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FRIEND OR FOE? LOCATING ICT WITHIN THE SOUTH AFRICAN GOVERNMENTAL DISCOURSE ON INDIGENOUS KNOWLEDGE SYSTEMS

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Abstract

The paper uses grounded theory to analyse the discourse on Indigenous Knowledge Systems within the South African government. Within this discourse, ICT is perceived both as a threat to African identity, through its potential facilitation of homogenisation and a potential ally, through its perceived potential to assist in the recording and dissemination of indigenous knowledge. The institutionalisation of IKS in South Africa has the potential to influence the balance of power between techno-centric and socio-centric approaches to local ICT research and development. In addition, it relocates the socio-techno divide from being a vertical division (between government and community) to a horizontal division, having impacts at all levels of society. In addition, the debate on IKS provides some indications of the nature of socio-centric approaches within the domain of the African identity, which may impact on understanding the potential ways in which ICT may be translated into this domain.

Keywords: Indigenous Knowledge Systems, ICT, African Renaissance, community, socio-techno divide.

1   INTRODUCTION

Indigenous Knowledge Systems (IKS) has received much recent attention as a possible escape route from the perceived impasse that has been reached in terms of many developmental initiatives (Briggs, 2005). Adoption of 'the language of IK' (Briggs & Sharp, 2004) by large institutions such as the World Bank (World Bank, 1998) serves as an example of the way in which world bodies involved in development are engaging with IKS. The discourse on IKS has therefore – understandably – become significant in Africa, with the many developmental challenges that face the continent. South Africa is considered in many ways a leading country in Africa. An example is its leadership role in the New partnership for Africa's development (NEPAD) initiative, which is considered an important African initiative. This country has recently taken significant strides towards institutionalising IKS, through policy (Department of Science and Technology, 2004) and through making it one of the priority focus areas of the South African National Research Foundation (National Research Foundation, 2006). Because of the prominent position of South Africa in Africa, the significance attached to IKS especially in South African governmental circles could be expected to have a significant impact on development not only in South Africa, but beyond its borders on the African continent.

Within the context of Information and Communications Technology (ICT), a significant portion of ICT research in Africa has a developmental focus and is closely linked to the governmental sector, which necessarily drives development efforts. A discourse, such as the one on IKS which has become prominent in government circles therefore has the potential to impact on the perceptions in government circles on the role and impact of ICT in African society and the IKS debate therefore becomes something that practitioners and researchers in the ICT context should take note of.

Because the IKS discourse could largely be understood to be socio-centric, an understanding of its implications does have the potential to shed some insights on the nature of the 'digital divide', or as Roode et al. (2004) more aptly names it, the 'socio-techno divide'. This paper therefore has implications for the ICT development agenda in Africa in that it demonstrates issues around the perceptions in indigenous discourse relating to the credentials of ICT and the potential that this may have on the acceptance and use of ICT, goals that could be achieved using IT and potential issues that ICT champions should consider when implementing ICT.

This paper examines the relationship between IKS and ICT through locating ICT within the discourse on IKS. The scope is limited for practical reasons to the high-level discourse in South African governmental circles; however, as previously stated, the influence of the South African government on Africa stretches significantly beyond the borders of South Africa, and it could be expected that the impact of the South African governmental views would therefore be more widespread.

It has to be made very clear that the research focused on interpretation of the socially constructed meanings of a particular group of people engaged in a specific debate. Everything reported on should be seen within this context. Nevertheless, we believe that the institutionalisation of IKS in South Africa implies that the entrenchment in law and policy of aspects of this socially constructed meaning may result in it impacting on events and actions within Africa.

The structure of the paper is as follows: Firstly, a grounded description of the main concepts in the discourse on IKS is presented. This grounded description was based on the analysis of various speeches made by South African government officials over a period of five years, as well as an analysis of the policy document of the South African government on IKS (Department of Science and Technology, 2004). Secondly, the perceptions on ICT within this discourse are highlighted. Thirdly complementarity between the grounded research that was conducted for this project and other published research on IKS as well as on ICT is highlighted. Then some potential implications for ICT research and development in Africa are highlighted and discussed. Finally, the conclusions that may be drawn from this research are summarised.

2   USE OF GROUNDED THEORY AS A METHOD

We have used grounded theory as a method to analyse the IKS landscape. There has been a significant number of previous studies in IS that used the principles and philosophy of Grounded Theory as their basis (Hughes and Jones, 2003). Especially within the domain of qualitative research, a grounded approach may yield valuable insights into complex social situations.

Our consideration in using this approach was to attempt not to impose preconceptions on defining the entities and relationships that would constitute a framework of understanding the discourse in IKS. We selected the approach by Corbin and Strauss (1998). Although we are aware of the debate within the grounded domain on the merits of the approach of Corbin and Strauss vs. the approach propagated by Glaser (Kendall, 1999) we believe that for a general understanding of the landscape, the Corbin and Strauss approach is adequate.

The purpose of this section is not to provide a detailed description of the methods of Grounded Theory. The Corbin and Strauss (op. cit.) version of grounded theory used for this project is briefly described in the following paragraphs.

The method is based on a number of assumptions. These are (1) the close interaction between researcher and data, i.e. researchers make use of own experience and context to make sense of the data; (2) findings are temporally and spatially limited; (3) research using grounded methods tends to be collaborative and discursive in nature, with researchers being in continuous interaction with others in the development of ideas through constructive criticism and discourse.

The coding procedures in grounded theory have as their focus the building (rather than analysis) of theory. The process of doing research using grounded theory method is summarized below in terms of open coding, axial coding and selective coding (note that the process is not rigidly structured and allows researchers freedom of backward and forward movement between the different aspects of analysis):

2.1   Open coding

Open coding entails a detailed examination of the data in order to determine as many as possible different meanings that the data could have in order to understand the meaning emerging from the data, rather than enforcing the researcher's own ideas onto the data; The data is questioned and compared in a systematic way in order to understand the meaning, processes and structural dimensions of reality as suggested by the data:

During the ordering process data is conceptualised ('labelled') and organized into categories depending on properties, dimensions and description.

We performed the open coding independently in order to identify as many as potential dimensions and meanings in the data.

2.2   Axial coding

During this part of analysis, categories and sub-categories are linked through consideration of properties and dimensions. During axial coding, the 'conditions, actions and interactions and consequences associated with a phenomenon' (Corbin & Strauss op. cit.) are identified and described. As noted by Brown and Roode (2004) the interrelationships are often neither simple nor unique with

multiple properties of multiple categories being potentially related in several different ways. For this project, the axial coding was performed collaboratively.

2.3   Selective coding

During this part of the process, the emerging theory is refined and integrated through discovery of the 'main theme' or 'core category' that relates to all other categories and could therefore be used to integrate all categories and concepts. The identification of the core category also allows for the refinement of the analysis in terms of consistency, logic and completeness. Obviously open, axial and selective coding processes do not take place linearly, but rather as an iterative hermeneutical effort.

3   ANALYSING THE DISCOURSE ON IKS

3.1   Selection of speeches that were analysed

The study could be considered to be exploratory. Therefore the research was deliberately limited to speeches from the official repository of SA government speeches by senior figures in the Department of Arts, Culture, Science and Technology (South African Government, 2007) that made more than a passing mention to IKS. These speeches presented by SA government officials cover the period 2001 to mid-2006. Although SA has eleven official languages, the speeches in the repository were all in English and no need for translation was therefore necessary. In addition, we included the official policy document released by government representing the official consensual view on IKS by the SA government (Department of Science and Technology, 2004). Obviously as noted by Roode et al. (2004) in their comments on the selection of speeches for analysis, there is an element of subjectivity involved in the selection of these speeches.

The purpose in selecting these speeches was to use addresses to a cross-section of audiences over a significant time period. The various speeches were therefore delivered to diverse audiences, ranging from South African government representatives and African peers to international bodies and diverse IKS holders and practitioners. These are shown in Table 1 below.

Although a detailed grounded analysis was made of the speeches and the IKS policy document, space restrictions imposed in terms of this paper mean that we only represent here main findings that relate to our discussion of the location of ICT within this discourse.

3.2   Results of analysis

The big picture that emerged from the analysis places at the heart of the discourse on IKS a desire and intention of affirmation of the African identity, with IKS being perceived as representative of African knowledge and thinking within the context of the African identity. Ten major themes emerged from the analysis. These were (1) African renaissance; (2) perceived threats; (3) IKS as systematic (scientific discipline); (4) Commodification; (5) Community; (6) Agency; (7) Institutionalisation; (8) Applications; (9) External support functions; (10) Partnerships and co-operation. The properties and dimensions of these categories are shown in tabular format in the appendix to this paper.

Speaker	Occasion	Audience	Comments
B Ngubane, Minister of Arts, Culture, Science and Technology (Ngubane, 2001)	2001 Annual General Meeting of the International Federation of Reproduction Rights Organisations	Representatives International Federation of Reproduction Rights Organisations	Speech selected as an example of an RSA government representative speaking to an international audience on IKS
BP Sonjica, Deputy Minister of Arts, Culture, Science and Technology (Sonjica, 2003)	2003 Science and Education Training Week Gala Dinner; Mafikeng, South Africa	Mainly dignitaries from the North-West Province, South Africa	This speech was selected as an example of the discourse on IKS to an 'internal' South African governmental audience
B Ngubane, Minister of Arts, Culture, Science and Technology (Ngubane, 2003)	2003 Signing of a benefit sharing agreement between the CSIR and the San people	San Council CSIR WIMSA	Speech to a combined audience of indigenous and scientific communities
M Mangena, Minister of Science and Technology (Mangena, 2004)	2004 Dinner of the Southern African Developmental Conference (SADC) Workshop on Indigenous Knowledge	Representatives of SADC countries attending the SADC workshop.	This was selected as an example of the discourse on IKS amongst African nations
M Mangena Minister of Science and Technology (Mangena, 2006)	Opening speech for the 2006 TCI Conference on Indigenous Knowledge Systems	Experts, scientists, holders and practitioners of IKS discipline.	A recent speech to a varied audience of IKS stakeholders.

Table 1.   Selection of speeches that were analysed.

The way in which these fit together is as follows:

The 'Western' or 'International' (as it is called in this discourse) drive towards globalisation, based on economic rationalities as well as the local (South African) history of oppression of indigenous people are **perceived as threats** to the African identity, which is considered to be localized and non-homogeneous. In reaction against these perceived threats, African leaders are pushing through efforts at institutionalisation of an **African renaissance**, which will promote African emancipation, unity and heritage. IKS is seen as the intellectual driver of the African renaissance, representing both African knowledge and African ways of thinking. IKS is human-centred and arises from **communities** rather than individuals, where its roots are located in the lives, beliefs and folklore of the indigenous people. Through the **agency** of IKS human benefits will be derived such as creativity; self-discovery and emancipation; it will result in locally relevant action; create a sense of community; redress imbalanced legacies; and improve lives, dignity and equality; it will result in the promotion of rights and appreciation of the worth of indigenous communities'; IKS promotes equality. As a result of the expected success of the African renaissance, IKS, in taking its rightful position in the world, will result in three benefits: (1) **commodification** of IKS, which will entail economic benefits to IKS holders (which are perceived to be mainly the unemployed, women, black people and communities) and recognition of their stewardship of IKS; (2) recognition of **IKS as scientifically valid discipline** in terms of its epistemology and ontology, and this discipline taking its rightful place in science and technology education, thus granting the knowledge grounded in the African tradition scientific validity and status; (3) **partnerships and co-operation** where IKS will add value to world debates; where IKS will be seen as being synergistic to 'Western knowledge systems' and where IKS holders and communities will benefit from relationships with private sector, industry and government. In order to realise these benefits from IKS, some **external (non-indigenous) support functions** need to be in

place in order to ensure that IKS is recorded, documented and disseminated. These functions may be technology supported.

4 LOCATING ICT WITHIN THE DISCOURSE ON IKS

4.1 Explicit location

ICT is seen as part of the threat posed by globalisation. As such, its credentials in terms of achieving aims such as redress, reduction of poverty etc. are suspect. All good things happening are expected to happen 'in reaction against' the threat of globalisation and therefore by implication partially in reaction against the influence of ICT. Yet, there is tension created through the recognition that ICT is required as intermediary to record IKS in order for its holders to benefit from their intellectual property within the (Western) economic domain, which seems like an opening for ICT to be seen as making a valid contribution to the preservation and affirmation of the African identity. ICT therefore serves as an intermediary to provide IKS with a basis within the Western economic domain.

4.2 Implicit potential locations of ICT Research and development

In the previous sub-section, the explicit location of ICT within the IKS discourse was described. However, there are some more implicit implications that are of importance for ICT research and development in Africa as well. These relate to the question: Can ICT 'cross the divide' and align itself with IKS in the perceptions of the people of Africa? Except for the intermediary role between the domains of IKS and Western economics discussed in the previous sub-section, some implied other potential ways in terms of the IK debate are seen to be through (1) ICT processes, products and artefacts embracing and representing African identity/values/ideas (2) uniquely African ICT systems (processes, techniques and technologies) being developed in Africa by Africans for Africans (3) ICT that derives from 'Western' sources being 'translated' when adapted for African use. (4) ICT becoming part of the indigenous research agenda through being researched by Africans in terms of African ontologies and epistemologies (5)ICT being applied in the fields primarily associated with IKS i.e. agriculture, medicine, folklore language; (6) focusing efforts on IKS holders, which would primarily constitute communities and community sub-groups, rather than individuals. The radical departure from ICT convention is the implication that, rather than translating the users' requirements to fit technology systems space, technology systems should be translated to fit into the users' space. In other words, where user's needs normally are validated through being translated into user requirements within the systems world, systems will now have to be validated through being translated into human-centred artefacts and processes rooted in the African culture and traditions. This translation may indeed imply a complete reconceptualisation of the nature of ICT.

5 COMPLEMENTARITY OF THE FINDINGS OF THIS STUDY WITH OTHER RESEARCH IN IKS

5.1 Research in IKS

One of the important dimensions of the IKS debate in literature is the mainstreaming of the marginalised (i.e. local disadvantaged communities and their knowledge) and the effective reduction of that which is considered mainstream (i.e. global economic powers and economic and scientific knowledge) to one of many options (Briggs and Sharp, 2005). This can be seen in the

institutionalisation of IKS in Africa, which mainstreams previously marginalised voices, while indeed the benefits of western technologies and economics seem to be perceived as a threat and as a result not considered by participants in the discourse to have particular benefits for Africa.

A caution by Briggs and Sharp relates to the level at which IKS manifests itself. This has been mainly at technical and artefactual level and not at higher conceptual levels, the argument being that the dominant power position of Western scientific thinking prevented these from emerging. Indeed examples cited within the SA governmental discourse on IKS are also on technical and artefactual level; although clearly an expectation exists that there will be new epistemologies, etc. It may be interesting to study the emergence of these higher order concepts associated with IKS within a context where the institutionalisation of IKS will presumably allow these to emerge.

A significant theme in IKS is 'resistance', with much of the literature situated in the context of post-colonialism. This mindset also emerges quite distinctly from the SA Government IKS discourse, with resistance being both to globalisation and the injustices that have formed part of South Africa's colonial and post-colonial history.

Briggs and Sharp (op. cit.) caution against 'unproblematic' views of IKS and indeed state that the concept of IKS has become 'highly problematic'. An important dimension to this is the connection between different knowledge systems. The discussion of problematic issues is largely absent from the SA government discourse, which is still largely optimistic and idealistic about the potential benefits of IKS, although there is a concession by Ngubane (2001) that one of the interesting dimensions of IKS is the creation of novel problems. Sorting out the practicalities associated with institutionalisation of IKS may indeed prove challenging, but may at the same time at least prove fruitful in terms of research and knowledge generation. The bigger problems may lie at a higher level, in avoiding the danger of relativism in judging knowledge generated in different knowledge systems, as well as the problem of compartmentalisation of knowledge (Briggs & Sharp, op. cit.). Some element of compartmentalisation may already be apparent in the call for protection of IKS knowledge and epistemologies (Mangena 2004, 2006), which may result in compartmentalisation of indigenous knowledge.

Venter (2004) confirms the basic philosophical tenet of community being placed before the individual in the African context. However, the concept of community is not without problems. Briggs & Sharp (op. cit.) highlights the problems related to defining a community. This problem is very real, given complexities such as difficulty in defining communal boundaries, the existence of communal sub-groups (such as traditional healers and women) and cross-generational Intellectual Property issues. The problem of defining community therefore has social, temporal and spatial dimensions and will not be easy to solve.

5.2 Research in ICT

The issues highlighted have some complementarity with findings in the existing body of research in ICT and IS.

Avgerou (2001) strongly argues for the recognition of alternative rationalities to western modernity in IS research and that these should not be summarily dismissed as 'irrational'. She also views the alternative rationalities as being historically and culturally situated. These views resonate with the focus within the IKS debate on rationalities linked to the African tradition and heritage and the view that these are in a separate domain from traditional Western knowledge. The institutionalisation of IKS in South Africa may result in a shift away from ICT and IS agenda's based on 'techno-economic rationality' (Avgerou, op. cit.) and result in a stronger focus on IS and ICT agendas based on viewpoints supporting alternative rationalities in terms of government funding and support.

Although the expectation exists that establishing IKS as a valid scientific discipline (with unique epistemologies and ontologies) and although the effect of 'alternative rationalities' can be detected as irrational moments in ISD in developing countries (Avgerou, op. cit.), the exact nature of these has not yet been described or deconstructed within the context of IS/ICT in Africa. In the light of criticism from within Western society of the scientific-economic rationalities by (amongst others) the various Marxist and post-modern movements (Avgerou, op. cit.) it may well be asked whether the expected 'new' epistemologies and rationality in African IKS will differ significantly from all existing ways of thinking and assumptions. More research into this topic is definitely needed.

In their collaborative research (Europe-Africa), Mursu et al. (2003) stress the importance of appropriateness of ISD methods that should address local needs and conditions and that should be focused on human needs. Although their theoretical point of departure still remains 'European', its rootedness in Russian social psychology implies a strong focus on the collective and collective activity. This could provide within the African context a view that is more community-centred, rather than focused on the individual and in this way could result in closer alignment of ISD practices with the African world view.

Roode et al. (2004) in discussing the digital divide, strongly advocate 'socio-centric' approaches to ICT development in which the focus is on the needs of people. They highlight the argument by Max-Neef et al. (1991) that these needs are not necessarily satisfied through economic goods, but may include host of other things such as 'social practices, subjective conditions, values and norms' (Max-Neef et al., op. cit.). This view obviously correlates strongly with the views emerging from the SA Government IKS discourse. Also apparent both in Max-Neef and the IKS discourse is the inherent dialectical nature of the relationship between needs satisfaction through non-economic goods vs. economic empowerment of the previously disadvantaged, which at least in the case of Africa belong to different domains.

Whereas Roode et al (op. cit.) conceptualise the socio-techno divide as 'manifest[ing] itself between the grass roots, community level and the higher governmental levels', the IKS discourse holds the potential to relocate the socio-techno divide. Through the institutionalisation of the indigenous (socio-centric) view at the highest levels in governmental and research bodies, this view is given a prominence that will make it hard to ignore. There obviously is potential for tensions being created between 'techno-centric' and 'socio-centric' worldviews not only across different levels of society, but also within the same levels. At the same time it should by implication become easier for human-centric community-focused ICT development and research projects to obtain funding and support from African governments.

6   DISCUSSION

Roode et al (2004) quotes Kvasny and Truex (2001) who in their analysis of the statements made by US government officials find the view dominating that 'technology is treated as this magical force that will erase centuries of discrimination and inequality'. From the analysis of the IKS discourse, it should be clear that for SA government participants in this discourse, IKS is seen as the magical force, rather than ICT, which through its alignment with Western scientific and economic rationality is seen as contributing to perpetuation of discrimination and inequality. Possibly both views are naïve, or at least limited in the extent to which they relate to the full complexity of reality. However, from a power perspective, the institutionalisation of IKS means that practitioners and researchers in Africa will have to take note of the more powerful lobby for human-centred approaches, with human centred in this case implying centredness on the African identity, customs and traditions.

Many of the implications sit uncomfortably within the ICT domain and therefore pose significant challenges in terms of ICT research and development in Africa. The most fundamental challenges are the challenge from within the discourse on IKS challenge of the validity of the fundamental

rationalities of science and economics and the validity to the African identity of the Western context within which ICT has its foundations. Addressing these potentially require a fundamental re-conceptualisation of ICT within the African context. Can ICT re-conceptualise itself and move away from being perceived in the minds of many on the African continent as being solely the offspring and the 'triumph of modernity' (Avgerou, 2001) and thus a threat to Africa well-being? Can ICT change its fundamentals, or at least be so protean in nature (i.e. being simultaneously global and local), that the African identity can relate to it positively?

Some questions need to be posed to the participants in the IKS debate as well. The main question may well be: When will the problematic nature of IKS surface in the African debate on IKS in order that its nature will be more critically assessed by participants in the IKS discourse? It should in this regard be noted that the benefits of IKS are not unanimously and unquestioningly accepted by all indigenous knowledge holders (Briggs, 2005); this dimension is largely absent from the current SA discourse on IKS.

Possibly the most interesting situation would entail not so much a constructivist position attempting to reconcile the African world view with Western scientific views, but a major paradigm shift on the fundamental nature of the relationship between the African identity and ICT. This could be interesting from a research and knowledge perspective – Kuhn's argument about paradigm shifts being the basis for knowledge creation (Kuhn, 1962) would seem to be applicable here – there may well be the possibility for significant new knowledge creation that could be unlocked as part of such a paradigm shift.

For ICT researchers and practitioners the discourse on IKS within the African context holds two further possibilities that may are important: Firstly the potential to understand more completely the meaning of human-centredness within the context of Africa and the African identity; secondly the potential to understand more completely the nature and structure of alternative rationalities that would form part of IKS and may impact on the success in the implementation of ICT projects.

7   CONCLUSIONS

7.1   Main conclusions

The South Africa governmental debate on IKS has as its focus the affirmation of the African knowledge and ways of knowing within the context of the African identity and traditions and to ensure its equal status to other knowledge systems and ways of knowing.

ICT is perceived to be part of the threat of globalization to the African identity, yet is also perceived to be useful in translating IK from the domain of the indigenous to the economic and other domains through recordal and knowledge management systems.

It is implied that in order for ICT to be perceived as being aligned with the African identity, the processes, systems and artifacts associated with ICT will have to either be translated into the indigenous domain (rather than the needs of the indigenous domain being translated into the domain of ICT) or these will have to be uniquely created within the African indigenous domain. These implications are potentially problematic for ICT, being primarily rooted in Western modernity, although interesting potential for knowledge generation exists in terms of possible paradigm shifts regarding the relationship between ICT and the African identity.

Studying the debate on IKS may offer some insights into the actual meaning of being 'socio-centric' in the African context, with concomitant advantages for socio-centric ICT development and research initiatives. The debate may also offer insights into alternative rationalities that are perceived to impact on ICT projects and ISD.

Institutionalization of IKS at the highest levels of government and research bodies in South Africa relocates the socio-techno divide and will impact on the power relationships between proponents of socio-centric approaches to (ICT) developments and proponents of techno-centric approaches. Whereas previously the divide was seen as mainly vertical between government and community, a horizontal divisionary effect could now be expected at all levels of society.

7.2   Lessons for Europe

The EU considers itself to be the largest donor of resources for development, including ICT-related development. Africa in particular is considered a priority, due to the widespread economic conditions of extreme poverty on the sub-continent. The EU recognizes that whereas until recently it was considered sufficient to focus on the provision of the technologies, the focus has to shift to the communities and recipients using these technologies. It recognizes that 'organisations introducing ICT will need to develop new work practices, culture and knowledge management systems' (European Union, 2005). We believe that better understanding by donors of the way in which ICT is located within the political and knowledge systems of those benefiting from these significant donations will contribute to the continued improvement of practices in donor agencies related to work, culture and knowledge, thus enabling improved effectiveness and efficiency in the application and use of EU funding.

7.3   Limitations and further research

The themes that emerged from this limited study indicate that they could be further and in more depth explored through inclusion of government speeches on NEPAD, the African renaissance and other topics related to the affirmation of the African identity and recognition of its value and place in a world of identities. In addition, the obvious political nature of the concept of IKS would suggest that a critical view of its use may further enhance understanding of the concept and its impacts, especially power related and emancipatory impacts.

In our (the researchers') focus on Health Information Systems, we would like to take the research further and examine the implications of IKS in the very sensitive and politicized area of ICT support for effective anti-retroviral treatment of patients at medical facilities, where IKS (and its close ally, traditional medicine) impact significantly on understanding between systems developers, users, medical practitioners and patients and therefore on all aspects of systems analysis, development and implementation.

In addition, the concept of IKS as 'alternative rationality' remains vague and undefined and more research is needed to investigate whether indeed IKS have epistemologically and ontologically unique qualities, or whether its existence is limited to the political and ideological domain.

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Appendix 1: Categories, properties and dimensions of major themes in the discourse on IKS in the South African government.

Major Category	Properties and [Dimensions]
African Renaissance	Grounded in IKS [None – fully grounded]; Promotion of African emancipation [oppressed – fully emancipated]; Unity [Disunity – united]; Identity[Globally homogenised – ubuntu]; African heritage [Forgotten – fully integrated]; Institutionalisation [Partial – full]
Perceived threats	Economic; Exploitation (Bio-piracy, lack of benefit sharing) [Exploited – equal partnerships]; Disparity (IKS against other economic sectors) [Disparate – equal]; Intellectual property [Non-recognition – recognised]; Globalisation; Homogenization (inter alia through ICT) [Communities, states, language, knowledge]; Local (South African) history; Marginalisation [Recognition, Transformation]
IKS as systematic (scientific) discipline	Domains; Complexity; Values; Richness Rationality; 'Cutting edge'; Scientific Part of Science and Technology education laboratories method [participatory, interdisciplinary] techniques and technologies Research agenda [Creation research problems] Uniqueness Epistemology [Creation, enrichment (existing)] African knowledge tradition Protection Research processes [Agenda, development new knowledge, role of institutions] Historical and cultural context [needs of people] Environment [Dynamic]
Commodification	Poverty eradication [Economic development, IKS holders, appropriate interventions]; Ownership; entities [unemployed persons, blacks, females, communities]; recognition [legal challenges]; Value [knowledge, products, resources, consulting, services, sustainability, innovation]; Starting businesses [small, practical, private sector]; Non-sharing [competitive advantage, no lower-income group incentive]
Community	Values [ubuntu, African culture]; Group types [cultural, religious, language, sub-groups, traditional leaders, women]; Locatedness [human-centred, indigenous people, people's lives, belief systems, identity, folklore.
Agency	Creativity; self-discovery and emancipation; action; creates sense of community; redresses imbalanced legacies; improves lives, dignity and equality; promotes rights; promotes appreciation of worth of indigenous communities'; promotes equality.
Institutionalisation	Promotion [Whole population, Community, Africa, World]; Development Legal Protection; Resources [Funding, trust, technical, infrastructure (centre)] Policy (on IKS)
Application	Diversity [agriculture, medicine, language' folklore, art]; Medicine[pharmaceutical, issues of use, uneven distribution Western medicine, accessibility, affordability,]
External support functions	Knowledge management documentation dissemination [local access, searches, retrievals] Technology support [Cross-linkages, adaptation]
Partnerships and co-operation	Western knowledge [synergy, separate, parallel, interface, integration,] World debates, Industry, Africa, Communities, IKS owners, Institutions and government