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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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