.000	
**Correlation is significant at the 0.01 level (2-tailed).				
b. Listwise N=209				

In light of South African consumers' perceived privacy threats the variable, consumer choice C, is dependent on South African banking institutions intervening by providing reassurance to consumers regarding security risk. There is a very weak relationship (*r* = **-.048**, significant at **p = .490**), meaning that we cannot conclusively state that risk has an influence on a consumer's choice on continued use of mobile banking services even though they could be aware of such risk. This is because the **p** value is not significant (**p =.490**).

INSTITUTIONAL PRIVACY ASSURANCE

This section revisits the hypothesis: **H4:** *r*IPA (*Institutional Privacy Assurance*) will negatively influence C. The SPSS output provided a matrix shown as **Table 7** below. Data analysis shows that two constructs used for rIPA are both negatively related to C with a Person correlation coefficient of r = **-.056** and **-.007** respectively.

TABLE 7: CORRELATION BETWEEN C AND RIPA

		C	rIPA	rIPA
		Banking and file sharing	I am satisfied with my bank's mobile banking application privacy policy	My bank provides explanations for the collection of my personal information
Banking and file sharing	Pearson correlation	1		
	Sig. (2-tailed)			
I am satisfied with my bank's mobile banking application privacy policy	Pearson correlation	-.056	1	
	Sig. (2-tailed)	.421		
My bank provides explanations for the collection of my personal information	Pearson correlation	-.007	.463**	1
	Sig. (2-tailed)	.914	.000	
**Correlation is significant at the 0.01 level (2-tailed).				
b. Listwise N=209				

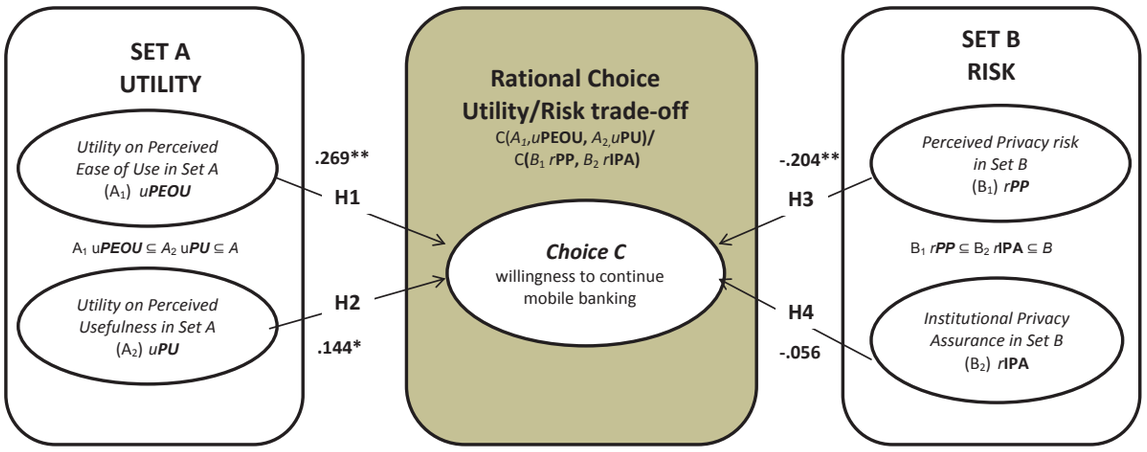
The data shows weak relationships and that institutional privacy assurance (rIPA) most likely affects the consumer's choice, but not as strongly as originally envisaged. According to data, the role of banks in providing assurance and maintaining obligations (or lack thereof) towards the privacy of client's personal information has not been significant.

REVISITING THE RATIONAL CHOICE MODEL FOR MOBILE BANKING UTILITY AND RISK

Based on empirical data we revisit and populate the model Figure 2, now shown as Figure 4: South African mobile banking consumer choice is influenced more by the perceived ease of use (u*PEOU*) of a technology (r = .**269****) than by perceived risk (r*PP*) (r = -.**204****). According to this study, the u*PEOU* variable has the most significant influence over all other variables when determining whether or not a consumer would continue subscribing to mobile banking services.

This is significant because it shows how mobile banking technology and services are currently perceived. The South African consumer (21-49, generically black, employed or self-employed) will forgo concerns about privacy and security in favour of utility. In banking contexts, this is a potentially significant insight for banking institutions, particularly if consumers exhibit this behaviour *after they start using mobile banking services*. The results can be interpreted to mean that once mobile banking is initiated, risk would not constitute a significant deterrent.

FIGURE 4: RATIONAL CHOICE CONCEPTUAL MODEL SHOWING EMPIRICAL RELATIONSHIPS



Drawing on the insights from rational choice theory this work provides empirical evidence of a weak relationship between consumers' perceived privacy risk (*r*PP) and their willingness to continue to subscribe (C). This is an interesting finding because it shows that consumers' understanding of privacy and security may not dampen their willingness to use Internet banking when there is perceived technological utility. Empirical data shows that uPEOU has a much stronger relationship with C than all other variables. It follows then that this is the rational choice explicated in this study. While South Africa was the study country, the results may have broader applicability, as the sample included a cross-section of the population according to geo-economic context (city, peri-urban, town), age, race and employment status.

IMPLICATIONS OF STUDY FOR INDUSTRY

Financial institutions should be aware that consumers of mobile banking will make choices that are not static. Dynamism in choices will depend on the following variables that are likely to shape perception of utility for mobile banking depending on whether consumers will gain or not at any point in time. These variables will include how utility (as opposed to risk) is framed, anchored, endowed and fair (Yang & Lester, 2008).

At present, the study has shown that the average consumer is willing to continue to subscribe (*choice* C) as long as there is perceived usefulness of the technology. A strong mobile banking brand must effectively portray utility and trust, while addressing risk, thus strengthening choice. Banks and the mobile telecommunications industry must build a clear brand that aims towards consolidating risk assurance and utility for consumers. Strong branding should be supported by continuous innovation in security standards and analysis of emergent security risks.

IMPLICATIONS FOR THEORY

This limited study contributed toward the construction of a broader knowledge base for understanding the choice of banking consumers to continue to use mobile banking. From a consumer perspective, the use of rational choice theory offers a way of conceptualising the choice made by a banked consumer. The study highlights the idea that privacy (and security risk) should not be looked at in isolation from other variables such as utility of technology. Significantly, according to the findings of this study, utility may at times override privacy and security concerns. This should be of concern to practitioners of data and information security, particularly if dynamics of utility variables keep changing in the context of transition to a digital banking and financial system. Greater investment is required in research and development (R&D) for information security products and services as the digital era advances, including on the African continent where R&D investment is meagre.

LIMITATIONS OF STUDY

One of the main limitations of this study is the notion that decisions are always rational. Other studies that show that this is not always the case include work by Yang & Lester (2008), who have philosophised about the existence of irrational behavior and argue that decisionmakers may not always optimise computational power in pursuit of maximising expected utility. Furthermore, in order to understand the decisionmaking process and choice of decisionmakers, qualitative approaches would be more appropriate to extract the reasons behind consumer choice.

CONCLUSION

The article examined consumer choice and the willingness of consumers to continue subscribing to mobile banking services. Indeed, increased mobile banking and mobile money transfer revenues across the continent (Toyama, 2009; Mishra & Bisht, 2013) suggest that these are common choices. The empirical results reveal that while theory may emphasise risk, perceived utility was noted as the overriding factor that influenced willingness to continue using mobile banking. At this stage it may be difficult to tell whether experience and familiarity with applications similar to mobile banking service applications played a catalysing role in influencing choice. Future research can consider the plausibility of other factors that influence choice in subscribing to mobile banking services.

Finally, as discussed above, it is disturbing that mobile banking consumers are paying less attention to risk. More needs to be done to raise awareness of security concerns and to build innovation capability in the field of information security for mobile banking and mobile money.

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APPENDIX: Survey Questionnaire

Section 1: Background Information

Location .....

1.1. Have you been an account holder of a South African bank?

Yes, I have been in the past five years	1
Yes, I currently am	2
No, I haven't been in the past five years	3

If you marked 1 or 2, then proceed to the questions below, or your participation in this questionnaire ends here. Thank you for participating.

1.2. Do you own a cellphone?

Yes	1
No	2

If you marked 1, then proceed to the questions below, or your participation in this questionnaire ends here. Thank you for participating.

1.3. Can your cellphone launch an Internet browser?

Yes	1
No	2
Not sure	3

If you marked 1 or 3, then proceed to the questions below, or your participation in this questionnaire ends here. Thank you for participating.

1.4. Have you used your cellphone's Internet to receive and perform any of the activities below? (Please indicate with an X where applicable)

RSS feeds	
Mobile banking	
Online streaming (ie audio, TV, Film, etc.)	
Downloads (ie Games, Music, etc.)	
Social networks (ie Facebook, Twitter, BBM, etc.)	
Email	
Modem & hotspot	
Content subscriptions (ie magazines, news, etc.)	
File sharing	
Other, please specify:	

Section 2: Biographic Information

This section of the questionnaire refers to background (biographical) information. Although we are aware of the sensitivity of the questions in this section, the information will allow us to compare groups of respondents. Once again, we assure you that your response will remain confidential and anonymous. Your cooperation is appreciated.

2.1. Gender

Male	1
Female	2

2.2. Age group

20 or younger	1
21 – 29	2
30 – 39	3
40 – 49	4
50 – 59	5
60 or older	6

2.3. Ethnicity

Black	1
Coloured	2
Indian or Asian	3
White	4

2.4. Marital status

Single	1
Married	2
Divorced	3
Living with partner	4
Widowed	5
Other, please specify:	6

2.5. Highest educational qualification achieved

Grade 11 or lower (Std 9 or lower)	1
Grade 12 (Matric, Std 10)	2
Post-matric diploma or certificate	3
Baccalaureate degree(s)	4
Post-Graduate degree(s)	5

2.6. How would you describe the area in which you are residing?

Urban	1
Rural	2

2.7. Size of your household, ie the number of people, including yourself, who live in your house/dwellings for at least three months of the year?

Live alone	1
2	2
3	3
4	4
5	5
6 or more	6

2.8. Employment status

Employed	1
Self-employed /independent consultant	2
Unemployed	3
Student	4
Other, please specify:	5

If you marked 1, 2 or 5, then proceed to the question below (2.9.), otherwise proceed to Section C.

2.9. Employment industry

Construction, trades & mining	1
Education and teaching	2
Banking & finance	3
Media	4
Automotive	5
Telecommunications	6
IT	7
Government	8
Non-governmental organisation	9
Consulting	10
Safety and security	11
Manufacturing & production	12
Legal	13
Property	14
Recruitment	15
Science & research	16
Sports & lifestyle	17
Travel, leisure & tourism	18
Aerospace & aviation	19
Customer service & call centre	20
Insurance	21
Retail & wholesale	22
Agriculture, fishing & forestry	23
Catering & hospitality	24

Fashion, art & design	25
Health, medicine & nursing	26
Marketing, advertising & PR	27
Oil, gas & alternative energy	28
Purchasing & supply chain	29
Sales	30
Social services	31
Transport & logistics	32
Installation, maintenance & repair	33
Warehousing & distribution	34
Other, please specify:	35

Section 3: Perceptions

Please note that every question in this section and sections to follow is associated with two scales: the first part seeks your level of agreement or disagreement towards the given statement; the second part aims to identify your level of importance towards the given statement.

3.1 Choice (please indicate by making an X in the relevant column)

Item code	Question	Current					Level of importance				
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Not important	Somewhat important	Neutral	Very important	Essential
C01	Mobile banking is important to my life	1	2	3	4	5	1	2	3	4	5
C02	I conduct and share personal banking information/files across my mobile device	1	2	3	4	5	1	2	3	4	5

Section 4: Perceptions (extract of actual)

Please note that every question in this section and sections to follow is associated with two scales: the first part seeks your level of agreement or disagreement towards the given statement; the second part aims to identify your level of importance towards the given statement.

4.1 Perceived ease of use (please indicate by making an X in the relevant column) (extract of actual)

Item code	Question	Current					Level of importance				
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Not important	Somewhat important	Neutral	Very important	Essential
PEOU01	Mobile banking applications are easy to install	1	2	3	4	5	1	2	3	4	5
PEOU02	I have never experienced timeouts with mobile banking applications.	1	2	3	4	5	1	2	3	4	5
PEOU03	Mobile banking applications allow conducting of banking at any time of the day.	1	2	3	4	5	1	2	3	4	5
PEOU04	Waiting period for authentication into mobile banking applications is short.	1	2	3	4	5	1	2	3	4	5
PEOU05	Doing banking using mobile banking applications is error-free.	1	2	3	4	5	1	2	3	4	5
PEOU06	Mobile banking applications' default screen lists types of banking transactions available.	1	2	3	4	5	1	2	3	4	5
PEOU07	Mobile banking applications offer helpful tips on banking using a mobile device.	1	2	3	4	5	1	2	3	4	5

4.2 Perceived usefulness (please indicate by making an X in the relevant column) (extract of actual)

Item code	Question	Current					Level of importance				
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Not important	Somewhat important	Neutral	Very important	Essential
PU01	Mobile banking applications allow for viewing of bank account statements.	1	2	3	4	5	1	2	3	4	5
PU02	Mobile banking applications help me avoid standing in long queues at the bank's branch.	1	2	3	4	5	1	2	3	4	5
PU03	Mobile banking applications allow for the purchases of prepaid airtime, electricity etc.	1	2	3	4	5	1	2	3	4	5
PU04	Mobile banking applications permits the making of payments.	1	2	3	4	5	1	2	3	4	5
PU05	Mobile banking applications are always operational.	1	2	3	4	5	1	2	3	4	5
PU06	Mobile banking applications permits the making cash transfers.	1	2	3	4	5	1	2	3	4	5

4.3 Perceived privacy risks (please indicate by making an X in the relevant column) (extract of actual)

Item Code	Question	Current					Level of importance				
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Not important	Somewhat important	Neutral	Very important	Essential
PP01	Mobile banking applications conceal subscriber's personal information.	1	2	3	4	5	1	2	3	4	5
PP02	Mobile banking applications do not store usage history without subscriber's knowing.	1	2	3	4	5	1	2	3	4	5
PP03	Mobile banking applications remove subscriber's browsing history upon log-out.	1	2	3	4	5	1	2	3	4	5
PP04	Mobile banking applications inform subscriber about ways of reinforcing security.	1	2	3	4	5	1	2	3	4	5
PP05	Mobile banking applications prevent the use of cookies to track subscriber's usage history.	1	2	3	4	5	1	2	3	4	5
PP06	Mobile banking applications prevent installation of add-on software that could compromise privacy information.	1	2	3	4	5	1	2	3	4	5
PP07	Mobile banking applications block installation of third party software that could compromise privacy information.	1	2	3	4	5	1	2	3	4	5
PP08	Mobile banking applications provide tips on security mechanisms' best practice.	1	2	3	4	5	1	2	3	4	5
PP09	Mobile banking applications suggest to the subscriber about necessary software upgrades.	1	2	3	4	5	1	2	3	4	5

4.4 Institutional privacy assurance (please indicate by making an X in the relevant column) (extract of actual)

Item code	Question	Current					Level of importance				
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Not important	Somewhat important	Neutral	Very important	Essential
IPA01	Mobile banking application protects the integrity of subscriber's personal information.	1	2	3	4	5	1	2	3	4	5
IPA02	I am aware of my bank's mobile banking applications privacy policy.	1	2	3	4	5	1	2	3	4	5
IPA03	My bank's mobile banking applications privacy policy is understandable.	1	2	3	4	5	1	2	3	4	5
IPA04	I am satisfied with my bank's mobile banking application privacy policy.	1	2	3	4	5	1	2	3	4	5
IPA05	I am pleased with my bank's mobile banking application information privacy assurance.	1	2	3	4	5	1	2	3	4	5
IPA06	My bank provides explanations for the collection of my personal information.	1	2	3	4	5	1	2	3	4	5
IPA07	I understand reasons behind collection of personal information by my bank.	1	2	3	4	5	1	2	3	4	5

TOWARDS AN ELECTRONIC MONITORING, OBSERVATION AND COMPLIANCE FRAMEWORK FOR CORPORATE GOVERNANCE USING BUSINESS PROCESS MANAGEMENT SYSTEMS

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ABSTRACT: Corporate governance has been heavily criticised, because of governance failures in companies across the globe. In response to these failures, legislative and regulatory changes have been introduced. However, skeptics argue that compliance with these legislative and regulatory acts is costly and time consuming, causing overregulation. Furthermore, many regulatory measures lack business value and there is no guarantee that adherence to these measures can be enforced. This article presents an argument for better utilisation of electronic means and specifically, business process management systems (BPMS), in support of good corporate governance. Through the application of Orlikowski's theory of "technologies-in-practice" as the theoretical underpinning of the study and collection of data from a BPMS vendor company and seven BPMS user companies in South Africa, an electronic monitoring, observation and compliance framework for corporate governance is proposed.

KEYWORDS
Electronic monitoring and compliance framework, business process management systems, corporate governance, fraud, corruption

INTRODUCTION
Corporate governance is simply described as the system by which companies are directed and controlled (IODSA, 2002). In the United States (US), corporate governance has been heavily criticised, because of failures of companies like Enron, WorldCom, Tyco, Adelphia and Global Crossing (Boyd, 2003; Hough et al, 2009; Kaplan & Holmstrom, 2003; Kreitner & Kinicki, 2004; Pearlson & Saunders, 2009). It is further revealed that US industries lose about USD400 billion a year from unethical and criminal behaviour (Kreitner & Kinicki, 2004). The resignation and arrest of top US managers suggests that there is an increasing level of managerial negligence and corporate irresponsibility that erode domestic and global trust in those firms (Elliott & Schroth, 2002; Michell, 2002). Europe's biggest corporate failure was Parmalat (BBC News, 2003; BBC News, 2008; Gumber, 2004). The company collapsed in 2003 with a EU14 billion hole in its accounts. Calisto Tanzani, Chief Executive Officer (CEO) of Parmalat, was detained hours after the firm was declared insolvent, charged with financial fraud and money laundering and sentenced to 10 years in prison. Hundreds of thousands of investors lost their money and the Parmalat group collapsed.

In South Africa the corporate governance situation is no different from that in Europe and the US. Amongst many cases of lapses in corporate governance, information technology (IT) vendors are often accused of offering bribes to government employees (Jarvis, 2009), notably in the State Information Technology Agency (SITA). In 10 years of existence of SITA (2002-2012), it spent approximately ZAR10 billion on ICT (Mtimunye, 2009). This sum of money is very attractive to parties who want to share in the stake. This situation led to various forms of corruption and fraud within SITA, at the cost of service delivery to South African citizens. The dimensions of corruption and fraud at SITA include bribery, embezzlement, extortion, nepotism, favoritism, collusion, split purchases, abuse of power, conflict of interest and over- or under- invoicing (Mtimunye, 2009).

In response to the many corporate failures around the globe, legislative changes (eg the Sarbanes-Oxley Act of 2002) and regulatory changes (eg governance guidelines for the NYSE and NASDAQ) were introduced in various countries (Hough et al, 2009; Kaplan & Holmstrom, 2003; IODSA, 2009; Pearlson & Saunders, 2009). In the US, the purpose of the Sarbanes-Oxley Act of 2002 (SOX) was to build and restore confidence in US and international capital markets (Hough et al, 2009). However, many skeptics argue that compliance with legislative and regulatory acts are time consuming, costly and cause overregulation (Cangemi, 2007; Kaplan & Holmstrom, 2003; IODSA, 2009; King, 2006; Sewchurran, 2007; Velichety et al, 2007). Furthermore, these efforts do not always provide business value to organisations. There is also no guarantee that adherence to these measures can be enforced, indeed, in the first three years of SOX, this was at best regarded as an overreaction to Enron and at worst ineffective and unnecessary (IODSA, 2009; Richardson, 2006; *The Financial Express*, 2006).

This article argues for the use of an electronic monitoring, observation and compliance framework that makes use of electronic means in support of good corporate governance, noting that IT is not a remedy for all corporate governance problems. A support framework with effective electronic monitoring systems for good corporate governance is proposed, utilising a BPMS approach. However, the components of such a framework are unknown, therefore the following research question is posed:

What are the components and requirements for an electronic monitoring, observation and compliance framework that will explain how a BPMS approach can be utilised in support of good corporate governance?

GOOD CORPORATE GOVERNANCE: A SOUTH AFRICAN PERSPECTIVE

The corporate governance problems identified in the introduction are in accordance with the findings of King (2006), who has done extensive work in the field of corporate governance in South Africa. King's work includes three groundbreaking reports: "The King Reports" (King I Report, 1994; King II Report, 2002; King III Report, 2009). These guidelines strive to improve the quality of governance in South African and international firms operating in South Africa (Hough et al, 2009; King, 2006). The King Reports do consider how good corporate governance could be promoted by IT, but do not present detailed guidelines for electronic monitoring and observation of company practice.

In the three King Reports, the King Committee identifies nine principles of good corporate governance (Hough et al, 2009; IODSA, 1994; IODSA, 2002; King, 2006; Kreitner & Kinicki, 2004). A description of each of the nine principles of good governance follows below. These may be summarised as adhering to the good corporate governance principles of fairness, accountability, responsibility, transparency, discipline, independence, social responsibility, leadership and sustainability. Most importantly, the foundation of these concepts is intellectual honesty, acting in good faith and acting in the best interests of the company.

1. *Discipline:* Discipline is the commitment by a company's senior management to adhere to universally acceptable, correct and proper behaviour.
2. *Transparency*: Transparency can be defined or considered as the ease with which an outsider is able to obtain a true picture of what is happening inside the company. This includes financial and non-financial aspects of the organisation.
3. *Independence:* Independence is the extent to which mechanisms have been put in place to avoid potential conflicts of interest between parties. Internal processes and decisions should be objective without undue external influences. King (2006) furthermore suggests the segregation of duties within a company, especially between board and management.
4. *Responsibility:* Responsibility concerns acceptance of all the consequences of organisational behaviour that allows for corrective action and penalties for mismanagement.
5. *Accountability:* Individuals or groups (such as the board of directors) in a company, who make important decisions, should be accountable for their decisions and actions.
6. *Fairness:* A system must exist in the company that takes a balanced view by taking into account all those that have an interest in the company and its future. This means that the rights and interests of all stakeholders in the organisation should be acknowledged and respected.
7. *Social responsibility:* A company should be aware of and respond to social issues, placing a high priority on ethical standards. A good corporate citizen should be seen as non-discriminatory, non-exploitative and responsible with regard to environmental and human rights issues.
8. *Leadership:* Leaders need to define strategy, provide direction and establish ethics and values that will influence and guide practices and behaviour with regard to sustainability and performance. Leaders should further ensure compliance with policies, procedures and plans referred to as the conformance role of the leadership. Leaders should further reflect the balance of skills, experience and demographic diversity to provide effective leadership and control.
9. *Sustainability:* Business, nature and society are interconnected in complex ways that must be understood by decisionmakers. Companies are increasingly expected to grow their business, but at the same time meet human needs of societies around the world, while also reducing the negative environmental and social footprint of their operations and products. This is referred to as the "triple bottom line".

APPLICATION OF IT IN CORPORATE GOVERNANCE

King (2006, p. 74) argues that the use of IT must be increased to foster effective corporate governance, viewing this as the ultimate way to achieve good governance in today's 24-hour borderless world: "Willingly or unwillingly, we are members of the information age. The ultimate light in regard to transparency and governance has become IT. The use of IT in the business world is not only an enabler but has also become of strategic importance. Through this strategic role it has become pervasive".

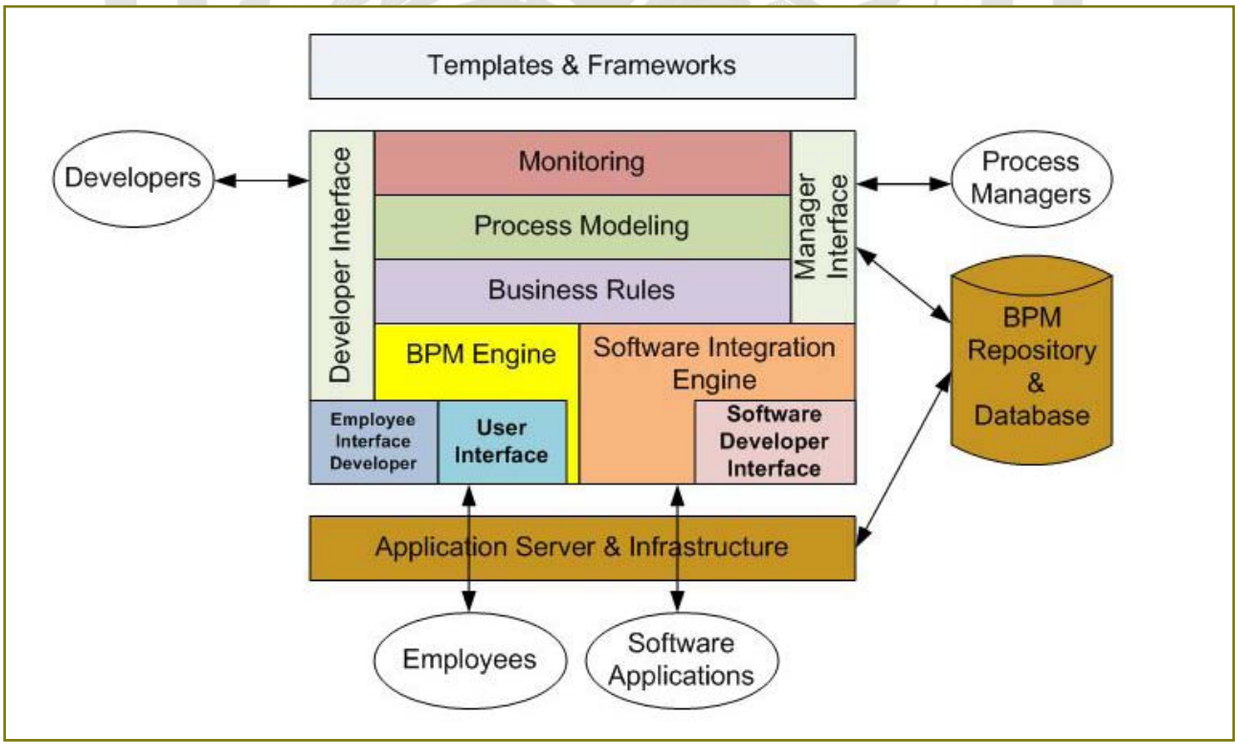
IT is a business enabler that has become of strategic importance (IODSA, 2009; King, 2006; Vecchiatto, 2009), and when aligned with the business goals, IT can deliver optimum value (Cangemi, 2007; Robinson, 2007; Tallon et al, 2001). The use of IT in governance is furthermore becoming a popular way to ensure regulatory compliance (Robinson, 2007; *The Financial Express*, 2006). The components of business process management systems (BPMS) for electronic monitoring, observation and analysis of corporate governance practice are discussed below.

BUSINESS PROCESS MANAGEMENT SYSTEMS (BPMS) AND ARCHITECTURAL COMPONENTS

A BPMS is defined as a generic software information system that is designed to manage operational business processes (Weske et al, 2004). A process is further defined as a collection of activities that takes one or more kinds of input and creates an output that is of value to a customer (Hammer & Champy, 1993). A BPMS gives an organisation the ability to rapidly make changes to business processes in the real-time business environment, reducing the risk of firms losing competitive advantage, minimises business process complexity for the user, and contributes to the strategic alignment of business processes with the business objectives (McGoveran, 2001). A BPMS makes business processes visible to process owners, users and auditors who are directly affected by the regularity pressures of acts like the Sarbanes-Oxley Act (Palmer, 2003) and in South Africa, the South African Companies Act 71 of 2008 as amended. The South African Companies Act is enforced by the Companies and Intellectual Property Commission in South Africa (Deloitte, 2013) and contains key elements of the King Reports.

A BPMS consists of a number of architectural components (Megard, 2002; Miers & Harmon, 2005; Miers et al, 2007; Palmer, 2003), as illustrated in Figure 1:

FIGURE 1: THE ARCHITECTURAL COMPONENTS OF A BPMS



Source: Miers & Harmon, 2005; Miers et al, 2007

- *Business Process Management (BPM) Engine*: The BPM engine consists of a multi-tier architecture, namely server, client and web services. The server component is responsible for the execution, monitoring and controlling of all automated business processes. The server also handles user interaction and routing and ensures that work is accomplished. The client component typically consists of a web portal through which a user can access relevant work items. Web services are used in the multi-tier architecture to expose specific functionality of the BPMS to external users.
- *BPM Repository and Database*: This is the database of the BPMS that stores business process definitions, integrity rules, process instance history, data flows, business metrics definitions, analytical and reporting definitions, transactions definitions, security information, simulation and error logs.
- *Process Modelling*: This is the part of the BPMS in which the user develops and designs business processes. Part of process modelling is organisational modelling. Organisational modelling allows the BPMS to define groups, roles and users with access permissions.
- *Business Rules:* The rule engine is mainly an extension of the process modelling engine in the BPMS to configure business process rules.
- *Software Integration Engine:* Consists of different application adapters, which make integration to third party enterprise software possible.
- *Monitoring:* The BPMS stores all process data (real-time information) for analytical purposes. This data is used for measurement of resources, organisational processes (ie to be able to identify bottlenecks in processes) and audits.
- *Templates and Frameworks:* Typically BPMS are accompanied by process templates for specific market segments. This reduces development time by providing a starting point for more complex client specific development.

In a later section, the authors explain how these components of the BPMS can be utilised for electronic monitoring, observation and compliance in support of corporate governance.

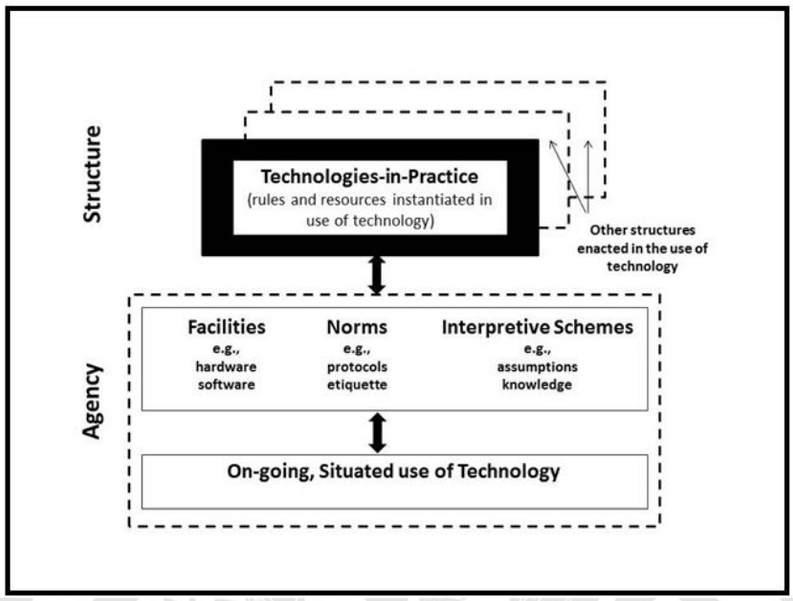
THEORETICAL UNDERPINNING: TECHNOLOGIES IN PRACTICE

A summary of Orlikowski's theory of "technologies-in-practice" serves as theoretical underpinning for the research. This theory is pertinent to electronic monitoring, observation and compliance in support of corporate governance, as discussed here. In her early work, Orlikowski (1992) depicts the relationships between technology, humans (agents) and the organisation. People (agents) design information systems and information systems change the way in which people work. The way in which agents work further changes the characteristics (including social behaviour and social action) of the organisation, referred to as structuration in a continuous process.

Orlikowski (2000) advances the structuration perspective by explaining that social structures are not and cannot be embedded in material artifacts, such as technology. Structuration, the enforcement or change in social behaviour and action, can only be achieved through recursive, ongoing technology use when users of a technological artifact interact with certain properties of the technology. Typically, the properties of the technological artifact are designed and developed by technology designers and developers for a specific organisational purpose, while properties are also added by users. The inscription process of technology (Orlikowski, 2000) explains that when people use technology, they draw on the inscribed properties of the technological artifact – those that were inscribed by the designers and those added by the users. In the process of use, the users also draw on their own interpretive schemes (skills, power, knowledge, emotional abilities, intellectual abilities, other), norms and other facilities (hardware and software) in a specific organisational setting as indicated in in Figure 2 below.

In an organisational setting, a community of users with similar work practices is required to use the technological artifact with its inscribed properties in a similar way; repeated use leads to institutionalisation in the organisation. Orlikowski (2000) refers to this institutionalised process of similar technology use as "technology-in-practice", as indicated in Figure 2 below. At this stage she argues, institutionalised and similar technology use for a community of users become firm prescriptions for social action that may impede change or reinforcement. Recurrent use of technology may simultaneously enact multiple structures, as indicated in Figure 2. Over time and as contexts change, different structures will emerge. However, in change lies the possibility and potential for innovation and learning (Orlikowski, 2000).

FIGURE 2: ENACTMENT OF TECHNOLOGIES IN PRACTICE



Source: Orlikowski, 2000

The structuration theory (Orlikowski, 2000) is pertinent to guide and inform this research project, because it introduces a perspective that links organisations and technology. The authors were not only interested in investigating how the King principles of good governance could be inscribed into a technological artifact such as a BPMS and its components, but also in the possible impact and change that such an intervention would have on the social behaviour and action (the structuration that occurs) in the organisation to support good corporate governance. The suitability of other structuration theories was investigated, but found not applicable. The structuration theory of Giddens (1984), for example, was eliminated, because this theory was ignorant of the role of technology and social structures (Jones, 1997). On the other hand, the adaptive structuration theory of DeSanctis and Poole (1994) was eliminated, because this theory had very little resemblance to original structuration theory principles (Jones, 1997).

RESEARCH METHODOLOGY

In order to present a broad perspective of how BPMS are utilised in support of good corporate governance, the authors adopted an interpretive research paradigm, using qualitative methods. This interpretive research paradigm approach holds that social life is based on socially constructed meaning (Chen & Hirschheim, 2004; Jones & Nandhakumar, 1997; Klein & Myers, 1999; Pozzebon, 2004; Webber, 2004). The research involves case studies of a BPMS vendor company in South Africa and seven BPMS user companies of varying sizes and from different industry sectors (banking, financial, technology, manufacturing, energy and petro-chemical) in the Gauteng province of South Africa. Case study research suits the interpretive stance well, as a number of researchers (Kwon & Zmud, 1987; Markus, 1983; Schultze & Orlikowski, 2004) have demonstrated how case study research enables an in-depth review leading to a broader understanding of the research phenomenon that offers the potential to improve practice-based problems.

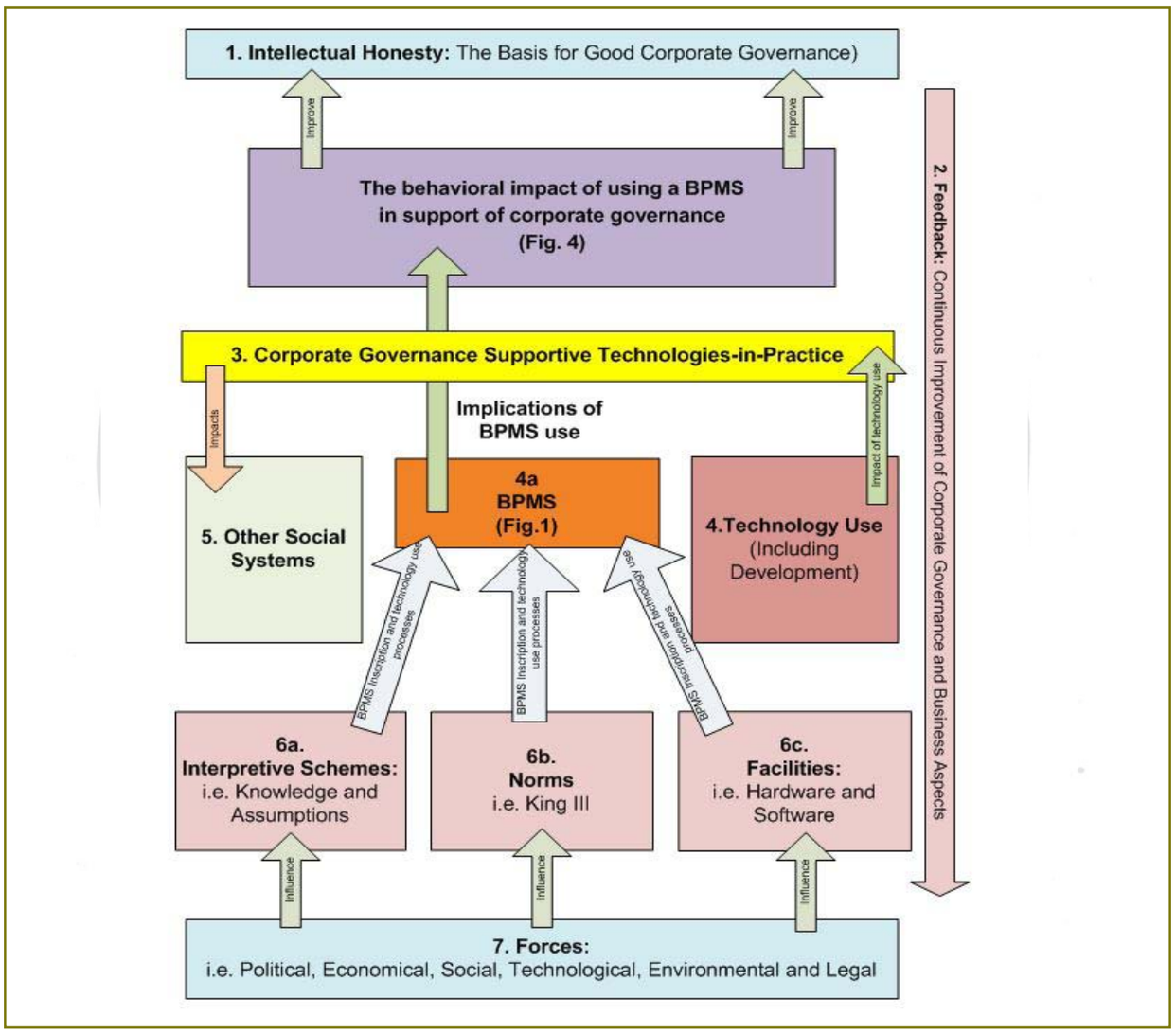
The case studies were documented through interviews and surveys between June 2010 and January 2011. At the BPMS vendor company, data was collected from 12 managers (24%), 14 business analysts (29%), 12 developers (24%), eight trainers (16%) and three other positions (7%). At the BPMS user companies, data was collected from six IT managers (24%), two general managers (8%) and 17 business analysts (68%). In all eight case studies, the participants represent different language groups, social backgrounds and genders. Data was systematically coded into themes and categories (thematic analysis), as it emerged from the BPMS vendor company and the seven BPMS user companies, using the constant comparative method (Strauss & Corbin, 1998). The themes and categories that emerged were used in the process to develop an electronic monitoring, observation and compliance framework for corporate governance.

Triangulation was used to increase the credibility and validity of the research results (Kennedy, 2009; Olsen, 2004). In this study, the triangulation approach brings together data from eight perspectives, the BPMS vendor company and the seven BPMS user companies, to gain a richer and more plausible account of a research phenomenon than would be possible with only one or two case studies. Orlikowski's (2000) "technologies-in-practice" theory was used to synthesise the research results and provide the basis for data analysis towards developing an electronic monitoring, observation and compliance framework for corporate governance following a BPMS approach.

TOWARDS AN ELECTRONIC MONITORING, OBSERVATION AND COMPLIANCE FRAMEWORK FOR CORPORATE GOVERNANCE

This section describes an electronic monitoring, observation and compliance framework for corporate governance. The framework was derived from the triangulated research findings. Throughout the sub-sections that follow, extracts of the raw data are presented. The themes and interpretation that emerged from the thematic analysis are tabled alongside them. Finally, Orlikowski's (2000) theory of technologies-in-practice was used as underlying theory to inform the synthesis of the various elements of the proposed electronic monitoring, observation and compliance framework for corporate governance depicted in Figure 3 below. Data is presented and analysed with the aim of testing the suitability of the framework.

FIGURE 3: AN ELECTRONIC MONITORING, OBSERVATION AND COMPLIANCE FRAMEWORK FOR CORPORATE GOVERNANCE: A BPM APPROACH



Data collected from the BPMS vendor and user firms reveals the following:

FORCES THAT IMPACT DESIGN AND USAGE OF TECHNOLOGIES SUPPORTIVE OF GOOD CORPORATE GOVERNANCE

Table 1 below presents extracts from the data on the forces seen to influence the design and usage of a BPMS in support of good corporate governance and themes that emerged from thematic analysis.

TABLE 1: DATA ANALYSIS OF FORCES THAT IMPACT THE DESIGN AND USAGE OF CORPORATE GOVERNANCE SUPPORTIVE TECHNOLOGIES

Raw data extracts from participants	Themes that emerged from the thematic analysis	Interpretation
Governance always depends also on the social, legal and cultural conditions … (BPMSVC Participant 12, 2010, online survey). Legislation and acts are different in different countries. The company rules are also different in different countries … (BPMSVC Participant 8, 2010). It depends on top management commitment to corporate governance. It also depends on legislation as corporate governance is impacted by legislation. Example: Telkom is listed on the JSE and NY stock exchange (BPMSVC Participant 1, 2010).	Social (culture and maturity), legal, political and economic forces	The forces that influence the design and usage of corporate governance supportive technologies can be analysed using a PEST[1] framework

Forces identified by respondents as affecting corporate governance include social, political and economic forces, hence these factors must influence the design and usage of the IT artifact for supporting corporate governance, as also identified by Orlikowski and Iacono (2001). By applying the PEST methodology to understanding the effects of these forces, organisations may be better able to use IT to support corporate governance, increasing the capacity to identify corporate governance opportunities and to create contingency plans to address corporate governance threats (Byars, 1991; Cooper, 2000; Pearce & Robinson, 2005).

INSCRIBING[2] THE KING PRINCIPLES OF GOOD GOVERNANCE INTO A BPMS

Table 1 below presents extracts from the daAs previously stated, a BPMS is a generic software system for design, execution and management of operational business processes (Weske et al, 2004). Orlikowski and Iacono (2001) argue that the analysis and usage of an IT artifact must acknowledge the multiplicity of fragile and fragmentary components that are present. This is also true for a BPMS, which consists of several architectural components, including the BPM engine, process modelling, the business rules component, the software integration engine, the monitoring component, the BPM repository and database, and templates and frameworks as indicated in 4a in Figure 3.

In Table 2 below, raw data extracts from interviews indicate how the King principles of good governance (fairness, accountability, responsibility, transparency, discipline, independence, social responsibility, leadership and sustainability) can be inscribed and supported by the architectural components of a BPMS.

1 A PEST analysis considers political, economic, social and technological factors.

2 Built in by designers during technology development (Orlikowski, 2000).

TABLE 2: IDEAS FOR INSCRIBING THE GOOD GOVERNANCE PRINCIPLES INTO THE ARCHITECTURAL COMPONENTS OF A BPMS

King principles of good governance	Raw data extracts from participants
Fairness	When all users of the BMPS are handled in much the same way, there exists no room for any form of discrimination – all (issues) are treated equally (BPMSVC Participant 15, 2010) (authors insert: using the Business Rules component). Metrics and measures that are built into the BPMS can be used to determine the need to re-allocate work to ensure that all end-users share an equal and fair workload (BPMSVC Participant 10, 2010) (authors' insert: using the BPM Repository and Database component). The principle of fairness can be incorporated in such a way that all stakeholders are involved in the design of the BPMS solution. Role clarification must be done in a fair and equitable manner (BPMSVC Participant 6, 2010). (authors' insert: using the Process Modeling component)
Discipline	Creating clearly defined roles in the BPMS forces people to be disciplined in doing their work. Processes are broken down into sequential tasks thus forcing people to finish certain activities before engaging in others thus making sure that people are disciplined (BPMSVC Participant 24, 2010) (authors' insert: using the Process Modeling component). Setting up the system so that the person responsible for the task has a certain amount of time to complete the task before it gets routed to a superior (BPMSVC Participant 21, 2010) (authors' insert: using the Process Modeling component). Processes can be executed in a specific standard fashion. The rule builder also assists in helping to execute decisions in a similar way by taking out human unfairness, bias. Process notification and escalation may help to keep to process and business deadlines (BPMSVC Participant 8, 2010).
Sustainability	Streamlining processes so that overhead costs in manpower are kept to a minimum (BPMSVC Participant 21, 2010) (authors' insert: using the Process Modeling component). Continuously improving processes and by quickly adapting processes to new strategic market opportunities, IT will help to make the financial condition of the company visible to those responsible to take the correct actions (BPMSVC Participant 8, 2010) (authors' insert: using the BPM Repository and Database component). BPM/BPMS can be used as a knowledge management tool where the company's intellectual property can be housed. An organisation can be sustainable and improve its operation through the use of such technologies (BPMSVC Participant 6, 2010).
Accountability and responsibility	Accountability can be incorporated into the BPMS through responsibilities and the audit trail (authors insert: using the BPM Repository and Database component). When a process is configured, responsibilities for actions are assigned to users (authors insert: using the Process Modelling component). Through the BPMS, it is possible to see who performed which action (authors' insert: using the Monitoring component). This will increase accountability (BPMSVC Participant 27, 2010). Both the BPMS and rules engines can be used to enforce responsibility by the required parties as per the organisation's rules and regulations. In order to complete an automated process successfully, the responsible parties must complete the activities and tasks assigned to them (BPMSVC Participant 10, 2010) (authors' insert: using the Monitoring component). As in accountability the tracking and reporting will monitor and the rules will enforce responsibility (BPMSVC Participant 5, 2010) (authors' insert: using the BPM Repository and Database component).
Transparency	Any decision made is recorded as part of the audit trail of a process. So if an internal or external auditor needs to go back and check who decided what, it can easily be done (BPMSVC Participant 19, 2010) (authors' insert: using the BPM Repository and Database component). Internal and external people may see all the processes of the organisation (authors' insert: using the Process Modelling component). Processes may be standardised throughout organisations to help produce information in a standard way (authors' insert: using Templates and Frameworks). The audit trail of any process provides visibility into that process (authors' insert: using the BPM Repository and Database component). It is also possible to see how the organisation is put together (authors' insert: using the Process Modelling components). The rule builder will provide a way for transparent decisionmaking – to see how a decision was made (BPMSVC Participant 8, 2010).

Independence	A BPMS rule builder can be configured to ensure that departments or individuals that may have a vested interest in the outcome of a particular process do not participate in the process (BPMSVC Participant 10, 2010). External auditors can audit processes (authors insert: using the Process Modelling and the BPM Repository and Database components). Processes can also be developed so that certain activities are independent from others to eliminate fraud and create segregation of duties. The audit trail will provide visibility into how actions were performed in the organisation and whether someonehas behaved dishonestly or unethically (BPMSVC Participant 8, 2010) (authors' insert: using the BPM Repository and Database component). Independence can be incorporated into the BPMS to improve independence in the organisation through reporting (authors' insert: using the BPM Repository and Database component). In the process engine, business rules can be used to ensure independence in the automated version of the process by ensuring that the correct steps are taken. Reporting can be used to monitor the levels of independence and flag any exceptions (BPMSVC Participant 27, 2010).
Leadership	Good leadership is achieved through fairness, consistency and transparency. So BPM offers a rule-based approach, everyone knowing their roles and offering capabilities that open up the organisation to the outside world (BPMSVC Participant 24, 2010) (authors' insert: using the Process Modeling component). The report builder may provide information to leaders to make better and accurate decisions about the company. The rule builder will help managers to make fair decisions, taking unfair human emotions and actions out of the equation (BPMSVC Participant 8, 2010) (authors' insert: using the BPM Repository and Database component). Enforcing the responsibilities of all role players, including those of the leaders (BPMSVC Participant 2, 2010) (authors' insert: using the BPM Repository and Database and Rule Builder components). Good leadership leads by example, by embracing processes, emphasising the value to be gained from having transparency and improving capacity (BPMSVC Participant 1, 2010) (authors' insert: using the Process Modelling component).
Social responsibility	The processes of the organisation can be designed to include the necessary social responsibility measures and controls, which can be enforced using the business rules. Reports can be used to highlight exceptions and to ensure that all processes adhere to the social responsibility policies and KPIs set by the organisation (BPMSVC Participant 27, 2010) (authors' insert: using the BPM Repository and Database component). To provide visibility in the processes and honest audit reports (no creative accounting), information is available to all those outside the company, thereby ensuring socially responsible action towards all stakeholders investing in the company (BPMSVC Participant 8, 2010) (authors' insert: using the Process Modeling and the BPM Repository and Database component). Using the Green IT approach, each organisation should have asset disposal policies and strategies in place so that they adhere to the good governance principle of social responsibility. The same concept can be used in the asset disposal policies for BPMS (BPMSVC Participant 6, 2010) (authors' insert: using the Business Rules component). Processes can be designed / developed around social issues such as racism, discrimination and civil rights … so a certain process must be followed to ensure that all the checks have been done (BPMSVC Participant 19, 2010) (authors' insert: using the Process Modelling component).

During the inscription process, designers play a proactive role in bringing forth their own realities through interpretive schemes (Figure 3, 6a), organisational facilities (Figure 3, 6c) and norms in the organisational context (Figure 3, 6b). Therefore, designers are both enabled by, and constrained in, their own sense-making and existing structures in the organisational setting (Orlikowski, 2000), when specific principles of good corporate governance are inscribed into a BPMS. Hence, the inscribing process of the King principles into a BPMS will have localised complexities. Technology designers may have difficulty in inscribing concepts or business rules that are unstructured, tacit, vague, ad-hoc, unpredictable and/or abnormally complex. This is due to the fact that explicit inscription of any technological artifact involves programming that requires explicit, externalised (not tacit), logical, structured and codifiable solutions. This also applies to a BPMS that has its own programmable and modelling languages, conventions and standards (Pearce & Robinson, 2005). In other words, a BPMS will not be the solution to all types of corporate governance problems.

CHANGING ORGANISATIONAL BEHAVIOUR IN SUPPORT OF CORPORATE GOVERNANCE

The research findings obtained from the thematic analysis indicated in Table 3 below, shows that there can be positive changes in organisational behaviour when a BPMS is applied to corporate governance. However, these changes can also be negative.

TABLE 3: CHANGING ORGANISATIONAL BEHAVIOUR IN SUPPORT OF CORPORATE GOVERNANCE

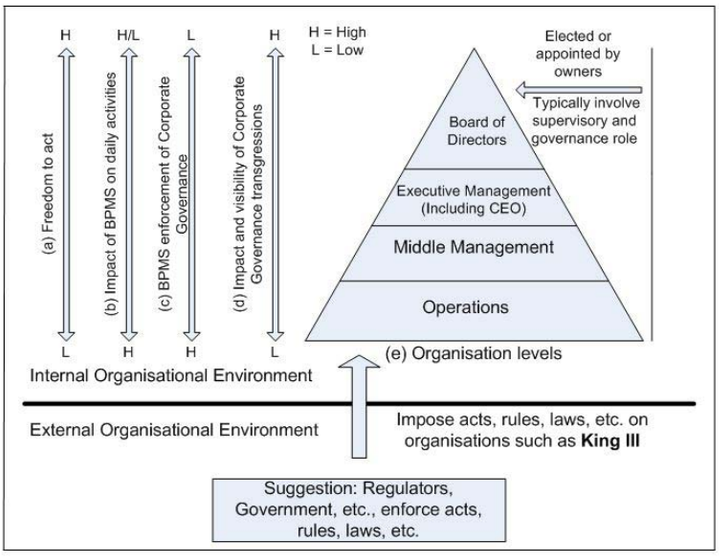
Raw data extracts from participants	Themes that emerged from the thematic analysis
Since a BPMS enables all the principles discussed in the previous questions, these principles should become more evident in the process used and in the company as a whole (BPMSVC Participant 15, 2010). They will do things with more diligence knowing that it is more possible to hold them accountable (BPMSVC Participant 9, 2010). … as the organisation matures employees prefer to follow well-structured processes (BPMSVC Participant 16, 2010). BPM can enforce standard process to be followed … thus making sure that human behaviour changes . It will be impossible to bribe an individual as he/she needs to adhere to the process (BPMSVC Participant 24, 2010). … a BPMS creates transparency which in turn creates responsibility and accountability (BPMSUC_A Respondent 23, 2011). … changes the way people work. People know they are measured on certain criteria. You get what you measure. Their behaviour will change in line with the measurement … (BPMSUC_B Respondent 22, 2011).	• The principles of good governance become more visible • A BPMS enforces the King principles of good governance • Employees make "mind-shifts" in favour of good corporate governance in transparent environments, enabling them to become more accountable and responsible • Employee accountability and roles become well-defined

When people use a technology (Figure 3, 4), they draw on the properties of the artifact inscribed by the designers and added by the users (Orlikowski, 2000). When the King principles of good governance are inscribed into a BPMS and its architectural components, the users will draw on the inscribed principles when they use the BPMS (Figure 3, 6b). Users also draw on their own interpretive schemes and the facilities available in the institutional context (Figure 3, 6a and 6c).

The ongoing enactment of a technology-in-practice reinforces that technology in the organisation, becoming routinised through habitual and repeated use (Orlikowski, 2000). In the case of this study, use of technology serves as a template to improve behaviour so that the King principles become more evident and enforced in the organisation. This is termed "good corporate governance supportive technologies-in-practice" in Figure 3, 3.

The behavioural impact of a BPMS in support of good corporate governance is illustrated in Figure 4 below:

FIGURE 4: THE BEHAVIOURAL IMPACT OF USING A BPMS IN SUPPORT OF CORPORATE GOVERNANCE



The traditional management classification of Anthony (1965) states that the organisation can be viewed as a three-level pyramid as indicated in Figure 4, (e). The strategic planning (SP) level of managers controls the long-term activities and decisions of the organisation. The management control (MC) level controls the medium-term activities of the organisation, while the operational control (OC) level controls the short-term activities of the organisation. The bottom-level managers deal with more detailed data and shorter time periods than high-level managers. The implication is

that control at lower levels is more concrete and structured, while decisions at upper levels are more unstructured (Ahituv et al, 1994). Therefore, a BPMS may enforce and support corporate governance better at lower levels of the organisation, where information and processes are more structured as indicated in Figure 4, (b) and (c). As a consequence, the impact of a BPMS is much higher at operational level than strategic or top-management level as indicated in Figure 4, (b).

Typically, the board of directors of an organisation are involved in strategic decisionmaking processes (King, 2006) as indicated in Figure 4, (e). When directors fail to act in good faith, neglecting care, skill and diligence, the impact and visibility of such corporate governance transgressions are high. Directors can cause significant damage to the organisational reputation when they neglect their duties as indicated in Figure 4, (d).

CONTINUOUS FEEDBACK THAT DEFINES THE ROLE AND NATURE OF A BPMS TOWARDS CORPORATE GOVERNANCE

The proposed electronic monitoring, observation and compliance framework caters for continuous improvisation and change as designers reconfigure the technology (the BPMS), users alter their habits of use, and/or social, economic and political practices unfold. Users may use a technology in ways that were not anticipated by the developers, or may alter or work around the inscribed properties to suit their purpose (Orlikowski, 2000), in either a positive or negative way. When a set of norms, such as the King principles of good corporate governance, are inscribed into a BPMS, the result and associated organisational behaviour may be different from what was anticipated. Therefore, continuous improvisation and change must be part of the ongoing BPMS design (Sewchurran, 2007). Such continuous improvement, resulting from constant feedback, involves automation of corporate governance activities and the enforcement of rules, acts and legislation, resulting in better-governed organisations, compliance and intellectual honesty that improve all aspects of the business, as indicated by Figure 3, 2.

The results indicate that the nature and role of a corporate governance BPMS includes continuous improvisation, standardisation, consistency and compliance. This results in a performance-driven culture, not only in corporate governance, but in all aspects of the business.

IMPACTING OTHER OVERLAPPING SOCIAL SYSTEMS

A technology is seen to be situated in a number of overlapping social systems, thus user's interaction with technology will impact on other social structures through the application of technologies-in-practice (Orlikowski, 2000). This is also the case for a corporate governance BPMS, which would be located in a number of overlapping social systems. As a consequence, the use of the BPMS and the resultant changes in organisational behaviour may influence those overlapping social systems, causing ripple effects in corporate governance inside and outside the organisation. Investors, for example, will have better trust in organisations that have IT-enabled measures for good corporate governance in place.

THE COMPONENTS OF AN ELECTRONIC MONITORING, OBSERVATION AND COMPLIANCE FRAMEWORK FOR CORPORATE GOVERNANCE

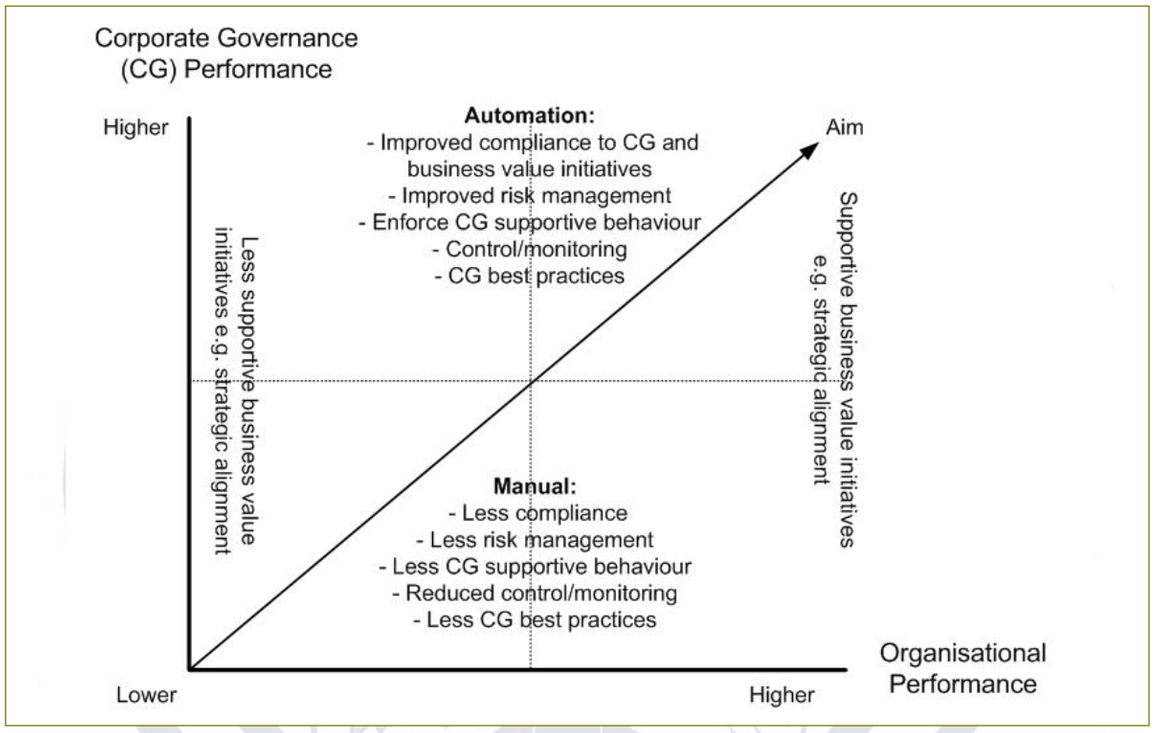
This study proposes adoption of an electronic monitoring, observation and compliance framework for good corporate governance, applying a BPMS perspective. The framework was developed by conducting a BPMS vendor case study and seven BPMS user case studies engaging participants from diverse backgrounds, including managers, IT managers, business analysts and developers. In understanding the components and requirements for an electronic monitoring, observation and compliance framework for good corporate governance and the contribution of a BPMS approach, it was found that attention should be given to:

- An inscription component: The King principles of good governance (IODSA, 1994; IODSA, 2002; IODSA, 2009; King, 2006) can be inscribed into a BPMS to address corporate governance problems for which the solutions are structured, logical and codifiable.
- An organisational behaviour component: The utilisation of a BPMS approach can increase visibility of the principles of good governance and promote changes in organisational behaviour in favour of good governance.
- A feedback component: Continuous changes are required as designers reconfigure the BPMS, users alter their habits of use and/or social, economic and political practices unfold. Ongoing improvisation, constant improvement, standardisation, consistency and compliance are needed to drive advances in corporate governance.
- An influence component: The utilisation of an electronic framework for monitoring and compliance in corporate governance may influence overlapping social systems as some firms may employ the BPMS approach, even when others may resist such approaches.

For the framework to be effective, the authors recommend a holistic approach, including enablers such as change management, top-management support, leadership, financial resources to support the process system, a process-thinking culture and policies. These enablers will differ from one context to another.

These formative findings and analysis suggest that automated business processes can result in improved corporate governance, as well as business value. BPMS applications can result in better risk management and lower organisational risk. On the contrary, where business processes are performed manually, there tends to be less compliance, decreased observation and visibility, reduced monitoring and control, poorer risk management, less corporate governance supportive behaviour, resulting in poor corporate governance practices, as indicated in Figure 5.

FIGURE 5: THE IMPLICATIONS OF USING A BPMS IN SUPPORT OF CORPORATE GOVERNANCE



The contribution of this work lies in explaining the components of a conceptual electronic monitoring, observation and compliance framework to address corporate corruption, fraud, misconduct, and other corporate governance weaknesses, noting that any particular framework will not be a remedy for all corporate governance problems. Extensive further researcher is required to analyse innovative IT designs and applications to fight corruption, fraud and corporate misconduct in the interest of better corporate governance.

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CASE NOTES:
SENPORTAL: INTERNET-BASED SERVICES FOR SENIOR CITIZENS

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ABSTRACT: Countless senior citizens retired before computers and the Internet became prominent. In many cases, cognitive and physical limitations restrict them from enjoying the benefits and opportunities the Internet has to offer. The project discussed here experimented with measures to assist the elderly to utilise some Internet-based services. SenPortal, a single, sign-on, front-end system using facial recognition, was established to assist senior users to enjoy Internet-based services such as Gmail, Skype, Google, Wikipedia and Facebook without having to use any user ID or password. The article reports on a case study undertaken in the retirement village where SenPortal was developed.

KEYWORDS
Senior citizens, Internet-based services, facial recognition, single, sign-on, voice recognition'social networking

INTRODUCTION: SENIOR CITIZENS AND THE INTERNET
In a matter of a decade, the Internet has revolutionised the way in which people communicate, do business and socialise. Melenhorst and Bouwhuis (2004) state that most senior citizens never used Internet services in the workplace and may therefore avoid using them now. However, in the United States (US), the leading online activities utilised by senior citizens are

- Search engines – 59%
- Keeping in touch with family and friends – 59%
- Gathering of information – 47%
- News/current events/weather – 43%
- Travel planning and reservations – 41%
- Finance and online banking – 24%
- Payment of bills – 23%
  (eMarketer: Digital Intelligence, 2008)

Despite the benefits and advantages, it is important to be aware of threats, as Internet users are often targets for fraud schemes. It must also be taken into account that older people differ from the younger generation in terms of both cognitive and physical abilities, making it more difficult for them to remember usernames and passwords or to work with input devices such as a keyboard or mouse (Greengard, 2009).

OBJECTIVE
The objective of the research was to develop an environment for senior citizens to effectively and safely utilise Internet-related services, taking into account their cognitive and physical abilities. This article reports on the research exercise designed to empower elderly people to use Internet-related services in a secure manner, to improve their quality of life.

CASE STUDY METHODOLOGY AND CHRONOLOGICAL RESEARCH PROCESS
The research project was designed to empower senior citizens to maximally utilise the Internet. The longitudinal case study was conducted at a retirement village in Port Elizabeth, South Africa, over a period of 18 months from May 2009 to October 2010. The particular retirement village was selected as it was easily accessible to postgraduate students, the management of the village was cooperative and most residents have children or friends who would like to communicate electronically. The case study methodology was selected to ensure that the investigation was implemented in a natural setting, involving senior citizens (Benbasat, Goldstein & Mead, 1987).

The case study incorporated elements of action research. Two computer workstations, with dedicated ADSL line, were set up in a small room in the community hall. Access to the room was controlled, but keys were easily available. The longitudinal study utilised some of the iterative and reflective elements of action research. The experimental process is thus presented as a series of events and the research results, captured continuously throughout the process, are reported chronologically.

The study was undertaken in two phases: Phase 1 during 2009 and Phase 2 during 2010. A research student was responsible for designing the technical aspects of the project, such as the development of the relevant software components. A local coordinator at the retirement village was identified to act as liaison between the researchers and the senior citizen participants.

PHASE 1 (YEAR 1)

QUESTIONNAIRE 1

All the senior citizens were invited to an inaugural meeting by the local coordinator where the project was introduced and the first questionnaire, Questionnaire 1, was completed by those interested in participating. The objective of Questionnaire 1 was to determine the Internet-related services the participants would like to be offered and to assess their computer and Internet skills and experience to date.
Results from Questionnaire 1 can be summarised as follows:

- 22 senior citizens committed to participate in the project, of whom 21 were older than 70 years.
- 11 (50%) of these indicated that they had worked on a computer before, albeit on main-frame terminals in many cases, while the other 50% had never worked on any computer previously.
- The most common reason for not having used a computer was the absence of need, opportunity or training.
- Most respondents (85% of the 22) indicated that they are interested in learning to use the Internet because they have children and/or grandchildren overseas with whom they would like to communicate regularly.

Based on analysis of the results from Questionnaire 1, it was decided to make available Google, Gmail and Skype. For security reasons, it was decided not to promote electronic banking or any e-commerce services at this initial stage.

TRAINING SESSION 1

The participants were invited to attend a first training session two weeks after administration of Questionnaire 1. The researchers prepared user manuals for the first training session. Twenty-two participants attended the session, exclusively dedicated to the use of Google and Gmail. A Gmail account was created for every participant and they were asked to gather the email addresses of those with whom they wished to communicate. In the second training session, Skype was introduced and its use explained. Participants interested in using Skype were assisted to create Skype accounts. A software programme was run in the background, which captured data regarding which of the three Internet services were used by which participant and for how long. A logbook was introduced and participants were asked to record problems, frustrations and positive comments.

TRAINING SESSION 2

At the second session, 20 participants attended the meeting. A few positive stories were shared, but predominantly negative comments were received. Participants complained about general operating system oriented problems and user identification (user ID) and password difficulties. In most cases, participants became confused with the various user IDs and passwords for signing onto the operating system, Gmail or Skype. One participant, a retired IT professional, volunteered to act as system administrator and to assist the others. He would ensure that both computers were running continually to obviate the need for start up. Additionally, it was decided to develop a front-end system, called Electronic Senior Citizen (eSenCit) that would act as a single, sign-on system. Single sign-on is a user authentication process that permits a user to enter one username and password in order to access multiple applications or services (SearchSecurity.com, 2008).

eSenCit, as a single, sign-on system, was partially successful. Once a participant logged on to eSenCit with a unique user ID and password, the system provided the user with three options, Google, Gmail and/or Skype. Three large icons appeared on the screen and the user merely had to click on the appropriate block. Also, if Gmail was selected, eSenCit would automatically log the user into his/her Gmail account, with the need for further user ID and password. Unfortunately, this service could not be introduced for Skype because of security settings in Skype. Once logged into eSenCit, the user still had to log onto Skype with another user ID and password. It was decided that one computer would run with eSenCit and the other with the normal Windows interface.

QUESTIONNAIRE 2

After six months, a second questionnaire, Questionnaire 2, was administered to receive feedback from participants (see Table 1 below). Results from Questionnaire 2 reflected that about:

- 90% of the participants used Gmail at least once a week.
- 65% never used Skype, mainly because they did not have anybody to communicate with.
- 50% never used Google.

TABLE 1: SENIOR CITIZENS' RESPONSES

Questions asked	Result
Is access to the computer room too restricted?	Yes – 45%
	No – 55%
How dependent are you on the administrator?	Not at all – 10%
	I need help occasionally – 70%
	I only use the computers when the administrator is there to assist – 20%
Which computer do you use the most?	PC with eSenCit installed – 50%
	PC without eSenCit installed – 35%
Do you use the printer provided?	Yes – 35%
	No – 55%
On which services would you require more training?	Gmail – 40%
	Google – 55%
	Skype – 60%
Did the project add to your quality of life? Is the project worth it?	Yes, definitely – 85%
	Maybe a little – 15%
	No, not really – 0%

KEY STATISTICS YEAR 1

The data log statistics for Year 1 usage (seven months) were analysed. The following are some important statistics:

- A total of 8 387 minutes (139,78 hours) was spent using the available Internet services.
- Gmail was by far the most popular service, using 6 666 of the 8 387 minutes (79.4%).
- Eighteen of the 22 users were active on Gmail, while four users did not record any time using this service.
- Twelve users spent time using Google, while one user spent more than 15 hours on Google.
- Only seven of the 22 users used Skype, while 217 of the 270 minutes (80%) recorded for Skype were utilised by one user. On further investigation it was identified that this user (a grandmother in her 70s) had a son and grandchildren in New Zealand and a daughter in the US.

PROBLEMS ENCOUNTERED

At the end of Year 1, it was clear that the project had many advantages, as 85% of the participants indicated that it had definitely added to their quality to life (Table 1). However, the following problems were identified:

(1) The use of user IDs and passwords was identified as a major barrier to ease of use and a positive experience.

(2) Comments extracted from the logbook indicated that the users experienced many frustrations: "John (the administrator) not available", "Could not log in", "Couldn't get into Skype or Gmail", "Printer is printing very small".

(3) Gmail made some changes to their authentication system and eSenCit could no longer log in users directly. Thus the restricted version of single sign-on was nullified and users were again fully dependent on user IDs and passwords.

(4) The administrator moved away and was lost to the project.

It is apparent that the bulk of the problems recorded related to user identification and authentication. Users were dependent on the administrator for assistance, but this could be explained by their problems with authentication.

PHASE 2 (YEAR 2)

In Year 2, it was necessary that the user interface, the user identification and authentication process and printing facilities were improved and made more user-friendly. The objectives for Year 2 were discussed at a meeting with the participants and set as follows:

- The identification and authentication of users of the system, as well as individual services, had to be simplified, because there were problems remembering all the user IDs and passwords.
- Single sign-on had to be re-instated to cater for all services requiring user authentication.
- Two additional services, namely Wikipedia and Facebook, were to be introduced.
- Printing facilities had to be improved.

With these objectives in mind, a new eSenCit front-end system was built. This system, called SenPortal, would make use of facial recognition technology to identify and authenticate individual users, thereby necessitating very little interaction from the user's side. SenPortal would also include a single, sign-on system that would log users automatically onto Gmail, Skype and Facebook once identified and successfully authenticated.

Midway through Year 2, the first version of SenPortal was introduced on one of the two computers. All users were registered on the facial recognition system and their individual user ID and password captured onto the single, sign-on component of SenPortal. Wikipedia and Facebook were demonstrated and explained to the participants and added to SenPortal.

Figure 1 presents the initial SenPortal login screen that welcomes a user. As mentioned at the top of the screen, the user merely has to look into the web camera (webcam) for three seconds. SenPortal then identifes and authenticates him/her and a confirmation screen (see Figure 2) is displayed, where he/she confirms identification. This initial login screen in SenPortal (see Figure 1) also has another option, *Switch Interface*, whereby the user can switch to the traditional, Windows-based login screen.

FIGURE 1: SENPORTAL FACIAL RECOGNITION LOGIN SCREEN



FIGURE 2: SENPORTAL LOGIN PROMPT



Once the user has been identified and authenticated successfully, SenPortal will display the home screen of the system front-end (See Figure 3).

FIGURE 3: SENPORTAL HOME SCREEN



The SenPortal home screen makes the following available to the user:

- Quick links to Google and Wikipedia (middle, left of screen).
- Access icons to the five Internet services offered (middle of screen). If the user chooses Gmail, Facebook or Skype, he/she will be automatically logged into that particular service (with a user ID or password), with no additional login required.
- An alert window in the top left for new email messages.
- A log-out link in the bottom right-hand corner.

SenPortal successfully combined facial recognition, as an identification and authentication mechanism, with single sign-on. The benefits of SenPortal are:

- One-time login.
- Access to multiple services with further login.
- No need to remember any usernames and passwords.
- No blocking of user accounts due to too many incorrect login attempts.

THIRD REVIEW

Towards the end of Year 2, a final questionnaire, Questionnaire 3, was completed by some (not all) of the active participants.
Results from Questionnaire 3 worth reporting are:

- 85% of respondents use Gmail *often* or *very often*. None of the respondents reported that they never use Gmail.
- No participants indicated that they use Google *very often*, while about 30% indicated they *never* use Google.
- Only three participants actively use Facebook, Wikipedia is used *rarely* and Skype was used *very often* by two participants.
- All participants indicated that Google and Wikipedia are *very easy* or *fairly easy* to use.
- Two participants indicated that Gmail was *difficult* to use whilst the rest indicated it is *easy* to use.
- 85% of participants indicated that SenPortal recognises them *always* or *most of the time*.
  15% indicated they were recognised *only sometimes* while nobody indicated that they were *hardly ever* or *never* recognised.

Comments recorded in the logbook also conveyed a positive situation. However, there seemed to be some problems with facial recognition, with the following comments being recorded in the logbook: “Couldn’t get into either computer”, “Computer recognised me at 11:00, 15:00, but not at 17:45”, “Wouldn’t recognise my face”. Furthermore, there were also problems related to the printer, certain actions on Gmail, like forwarding and opening attachments, and closing down/logging off.

With SenPortal, most of the user ID and password problems that were previously prominent seemed to have been resolved, yet facial recognition still remained a problem. Studying relevant literature, it was learnt that lighting can play an important role in this regard. Ruiz-del-Solar and Quinteros (2008) reported that variable illumination is one of the most important problems in facial recognition. Thus, because the computer room has

a window to the north-east, with the sun illuminating the room differently at various times of the day, altered lighting conditions appeared to be the major reason for facial recognition problems. Creating standard lighting conditions in the room and changing the settings on the system solved this very effectively.

DISCUSSION AND CONCLUSION

Information technologies and the Internet offer numerous opportunities to senior citizens to improve their quality of life. Unfortunately, many are not in a position to make use of them, because of cognitive and physical restrictions. Internet-based services, therefore, should be designed in a more user-friendly manner to offset such restrictions, which can also include short-term memory loss. It can be argued that the primary objective of the experimental research project to "develop an environment for senior citizens to effectively utilise some of the Internet-related services, taking the cognitive and physical abilities of elderly people into account" has been met.

From the research results it is apparent that a front-end system like SenPortal is able to successfully address the problem of authentication and easy access to selected Internet services. SenPortal makes it possible for a senior citizen user to access his/her Gmail, Skype or Facebook account with two clicks of a mouse, firstly to confirm identification and secondly to select the service. Based on the needs of the elderly, it is imperative to have an administrator on site and readily available to assist novice users with the various services.

SenPortal made it possible for the participants to be authenticated with minimal activity from their side. By using facial recognition, combined with a user-friendly, front-end system, a group of senior citizens, mostly over 70 years old, have successfully used email, search engines and online social networking. But once logged into a service, like Gmail for example, it was noticed that that the users struggle to type an email message. Thus future plans include making use of voice recognition to assist senior citizens to compose their email messages faster and with less physical activity on the keyboard.

Participants confirmed that the project has added to their quality of life. No transactional services, like electronic banking, online purchases or electronic government services, were made available. Introducing such services would require further experimental design and the creation of a secure environment for senior citizen users.

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SECTION II

CHALLENGES IN LEADERSHIP OF ICT POLICY AND E-DEVELOPMENT



THE EFFECTS ON POLICY OF THE COMPOSITION OF THE ICT PUBLIC POLICY NETWORK IN SWAZILAND

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ABSTRACT: The composition, relationships, alliances, power structures, norms and bureaucracies in policy networks affect not only the policymaking process but also the policies that result. This article reports on a study which analysed the dynamics of the ICT policymaking network in a developing country, Swaziland. The study uses a policy network analysis (PNA) approach to analyse the Swaziland national ICT policy network. The findings of the study show that government recruited mainly conformist actors into the policy network so as to meet set deadlines, and that policymaking was dominated by political agendas and strong foreign intervention, while side-lining key local policy actors.

KEYWORDS
Policy networks, government, conformist actors, foreign intervention, ICT policy, Swaziland

INTRODUCTION: POLICY NETWORK AND POLICY PROCESS
Since public policies are a key ingredient in achieving developmental goals, it can be concluded that rigorous and all-encompassing information and communication technology (ICT) policies are a prerequisite for achieving the desired impact. It is therefore worthwhile to invest effort in understanding the policy formulation process and how it impacts on the policy content and its outcomes. In this article, we focus on ICT policy formulation in a developing country context in order to contribute towards understanding the high failure rate of ICT policies in such contexts (Gillwald, 2010).

The policy formulation process is a complex interaction among a wide range of actors. Citizens generally entrust their governments to formulate public policy (Kendall, Kendall & Kah, 2006). For their part, governments recruit other policy actors, for example, business, academics and non-governmental organisations (NGOs), to assist in the process. However, their agendas may not always be aligned. The reasons governments embark on policymaking processes may have little to do with good governance or socio-economic development (Hosman, 2010). The reasons may relate to political achievements, catching up with others, requests from international bodies or economically powerful countries, securing or attracting donations from foreign agencies, and, as has been the case in some African countries, a motivation for spending public funds. In many cases, the recruited parties may also be disinterested in good governance or development (Stanforth, 2006). For example, business corporations may participate in policy networks primarily to secure and further their business interests. International NGOs may wish to instil so-called international standards and best practice applicable elsewhere. Often, the interests of these actors make their way into the final policy, usurping the space of local actors with limited voice.

Using the case of the Swaziland national ICT policy network, this study sought to understand the role of policy actors in an ICT policymaking exercise, making explicit their effect on the process of policy formulation. It sought to understand the dominance, the alliances, the marginalisation and the power structures that existed in this policy network and how these characteristics affected the overall policy process. This article discusses two questions:

- *How does the composition of a policy network affect policy processes?*
- *How do relationships, alliances, power structures, interests, bureaucracies and norms in policy-making bodies affect policy processes?*

Swaziland was chosen both as a response to calls for more ICT policy research in Africa and because it is one of the smallest African countries, often ignored in research (Delano, 2009; Kendall, Kendall & Kah, 2006). A policy network analysis (PNA) approach was used as a theoretical underpinning for the study because of its ability to understand and identify the key characteristics of policy networks. The Swaziland national ICT policy network was established in 2006. Of the 22 policy actors in the network, 16 of them were interviewed for this study. The study offers an analysis of an often ignored source of development project failures, namely the role of policy actors.

OVERVIEW OF PERSPECTIVES ON POLICY ACTORS AND POLICYMAKING

Public policy involves a statement of intent on any socio-economic matter that outlines the goals and aspirations of a country, and a set of principles that the government and the populace need to uphold to achieve the identified goals (Cloete, Wissink & De Coning, 2006). The policies contain the intentional actions of the government, are the authoritative allocation of values for the society and provide a projected programme of goals, values and practices (Dye, 1978). Dye's (1978) definition makes it clear that government is the primary agent in public policymaking and that government has the power to make decisions on behalf of the people. This, however, does not negate the role of non-governmental participants in the formulation and implementation of public policy (Dye, 1978). Public policies are typically a result of conciliation processes and are by definition techno-political processes that define and match goals among concerned social actors (Howlett, Ramesh & Perl, 2009).

Policies are interrelated decisions taken by political actors in terms of selecting goals and the means of achieving them (Howlett, Ramesh & Perl, 2009). Therefore, the capacity of government to implement its decisions is a crucial component of public policy; government's capacity therefore also determines its policy choices.

Sometimes policymaking processes do not involve active participation of the larger population. Governments may make critical decisions and policies through closed and non-transparent processes. In some cases public participation is only *symbolic* (Barnes, 2006; Kendall, Kendall & Kah, 2006; Mohamed, 2006). Policymakers in the developing world often ignore the idea that effective policies can only be achieved by outlining clear and possible goals through policy improvements and by appealing to societal interests. On the other hand, the lack of participation of civil society in the development of the policies may lead to resistance to those policies (Heeks, 1999).

Which information decision makers choose and how they do so may cause gaps between process and substance in public policymaking (James & Jorgensen, 2009). Currently, developing country policymakers face an array of economic, social and political choices, due to the challenges of a complex, fast-changing and uncertain environment. Osman (2008) attributes the lack of clarity, drive and vision among policymakers to the lack of democracy and good governance in many countries.

The involvement of foreign actors in the policy process, which is often the case in developing countries, brings additional dynamics into an already complex process. In most cases the foreign actors possess power due to financial strengths and access to economic and political elites that may result in their views, or views aligned with their agenda, being privileged. This may result in acceptance of minority views at the expense of representative and democratic views (Norton-Griffiths, 2010). Such a situation creates an environment where consensus and coalition become more important than inclusive policy processes, such that policy alternatives that are deemed to be compatible with existing policies and regulations are more likely to be selected (Liu, Lindquist, Vedlitz & Vincent, 2010).

POLICY NETWORK ANALYSIS (PNA) APPROACH

Policy network analysis (PNA) offers a way to study policymaking processes, structures, outcomes and relations between policy actors. PNA emanates from examining policy networks, in ways that describe meso-level relations (between government and interest groups) and micro-level (interpersonal) relations (Marsh & Rhodes, 1992; Moran, Rein & Goodin, 2006 Rhodes, 1997). Networks can be seen as clusters of actors connected to each other by resource and interest dependencies (Borzel, 1998). These then become establishments that provide actors with platforms for certain courses of action (Blom-Hansen, 1999). PNA developed as a criticism of earlier policy analysis methods, which were seen to be too instrumental and mechanistic. PNA addresses this critique by considering policies primarily as a result of the collaboration of different sets of actors.

POLICY NETWORK SCHOOLS OF THOUGHT

The two schools of thought in the field of policy network analysis are (i) the interest intermediation and (ii) the governance schools. The former sees policy networks as varying forms of relationships between interest groups and the state, while the latter sees policy networks as a way of organising political resources that are scattered in both the private and public sectors (Borzel, 1998). This study adopts the interest intermediation paradigm because it defines and understands policy networks as a relationship between the government and interest groups.

In interest intermediation, policy networks are seen as power dependency relationships between government and interest groups where resources are exchanged (Borzel, 1998). Policy networks can become structures through which entities make routine decisions in a given area of policy. In most cases, privileged groups and entities have strong relations with governments and this may result in other interests being side-lined (Moran, Rein & Goodin, 2006).

The constitution and behaviour of networks affects the policy outcomes and illustrates the power variations among the different actors (Rhodes, 1997). Interest intermediation emphasises the need for negotiation between interest

groups and government actors, and is often characterised by close relationships between particular groups and the government. During such negotiation processes some ideas may become more dominant and controlling than others. These are not necessarily the government's ideas (Rhodes, 1997). Generally, the dominance of particular actors is a result of their respective resources and skills. Over time, however, participants' interests may become institutionalised in government, while interactions and relationships become routine, due to constant consultations and private rather than public lobbying (Marsh & Rhodes, 1992; Moran, Rein & Goodin, 2006.

POLICY NETWORK ACTORS

Various actors come to the policy network to pursue their own interests; and these can either be facilitated or constrained. Governments need the different actors to promote their policy objectives. Though they may deem some of the policy participants as extremist and unrealistic in their demands, others are seen as responsible and acceptable. Governments need the actors' expertise, information and resources for political support and for implementing policies (Moran, Rein & Goodin, 2006. Policy actors can be categorised as:

- *Topocrats* (having local autonomy) – these are governmental entities that organise policy networks to enhance their interests. They seek to protect their independence and the particular wing of government to which they belong.
- *Expenditure advocates* (focused on sectoral policy goals) – these seek to incorporate sector-specific goals in the political/policy system. They want to see new public programmes in place, more fiscal support for new and existing programmes, and new public sector regulation.
- *Expenditure guardians* (focused on macroeconomic control) – these seek to control and restrain public expenditure and activity.

Actors assume and select their positions depending on the policy issue at hand (Blom-Hansen, 1999). There must be a clear balance and proper interest intermediation to get to the *ideal* policy. Excluding any one category type may result in a suboptimal policy.

POLICY NETWORK CLASSIFICATIONS

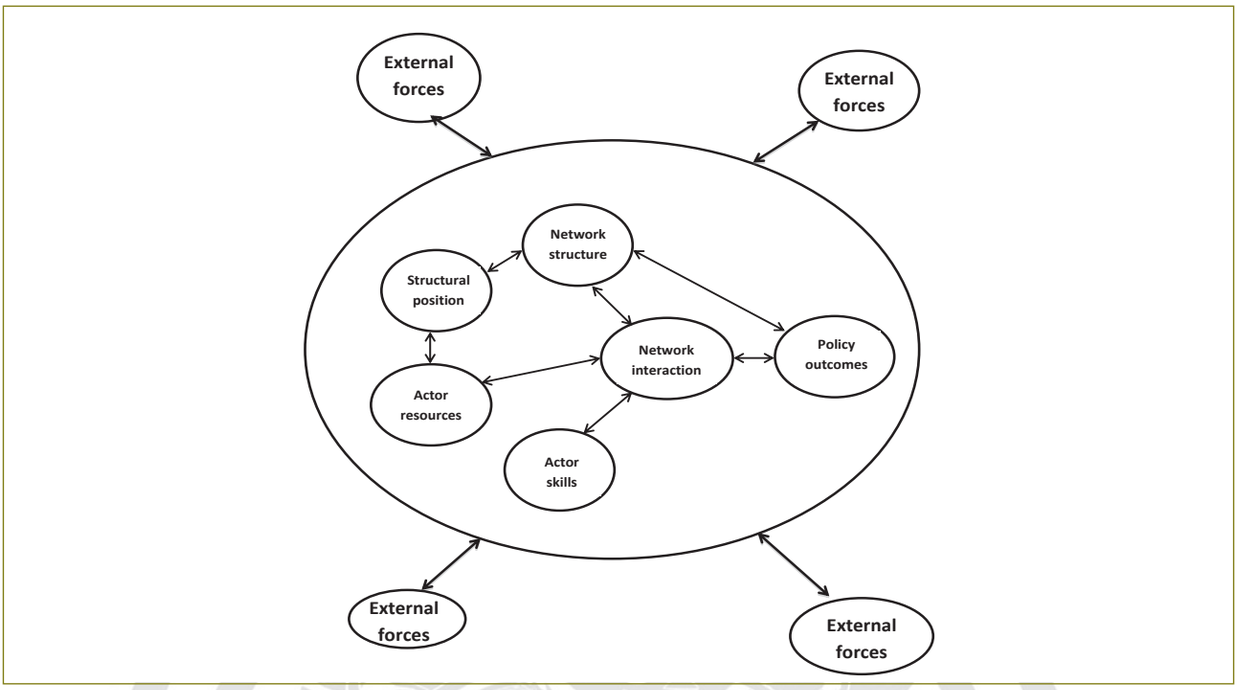
There are a number of policy network classifications. This study uses the Marsh and Rhodes (1992) typology, which is well developed and well documented since it has been successfully used to analyse a variety of problems in policy analysis (Borzel, 1998; Rhodes, 1997). This classification enables a uniform characterisation of policy processes and comparisons. It adopts the following four dimensions: memberships, interdependence/integration, resources and power. The typology acknowledges that policy networks are sometimes characterised by dominating interests. It sees policy networks as relationships between interest groups and the government; and policy networks are categorised according to the degree of closeness of the relationships between the two groups.

The typology treats policy networks as either policy communities or issue networks (Daugbjerg & Pedersen, 2004; Rhodes, 1997). Policy communities involve close relationships between policy actors. A policy community is characterised by a tight, closed, well-integrated and highly institutionalised network where membership is difficult to access. Issue networks, on the other hand, involve loose relationships between policy actors and may include government authorities, legislators, business people, academics, lobbyists, and even journalists. Issue networks normally involve policy consultations (Rhodes, 1997). Access to issue networks is generally open and the degree of integration and institutionalisation is low, which in most cases results in the instability of the network.

OPERATIONALISING PNA

The approach to adopting PNA in this study is based on the works of Marsh and Rhodes (1992). This model is meant to facilitate the understanding of the elements and relationships of PNA (Erridge & Greer, 2000) and is applied to the Swaziland case. The model, illustrated in Figure 1, shows the relationships between elements in a policy network.

FIGURE 1: ELEMENTS AND RELATIONSHIPS OF POLICY NETWORKS



Source: Erridge & Greer, 2000

The structural position of a participant in the policy process relates to its standing in the society. It is dependent on the reputation of the actor and the resources that it possesses. Policy network actors may exchange the following five resources: authority, money, legitimacy, information, organisation. Access to information is vital and promotes knowledgeable and productive policy actors (Rhodes, 1988). In policy networks, actor skills are used to gain advantage in the policy interactions (Erridge & Greer, 2000; Marsh & Rhodes, 1992; Rhodes, 1988). Skilful actors can produce winning strategies aligned to their particular interests, which will in turn impact on organisational values (Rhodes, 1988).

The network structure is the actual formation and setup of the policy network. It is the team that has been assembled and tasked with the formulation of the policy.

A structure has rules and regulations (rules of the game), as well as norms and bureaucracies (Erridge & Greer, 2000; Marsh & Rhodes, 1992; Rhodes, 1988). Marsh and Rhodes' classification posits that networks are political structures that influence policy outcomes and are responsible for facilitating or constraining actors in the network. Rhodes (1988) identified rules of the game that reflect the core values of the network and may be formal (statute-based) or informal. Rules prescribe the general perception of the policy and its application and each player's role. However, the rules of the game are affected by behavioural norms, which usually regulate the behaviour of the participants in the network, eg general bureaucratic norms.

Exogenous factors are influences that are not physically present in the policy network but affect the proceedings of the network. These may take the form of foreign assistance or pressure from powerful organisations not represented in the network. In some cases they may come from public opinion (Erridge & Greer, 2000; Marsh & Rhodes, 1992; Rhodes, 1988). A network interaction is a confluence of different factors that may or may not work well together. It is a meeting place for diverse skills, resources, exogenous factors, rules and bureaucracies (Erridge & Greer, 2000; Marsh & Rhodes, 1992; Rhodes, 1988). The more diverse the actors, the more complicated the interactions may be.

CASE DESCRIPTION: SWAZILAND NATIONAL ICT POLICY NETWORK

Swaziland remains as the last absolute monarchy in Africa. In Swaziland, the head of government (the Prime Minister), ministers, some members of the House of Assembly (the lower house), two-thirds of the Senate (the upper house), senior government officials and controlling officers, and other senior administrators are appointed by the King (GoSa, 2005). This presents a rare political climate. In most democratic states, heads of state and the top echelon of government change with elections. In some democracies, this also means a change of agenda, focus, policy and strategy. In Swaziland, the head of state is installed on a permanent basis, with other parts of government changing and political heads at times rotating from one office to another.

The Swaziland National ICT Policy Network was composed of 22 actors of which three were private companies, four were non-governmental and 15 were either government departments or parastatals (see Table 1).

TABLE 1: ACTORS IN SWAZILAND ICT POLICY (GOSB, 2005)

Actor	Sector	Category of actor	Actor type (as seen by government)
Prime Minister's Office	Public	Topocrat	Conformist
Ministry of Tourism, Environment and Communication (MTEC)	Public	Topocrat	Conformist
Ministry of Housing and Urban Development (MHUD) – Chairman of the Committee	Public	Topocrat	Conformist
Ministry of Enterprise and Employment (MEE)	Public	Topocrat	Conformist
Ministry of Economic Planning and Development (MEPD)	Public	Topocrat	Conformist
Ministry of Education (ME)	Public	Topocrat	Conformist
Ministry of Public Works and Transport (MPWT)	Public	Topocrat	Semi Conformist
Ministry of Health and Social Welfare (MHSW)	Public	Topocrat	Conformist
Ministry of Public Service and Information (MPSI)	Public	Topocrat	Conformist
Computer Services Department (CSD)	Public	Topocrat	Conformist
Central Bank of Swaziland (CBS)	Public	Guardian	Conformist
Swaziland Broadcasting and Information Services (SBIS)	Public	Guardian	Conformist
Swaziland Investment Promotion Authority (SIPA)	Public	Guardian	Conformist
Swaziland Post and Telecommunications Corporation (SPTC)	Public	Guardian	Semi-conformist
University of Swaziland (UNISWA)	Public	Guardian	Conformist
TIBIYO (a royal investment company)	Private	Guardian	Conformist
MTN	Private	Guardian	Conformist
Swaziland Industrial Development Company (SIDC)	Private	Advocate	Semi-conformist
Association of Internet Service Providers (AISPs)	Private	Advocate	Semi-conformist
Consumers Association	Private	Advocate	Semi-conformist
Federation of Swaziland Employers and Chamber of Commerce (FSE&CC)	Private	Advocate	Semi-extremist
Coordinating Assembly of Non-Governmental Organizations (CANGO)	Private	Advocate	Semi-extremist

The policy, formulated in 2006, was completed with the assistance of the government of Finland and the United Nations Commission for Africa (UNECA). The Finnish government provided financial and expert assistance for the process while UNECA provided expert support (GoSb, 2005). MTEC was the department responsible for ICTs in Swaziland at that time.

METHODOLOGY

Policy network analysis is a qualitative methodological approach. Data for this study was obtained through review of documents and interviews with 16 of the 22 members of the policy network between November and December 2011. The members of the policy network were identified with the assistance of MTEC. The interviews sought to establish the relationships, alliances, power structures, interests, bureaucracies and norms that existed among the policy actors. Interview questions were based on the constructs of PNA, namely actors' structural position, resources, skills, as well as network structure, exogenous factors and network interaction.

Secondary sources used were the publicly available documents of the various actors, for example annual reports. Efforts to acquire the policy network documents such as minutes and action plans were unsuccessful, since they are categorised as classified government documents. Documents from actors not interviewed were also reviewed to establish their degree of conformism, structural position, skills and resources.

Memory lapses were a limitation since some policy actors could not clearly recall some of the events of the policy process. The failure to obtain some of the policy network documents was also a limitation, because the documents could have been used for triangulation purposes.

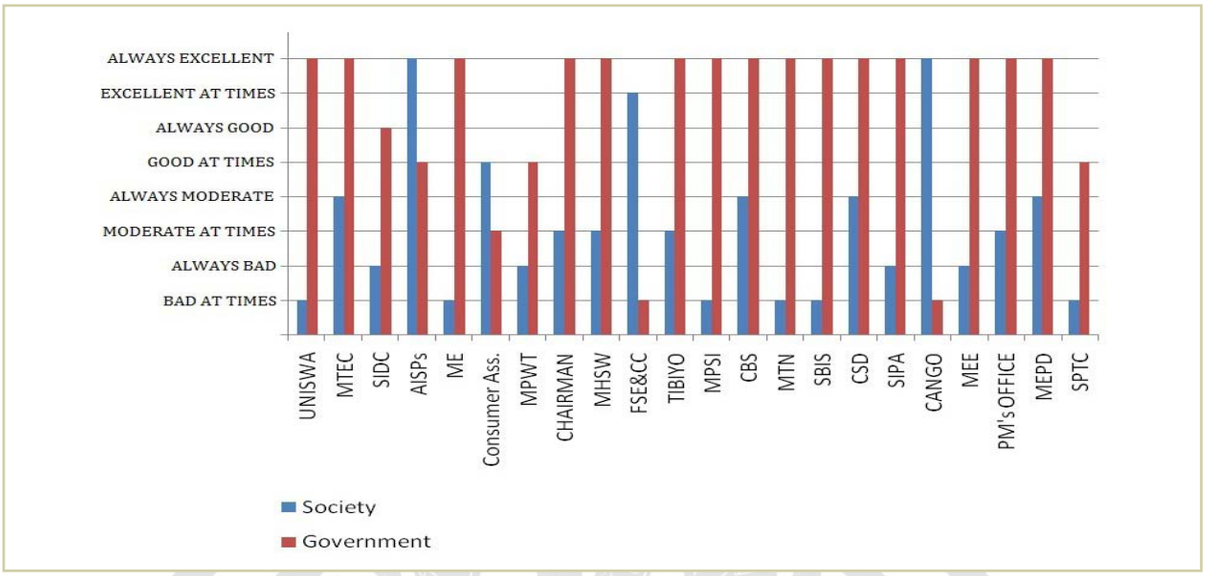
THE SWAZI ICT POLICY NETWORK

STRUCTURAL POSITION OF ACTORS

The policy network was populated mainly by government departments and units that were mostly loyal and conformist to the government, but not necessarily aligned to the societal interests (recall Table 1). Of the 22 actors in the policy network, 15 were either government departments or government-controlled institutions, therefore, most of the actors were in good standing with government in terms of reputation, authority and legitimacy. The Ministry of Public Service and Information was one of the senior government departments and hence had been involved in all government policies and strategies, while the Ministry of Public Works and Transport prided itself on being one of the mobilisers of the policy process.

The non-government actors who were recruited into the network had mainly earned their inclusion through activities that made them important to the government. AISPs, though small, were well recognised and respected for introducing the Internet in Swaziland. MTN was the only mobile telecommunication company in the country. Most of the other non-governmental participants were involved in community work such as charitable activities. Their involvement in community activities boosted their structural position in relation to government, and partly in relation to the Swazi populace. Government perceived the community work as complementary to its own activities. Some of the semi-conformist and non-conformist actors in the network had a history of challenging the government's position on issues, for example, CANGO had challenged government policy positions through press statements. However, this potential source of conflict with government was counterbalanced by its country-wide poverty reduction exercises. CANGO claimed to have garnered its influence through its hands-on involvement in the community, especially in poor communities. It claimed that it was included in the network because it was "… very popular with the masses … came at a time where there was no link with the grassroots people, so they [government] saw us as their saviour …" The reputation of the policy actors was assessed from interviews and from secondary sources, appraising their stance and views over a period of time. The relative size of some of the actors also contributed to their influence and authority in the Swazi society and in government circles. All actors commanded influence and authority in their own way. Figure 2 illustrates the reputation (influence and authority) the actors had in government and in Swazi society.

FIGURE 2: REPUTATION (INFLUENCE/AUTHORITY) OF POLICY ACTORS TO GOVERNMENT AND SOCIETY



Source: Metfula, 2013

ACTOR RESOURCES

In 2005 most of the policy actors were well resourced. UNISWA's good standing was evident in their increasing student intake. As a result, "money or any resource was not at all an issue" for UNISWA. The Consumers Association and CANGO were receiving financial support from international organisations. FSE&CC was receiving funding and technical support from member companies, payments for services provided to members, and donations from international bodies. However, TIBIYO and SIDC were experiencing hardships. SIDC "[was] stagnant because our focus was on FDI and it was slowly going down". Like most institutions in the country at that time, government departments in the policy network were financially stable.

Considering the small size of Swaziland most of the actors were relatively large. Although some organisations were small in terms of staff numbers, they had large memberships. However, contrary to expectation, the unit in the MTEC responsible for ICT policy formulation was the smallest of all the actors and had only two staff serving as the secretariat of the policy network. The unit was inadequately funded and did not have a budget to remunerate the policy actors.

NETWORK STRUCTURE

All the actors, except the chairman, were recruited by MTEC. The chairman was recruited by Cabinet because it believed that he was a user and advocate of ICTs and ranked higher than other principal secretaries in terms of ICT usage and literacy. Since the various policy actors represented different sectors and groups in the population, MTEC gave them varying reasons for their recruitment. They all believed that their recruitment was, to a large extent, connected to their structural position.

Professionalism was said to be an important value that actors were required to uphold at all times. Yet, either due to memory lapses or overt weakness of the policy process, only three participants recalled being given terms of reference. Most said all that was emphasised in the first meeting was professionalism and the importance of getting the task "over and done with".

The policy process was fraught with myriad challenges, with a clear divide between government and non-government actors. Private and government participants each accused the other of bureaucratic approaches (see Table 2). Some actors, however, denied the existence of bureaucracy. The chairman stated that he "[…] did not see any bureaucracy, in fact, I did not care if it existed. I did not care if we formed the quorum or not – I just started meetings". Non-governmental actors felt government was controlling the policy process through its many participants and that the policy network was too large to achieve any tangible outcomes.

TABLE 2: NORMS AND BUREAUCRATIC APPROACHES IN THE POLICY NETWORK

Norms and bureaucratic approaches	Cause of norm or bureaucratic approach	Affected actors
Wanting remuneration and hence pulling out	Private sector	CSD, ME, MPWT, MPSI, SBIS
Treating the process as secondary: Belief that their time is more valuable	Private sector	CSD, ME, MPWT, MPSI
Compromising important dates		
Safeguarding individual interests	Private sector	ME
Laxness: Poor turnaround time and feedback cycle	Government	MPWT, MHSW, AISPs, CANGO, SIDC, FSE&CC
Pressure to complete the process	Government	UNISWA
Desire to mimic other countries	Government	UNISWA
Failure to remunerate	Government	MHSW, SIDC, AISPs, Consumers Association
Prolonged meetings	Government	Consumers Association, CANGO
Decreasing interest/input	Government	Consumers Association
Mistrust	Government	CANGO
Frowning and non-accommodation	Government	CANGO
Poor discussions, not open and robust	Refusal to be specific	CBS

Other accusations against the government team related to hosting meetings with no set targets. Some actors, both government and private sector, blamed the network leadership and secretariat for being inefficient and for creating a poor feedback cycle unable to keep the policy actors aware and informed of the policy process. This led to some members being frustrated and leaving the policy network. MHSW postulated that the "team contributed and left".

Remuneration was also a concern for participants from the private sector who expected financial compensation for their involvement in the process. Some lost interest due to no remuneration. Government departments criticised the private sector for thinking that their time was more valuable than that of others and for expecting remuneration for an activity conducted in the "national interest".

ACTOR SKILLS

The actors in the network possessed a wide range of skills, strategies and values relevant to the policymaking process. Most institutions sent representatives who were either IT experts or at least computer literate. However, none of them had previously been involved in an ICT policymaking process. To address its skills shortage, MTEC frequently requested technical assistance from UNECA, which "came in to assist us and even appointed someone from Zimbabwe". Furthermore, MTEC's Principal Secretary, the most senior official in a government department, "was not good technically [not computer literate] so the Cabinet had to find someone to stand in his place". In a bid to meet deadlines and to complete the policy work, the Cabinet appointed the .Principal Secretary from the Department of Housing and Urban Development, who supposedly had the relevant expertise, to chair the committee.

The skills that the actors possessed were not fully utilised, and therefore did not benefit the network much. For example, skills for mobilising, coordination and sensitising, which MPWT, CANGO and FSE&CC possessed, were not used, possibly because the policy process was weakened by the domination of the government actors. This may have influenced some actors to quit before they could contribute to the process. Only MPWT was successful in mobilising and sensitising policy actors about the importance of the policy at the beginning of the policy process. Utilising these skills extensively would have complemented the attributes of the chairman and his ability to get the actors to work together.

The strategies employed by policy actors ranged from persuasion to professionalism. The Chairman, UNISWA, the Consumers Association and MPSI believed firmly in persuasion. The Chairman felt it was his job to persuade the policy actors and to remind them that the policymaking process, and eventually the policy, would benefit them and their institutions. On the other hand, AISPs, SIDC, CSD, SBIS and MHSW were advocates of professionalism. Persuasion was probably the main strategy that kept the policy process alive, given that some participants claimed that the process was weak and lacked vibrancy.

EXOGENOUS FACTORS

The influence of external factors on the policy process was assessed by investigating whether the actors interacted directly with, or received assistance from, any institution that was not part of the process but had interests in it. Six participants fell into this category (see Table 3). There were no obvious differences among the actors in terms of the exogenous factors, except that most external influences (external to the network actors), especially on government actors, came from foreign agencies and from the government itself, namely the Minister and the King.

TABLE 3: EXOGENOUS FACTORS AND ACTORS IN THE POLICY NETWORK

Causal actors/ factors	Direct influence		Indirect influence	
	Targeted actors	Influence/effect	Targeted actors	Influence/effect
UNECA	MTEC	Verifying the correctness of the policymaking process. Checking if the set standards are met by the policy. Setting timelines and deadlines for the policymaking process.	CSD, MPWT, Chairman, UNISWA, TIBIYO, SIDC, AISPs	Providing frameworks and templates to be used in the making of the policy. Imposing timelines and deadlines. Ever-increasing presence and visibility of UNECA in the policy process.
Finnish experts	MTEC	Providing financial support for the policymaking process. Checking if the set standards are met by the policy. Assigning certain tasks to the Minister (MTEC).	None	None
World Summit on the Information Society (WSIS)	MTEC	Influencing timelines and deadlines for the policymaking process.	None	None
Media Institute of Southern Africa (MISA)	SBIS	Showing interest in certain aspects of the policy such as journalistic issues and media freedom.	MTEC	Showing interest in a more liberal media
UNESCO	ME	Providing financial support to ME. Expecting support from ME in UNESCO's projects.	None	None
Government	None	None	ME, Consumers Association, UNISWA, SIDC, AISPs	King's interest to see the policy delivered as soon as possible. Pressure to deliver the policy in a short space of time. The sense that Swaziland is lagging behind in ICT.
Regional bodies (including SADC Secretariat)	MPWT	Providing regional and international policy benchmarks that can be used in the policymaking process.	None	None
Minister of MTEC	None	None	MPSI	Policy leadership
Local media	None	None	SBIS	No interest in the policy-making process by local media
Labour unions	FSE&CC	Offering labour-related views for the policymaking process.	None	None
Donors (not specific)	CANGO	Expecting CANGO to represent their (donors) views and interests in local policymaking bodies.	None	None

UNECA was the most dominant exogenous actor in the policy network. UNECA provided most of the technical assistance to the secretariat and frequently checked if standards stipulated in the templates were followed in the formulation of the policy. The Chairman admitted that UNECA "came in and gave us some guidelines to follow".

The Minister (MTEC) stressed that "had it not been for UNECA, we would not have the policy we are talking about today". However, some policy actors felt that the behind-the-scenes workings of UNECA resulted not only in the adoption of cut-and-paste policy pillars adapted from other countries, but also the urgency to deliver the policy. TIBIYO postulated that "my understanding was that we had a policy from some African country which we were supposed to use to sort of speed the process up". As UNECA's hand became more visible in the proceedings some actors, especially private participants, pulled out of the process as they felt that their contributions were not necessary.

MTEC was also receiving financial and technical assistance from the Finnish government. Finnish experts occasionally visited the secretariat to verify that they were doing the right thing. The experts also expressed their expectations to the Minister (MTEC).

Like MTEC and ME, CANGO constantly dealt with donors who wanted them to support their projects on any given platform, including the national ICT policy network. CANGO's feeling was that "the donor conditions twisted our focus. It was a win-win situation, they get what they want and you get what you want". CANGO, however, had limited influence in the policy network and non-extensive involvement to effectively incorporate some of its external influences.

Regional bodies like the SADC also had some influence in the policy process. The greatest source of outside pressure for MPWT was regional bodies who from time to time supplied them with information and benchmarks which they shared with other government departments.

As a non-governmental organisation that worked with the civil society and other civic organisations, FSE&CC engaged labour unions in their preparations and consultations for the policy process. FSE&CC posited that the unions "were not involved so we had discussions with them, just to put them on the loop".

Government constantly expressed the view that Swaziland was lagging behind in terms of ICT compared to other countries. This put pressure on some policy actors to complete the policy process. More importantly, pressure came from the King's direct interest in the process and the objective for the policy to be ready that same year, 2005, in readiness for the World Summit on the Information Society in Tunis.

DISCUSSION AND CONCLUSION

Research points to the low success rate of ICT policies in developing countries and the need for further research focusing on ICT policy process in those countries. As a contribution to the discourse, this study explored the dynamics of ICT policy networks in Swaziland. By direct involvement in policymaking, policy actors exert influence on public policies and their outcomes. The relationships, alliances, powers, interests, bureaucracies and norms of the policy actors depend on the composition and dynamics of policy networks.

This study illustrates how government actors may systematically weaken the voice of other actors in a policy network, pushing their own agendas while making the process appear democratic. The Swaziland ICT policy network was skewed in favour of government and the actors were predominantly conformist. This meant that there were: 1) strong relations and alliances among government actors; 2) retention of power and control by government; 3) pursuit of government interests; and 4) dominance of government bureaucracy and norms. This allowed the government to shape the discourse . This is particularly detrimental in a context where the government has a unified voice that may arise through monarchy or one-party dominant states, or weak opposition. In Swaziland, the dominance of the government actors weakened the process and silenced alternative voices. This implies that the apparently democratic approach of including participants from diverse backgrounds in policy processes may not allow the majority voices to permeate into policy.

Agenda-setting in the policy process could also have negatively affected the process. The agenda for the ICT policy was mainly driven by exogenous factors. This could be partly due to lack of appreciation and understanding of ICTs and their impacts (Chigona, Vergeer & Metfula, 2012). The need to have an ICT policy did not emanate from within the country, rather it was born from processes outside the country such as WSIS. In the case of Swaziland, the government desired to have the policy ready to catch up with the latest benchmark. This raises the important question of how interest in and appreciation of ICTs and their impact can be aroused in the developing country context, how local debates and local ownership of the policy processes can be facilitated.

The study points to the powerful role of foreign actors in ICT policy in developing countries. The policy was mainly supported and shaped by Finnish experts and UNECA. The two exogenous actors were powerful, if invisible, participants in the policymaking process. Foreign technical support in ICT policy formulation is likely to be a welcome

and valuable contribution to developing countries, particularly due to lack of local expertise in ICT policy. In this case, though the local actors possessed technical ICT knowledge and some were experienced in formulating other policies, no one had experience in formulating ICT policies. The input of the international partners was therefore invaluable. However, the involvement of the foreign actors contributed to undermining local enthusiasm in the policy process.

This study focused on the policy formulation process, addressing itself to the composition and dynamics of the policy network, not to the outcome of the process. It is recommended that future studies look at how policy network composition and dynamics affect the policy content and its implementation, as well explore factors pertinent to effective foreign support for policy in developing countries.

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UNIVERSAL ACCESS AND SERVICE INTERVENTIONS IN SOUTH AFRICA: BEST PRACTICE, POOR IMPACT[1]

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ABSTRACT: Post-apartheid South Africa placed universal access and service at the forefront of its communications policy and regulatory interventions from 1996. It followed global best practice by imposing universal service obligations on licensees by establishing a universal service fund and a dedicated universal access regulatory body, as well as awarding targeted operator licences in areas of low teledensity. The effectiveness of these interventions is open to question, with fixed-line teledensity falling and prepaid customers in the mobile sector now accounting for the overwhelming majority of telephony users nationwide. Starting with an overview of South Africa's universal access and service imperative, this paper assesses the value and effectiveness of these universal access and service interventions. It shows how the burgeoning access to mobile has little to do with the impact of these interventions. Finally, the implications of this for universal access and service policy and regulation, and for its implementation, are considered.

KEYWORDS:
Universal access, universal service, UAS, USOs, USF

INTRODUCTION
Telecommunications reform in South Africa was accompanied by a strong policy commitment to achieving universal access and service (UAS). This resulted in a number of specific interventions designed to extend access to telecommunications services, largely informed by global best practice (Blackman & Srivastava, 2011; infoDev, 2009; Intven, 2000; ITU, 1998; SADC, 2011). Many of these, however, are regarded with scepticism, or are seen as having failed (Gillwald, 2006; Hodge, 2004; Perry, 2010). Yet at the same time, South Africa's mobile teledensity has soared to 67 million active SIM-cards in a population of 52 million (MTN, 2013; Tarrant, 2013; Telkom, 2013; Vodacom, 2013), which translates into 126% teledensity, though per capita user penetration is lower[2] . This increase is arguably despite, rather than because of, targeted UAS interventions, and is largely attributable to the runaway growth of prepaid mobile. The UAS concept has a lengthy pedigree (Mueller, 1997). Current usage distinguishes between widespread access at the individual/household level (universal service) versus widespread access via public facilities such as payphones (universal access), adopting 'universal access and service (UAS)' as a portmanteau policy term (Blackman & Srivastava, 2011, pp. 153-154).

A critical assessment of South Africa's UAS policy and practice in relation to global best practice, in order to identify impacts and to account for shortcomings, is therefore necessary. The lessons from such an analysis will be of value not only for developing countries still designing and implementing UAS interventions for telephony and Internet services, but also for those contemplating UAS interventions in relation to national broadband plans. South Africa is presently engaged in a full review of ICT sector policy and development of a new broadband policy, both of which include UAS interventions. Namibia has recently adopted a national UAS policy which foresees broadband interventions.

Firstly, this article shows why UAS has been a central pillar in South Africa's telecommunications reform. Secondly, it documents the key components of consequent UAS interventions: the imposition of universal service obligations on licensees, the establishment of a dedicated agency to deal with UAS issues and a universal service fund, and the awarding of licences in areas of low teledensity. Next, an assessment of each of these UAS interventions is undertaken leading to a conclusion.

BACKGROUND
South Africa's transition to democracy in 1994 and its subsequent engagement with telecommunications reform took place against the background of an increasing interest in UAS as a central sector reform issue (Hudson, 1994), and in the context of a racially discriminatory history of systematic denial of access to telecommunications services for the majority of the population. Hence, in the policy guideline on telecommunications, the Reconstruction and Development Programme (RDP) emphasises the racial distortions to access under apartheid:

> For black people it is estimated that less than 1 (fixed telephone) line per 100 persons is in place compared with about 60 (fixed telephone) lines per 100 white persons. Other countries with comparable per capita wealth have 30 lines per 100 persons. The situation is far worse in rural areas (ANC, 1994).

1 This article was developed from a 2010 paper presented at the International Telecommunications Society Conference 'Telecommunications: Ubiquity and equity in a broadband environment', Wellington, New Zealand.

2 The teledensity figure includes SIMs used for 3G data, machine-to-machine communications and telemetry, and does not account for multiple SIM ownership.

The RDP acknowledges the role of telecommunications as an "indispensable backbone for the development of all other socio-economic sectors", and commits the country to "provide universal affordable access for all as rapidly as possible within a sustainable and viable telecommunications system" (ANC, 1994).

This recognition of a deeply racialised communications divide finds further expression in the objectives of the White Paper on Telecommunications which emerged from the post-1994 telecoms reform process: "Our particular goal is to balance the provision of basic universal service in telecommunications to disadvantaged rural and urban communities with the delivery of advanced information services capable of meeting the needs of a growing South African economy" (RSA, 1996a, p. 1). The Telecommunications Act 1996 likewise lists the intent to "promote the universal and affordable provision of telecommunication services" (RSA, 1996b, 2(a)) foremost among its 17 objectives. With the passage of the Electronic Communications Act (RSA, 2005), by which time substantial strides had been made towards securing universal access to telecommunications services, this overarching goal of universal affordable access was modified to a less strongly formulated commitment to "promote the universal provision of electronic communications networks and electronic communications services and connectivity for all" (RSA 2005 2(c)). This vision of "universal affordable access for all" animated subsequent regulatory interventions (Hodge, 2004; Msimang, 2006) over the critical transition years post-democracy towards a reformed communications environment.

SOUTH AFRICA'S UNIVERSAL ACCESS AND SERVICE INTERVENTIONS

We now turn to a brief overview and assessment of each of the universal service and access interventions adopted in South Africa. The discussion reveals strengths and weaknesses with respect to each component of policy and its implementation.

UNIVERSAL SERVICE OBLIGATIONS (USOS)

The imposition of USOs is widely considered a standard best practice component of UAS implementation (Blackman & Srivastava, 2011; infoDev, 2009; Intven, 2000; ITU, 1998) and comprises "mandatory service obligations … imposed by licence conditions or other regulatory measures" (Intven, 2000, p. 6-3) either on individual operators or on a class of operators. USOs typically take the form of requirements to supply certain types of ICT services to defined classes of customers. Examples include: connecting additional fixed-line customers, installing more public payphones, or providing mobile network coverage to specified geographic areas or proportions of population (Intven, 2000, pp. 6-11), but they can also include other obligations such as the carriage of free emergency calls. In essence, USOs are an enforced internal cross-subsidy from more lucrative market segments to non-profitable services and areas.

In South Africa, the licence issued to the fixed line incumbent operator, Telkom, specified a number of USO rollout targets over the period 1997-2002. The focus was largely on additional access lines, mainly in "under-serviced areas" and to "priority customers" (defined as hospitals, libraries, local authorities or schools), but also dealt with the installation of public payphones (Table 1). The licence included an extensive list of under-serviced areas (RSA, 1997).

South Africa was relatively unusual in including USOs for its mobile operators, an approach the ITU still urges as best practice today (ITU, 2008, p. 36). Along with the imposition of network geographic and population coverage requirements, the USO requirements for mobile focused on "community service telephones" – essentially a public payphone on the mobile network "freely accessible" to the "general public" (ICASA, 2002a, p. 5) – with slightly differentiated requirements across the three licensees. Additional obligations were imposed on MTN and Vodacom in 2004 in return for access to additional spectrum (ICASA, 2004a; ICASA, 2004b). These took the form of requirements to distribute free SIM-cards and handsets, as well as provision of Internet access to public schools and to institutions for people with disabilities, and were later extended to Cell C (ICASA, 2009a; ICASA, 2009b) (see Table 1).

The licensing of South Africa's second PSTS operator, NeoTel, was accompanied by the imposition of a hybrid range of USOs. These included defined coverage rollout targets similar to those imposed on mobile operators, according to a "confidential" rollout timetable, as well as the provision of community access in the form of high-speed Internet access to schools and clinics, reflecting ongoing shifts in the communications landscape (Table 1).

TABLE 1: UNIVERSAL SERVICE OBLIGATIONS IMPOSED ON LICENSED OPERATORS IN SA

Operator	Access lines	Coverage	Payphones/community access points
Telkom (PSTS)	2 690 000 over five years - 1 676 000 in under-serviced areas - 20 246 to hospitals, libraries, local authorities, schools - 3 204 to under-serviced areas, villages	N/A	120 000 public payphones over five years
Vodacom (Mobile)	N/A	60% of population within two years 70% of population within four years Timetable for specified coverage areas	22 000 community service telephones in 70 specified areas over five years - 1 250 000 SIM-card connection packages - 125 000 handsets - 140 institutions for people with disabilities provided with Internet access (10 terminals each) over three years - 5 000 public schools provided with Internet access over eight years - (subject to approval of implementation plan)
MTN (Mobile)	N/A	60% of population within two years 70% of population within four years Timetable for specified coverage areas	7 500 community service telephones over five years - 1 250 000 SIM-card connection packages - 125 000 handsets - 140 institutions for people with disabilities provided with Internet access (10 terminals each) over three years - 5 000 public schools provided with Internet access over eight years - (subject to approval of implementation plan)
Cell C (Mobile)	N/A	40% of area within 1 year (roaming) 8% of area within five years (own network) 80% of population within one year (roaming) 60% of population within five years (own network)	52 000 community service telephones in under-serviced areas (with less than 10% fixed teledensity) - 1 250 000 SIM-card connection packages - 125 000 handsets - 140 institutions for people with disabilities provided with Internet access (10 terminals each) over three years - 5 000 public schools provided with Internet access over eight years - (subject to approval of implementation plan)
NeoTel (PSTS)	N/A	60% of population in defined metropolitan areas within five years 80% of population within 10 years Subject to "confidential" "Rollout Timetable"	Establish and maintain "high speed Internet connectivity" to: - 2 500 public schools / education institutions - 2 500 public rural clinics Subject to approved implementation plan

Compiled from: RSA, 1997; ICASA, 2001; ICASA, 2002a; ICASA, 2002b; ICASA, 2004a; ICASA, 2004b; ICASA, 2006; ICASA, 2009a; ICASA, 2009b

UNIVERSAL SERVICE AGENCY (USA)

The creation of a specialised agency in 1996, the Universal Service Agency (USA), with a mandate to focus on issues pertaining to UAS (RSA, 1996b, Ch. 8), reflects an early, ground-breaking structural intervention (Msimang, 2006, p. 225)[3]. It reflected the commitment to ensuring universal affordable access to telecommunications for all citizens, in particular the historically disadvantaged black majority.

The mandate of the Agency dealt with a variety of objectives, many of them rather vague:

(a) promote the goal of universal service;
(b) encourage, facilitate and offer guidance in respect of any scheme to provide … [UAS] …;
(c) foster the adoption and use of new methods of attaining [UAS];
(d) stimulate public awareness of the benefits of telecommunication services.
(RSA, 1996b, Section 59 (1)).

3 Intelecon (2009, p. 2) identifies three other similarly separate entities, all established several years after the USA.

The USA was further required to assist the Minister in formalising definitions for UAS, as well as undertake research, make investigations, issue information and table recommendations relating to UAS (RSA 1996b, Sections 59 (2) and (3)). Most importantly, the USA was put in charge of the administration of the Universal Service Fund (RSA, 1996b, Section 65 (4)). This is contrary to international best practice. A 2009 report notes the overwhelming majority of funds as placed under the control of the regulator (Intelecon, 2009).

UNIVERSAL SERVICE FUND (USF)

The creation of a dedicated fund (USF) to finance interventions to increase access to telecommunications services and to bridge the digital divide has for some time been considered best practice UAS policy (ITU, 1998, pp. 91, 2; Intven, 2000; ITU, 2003). Conventionally, such a fund aggregates monies to support the promotion of UAS. Funds are usually sourced by levying a tax on operators (and hence on users), requiring them to contribute a small, defined percentage of revenue. The fund is then applied by a variety of means towards interventions targeted at increasing access for disadvantaged groups and in under-serviced areas, thereby providing a more effective, targeted cross-subsidy from revenue-generating services to uneconomic ones (Intven, 2000, pp. 6-22ff; Msimang, 2006, p. 224, ITU, 2011, p. 8ff). In South Africa, the Telecommunications Act provided for the establishment of such a fund to be administered by the USA, a USF to be "utilised exclusively for the payment of subsidies … for the assistance of needy persons towards the cost … of telecommunication services" and, in certain circumstances, to subsidise the "extension of [the PSTS] to areas and communities which are not served or not adequately served" (RSA, 1996b, 66 (1) (a) & (b)). Contributions to the fund were initially set by Ministerial policy directive, and later regulated by ICASA (2008).

UNDER-SERVICED AREA LICENSEES (USALS)

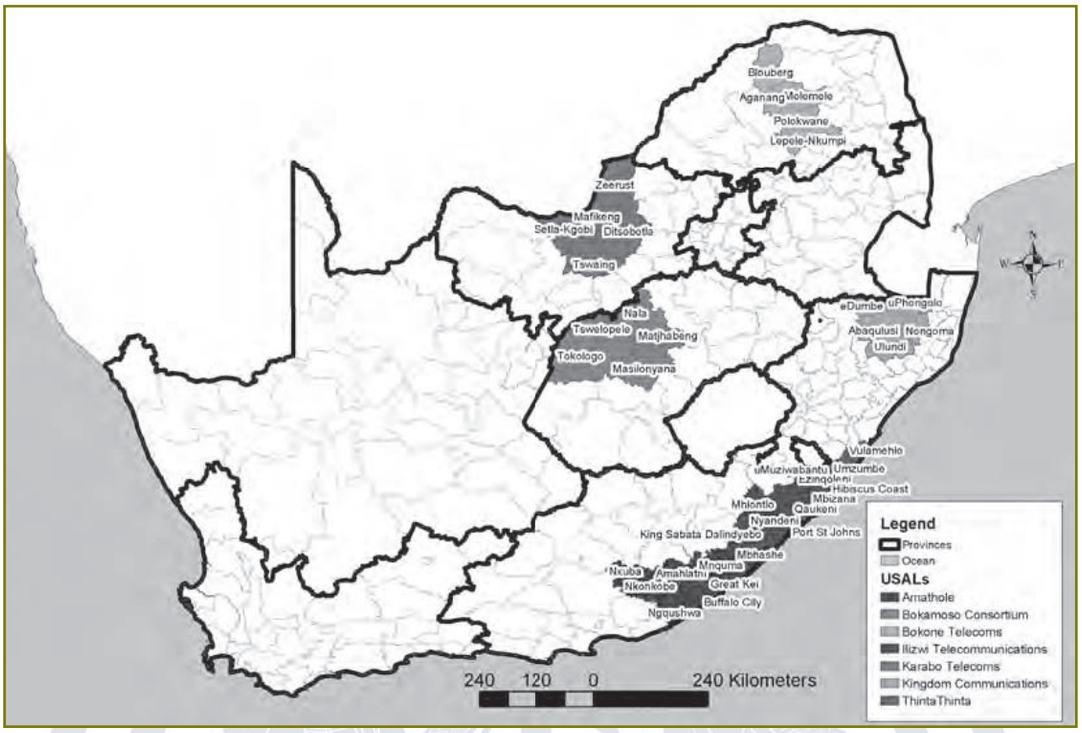
A fourth potentially innovative approach to the provision of access was introduced under the 2001 amendments to the Telecommunications Act. The amendments introduced a new category of under-serviced area licensees (USALs), designed to allow "small businesses" to provide a range of telecommunication services (including VoIP (Voice over Internet Protocol) and "fixed-mobile"[4]) in areas "where there is teledensity of less than 5%". It was further intended that "historically disadvantaged groups", including women, would benefit from the award of such licences (RSA, 1996b, Section 40A).

Msimang (2006, p. 241) and Thornton (2006, p. 4) have noted that participation of small business in providing telecommunications services was foreseen in the White Paper (RSA, 1996a), but the inspiration for this form of licensing may also have derived from the experience of telecommunications cooperatives in the United States, as the NTCA was a lobbyist in the process leading up to the 2001 amendment (NTCA, 2001). The model may also owe something to the experiments in rural payphone licensing undertaken in Chile and other jurisdictions in South America (Wellenius, 2002).

Subsequent to this amendment, the Minister specified 27 areas as under-serviced, based on fixed-line teledensity figures. The regulator then ran a series of licensing processes, leading to the initial award of seven USALs in 2004/5 (Figure 1), with an additional seven licences awarded in 2007, this time using the licensing categories of the new Act (Senne, 2008a). To support these new licensees, a contribution of R5 million per annum over three years was earmarked to be provided from the USF. There were also discussions around providing business development support and instituting regulatory measures, such as asymmetrical interconnection, to ensure a viable business case (Gillwald, 2006, p. 8ff).

4 Defined as call mobility that does "not permit call handover between cells" (RSA, 1996, (1)).

FIGURE 1: FIRST SEVEN UNDER-SERVICED AREA LICENSEES



Source: Human Sciences Research Council, no date

ASSESSING SOUTH AFRICA'S UAS INTERVENTIONS

Taken together, the provisions outlined above demonstrate South Africa's commitment to giving UAS a central place in policy and regulation, and to aligning implementation with global best practice. Given this commitment, it is important to consider the degree to which the various interventions have been successful in meeting their objectives. It is not only a question of whether the level of access has increased: undoubtedly it has. The assessment also needs to consider whether each of these interventions contributed towards that goal, the extent of that contribution, and its impact on access in practice.

Two of the interventions (USOs and the USF) constitute mainstream thinking, while the USA and the USALs were less conventional, but by no means far removed from similar interventions elsewhere. An examination of the effectiveness of each may shed light on the effectiveness of policy implementation, and provide guidance for policymakers and regulators elsewhere, serving to enrich an understanding of global best practice.

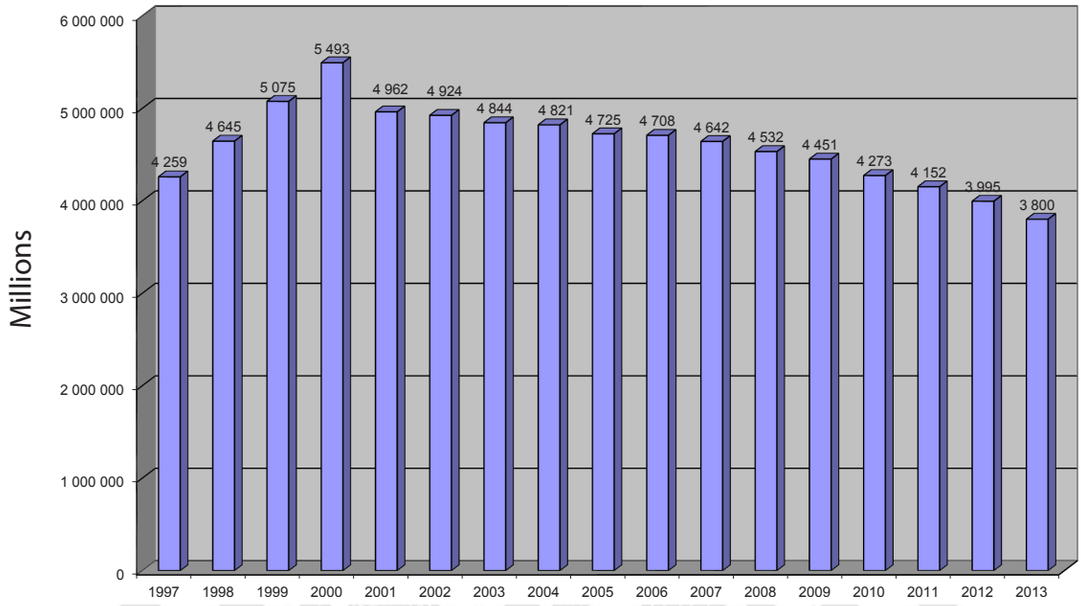
UNIVERSAL SERVICE OBLIGATIONS (USOS)

It seems clear from the pattern of obligations imposed on the incumbent, Telkom, and on the mobile licensees, Vodacom and MTN, that the expectation was for fixed-line operators to shoulder the greatest burden in providing access to under-serviced areas (Table 1). However, the imposition of targets on Telkom has had almost no net effect on fixed-line penetration (Figure 2), despite considerable cost and much wasted effort. In the words of one analyst, it has merely demonstrated the "failure of the universal service policy" (Hodge, 2004, p. 5). Telkom installed 2,67 million lines between 1998 and 2002, falling only marginally short of its rollout targets (ICASA, 2010, p. 5). However, most of these new connections – 2 003 million – were disconnected, with early indications that this was due to the inability of subscribers to pay for the services acquired under the USO rollout (Hodge, 2004). Migrating such customers to prepaid fixed-line, or simply cutting outgoing calls, seems never to have been considered.

Additional reasons for this decline in fixed line access includes fixed-mobile substitution as users migrated to prepaid mobile packages that were easier and cheaper to acquire, and more apposite for low-income users (Hodge, 2005). Nonetheless, the shift does suggest a failure of fixed-line USO policy.

The trends are clearly evident in the increase and decline in fixed lines over the period 1997 to 2013 (Figure 2). Despite an initial upsurge in the subscriber base as Telkom sought to meet its USO targets, the numbers steadily declined from a peak of 5,,5 million in 2000 to 3,8 million in 2013. The proportion of residential post-paid subscribers also declined, from 40,1% in 2002 to 30,8% in 2009.

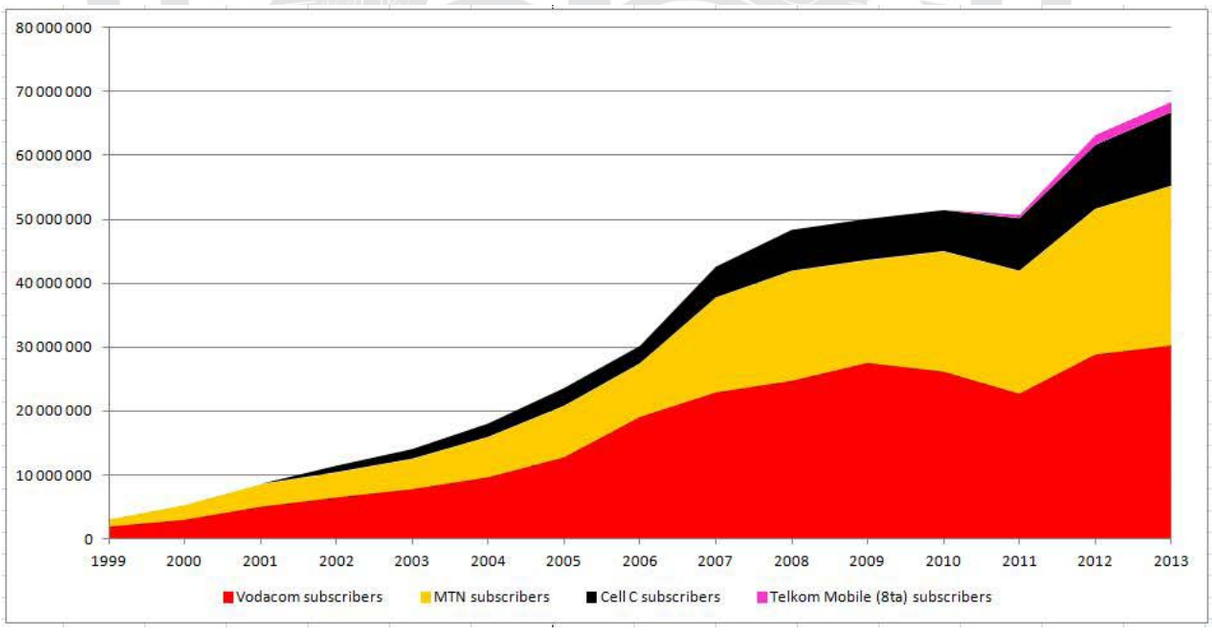
FIGURE 2: SA: FIXED LINES (1997-2013)



Source: Telkom, 1998-2013 Annual Reports

It is ironic that the mobile operators, on whom no specific subscriber rollout targets were imposed, exceeded all growth expectations, rendering USOs in respect of network coverage superfluous. By 2001 there were already more mobile subscribers than fixed lines in South Africa. The market share of mobile has continued to grow (Figure 3), reaching a total of 51,4 million in 2009, an order of magnitude greater than fixed-line penetration.

FIGURE 3: SA: MOBILE SUBSCRIBERS (1999-2013) [5]



Source: Author's own data, compiled from annual Reports of MTN and Vodacom, and Cell C press statements

Community access is a similarly mixed picture. Telkom easily met its payphone target, reaching 195 000 payphones in 2002, but the numbers steadily fell to 132 000 by 2009. This may be partly due to payphone vandalism and to increased competition from mobile community service telephones (CSTs). By contrast, the mobile operators all met the CST component of their USO rollout targets (Msimang, 2006, p. 235; ICASA, 2010), which were exceptionally low, based on an estimated total market of less than a million consumers.

5 The dip in numbers in 2011 is likely due to the introduction of compulsory registration of SIM ownership under RICA (Regulation of Interception of Communications and Provision of Communication-Related Information Act).

Indeed, these CST targets were substantially exceeded. Vodacom, the only operator to specify CST numbers in its annual results, lists 118 000 CSTs in 2009, with MTN reporting 22 000 to ICASA (2010, p. 7), and Cell C thought to have rolled out 100 000 (Jones, 2008). There has been considerable difficulty verifying and coordinating this rollout, with each operator proceeding in accordance with its own interpretation of its obligations (Msimang, 2006, p. 235). The legal wrangle between mobile operators over CSTs was partly over the location of the rollout, but also suggests that the ability to arbitrage the low termination rates applicable to call traffic from such phones incentivises operators to exceed their obligations and maximise CST rollout (Jones, 2008).

The effectiveness of South Africa's USOs is, therefore, open to question, with fixed-line teledensity continuing to fall, and with prepaid customers in the mobile sector now accounting for the overwhelming majority of telephony users and public access points nationwide. Rather than regulatory intervention, it is market forces that have undermined the fixed-line USOs and caused the mobile operators to exceed their USOs by several orders of magnitude.

UNIVERSAL SERVICE AGENCY (USA)

Despite its importance as an institutional intervention aimed at placing UAS at the forefront of telecommunications policy, the USA has struggled to make an impact.

This is partly due to structural issues created by complex lines of reporting and accountability between the Agency, the Minister, and the regulator (RSA 1996b, Sections 59 and 66). For example, until recently, several attempts by the USA to produce the required UAS definitions foundered because the Minister, rather than the Agency, is required to gazette them. Statutory appointment procedures place the USA under close control by the Minister, who also directs the Agency in the expenditure of the USF. As Limpitlaw comments:

> … from a regulatory point of view the Agency is very awkwardly positioned and it is not surprising that its track record of meeting its aims is extremely poor. It occupies a bizarre regulatory space, answerable to both ICASA and the Minister" (2004, p. 5255).

An internal report similarly describes the Agency as "weakly embedded in South Africa's regulatory space" (USA, 2005, p. 20) and points to a legal mandate that has consistently "undermined the independence of the Agency" (USA, 2005, p. 94).

The USA has been widely and consistently criticised for poor performance and ineffective management. The same report catalogues a damning litany of failures, including poor "management and accounting practices" coupled with lack of "human resource capacity", a "chronic lack of funding", engagement in "activities [not] consistent with the Agency's mandate", neglect of "core functions … to monitor and analyze the RSA telecom sector", failure to "prepare, submit or otherwise comply with statutory reporting requirements", undertaking project implementation without "mandate or authority" (USA, 2005, pp. 93-4). The organisation has been implicated in allegations of ongoing maladministration and corruption (see for example UDM, 2013).

Despite the structural contradictions and poor track record described above, and in the face of the initial vision of the Agency's mandate as transitional and temporary (Msimang, 2006, p. 231), the USA was not absorbed within the sector regulator, as some had recommended, in either the 2001 amendments to the Telecommunications Act or in the Electronic Communications Act 2005. In fact, there was little substantive change to the role and functions of the body, apart from increased adherence to the policy fiat and direction of the Minister, and a cosmetic title change to "Universal Service and Access Agency of South Africa" (RSA, 2005, Ch. 14). The oversight role of a board appointed by the Minister (introduced by the 2001 amendment to strengthen governance) was continued, and administration of the renamed "Universal Service and Access Fund" perpetuated, subject to many of the same accountability tensions between Agency, Minister and regulator (RSA, 2005, sections 87, 88) described above.

The Agency established in ground-breaking fashion to spearhead UAS interventions has thus ultimately proved ineffectual.

UNIVERSAL SERVICE FUND (USF)

The Universal Service Fund, closer to best practice, may be thought to have had a better track record. Certainly contributions were collected and funds were expended. Contribution levels were initially set at 0,16% of operator revenue, and later raised to 0.2%. The fund was initially capped at R20 million, with the contribution of the incumbent not to exceed 50% of this, but has been uncapped since 2001 (Msimang, 2006, pp. 225-6). Payments are collected by ICASA, but handed over to National Treasury and not accounted for to USAASA. No financial statement in respect of the fund seems ever to have been issued. A recent attempt to ascertain the current balance in the fund produced a speculated estimate of around R1 billion (Perry, 2010, p. 19). However, an earlier USAASA annual report suggests

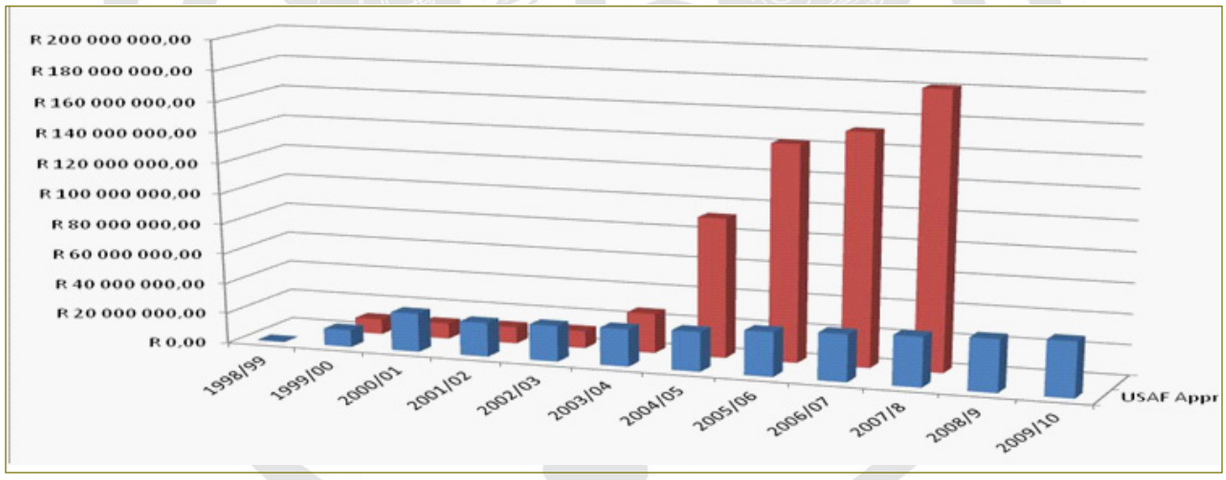
that the total contributions to the fund between 1999 and 2008 amounted to R636 million[6] (USAASA, 2008, p. 14) – suggesting that Perry's figure is likely to be an under-estimate. Substantial levels of funding towards UAS have thus clearly been available for a number of years.

The fund has been under-utilised, with reported expenditure by 2008 totalling a mere R227 million (USAASA, 2008, p. 14) – just over 35% of the amount available - leaving an unspent surplus of R409 million. Not only has expenditure been minimal, it has been ineffective. Initially the fund was used to fund a series of telecentres, in contravention of its formal legal mandate. The Agency's own consultants' report comments that the "Agency, which had not [sic] mandate or authority to undertake implementation projects, nonetheless made implementation its core function" (USA, 2005, p. 93).

The performance of these telecentres has been substandard. By 2000 only 65 telecentres had been established. Furthermore, 32% were found in 2001 to be no longer operational, with "less than half (47 per cent) … [having] both computers and phones working, though all had been provided with this equipment at the start" (Benjamin, 2003, p. 5). By 2005 the programme had been downscaled. With only 111 of the original target of 4 000 telecentres established, the focus then shifted to the rollout of "Cyberlabs[7]" and "Community Digital Hubs[8]" (USA, 2005, p. 77ff). A recent USAASA annual report suggests little change, with expenditure directed "to rehabilitate and equip Community Access Centres, Cyberlabs in schools and Digital Hubs; to enable internet connectivity in [further education and training institutions]; to subsidise USALS; to teach ICT skills to personnel who manage these centres; to conduct research that will inform USAF and for special projects such as Mindset Network and Square Kilometre Array" (USAASA, 2009, p. 17).

A summary of income and expenditure is shown in Figure 4 below. It appears that the fund's track record is less than illustrious, with expenditure being inappropriate, ineffective, and often wasteful, leaving a massive unspent surplus totalling nearly two thirds of contributions.

FIGURE 4: UNIVERSAL SERVICE FUND: INCOME & EXPENDITURE (1998-2010)[9]



Source: USAASA, 2008, updated with information from USAASA, 2010

UNDER-SERVICED AREA LICENSEES (USALS)

The final pillar of the UAS interventions discussed in this paper is the USALs. Essentially a rural operator model, it aimed to fulfil many of the criteria articulated by Dymond and Oestman (2003), including market orientation, technology neutrality and asymmetrical pricing. It seeks to leverage market forces, creating an incentivised licensing regime aimed at addressing the "market efficiency gap". Furthermore, the 27 designated under-serviced areas cover a substantial proportion (47%) of South Africa's population (Gillwald, 2006, p. 7), confirming the importance of the intervention. However, this intervention, too, has been problematic.

Several commentators recognised the need for the USALs to be supported by a range of policy and regulatory measures for their success. Gillwald put forward several critical success factors required to ensure viability and "sustainability" of the USALs, including a "funding framework … an asymmetrical interconnection regime … a flexible low-cost regulatory regime; and a licensing process that is kept as simple as possible" (Gillwald, 2002, p. 1).

6 2009/2010 compliance reports put the combined contribution for major telecoms licensees at ZAR 218 million.

7 Effectively computer laboratories in schools.

8 There is no definition of what Community Digital Hubs are or what distinguishes them from telecentres.

9 No official figure for contributions since 2008/9 is available, although a perusal of selected licensee compliance reports submitted to ICASA suggests that at least ZAR437 000 000 was collected in 2010.

However, only funding support for USALs was put in place, pegged at an unreasonably low ZAR5 million per annum over three years, subject to performance reporting. This compares unfavourably with estimated start-up capital requirements in the order of USD5 to USD20 million (Gillwald, 2006, p. 10)). A review of the first seven licensed USALs found this amount to be woefully inadequate, recommending that it be "increased substantially … and that operating expenditure and capital expenditure be availed and administered separately" (Thornton, 2006, p. 2). It is thus clear that the USALs received insufficient support to succeed, even though abundant financial resources were available for this purpose.

A complex range of other factors mitigated against the viability of the USALs. Consistent with Dymond and Oestman (2003), both Thornton (2006) and Gillwald (2006) argued in favour of cost-based termination rates, with the latter specifically arguing that without "cost-based asymmetrical termination charges … that [recognise] the asymmetrical cost of terminating calls in … low-density, high cost rural areas … a sustainable business case cannot be made for USALs" (Gillwald, 2006, pp. 11-12). No such interconnection regime was ever implemented.

There were also inbuilt structural disadvantages in the ownership requirements foisted on the USALs. They were required to be small business operations, with participation and ownership by historically-disadvantaged groups, putting them at a significant disadvantage in terms of technical expertise and managerial skills. The limitation on foreign ownership to a maximum of 25% further mitigated against their ability to attract investors (Gillwald, 2006). None of these requirements implies failure on its own – in fact, several align with important national policy objectives. However, in combination they created a set of structural constraints that guaranteed technical and commercial failure. Suggestions that a comprehensive capacity-building programme be put in place to address some of these deficiencies were never implemented.

The market structure and environment also undermined the viability of the USALs. For instance, the determination of the 27 under-serviced areas was based on outdated fixed-line teledensity data (Gillwald, 2006 p. 7) without reference to mobile penetration, which had surpassed fixed-line teledensity by the time the first licences were issued. This put the USALs in a position of competing for shares in a market of unknown saturation, rather than for the entire market as in the case of the analogous Chilean experiment (Wellenius, 2002). Furthermore, permitting only limited mobility for the USALs disadvantaged them in competition with fully mobile services. Finally, the subsequent Ministerial determinations liberalising the VoIP market, permitting resale and opening the door to self-provisioning (DoC, 2004), further cut the ground from under the USAL business case.

The eventual fate of the USALs is not clear. Several became mobile resellers (Lowman, 2005). Thornton concluded that "without significant intervention … most if not all of the USALs will not survive" (2006, pp. 1-2). By early 2008 USAASA noted that none of the original seven licensees was yet operational, opining that only three remained potentially viable (Senne, 2008b). Yet, barely four months earlier the Minister, while issuing a series of policy directions, had included a bizarre injunction to ICASA: "where there is more than one licence in a province, [to] merge the licences and issue one Provincial Under-Serviced Area Network Operator (PUSANO) licence" (DoC, 2007, p. 9). This would have forced the two remaining potentially viable operators each to merge with another, non-viable licensee. No subsequent progress seems to have been made with these enforced mergers. The final knell for USALs was sounded when the incoming Minister conceded that the "concept and the possible remedy had not worked" (Vecchiatto, 2009) and scrapped the decision to merge USALs into PUSANOs (DoC, 2009).

The USALs thus became an unfortunate historical footnote to UAS in South Africa. They were never provided with the necessary enabling regulatory and business environment, and were overtaken by events as policy moved on, vitiating the model. It is regrettable that an experiment so innovative was doomed to fail so dismally.

IMPACT OF UAS INTERVENTIONS

For South Africa it is now effectively 20 years from the RDP's clarion call to "provide universal affordable access for all as rapidly as possible" (ANC, 1994). To what extent can the country be said to have achieved universal access to telecommunications services?

The analysis set out above suggests that the main planks of South Africa's UAS policy have contributed little to the upsurge in access in a country where uptake has instead tilted dramatically towards mobile telephony, a clearly defined global trend. South Africa's fixed-line USOs have been ineffective in increasing access. The additional USOs imposed on the mobile operators in 2004 do not reflect recognition of the market shift towards mobile, but rather a requirement for a perfunctory quid pro quo. No evidence of such a shift in thinking exists and the lackadaisical enforcement of the additional USOs suggests their strategic importance was never recognised.

While it may be argued that the USOs in respect of signal coverage for mobile were an enabler, it is likely that the innovation of mobile prepaid services introduced by MTN in 1996, and emulated by Vodacom, enabled the market to mushroom on the mobile platform, with prepaid mobile subscribers making up 83.8% of South Africa's mobile users by 2007.[10] Other research (Hodge, 2005; Kalba, 2008) has similarly identified the impact of prepaid, along with other contextual factors, as a key driver of mobile diffusion.

The impact of this shift is illustrated by data from the 2011 Census (Stats SA, 2013) which shows that 88.9% of households have "access to" a cellphone, with provincial variations ranging from 93,8% in industrialised Gauteng to 81,9% in impoverished, mostly rural Northern Cape. Broken down by racial categorisation – with the racially-based chasm in access to telephony being one of the central justifications for South Africa's pre-eminent focus on UAS – the discrepancy ranges from 96,1% household penetration for "Whites" to 83,7% for "Coloureds". This suggests that despite remaining discrepancies, the mobile explosion has been a great leveller of the digital divide that impelled South Africa's commitment to UAS. By contrast, enormous discrepancies in fixed-line access remain, with household penetration ranging from a high of 18% in Gauteng to a low of 3,8% in impoverished, mostly rural Limpopo, and penetration by racial categorisation ranging from a high of 61,9% for "Indian / Asian" households to 5,9% for "Black" households.

This analysis implies the failure of fixed-line USOs and the success of market structure and dynamics as key drivers in dealing with the digital divide inherited from apartheid.

The Universal Service Agency and Universal Service Fund interventions did not contribute to the upsurge of mobile access. Likewise, the USAL experiment contributed only failure. The USA was largely ineffectual, while the USF engaged in ineffective attempts to fund a variety of forms of Internet rather than telephony access. The critique here is twofold. Firstly, telephony access including mobile access should have been prioritised in the early years of operation of the fund, laying the foundation for Internet access and broadband access. Secondly, the various Internet access projects, telecentres in particular, were poorly conceived and badly operationalised.

Though South Africa remains far from achieving universal service in respect of fixed-line telephony, a problem for extending fixed broadband; it has achieved universal service in mobile telecommunications, given mobile teledensity of 126%. Even if one treats the figures with caution, and applies qualifications and allowances for multiple SIM-card ownership (Sutherland, 2009; Goldstuck, 2009), these figures suggest around 42 million mobile users, a mobile per capita teledensity of 72%,[11] an impressive penetration rate for a middle-income developing country – and arguably close to universal mobile service.

CONCLUSION

The imperative towards achieving universal access and service for political, social and economic reasons is one that South Africa shares with many developing countries, one that remains widely applicable across sub-Saharan Africa. As we saw at the outset, South Africa was perhaps uniquely placed by virtue of its history to accord UAS pride of place in its ICT sector reform policies and interventions. To its credit the country did so, imposing universal service obligations upon all licensed operators, establishing a dedicated quasi-regulatory entity to drive UAS, creating a USF to fund UAS interventions, and licensing under-serviced area operators.

Each of these interventions is either derived from or consonant with international best practice in respect of UAS policy and regulation. Yet each seems to have been ineffective at best, making little if any impact on the dramatic upsurge of access to mobile telephony that has characterised South Africa's ICT sector. It would accordingly appear that sector dynamics and market forces were far more responsible for increased levels of UAS than specifically-targeted policy and regulation.

Such a failure of policy to make an impact could perhaps be accounted for by disjunctures in the domestic application of international best practice, due for example to the vicissitudes of policy transfer (Chulajata & Turner, 2009). It may also point to failures of institutional capacity in South Africa's regulatory institutions, such as skills constraints, poor policy co-ordination or lack of ongoing research to inform policy implementation. Alternatively, it may point to problems with international best practice itself, or suggest the need for implementation of UAS intervention that is dramatically more flexible, responsive and open to dynamic adjustment in the face of shifting technology and market trends than anything hitherto attempted, noting new trends in mobile access and mobile broadband.

The problems documented here in respect of South Africa's quest to achieve UAS have implications for other countries in sub-Saharan Africa, and for policymakers and regulators in other developing countries that face similar challenges and constraints, and who will need to think innovatively about the application of universal service funds and other

10 Source: Annual Reports of MTN and Vodacom and Cell C press statements.

11 The census figures cited above reflect access at a household level – arguably a less valid measure of UAS than per capita figures in the case of a highly personalised, reluctantly shared device like a cellphone, except, perhaps, in poorer communities.

UAS interventions. For most developing countries universal access to telephony services by means of mobile is the current and central preoccupation of UAS policy, and correctly so. But should they abandon the attempt to implement international best practice in respect of UAS policy and regulation, and turn their trust instead to market forces alone? Or does international best practice need to be adjusted in the light of the lessons of the South African experience? What are the implications of these lessons for the future of USOs and USFs?

Also, what are the implications of these lessons for countries moving on from a focus on mobile towards consideration of UAS in respect of broadband and the Internet? South Africa's latest draft broadband policy, for example, has universal access and service as a primary focus, and discusses in some detail the role of USAASA, the USAF and USOs in the rollout of broadband infrastructure and services. As this analysis has shown, broadband USOs that are formulated in the narrow, technology-specific manner of their predecessors would, in all likelihood, be doomed to failure. The track record of both the USAF and USAASA suggest that their intervention, unless carefully reconfigured, is likely to be ineffectual at best, and open to opportunities for corruption at worst. An approach is required that is more research-based, flexible, agile and responsive to changing circumstances.

Such considerations, and the questions that underpin them, point to the need for further research in the critically important area of universal access and service, and in respect of the interventions designed to achieve this key developmental goal.

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E-TOLL ROADS: ANALYSING A CASE OF COLLECTIVE MORAL DISENGAGEMENT IN AN E-GOVERNMENT PROJECT

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ABSTRACT: There has been little research that examines how public managers involved in e-government decisionmaking can sometimes negatively affect the welfare of citizens and waste public resources. This case study analyses collective moral disengagement mechanisms used by leaders and their subordinates to justify a controversial urban e-tolling project in South Africa. Using deductive content analysis, legal documents and public records were coded for modes of moral disengagement. The results show that public managers morally exonerated their decision: by endowing it with socially worthy purposes; euphemistic labelling; displacing and diffusing responsibility; downplaying negative consequences; making favourable comparisons; and disparaging and blaming opposing groups. Enhancements to existing governance frameworks and broader societal safeguards are recommended to prevent moral transgressions and improve e-government decisionmaking. Specific tactics for reputation rebuilding are also recommended when the publicity of alleged moral transgressions is high. Further research is needed to investigate how e-government leaders and broader social actors can engage public managers to enhance transparency and accountability.

KEYWORDS:
Decisionmaking, e-government, ethics, e-tolls, moral disengagement, transparency and accountability

CASE STUDY CONTEXT: E-TOLLING PROJECT IN LIMBO

This research is conducted on one of South Africa's most controversial e-government projects – the Gauteng Open Road Tolling (ORT) project. The project, initiated in 2006, has sparked a challenge from various groups in civil society and has been embroiled in a lengthy legal battle. The South African National Roads Agency Limited (SANRAL), a state-owned enterprise, is primarily responsible for the financing, development, maintenance and rehabilitation of South Africa's 16 170km national road network. Its activities include non-toll and toll operations. Toll roads are self-funding based on the user-pays principle. SANRAL has used two types of tolling: traditional toll collection at a toll plaza; and electronic toll collection (ETC), where either credit cards or an electronic transponder system (e-tag) identifies the vehicle and allows it to pass. Most of the conventional tolls are on newly built routes for long distance destinations, mainly found on regional roads.

There has been increasing interest in private toll roads as an alternative way of meeting highway needs. SANRAL has partnered with private entities to design and build the facilities and manage these operations. The controversial ORT project intends to use overhead gantries approximately every 10km along Gauteng's existing urban highway system to collect toll fees electronically. The gantries are fitted with electronic readers that recognise vehicle identifiers such as e-tags or vehicle number plates – and are set to automatically deduct toll fees from a road user's registered e-toll account. Users would be serviced by a complex of service channels including a call centre and website, e-toll kiosks and e-tag outlets at various shopping malls, and e-toll customer-service centres situated along the freeway network. SANRAL has also procured a central account management and clearing system, and established a violations processing centre as part of the operation.

Lack of transparency has been the hallmark of the e-toll project. Public managers voiced their reluctance to share vital information. For instance SANRAL initially refused to disclose details of the Electronic Toll Collection Joint Venture: "The information requested by Opposition to Urban Tolling Alliance (OUTA) is and remains the intellectual property of third party organisations" (SAPA, 2012a).The decision to use a foreign company instead of stimulating the development of local technology was also questionable. Headquartered in Austria, the e-tolling and traffic solutions firm and the largest shareholder in the e-tolling consortium, reported in the 2010/11 financial year that its road solutions projects segment, under which e-tolling falls, grew 247% year-on-year (Rasool, 2012). According to the CEO: "This positive development resulted largely from electronic toll collection system implementations in SA and Poland" (ibid). Opponents claim that the Government Employee Pension Fund (GEPF) holding R15.7 billion in SANRAL bonds was another reason for the lack of transparency (ibid). Some critics argued that this conflict of interest was the real reason government insisted on pursuing the project, despite its unfeasibility and despite it facing public resistance (ibid).

A cross-section of society, including Gauteng residents, business, trade unions, civil society groups, a few opposition party politicians and senior government officials such as the Deputy Minister for Transport have voiced strong opposition to the ORT project. Drive-slow demonstrations and other civil disobedience protests were held to voice opposition to tolling. There is a general consensus among Gauteng residents that e-tolling was a bad decision and will result in harm. Despite pressure from SANRAL and the state, reports suggested that only 350 000 out of an estimated four million registered vehicles in Gauteng had registered to pay e-tolls (OUTA, 2012a). In late 2011, the opposition groups formed

an alliance to legally challenge the project. The Opposition to Urban Tolling Alliance (OUTA) received over R5 million in financial support from business and citizens around the country to cover their legal costs (ibid). On 29 April 2012, just two days prior to the official launch, the High Court granted the interdict sought by opposition groups to halt the commencement of tolling pending a full review of the e-tolling records and decisions.

PROBLEM: E-GOVERNMENT, MORAL AND ETHICAL DILEMMAS

Although ordinary people may care about behaving ethically, they tend to justify and distance themselves from their unethical behaviour in everyday life (Tenbrunsel, Diekmann, Wade-Benzoni & Bazerman, 2010). Similarly, public managers are vulnerable to moral and ethical risk whenever they engage in actions that can harm or benefit others (Gauld & Goldfinch, 2006).This poses an interesting dilemma in an era of hyper-privatisation, spurred on by powerful corporations, where the social arrangements between government and the citizen are being increasingly constructed in the image of the market (Jurik 2004; Leye, 2007). This is partly due to the increasing surveillance capability of new ICTs that have improved our ability to collect and manipulate the personal information of citizens for a variety of commercial ends (Walsham, 2012).

Electronic government refers to the important role that information and communication technologies (ICT) can play in reducing the administrative and operational costs, as well as enhancing the services that central and local government deliver to citizens and businesses (Kupe & Okello, 2012, Heeks & Bailur, 2007; Yildiz, 2007). While ICT can play an important role in government, it can also bring about a lack of attention to alternative, more cost-effective avenues of action to follow in a wide range of service-delivery situations. An over-reliance on ICT and associated private-sector providers can even obscure the state's priorities (Rose-Ackerman, 1999; Van Slyke, 2003; Irani et al, 2005). For instance, the increasing surveillance capability of ICT can be used for political ends (eg staying in power) and to bolster private interests (eg profit). Yet effective ICT investments can contribute positively to the state's credibility with citizens and provide political return for leaders (Savas & Schubert, 1987). However, this requires that public managers must hold themselves collectively accountable for their actions when they enter into these potentially harmful investments (Marche & McNiven, 2003; Hinrichs, 2007).

One of the potential harmful effects of the Gauteng ORT project is the widening of inequity, particularly for low income road users. In the absence of feasible alternatives, segregating the Gauteng road systems by affordability prevents many citizens from accessing the basic right to free movement. The decision to use private capital and expertise instead of considering alternative funding models is also likely to negatively influence future road pricing (toll rates), as private partners look to maximise their return on investment and the state looks to service the debt. Consequently, the project is likely to have a negative influence on the personal finances of many road users and the broader economy. The project's lack of transparency may also harm existing trust relations between the citizenry and the state.

This study's analysis is grounded in the social cognitive theory of moral agency (Bandura,1990; Bandura,1991). According to Bandura (1991), moral disengagement is the self-regulatory process through which people free themselves from guilt and self-sanctions, allowing them to engage in unethical conduct. This theory also asserts that being part of a group neutralises the implications of a person's role and obscures their personal accountability in morally tenuous situations. Moral disengagement has explained political and military violence, organisational corruption, corporate transgressions, illicit consumer behaviour, unfair labour practices and the decline in civic behaviour (Caprara et al, 2009; Paharia & Deshpandé, 2009; Shu, Gino, & Bazerman, 2011).

To date, the role of moral disengagement has not been fully investigated in the e-government context. Since people use moral disengagement mechanisms to downplay the ethical content of their decisions and to make decisions that advance their organisational and personal interests, it is reasonable to assert that these mechanisms play an important role in explaining controversial project decisions made by e-government leaders and their subordinates. It is interesting to analyse whether moral disengagement mechanisms facilitate the cognitive dampening or exclusion of moral considerations in e-government decisionmaking. This study therefore seeks to contribute to knowledge about ethical decisionmaking in e-government projects by exploring the notion of moral disengagement as the process which influences morally dubious or unethical decisionmaking behaviour (Bannister & Lalor, 2001).

Thus, the purpose of this research is to answer the question: What are the collective cognitive strategies that public managers used to legitimise their e-toll investment decisions?

LITERATURE REVIEW: ETHICS IN E-GOVERNMENT DECISIONMAKING

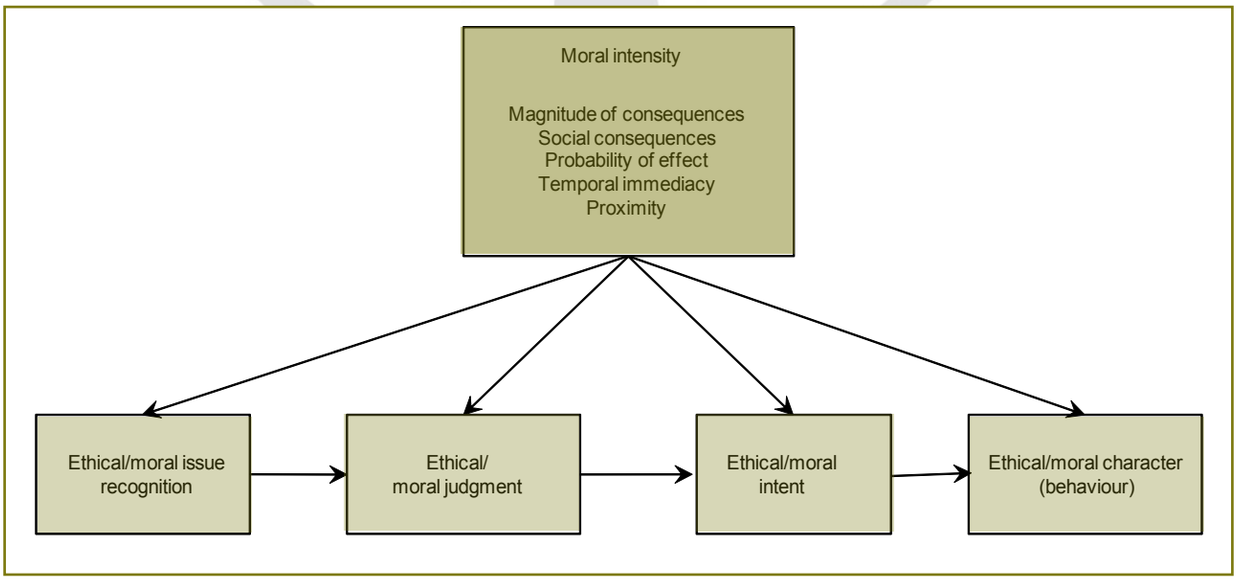
Jones (1991) defines unethical behaviour as any action in decisionmaking that is either illegal or morally unacceptable to the larger community. Ethical decisionmaking entails that the group makes a choice between what may be considered a right or wrong course of action based on some moral standard (Bandura, 2007). Research has attempted to explain unethical decisionmaking using macro-level factors such as environmental pressures, and individual differences between team members such as personality factors, demographics, and values and beliefs (Allmon, Page & Roberts, 2000). For instance Kohlberg (1976, 1984) suggests that advanced moral reasoning requires higher levels of cognitive complexity. However, these approaches reveal very little about the socio-cognitive processes that people employ when they decide to act in an unethical manner.

Rest and Barnett (1986) propose that moral failure in decisionmaking can occur due to group deficiency in any one of four phases (see Figure 1). The process starts with *recognition that a moral problem or opportunity exists*. During this phase, the group displays sensitivity towards the problem that exists and the welfare of others. In doing so, they know how possible alternatives will impact others and be viewed by them. The second phase involves making a moral judgment *concerning which course of action is morally right or wrong*. The group may consider a utilitarian (the greater good), care (the vulnerable) or justice perspectives (fairness of process and outcomes). The third phase, moral intention, involves *prioritising their choices in response to a given situation*. Here, the group faces up to its commitment to pursue a moral course of action. Members often find their moral values in conflict with their personal values, as a higher value needs to be placed on moral judgment and taking responsibility for moral outcomes. The final phase involves *executing and implementing a morally based course of action*. The group carries out its intentions by meeting the goals and outcomes of its chosen course of action. Individuals in the group should have the courage and persistence to overcome fatigue and temptations and implement the course of action that serves the moral goal (Rest et al, 1999).

Jones (1991) expanded upon Rest and Barnett's (1986) model by adding *issue contingencies* in the decisionmaking process. The model posits that moral intensity – the degree of moral relevance an *issue* holds for the decisionmaker or group – influences decision outcomes. Elements of moral intensity issues include: *magnitude of consequences, social consensus, probability of effect, temporal immediacy, proximity,* and *concentration of effect*. The *magnitude of consequences* considers the total harm or benefit that will arrive from a particular act. *Social consensus* assesses the extent of social agreement supporting the notion that the act is good or bad. *Probability of effect* gauges the likelihood that an action will occur and result in harm. *Temporal immediacy* looks at the perceived length of time between the act and its resulting consequences. *Proximity* appraises the feelings of closeness the decisionmaker has with those who would be affected by the act. Lastly, *concentration of effect* measures the number of people the decisionmaker believes will be affected by the act. An increase in any one of these issue elements increases the overall moral intensity of the decision (see Figure 1).

This issue-contingent model tends to emphasise the interaction between the person or group and the situation as a cause of unethical behaviour. Certainly these contingencies regarding the decision can override a person's moral compass and compel them to act in unethical ways, yet this approach also ignores the reasoning processes that occur when people collectively decide to act unethically.

FIGURE 1: ISSUE-CONTINGENT MODEL



Source: Jones, 1991

Formal decisionmaking techniques seek to provide an objective and reliable information base to facilitate moral and ethical decisionmaking and justify the *overt goals* (tangible benefits) of e-government investments. However e-government decisionmaking can also be used to serve the covert goals of one or more stakeholders. Stakeholders with *covert goals* do not wish to admit publicly that their intentions on the project are to serve their private interests or their organisation's interests above the interests of others (Irani et al, 2005). Formal decisionmaking processes in e-government projects can also be viewed as a token gesture meant to serve *ritual goals* by expressing an image of rational and accountable management (Walsham, 1999). Public managers can use the idea of rationality to pursue their personal agendas.

Empirical research has found ample evidence to suggest that decisionmaking in most types of organisations is predisposed to elements of irrationality (Goldberg & Centers, 2012). Whereas rational decisionmaking is associated with measurable, calculated, factual, reasoned hard data, irrational elements such as personal preferences, gut feelings, subjectivity, politics, intuition, entrepreneurship, ambition, instincts and beliefs are very much at play (Land, 2000). Gauld and Goldfinch (2006) argue that irrationality in e-government decisions is a combination of:

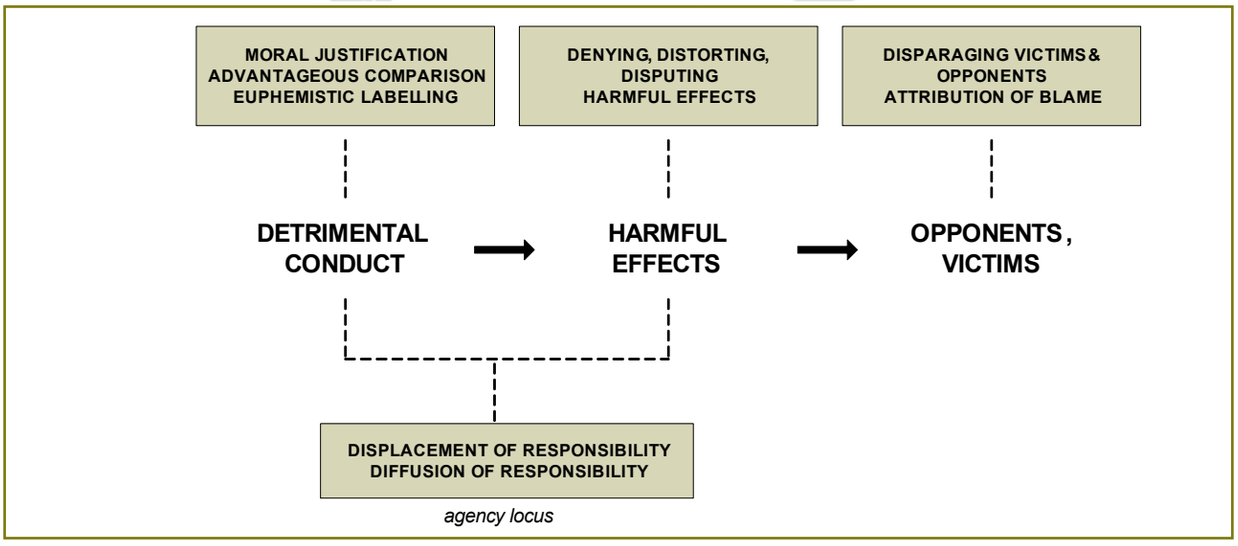
- *Idolisation or technical infatuation* – where politicians and public managers vastly overestimate what transformational effects can be achieved by ICT.
- *Technophilia* – where the e-government profession perpetuates the myth that ICT is the solution to various government challenges.
- *Lomanism* – where public managers are seduced by overly enthusiastic and dedicated salespeople.
- *Managerial faddism* – the tendency for consultants and public managers to embrace the idea that a problem (funding road infrastructure) can be fixed along the lines of a new managerial fad (e-tolling), with advancements in ICT often being a key element.

However, arguments such as these say little about how decisions that are required for unethical conduct are collectively normalised in an e-government project. Applying the moral disengagement mechanisms explained by social-cognitive theory to an e-government case study may offer a new perspective for researchers and fill some of the void present in existing ethical decisionmaking frameworks. Recognition of these moral disengagement psychological processes and how they are activated will lead to a better understanding of why public managers are prone to engage in unethical or economically dubious decisionmaking behaviour.

THEORETICAL FRAMEWORK

Social cognitive theory provides an appropriate conceptual apparatus to assess structures and processes through which moral agency operates in the realm of e-government decisionmaking; and to guide interventions aimed at promoting desirable or ethical decisionmaking behaviours (Bandura, 1991; Bandura et al, 1996). This theory assumes that people reflect on the consequences of their conduct, pursue goals in accordance with their own standards, enact actions that give them satisfaction and self-worth, and avoid behaviours that carry self-censure. Yet people can violate the principles of desirable and ethical decisionmaking behaviour despite being ethically committed, while continuing to profess the same principles without incurring any blame or guilt or feeling compelled to provide any kind of reparation (Bandura, 2007; White, Bandura & Bero, 2009). They use moral disengagement mechanisms to make their unethical conduct acceptable by convincing themselves that their questionable behaviour is morally permissible (see Figure 2 below).

FIGURE 2: MECHANISMS THROUGH WHICH MORAL SELF-SANCTIONS ARE SELECTIVELY DISENGAGED



Source: White, Bandura & Bero, 2009

People who behave unethically are also prone to "motivated forgetting" of ethical standards – they are serial "revisionist historians", recalling their past selectively in ways that support their decisions (Mather, Shafir & Johnson, 2000; Shu, Gino, & Bazerman, 2011). They also tend to overemphasise the positive features of their chosen options compared to the negative features and have a strong motivation to bias their judgment to support their desired conclusion (Goldberg & Centers, 2012).

TABLE 1: CATEGORIES AND THEMES OF MORAL DISENGAGEMENT MECHANISMS

Categories	Definition including key themes
Moral justification	The use of moral explanatrions to justify harmful decisions and to challenge rational decisionmaking norms. Harmful decisions are regarded as serving worthy purposes and actors reward themselves for performance.
Euphemistic labelling	The use of sanitising and convoluted language to make harmful decisions personally and socially acceptable.
Advantageous comparison	Comparing or contrasting harmful decisions to actions that make them appear benign, of little consequence, or of lesser negative effect.
Displacement of responsibility	Absolving the individual or group of personal responsibility for harmful decisions by viewing it as being ordered by others, and by creating systems of deniability that keep actors intentionally uninformed.
Diffusion of responsibility	Absolving the individual of personal responsibility for harmful decisions by giving responsibility to the group and various facets of decisionmaking to sub-groups. In this way no one is held personally accountable for the harmful decision taken.
Disparaging, denigrating critics, and victims	Attributing disparaging qualities to other opponents and/or those who will suffer the consequences, accusing them of irresponsible or sinister motives.
Attribution of blame	Blaming the victims for bringing harm to themselves by their behaviour. Other circumstances such as external conditions are also blamed for harmful effects.
Minimising, denying, disputing or distorting consequences	Any evidence of harm is discredited.

Adapted from: White, Bandura & Bero, 2009

IN-DEPTH CASE STUDY APPROACH

This study adopts a qualitative case study approach because it has the advantage of enabling the examination of the rich social, political and economic influences on e-government decisions. The Gauteng ORT project requires scholarly analysis because it represents large-scale e-government initiatives that involve complex arrangements among civic participation, inter-governmental collaboration and public-private partnerships. Yin (2008) endorses a single case approach, explaining that it can often produce a more in-depth study and consequently greater insight.

The case study approach and the use of the selected theoretical framework allowed the researcher to make an informed analysis of the case. The intention was not to generalise the findings to a wide range of e-government decisions (Ruddin, 2006). Instead the goal was to perform an analytical generalisation – that is, to generalise a particular set of results to the study's theoretical propositions about moral disengagement. Four criteria were used to ensure the scientific rigour of this study (Guba & Lincoln, 1985): confirmability (use of standard coding protocol), credibility (minimising bias and improving the neutrality of the results by establishing a match between the different codes, by using content obtained from multiple sources, by employing an academic blind to this study to check the research design, all provided reasonable verification of the accuracy of the coding procedure, triangulation), transferability (assessing the degree of similarity of the viewpoints between the different decisionmakers, eg Finance Ministry and Transport Ministry) and dependability (reliability, accuracy and consistency of the data were achieved by resorting to public records, which reflect the candid view of the person) and by creating an audit trail of documents (Darke, Shanks & Broadbent, 1998).

DIRECTED CONTENT ANALYSIS

The study of ICT public sector moral transgressions in decision making is not easily examinable using conventional research approaches. Researchers tend to rely on scandals, the media, public enquiries, police investigations, whistleblowers and legal battles to get a momentary peek into the cloaked world of public managers and their involvement in morally dubious activities (Bandura,Caprara & Zsolnai, 2000). A number of documents and records supplied by SANRAL, the National Treasury and the Department of Transport to the High Court, now publicly available, provided insight into how decisionmakers justified their actions. Consequently, published secondary sources become a pivotal source of data for the researcher. Over 60 documents were analysed, including publicly available copies of affidavits, court transcripts, letters, internal memos, internal planning documents, correspondence, public statements, press releases and newspaper articles. Sources included public sector officials, executives, lawyers, public relations experts, contracted researchers and consultants. Public managers also used television and radio interviews as strategic tools in the social management of moral disengagement to present a different perspective from the opposing groups. Some of these transcripts were also examined for moral disengagement mechanisms.

DOCUMENT SELECTION APPROACH

Documents were coded for the pre-defined categories of moral disengagement described in Table 1. These coding modes of moral disengagement served as the guide for the coding procedure (Hsieh & Shannon, 2005; Bandura et al, 1996). It includes formal definitions of each of the mechanisms and exemples representing the different ways in which moral disengagement is manifested. The author independently coded the content and achieved consensus with an assistant researcher in the case of any discrepancies. Another academic blind to the purpose of the study coded 20 randomly chosen excerpts, assigning 18 of them to the same categories as the author, yielding a 90% level of agreement. Seventy examples of moral disengagement were observed in the documents and entered into a database. Examples were selected for each moral disengagement category based on the following: (1) the example is unambiguous as an indicator of moral disengagement; (2) it is representative of a number of statements in the dataset; (3) it reflects an important development in the response of public managers with regard to the impact of their decision. The most illustrative of these were included in this article. The sources of the 70 statements were categorised by the functional role of the personnel (examples: Minister, Director General, consultant, executive, lawyer, researcher or public relations expert). Version 5 of ATLAS.ti was used to code and store the categories and themes.

RESULTS AND DISCUSSION

All eight different moral disengagement mechanisms were evident in the Gauteng ORT case. The sections that follow document how each of the mechanisms of moral disengagement were enlisted by the actors.

MORAL JUSTIFICATION

Moral justification of the e-government project took the form of social, economic, legal and symbolic justifications (Bandura et al, 2000). These included promoting the importance of the road infrastructure to the national economy; the purported social benefits of e-tolling; protecting the integrity of the decision to use e-tolling compared with alternatives such as a fuel levy; the promotion of the free enterprise system and black economic empowerment; legal justification to protect the "intellectual property rights" of their private partners, and to symbolically project South Africa as being prepared to host the 2010 FIFA World Cup® soccer tournament. An economist for the public sector portrayed the decision to introduce e-tolling in a positive light (Sankaree & Botha, 2012): "I know what the value of my time is. SANRAL, as far as I am concerned, should get a medal for what they have done in terms of time saving". The e-tolling system was invested with further economic justifications. In a television interview (Sankaree & Ali, 2012), the CEO of SANRAL stated that: "The studies that everybody is doing aren't showing that … we have created about 10 000 jobs and what we have been contributing to the economy of Gauteng is over R14 billion in one year".The following excerpt from SANRAL's business plan (OUTA, 2012b:38) presented to the Minister of Transport in 2005 provides evidence that the soccer world cup was used as a reason to expedite the project at the expense of legal processes: "The environmental process will be a major stumbling block, if this project needs to be completed or partially completed for the FIFA 2010 Soccer World Cup®. If some of the sections are not completed by then, there will be severe traffic congestions by 2010".

ADVANTAGEOUS COMPARISONS

The legitimacy of decisions was coloured by what the e-tolling project was compared against. Decisionmakers used the contrast principle to make their decisions seem righteous (Cialdini, 1993). By using comparative exoneration they freed themselves of restraint over the morality of their investment decisions, by the following examples of statements (South African Government Online, 2011): "I must state that tolling remains one of the most viable means of funding transport infrastructure all over the world. Many countries – developing and developed – including China, the United Kingdom, the United States of America, use tolling to raise funds for the construction of much-needed transport infrastructure".

Although the Minister of Transport approved tolling on the basis that users would be required to pay between 28.5% and 36% of the capital cost of the project, opposition groups calculate that road users would actually be paying 162% of the capital costs in the form of toll collection. The resulting financial consequences of this decision to road users, taken over a 20-year period, would amount to a staggering R33.4 billion in toll collection costs (OUTA, 2012b: 76). The Minister of Finance denied that the tolling costs were disproportionate (South African Government Online, 2012):

> From what we've been informed the cost of collection would be about 20% once the initial phases have gone through to set up machinery and so on. And by international comparison in respect of these sorts of mechanisms that's fairly low. So we've satisfied ourselves that it is within acceptable limits if you like, in terms of international experience.

SANRAL's own research (Graduate School of Business, 2010: 36) conceded that: "paying for roads through taxes or a dedicated fuel levy is simply cheaper than imposing tolls on a road even if this is through an ORT system. The cost of collection is far lower because it does not incur the cost of the toll collection system".

EUPHEMISTIC LABELLING

Politicians and corporate leaders are aware that language shapes the citizenry's perceptions and thoughts about their actions. These actions take on quite a different meaning depending on terminology used. The analysis confirms that decisionmakers reduced their self-sanctions by presenting their activities in sanitised, convoluted and innocuous language. For example, the privatisation of once public roads was disguised as "e-roads" and citizens were rendered new as "e-road users" or "beneficiaries". The notion of "free roads" was viewed as a taboo; the use of roads was posed as a "benefit", not a right paid for by taxpayers. A SANRAL report stated that (SANRAL, 2012c: 182):

> The current 'free at the point of use' system comes at a very high economic cost. 'Free' roads breed congestion; 'free' roads slow up freight delivery, 'free' roads get people to work late; 'free' roads reduce economic growth, and they slow employment creation.

Banks and private investment firms are also turning once publicly owned road infrastructure into a "new asset class"; a "fixed-income proxy" which "delivers similar yield expectations to high-yield bonds and real estate, with less risk". e-Roads have become investments that are "safe like high-grade bonds" but with "stock market-like returns". After all, competition is limited and it is difficult to build a rival e-road. Citizens have become "captive customers" from whom "cash flows are guaranteed" (Thornton, 2007).

The new traffic police are to be called "peace officers" – an oxymoron (SANRAL, 2012a). Are toll highways meant to be managed like a conflict zone? SANRAL and government appear unclear about the enforcement procedures for non-payers and how the debt collection process is to be enforced by an already backlogged judicial system. SANRAL (2012a) is also seeking to legislate that "an employee in full or partial uniform" may "at any time enter any motor vehicle and inspect such vehicle and any electronic device installed therein for the purpose of toll collection". This proposal ignores both the Criminal Procedure Act and the Constitution of the Republic of South Africa that protects the right of every citizen not to have their person, home or property (which includes a motor vehicle) searched without a warrant.

Furthermore, the marketing of the project portrays technology in morally neutralising terms to persuade "e-road users" to get "e-tagged" at "e-toll customer service outlets", and transform themselves into a responsible "e-toll account holder" who accepts the concept of "road pricing" (SANRAL, 2012b). Citizens are being influenced by a combination of bullying tactics and psychological persuasion intended to create a desire to use the "new" e-road products. Ironically, the opposition's reference to "e-tags" as a modern "electronic dompas" is perhaps a more fitting description of reality – the paper dompas curtailed the movement of black citizens into so called white areas during the apartheid era (Justice Project South Africa, 2012a). So these words have negative connotations for most South Africans.

Public managers and their private sector partners resort to linguistic camouflage to increase their own willingness to engage in further dubious activities. These sanitising euphemisms are intended to neutralise public perception to the harmful realities of the decisions made.

DISPLACEMENT AND DIFFUSION OF RESPONSIBILITY

Decisionmakers spare themselves self-disapproving reactions by shifting responsibility to others or to situational circumstances. In this way, they absolve themselves of personal responsibility for the harm they are causing. For instance, e-government projects contain complex divisions of labour in which the subdivided decisionmaking activities can seem harmless in themselves. People can easily divert themselves from the morality of what they are doing to the operational details and efficiency of their specific tasks. In this case, public managers absolved themselves of personal responsibility for the harm caused by their decision by viewing their activities as ordered by others and by

creating systems of deniability that kept them intentionally uninformed. They shifted responsibility for their decisions to consultants, contracted researchers, and partnering organisations that served as their proxies in the decisionmaking process. For instance, one of the affidavits (SANRAL, 2012c: 135) read: "Two auditing firms namely Deloitte and PWC were appointed to review the SANRAL financial model. Deloitte reviewed the inputs to the SANRAL Cost Model and the overall results presented. PWC reviewed the formulae and outputs of SANRAL Cost Model, and the inputs, formulae and outputs of the SANRAL Revenue Model".

Furthermore, since this was a group decision, decisionmakers collectively reduced their personal accountability for the harm they produced. In addition, the very structure of the state bureaucratic machinery obscured personal accountability. These insulated structural arrangements provided public managers with protection from self-criticism and spared them loss of self-respect for authorising a morally dubious investment. For example, SANRAL held the National Treasury and the Department of Transport (DOT) responsible for not considering the use of the fuel fund to finance the development and maintenance of the roads (SANRAL, 2012c: 99):

> The reinstatement of a "dedicated fuel fund" is debated and demanded by many… .The draft RISFSA initially proposed that this funding mechanism be reintroduced however National Treasury was not in support of the proposal. The DOT has indicated that it will investigate this matter further with the intention of tabling it again at a later stage.So some of these public managers created schemes of deniability that left them blameless, as global effects in decisionmaking were seen as the cumulative products of local actions.

DISPARAGING, DENIGRATING CRITICS AND VICTIMS

Decisionmakers related to naysayers and opposing groups in impersonal ways. They grouped, divided, devalued, and dehumanised those not in favour of their decision. Opponents such as OUTA were disparaged for being scaremongers and destabilising the country's economy. Furthermore, SANRAL belittled OUTA's actions in a press release, referring to it as nothing more than a "fund-raising exercise" (SAPA, 2012b):

> SANRAL remains concerned about ongoing statements made in the media about various aspects of this matter, which appear to be designed to cast doubt on the process and litigate the matter rather in a court of public opinion, as part of an ongoing fund-raising exercise.

The strength of moral self-censure depends on how those who suffer the consequences of our actions are regarded. Those who are not part of the in-group are easily removed from moral considerations when they conflict with the in-group's interests.

As a result, moral self-sanctions are disengaged or blunted by depersonalising and stripping opposing groups of the right to be treated with respect. For instance, when faced with mounting public resistance SANRAL attempted to intimidate motorists by introducing a punitive rate – a rate that was almost 580% higher than the discounted rate – for those who did not purchase an e-tag (Justice Project South Africa, 2012c).To further intimidate motorists into complying, another public official suggested that those who do not register for e-tolling will not have their licence disc re-issued (Justice Project South Africa, 2012b):"… it would be considered in the same light as not paying your traffic fines, which was a cause for disallowing the renewal of a vehicle licence". The Minister of Transport was reported to have said: "If you don't like it, catch a taxi" (Justice Project South Africa, 2011). A protester stated: "This must send a message to government that they should not treat us like subjects but like human beings who brought them into office" (Sankaree & Mseleku, 2012).

DISREGARDING, MINIMISING AND DISPUTING

Public managers also avoided facing up to the harm they cause through their decisions by disregarding, minimising or disputing the naysayers. The public documents revealed that they provided contradictory evidence to challenge their opponents. They also attempted to trivialise the impact of their decisions, thus neutralising any moral concerns. Another common tactic used for neutralising moral concern was the derogating and discrediting of opposition groups as misguided crusaders. The following comment by the Minister of Finance attempted to minimise the harmful economic effects to frequent travellers using these urban routes, arguing that the opposition groups were putting out inflated numbers to the public (Bizcommunity.com, 2012): "… statistics derived from the gantries on the highway showed that people would not be paying more, on average, than R100 to R150 a month".

Some opposition groups (OUTA, 2012b; Justice Project South Africa, 2012c) argue that apart from negatively influencing the wallets of lower-income motorists, e-tolls will effectively redistribute a once public service by income class. Yet, according to Ngoepe (2012), a Treasury official argued that their study showed that the poor would not be affected in using the vital public facility because the poor used public transport. "We have done a study on the people who use the highway and we are certain that we are not touching the poor. People who use public transport are the poor".

Meanwhile OUTA's contentions of harm were viewed as "inaccurate and exaggerated", as having "no basis" and as being "misconceived" (Gordhan, 2012: 14). OUTA's estimates of e-tolling costs were also viewed as "simplistic and patently incorrect figures" (Ali, 2012: 6). Senior public officials dismissed the High Court's intervention in granting the interdict that tolling should not commence, arguing that the court was" overstepping the line", in "fundamental breach of the division of powers" and interfering in "a crucial aspect of government of policy in the form of the revenue procurement and allocation" (South African Government Online, 2012).

ATTRIBUTION OF BLAME

The e-tolling project was initially conceived to be delivered within a broader context of an integrated public transport system and improvements to non-toll alternative routes. The opposition groups argue that SANRAL and the Minister of Transport failed to consider their own social impact assessment, which assumes that an integrated transport plan and viable alternative routes exist before e-tolling may commence. Instead of SANRAL and the Minister answering these charges, they blamed people who are adversely affected for their position.

Adverse effects were ascribed to the personal choice of citizens for their "ineffective use of private transport" or the poor use of the beleaguered public transport system, or were displaced to other factors such as environmental concerns (SANRAL, 2012c: 130). A SANRAL report stated (SANRAL, 2012c: 77):

> This situation is caused by a combination of factors including the marginalisation and under-use of public transport within the province…the increasing use and reliance on private cars within a context of historically sub-optimal public transport systems and the spill-over effects of a failing rail system that has suffered years of under-investment and poor service quality.

The same document stated that "the private car and freight car users should be paying a greater portion of the real costs of using the road network" (SANRAL, 2012c: 87).

MORAL ENGAGEMENT

At times, some public managers expressed reservations or concerns about the project. A prominent trade union leader whose union played a leading role in the protests – despite making a significant profit from the road infrastructure portion of the project – framed the pricing of existing urban routes as a form of economic apartheid (Vavi, 2012):

> The logic of those that say that the poor do not use the motorways, except by public transport, is that they should be permanently excluded from access to the best roads. They must find the pot-holed side roads to get from point A to point B, while the rich glide along in their fancy cars on these highways. Tell me about economic apartheid, again.

The CEO of SANRAL acknowledged that "the economic benefits would have been even higher if they were to be funded in part or wholly from the National Treasury", because "tolling reduces user benefits by the cost of the tolling infrastructure" (OUTA, 2012b: 56).The previous Minister of Transport also expressed doubts about the benefits of e-tolling in response to a question on the scheme's efficiency raised in parliament (COSATU, 2012).

These individuals at times adhered to moral standards. However, they also succumbed to strong social pressures and consequently compromised their standards by allowing the project to continue, without taking reasonable steps to address their concerns about the public good.

CONCLUSION: WHERE TO FROM HERE?

The findings in this South African case demonstrate that role players in e-government initiatives sometimes resort to systematic and collective moral disengagement strategies to justify projects that are developmentally and economically dubious (White et al, 2009). The study contributes to previous research by confirming the analytical generalisation of the moral disengagement concept (Ruddin, 2006) to a specific e-government case. The results show that senior public managers morally exonerated their decision by: endowing it with socially worthy purposes; euphemistic labelling; displacing and diffusing responsibility; downplaying negative consequences; making favourable comparisons; and disparaging and blaming opposing groups. Given that these psychological devices were used for moral disengagement, additional safeguards are recommended to prevent dubious e-government investments. Researchers have often linked the success of e-government initiatives to strong leadership (OECD, 2003; Marche & McNiven, 2003). Strong ethical leaders are perhaps more cognisant of the developmental and economic consequences of e-government decisions. By adopting the safeguards proposed below, leaders can perhaps play a more important role in improving e-government decisionmaking.

HOW CAN E-GOVERNMENT LEADERS FACILITATE MORAL ENGAGEMENT?

The findings here re-emphasise the perspectives of previous research which advanced the role of leaders in reinforcing good governance (OECD, 2003). The empirical examination of moral disengagement provides an alternative theoretical path to advance the notion that leaders need to be transparent, they need to be accountable, and they also need to proactively prevent corrupt behaviour and promote honest behaviour (Beu & Buckley, 2004; Marche & McNiven, 2003).

This study has three major practical implications for leaders of e-government initiatives. The first major practical implication is concerned with the duty of leaders to promote moral engagement among subordinates. The evidence from the case corroborates prior research that found subordinates to be susceptible to moral disengagement as they displaced responsibility for their behaviour onto the leader (Beu & Buckley, 2004; Hinrichs, 2007). This study supports the notion that subordinates are particularly prone at holding leaders ultimately responsible for moral decisions. Table 2 presents guidelines that can be adopted by leaders to provide safeguards and promote moral engagement among subordinates:

TABLE 2: PROMOTING MORAL ENGAGEMENT AMONG SUBORDINATES

No	Guidelines
1	Create and nurture an environment where subordinates are not blind followers and are able to voice their ethical concerns in an appropriate manner.
2	Openly convey and reiterate that subordinates are jointly accountable for moral and ethical issues.
3	Put in place mechanisms to hold a person or group accountable for questionable actions. Also engage in open communication that promotes and rewards ethical behaviour.
4	Insist that the group considers different options during decisionmaking (option analysis) to avoid poorly motivated reasoning or well-motivated forgetting.
5	Be aware of personal, as well as group, egocentric tendencies.
6	Recognise that a moral problem or opportunity exists when making decisions and demonstrate sensitivity towards the welfare of others (especially absent others like citizens).

Even where these guidelines are adopted, the evidence from the case suggests that e-government leaders cannot rely completely on the in-group to make ethical decisions (Beu & Buckley, 2004). Effectively engaging with external stakeholders is another avenue by which leaders can reinforce good governance (Ochara, 2008) (see Table 3 below). Therefore the second major practical implication is concerned with the effective engagement of external stakeholders. The following guidelines are offered:

TABLE 3: ACTIVELY ENGAGE EXTERNAL STAKEHOLDERS

No	Guidelines
1	Be transparent about the details of the project to citizens and other interested stakeholders.
2	Engage and value the role of dissenting voices from civil society, business and academia. Pay attention to these stakeholders to minimise group-think.
3	Appoint independent researchers rather than rely on contract research and consulting firms alone to inform policy decisions. The latter are more likely to be supportive of in-group norms which may bias their findings. Independent researchers are more likely to offer a more objective judgement.
4	Depending on the moral intensity of the initiative, hire external trainers to raise awareness and teach ethical decisionmaking, based on case examples similar to the ethical dilemmas being faced.

The concept of moral disengagement is also useful in advancing an understanding as to why e-government initiatives can sometimes be viewed as an ethical scandal by the public and how these scandals can lead to reputational damage. The third major practical implication, therefore, is for leadership to focus on rebuilding the initiative's reputation (Sims, 2009). Failure to deal with reputational issues may lead to permanent distrust between government and citizens (Marche & McNiven, 2003), as well as lower staff commitment to the initiative (Peterson, 2004). Reputational damage may even dissuade citizens from using the e-government service. To rebuild reputation, the following guidelines are offered in Table 4:

TABLE 4: REBUILD REPUTATION

No	Guidelines
1	Repair unjust outcomes that led to the controversy by changing existing e-government systems, processes and policies.
2	Decouple parts of the initiative that morally transgressed from parts that still have their integrity intact and confront the individuals or groups responsible for the parts that transgressed.

HOW CAN CIVIL SOCIETY FACILITATE MORAL ENGAGEMENT WHEN REQUIRED?

The concept of moral disengagement advances our understanding of how leaders sometimes deal poorly with transgressions. Indeed, some leaders abuse their power to serve their self-interest, with little regard for the needs of the broader society (De Hoogh & Hartog, 2008; Beu & Buckley, 2004). Therefore, there will be times when civil society should organise counter-power to appropriately challenge leaders who do not deal effectively with transgressions (Castells, 2007).

For instance, one of the major issues that arise from the analysis of the Gauteng ORT case is that profit motives pertaining to the government pension fund and private interests were prioritised over democratic values, such as the principle of equality of access to public goods (Jurik, 2004; Rose-Ackerman, 2002; Rose-Ackerman, 1999). This was the case despite the risk of increased costs to users of the public road infrastructure. In this and other cases not studied here, powerful corporations have become the established engine for economic growth and employment, while public infrastructure appears to be reduced to little more than an opportunity for investment returns. Not surprisingly, there is potential for inappropriate relationships with private corporations and governments that tout narrow economic rationality over social responsibility (Marche & McNiven, 2003). From a policy reform perspective, civil society should ensure that safeguards are built into social systems and regulatory frameworks (see Table 5 below):

TABLE 5: THE ROLE OF CIVIL SOCIETY IN FACILITATING MORAL ENGAGEMENT IN E-GOVERNMENT INITIATIVES

No	Guidelines
1	Insisting on mandatorily high standards of disclosure from both private corporations and governments.
2	Insisting on regulating the role of the state and the private sector and their use of ICT. For instance, the state must not be allowed to collude with the private sector and multinationals to unfairly or unreasonably prevent citizens from accessing basic public services.
3	Insisting on a diversity of opinions by mandatorily involving a broad set of stakeholder representations in large scale e-government initiatives that have a significant impact on society.
4	Forming a cohesive organisation to challenge controversial e-government initiatives that defend morally dubious actions, by using initial consensus-seeking measures such as meetings, and conflict measures such as the use of regulatory mechanisms, by way of the courts to test the legitimacy of the project.
5	Mobilising society to challenge controversial e-government initiatives using social mechanisms such as the media, subtle forms of protest campaigns, more active forms from passive resistance, wider public demonstration and open civil disobedience.

In summary, the guidelines offered here for leaders and civil society suggest that current e-government discourse should not be led unevenly by economic rationalities at the expense of deeper intellectual debate over the role of leaders in reinforcing good governance and ensuring the active participation of civil society (Kupe & Okello, 2012). Deeper intellectual debate over the role of civil society in organising counter power to challenge unethical relationships between private corporations and governments is also needed (Castells, 2007). Lack of good governance and an overemphasis on economic rationalities can lead to collective moral transgressions by leaders, their subordinates and private corporations (Ochara, 2008). Although e-government intends to promote democracy, there is a need to be aware of the potential danger that actors responsible for these initiatives can sometimes infringe on democratic values such as participation, equity, fairness and social justice.

FUTURE RESEARCH

Further research is needed, including case studies that critically analyse e-government initiatives. More specifically, there is a need to understand the systemic influences that shape the form and level of moral engagement in these arrangements in order to improve decisionmaking and ultimately e-government success. For instance, future research could examine the extent to which moral engagement levels by leadership influence subordinate moral engagement levels; and whether e-government projects with complex governance arrangements (due to increased intergovernmental collaboration and public-private partnerships) are more susceptible to moral disengagement.

In conclusion, e-government research also needs to turn its attention to the prevention of moral transgressions and the improvement of future behaviours of e-government leaders, subordinates and private corporations. The insights provided by the concept of moral disengagement investigated in this paper will hopefully contribute towards improving existing governance frameworks for e-government initiatives – improvements that recognise the need to foster greater trust, closer engagement, responsible behaviour, effective decisionmaking and ultimately better service delivery to the citizen.

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SECTION III

BOOK REVIEW



MING, A., AWAN, O. & SOMANI, N. (EDS) (2013).

E-GOVERNANCE IN SMALL STATES,

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OVERVIEW OF THEMES DISCUSSED: E-GOVERNANCE AND SMALL STATES

With millions of people still remaining outside the net of sustainable development benefits, small states are searching for new governance paradigms to deliver development promises. How does one govern a small state efficiently by using new forms of technologies? Thirty-two of the Commonwealth's 54 member states are classified as small states, with populations of less than 1.5 million. This puts to the test ideas on the traditional governance of nations and forces their governments to look for alternative ways to fulfill socio-economic expectations.

The complex development challenges associated with governing small states include geographic isolation in small islands, population dispersion in small economies and human capital skills shortages. In the 21st century, we see the emergence of new approaches to dealing with these difficulties, noting experiences and strategies evident around the world for using ICT to improve governance and to create efficient and inclusive public service delivery. Furthermore, the deployment of ICT for "micro-governance" in "small developing states also improves the quality of institutions for service delivery, which in turn has been shown to improve political stability, raise the public debt threshold, decrease growth volatility and increase foreign aid and investment" (Ming, Awan & Somani, 2013, p. xi). Thus, e-governance, delivering public services and engaging with citizens via digital platforms may become imperative for small states who wish to foster greater social and economic accountability. The authors argue that, as governments are major economic stakeholders in most small states (Rwanda, Swaziland, other), the adoption and effective implementation of e-governance is likely to have a more significant impact on the economic and social development of small states than that seen in larger or developed countries. However, the access and use of ICT for governance is at a formative stage in small states, which face considerable challenges due to the high cost of technology, the absence of adequate electronic communications infrastructure, the absence of a sufficiently broad and sophisticated skills pool and a small private sector with limited investment capacity. According to the authors, 18 of the Commonwealths' 32 small member states are ranked in the bottom half of e-government indices.

The authors stress that e-governance tools must be integrated into wider good governance goals and e-governance strategy requires substantial political determination. Leaders must understand how to adapt e-governance projects to policy objectives, while chief information officers (CIOs) and their teams develop the underlying business processes, organisational structures and capacities, and robust data architecture needed to support constant adaptation. Hence the book provides insights to strengthen the understanding of policymakers, outlining the conditions and processes involved in planning and executing e-governance projects in small states.

The ultimate message of the book is that e-governance is a government transformation project, not a technology project. The various authors take into account wide development imperatives beyond the mere computerisation of government operations. The chapters consider elements of democracy and its ancillary service delivery components of good governance. When well implemented, the consequences of e-governance for beneficiaries can be revolutionary for the lives of citizens, especially in small states.

CHAPTER OVERVIEW

The book spells out the benefits of e-governance in six brief chapters, all of them well-argued by specialists, policymakers, government executives and renowned researchers of the Commonwealth. Case studies include a transparency portal in Brazil, a budget tracking tool in Kenya, community information centres in India, raising water pressure in Tanzania, Stop Stock-outs in Kenya and Uganda, the CU@SCHOOL in Uganda, e-governance in the Seychelles, ICT4GOV in the Democratic Republic of the Congo, and Ushahidi in Kenya.

The first chapter outlines a perspective on e-government and e-governance benefits, also explaining the design and implementation cycle and stages of maturity. Pillars for successful e-governance initiatives are a coherent national ICT strategy as an economic development priority, and the design and successful implementation of strategy. The second chapter considers the challenges experienced in common by small states, including geographic isolation of small

economies, high risk of natural disasters, income volatility, limited institutional capacity and absence of specialised and tested e-government practices. It suggests a framework and conditions essential for e-governance success in small states in the Commonwealth.

Thirdly, e-government strategy development process is analysed, noting the requirements for strong leadership; and championing sound financing, monitoring and evaluation practices. Only adaptable, reconfigured and efficient government processes can deliver value and accountability to society in small states. This discussion raises the fourth focus, on government process re-engineering (GPR), a methodology to analyse and redesign organisational processes. It observes that for e-governance and GPR to succeed as a process of change, the efforts must be accompanied by strategies for change management and communication.

Fifthly, effective implementation plans are required to integrate legislative, regulatory and policy mechanisms, ICT infrastructure, architecture and standards. Project cost remains a fundamental concern of the authors, as inappropriate costing and cost containment often leads to failure of e-governance projects. Finally, it is argued that e-governance will continue to evolve and new directions will emerge with particular relevance to small states. Specific attention is thus given to "m-governance" and cloud services.

CRITICAL ANALYSIS

It can be argued that, in the future, public sector institutions will battle to survive without an efficient e-governance system and its foundation e-government platforms. In less than 150 pages, the authors offer a practical and evidence-based framework to conceptualise, design, implement and operate e-governance in small states. They propose a number of critical success factors including a clear vision, political leadership, administrative leadership, consultation with stakeholders, financing e-government, e-governance monitoring and evaluation, and ICT capacity building. There is little here that is new.

More relevant is the discussion of the tension between traditional human governance and e-governance in small states. One questions why the need for e-governance in small states, especially in the Commonwealth. The answer is clear. Small states, because of the significant challenges they face to deliver services and manage the multiple constraints of sustainable economic development, need powerful instruments of government. In particular, e-governance can provide the platform to strengthen economic development, stronger, open, transparent and efficient democratic public institutions.

The debate about the appropriate tools and technologies to help strengthen government service delivery shortages is not new. What makes this book interesting is the discussion of the choice available among the basket of readily available technologies and practice, which can enhance innovation and limit the risk of failure.

Who is this book really for? The technical nature of the book limits the scope of its audience to specialists, technologists and policymakers. For this reason, it will appeal only to a narrow selection of readers. Certainly those who access it will find the content directly applicable to what they need to do to make e-governance a success. At the same time, one would have wanted the book to strike a chord with a wider audience outside the scope of technicians and government officials. Clearly the book is for a specialist audience, to the detriment of greater audience appeal.

The case studies attempt to convince the reader that e-governance in small states is worth addressing as an effective tool of government. But there is no clear evidence that this is so. It may serve only to raise the importance of the issue and sensitise policymakers, government officials and practitioners in small states that they too can use e-governance for development purposes.

In Africa, ours is a race against poverty, inequality, unemployment, lack of distributed knowledge and individual learning competencies, and slow democratisation of governance systems. Can e-governance help rethink and fast forward Africa, and its peoples? Perhaps. But the book does not address these issues.

What do I, as reviewer, really think about e-governance? There seems to be too much emphasis on technologies, rather than on the human element of e-governance and its specificity in small states. Even if technologies are the necessary backbone for e-governance systems, human competencies remain the final arbiter of their success. Furthermore, e-governance seems costly in terms of design, technicality, implementation and management. e-Governance solutions are often no better than traditional governance tools, since there is a tendency to replicate existing government models by putting the old governance instruments in electronic format or on the Internet. Government officials and citizens transfer their old behaviours online. Unfortunately, that perception is difficult to shed given the experiences in small states as discussed in the book. Finally, the adoption of e-governance systems should be evidence-based as suggested in this book. However, policymakers and practitioners should be careful not to overestimate the value of the evidence that may not apply to their specific context.

The book offers no overall conclusion and it misses a few important themes. It fails to make a worthwhile comparative analysis between the small states of the Commonwealth and the world leaders in e-governance. The confined focus on small states and the particular selection of case studies does not allow a comparative analysis of e-governance success. Very little is discussed about e-governance private public partnership projects, leaving the impression that e-governance is exclusively public sector focused. Public-private partnerships could be useful in small states given budgetary constraints in the public sector, even where the private sector is weak.

Another missing theme is a discussion of the economics of e-government and e-governance. Besides the idea of financial viability that superficially recognises the inability of small states to allocate resources to sustainable e-governance, the book has neglected an opportunity to address the complex issue of the economics of e-governance, relating to demand and supply of infrastructure and particular services, minimum funding levels and resources needed to design, implement and manage sustainable e-governance projects in small states. There is limited attention to the types of funding necessary to start an e-governance initiative or to the particular economies of scale that can be reached in small states.

Also missing from the book is a discussion of the link between e-governance and the learning-by-doing curve that is necessary to entrench an e-governance project from inception to completion and constant innovation. Building a learning component into any e-governance project should be a mandatory systemic approach to success.

Completely lost in the book is the issue of the profile of e-governance project managers and officers in small states. What types of skills and competencies do they require to manage e-governance systems efficiently and effectively? Furthermore, there is limited discussion about the role of local languages; rather there is an assumption that the English language is the default language for the Commonwealth small states. Finally, besides the generic list of success factors, the book omits to discuss the performance management of e-governance that includes systems to measure these success factors and the impacts of e-governance in small states.

Despite its weaknesses, this book is worth reading and using as a starting point for small states, given its summation of many of the basic requirements for e-governance.


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