The integrity of the human person in an African context:
Perspectives from science and religion

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Information technology and the human person in an African context

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INTRODUCTION

Although information and communication technology (ICT) can currently be regarded as a vehicle of mainly Western civilisation and culture, Africans should not merely accept it as such, because that would imply subjugation to a new, technological-cultural colonialism. On the other hand, we cannot ignore the technology and try to completely go back to our traditional ways of doing things. Ways have to be found to create an African information society while protecting Africa from exchanging colonialism for 'tocracy', that is, government or oppression by information technology (IT).

After discussing the relationship between science and technology, we examine the interaction between technology and belief systems. This will be followed by a discussion of some philosophical aspects of technology and the concept of ubuntu, the African philosophy about humanity. In conclusion, a few suggestions are made about possible ways to build ubuntu values into IT.

RELATIONSHIP BETWEEN SCIENCE AND TECHNOLOGY

Although this conference provides a platform for the discussion of matters regarding the relationship between science and religion, our paper deals mainly with the relationship between technology and belief systems. We took the liberty to extend the religion theme to include other belief systems. It should also be made clear that science
and technology are not the same thing. Science represents human understanding of the universe, while technology pertains to the artefacts made by humans. Science deals primarily with man’s creation of knowledge; technology primarily deals with the application of this knowledge. Of course, this assumption also pertains to information and communication technology. If science and technology are differentiated in this way, it also implies that the relationship between science and religion will differ from the relationship between technology and religion (Goodenough 2000:5-6).

Yet, it cannot be denied that there is a close interplay between the forces of science and technology. Technology is usually built on the insights of science, and often leads to new questions and problems that can be investigated by science. Science, on the other hand, is often made possible or enhanced by the use of technology. According to Drees (2002:599), ‘modern technology is interwoven with science’. Therefore, although we focus here on the relationship between (information) technology and belief systems, it may sporadically be necessary to refer to science as well.

RELATIONSHIP BETWEEN TECHNOLOGY AND BELIEF SYSTEMS

At first, if one does not reflect on the issue, it may seem strange and even a bit silly to discuss the relationship between technology and belief systems. Technology seems to be a ‘hard’ issue and belief systems to be a ‘soft’ issue, two unrelated and separate phenomena. However, this is a very dangerous point of view, because it may sever the ties between technology and the humanities, which in turn could lead to a ‘technopoly’, that is, ‘the surrender of culture to technology’ (Postman 1993).

On the contrary, various authors have indicated that technology, including ICT, influences our belief systems, such as anthropology (our self-understanding), ontology, epistemology and theology. According to Drees (2002:598), ‘powerful technologies redefine ... human identity and meaning as well as ideas about reality and God’. In fact, it has to be stressed that technical systems also have a social side. This explains why the adoption of new technology often has economic and sociopolitical consequences that may not have been intended or even foreseen; for example, electronic communication and the World Wide Web enabled the multiplication of alternative religious, political and sexual communities (Ho et al 2002). Chowdhury (1998:20) stresses just how radical this influence of ICT is: ‘Modern information and communication facilities have drastically changed the way we talk, work, study, and in fact all the day-to-day activities that we perform.’ Drees (2002:597, 600) agrees that information technology affects people’s perceptions of what gives meaning to their life. He warns that the influence of technology is not only positive: ‘While consumption has become easier, some of the more demanding but meaningful and rich experiences have been lost.’

Let us therefore first look into the influence of technology on our anthropology and self-understanding. One example of man’s self-image is to be found in the Judeo-Christian religions: according to the Bible, man is made in God’s image. Through the ages, this idea was interpreted in various ways and ICT will probably again change our understanding of it. If it were to become possible to implant microchips in people’s brains, technological evolution would complement or replace biological evolution, and homo sapiens would become techno sapiens (Jackelén 2002:289, 296-299). This will have a serious effect on our self-identity as ‘image of God’. Could technical improvement replace the dogma of sanctification? Could immortality via personality preservation replace resurrection? According to Drees (2002:602), we have already started to think of ourselves as little machines: ‘We may consider ourselves as made in God’s image, but we speak of ourselves as if we were made in the image of machines’ – for example, we say that we are ‘under stress’ or ‘huge pressure’, we ‘let off steam’, and we ‘tune in’, etc. An example of using ICT metaphors to describe people and God is to compare forgiveness with the deletion of unwanted data on a hard disk.

Technology influences not only our self-image, but also our society. Technology had a huge influence on the emergence of the human species and its social structures. For example, the change from copper
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to iron caused a more democratic society, but also different labour classes; using coal for power generation caused large industrial cities (Drees 2002:600-601). ICT is not excluded from this effect on society. According to Soukup et al (2001:367), information and communication technologies influence many aspects of the cultures in which they are embedded, such as sociology, education, entertainment, business and politics. Welsch (2001), for example, discusses the ‘technocracy behind politics’ in the United States, indicating how the linking of information in various databases enables politicians to adapt their messages for specific communities. Because the Internet enables greater access to political information, it will affect the power relations between governments and citizens (Odendaal 2003). Goodenough (2000:7) even suggests that technology has become the American culture.

It is not only the culture of the First World that is heavily influenced by technology: according to Cinquegrani (2002) the countries in Eastern Europe moved in less than 15 years from a socialist economy through a market economy and technological economy to a learning economy. New communication technologies and the Internet caused a fast and wide transition from the market economy to the technological one, but the market, technological and learning economies still coexist in a complex mix. This complexity is further augmented by the fact that the Eastern-European societies have not had enough time to understand their present in order to be able to desire possible, alternative futures. In this regard, there may be a number of similarities between the situation in African and Eastern-European countries. In 50 years, Africa moved from colonialism into a complex mix of traditionally African, market, technological and learning societies.

Indeed, like Eastern Europe, African countries did not escape the huge influence of modern ICTs. According to Chowdry (1998:20), ‘the wave of developments in IT has reached Africa and people have embraced it’. One of the major shifts that are taking place in Africa (as in the rest of the world) is the transformation from traditionally closed systems to open systems. According to Anderson (1999), information and communication technology plays a major role in trans-

forming traditionally closed communities into open systems. In addition to real-life communities, virtual communities have been created in cyberspace. The main characteristics of these virtual communities are ‘disintermediation’ and ‘aggregation’: the middleman is eliminated, and people can interact directly with other like-minded individuals or groups. A person can simultaneously be a member of different communities, and this can lead to conflict between the various sets of values that are inherent to each of these communities.

Even the way we think about being (ontology) is influenced by technology. Goodenough (2000:7) says, ‘Our entire experience of existence has been technologized.’ To exist in cyberspace adds a whole new dimension to the essence of ‘being in the abstract’ (cf the definition of ‘ontology’ in The Concise Oxford Dictionary). According to Drees (2002:598-600), the aim of science (and technology) is not only aim to understand reality, but also to transform reality. If reality changes, our concept of the essence of being also changes. Advanced medicines, for example, have changed our sense of human vulnerability. Could the computerised exploration of space change our idea of the essence of life (if signs of other forms of life were found on Mars or other earth-like planets in deep space)?

Moving on, from ontology to epistemology, we should acknowledge that technology also changes the way people understand and know (Drees 2002:600-601). ‘A basic cultural practice such as writing affects how cultures frame knowledge and organize the world’ – the art of writing caused the phenomenon that concrete thought was replaced by analytical thought (Soukup et al 2001:366-367).

Donohue (2002/2003) discusses television as an example of a modern ICT that has changed the ‘epistemology of popular culture’. The new way of making sense, replacing critical thinking, is ‘a process of conceptualization based on generalizing from spontaneous impressions’. According to Soukup et al (2001:366), ‘(L)ogical patterns of analysis have given way to image, word, sound, and movement.’ This indicates that ‘We have shifted from left-brain exclusivity to a more equilibrated employment of the right-brain: using imagination, asso-
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...creation, creativity, art, and music'. Television also drags along other ICTs in its quest to change the way people understand. They create a superficial 'electronic imagination' that replaces reflection and the metanarrative that people use to make sense of the world.

Fantasizing within the confines of traditional narrative structures produces idealized pictures of the world we live in... In the electronic imagination, to fantasize is not to create a more pleasant version of one's life but to escape it altogether (Donohue 2002/2003:388, 397).

Having said that technology changes our anthropology, sociology, ontology and epistemology, it should come as no surprise that religion and theology are not exempt from this influence. It is obvious that ICT has an extrinsic effect on theology: it facilitates wider access to theological texts, the ability to easily search for and through these texts, and the idea of sharing versus privacy and separation (Soukup et al 2001:368).

Religious communities, as well, are affected: like other communities they are becoming more open (Anderson 1999). Geographical boundaries and explicit membership are fading, old doctrines are reinterpretated and leaders of different religions are working together to obtain common goals. Even ideas about what is acceptable behaviour or not are now transferred by the electronic media.

But ICT is also influencing religion and theology on a deeper level. According to Soukup et al (2001:368-377), the initial extrinsic effect of ICT on theology will eventually lead to 'a more powerful intrinsic change'. The intrinsic changes pertain to the context, resources, communicative methods and cognitive processes. This may have a serious effect on our concept of religious and theological authority. Tobie (1986:19) agrees that even our concept of God is changing. 'The human perception of God changes as human life changes. Today, computers are playing a central role in the contemporary evolution of the human view of God.'

Goodenough (2000:7) is even more negative about the relation between technology and religion, saying that the consumption of technological products has become a 'dominating force' in the American culture, to such an extent that it can be regarded as a religious doctrine. Technology has become a god; the use of technology has become religion. But, maybe, this is pushing it a bit too far. Computers do not necessarily diminish our experience of God, but also provide new perspectives and ways to think about God, and may even increase our appreciation of 'the intelligence behind creation' (Tobie 1986:19).

There is also another perspective on the relationship between technology and religion. Our belief systems also influence technology and its use. Our ideas about people and humanity often direct the development of technology. In Artificial Intelligence (AI), for example, we wish to simulate what we believe is the essence of human intelligence: 'cognition, perception, action, learning, creativity, and emo-
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phenomenon that influences attitudes towards IT. Referring to Africa, Chowdury (1998:11), says 'the paucity of software written in local language hinders adoption of information technologies'.

Also religion, the deepest belief system, influences the creation and adoption of new technologies. Religion has not only a reflective function, 'but often also an evocative function and a transformative interest' (Drees 2002:599). Ethical values influence the development and use of technologies. According to Goodenough (2000:5, 9, 12), technological ethics should be inspired by religious and artistic sensibilities (the 'muse') and controlled by scientific understanding (the 'linchpin'). Whereas science represents an 'empirical truth' and religion 'revealed truth', technological ethic represents a 'consensual truth'. The ethical soundness and acceptability of technological developments should be judged through 'a dialogue between many persons who bring diverse cultural and religious and scientific and philosophical and political sensibilities to the table'.

TECHNOLOGY: ULTIMATE LIBERATOR OR ULTIMATE OPPRESSOR?

Above, we indicated that there is a reciprocal influence between technology and human belief systems. In this section, we focus on some philosophical aspects regarding technology before moving on to the concept of humanity in Africa.

According to Drees (2002:599-600), there are various dimensions of technology, namely

- material dimension: devices and infrastructure
- sociological dimension: organisation (actions, services) and skills (education)
- psychological dimension: attitudes (active-technological or fatalistic)
- cultural dimension: the technological culture is influenced by technological developments, for example, human relations and customs
The social philosophy of technology focuses on technology as culture and studies the 'interactions between technological developments and wider culture' (Drees 2002:602). It is a humanities philosophy versus an 'engineering philosophy of technology' that studies technology as design.

Technology can be regarded as a liberator (positive), threat (negative) or instrument of power (neutral) (Drees 2002:602-603). Obijiofor (1998:454) asks the question, 'Will the new information and communication technologies launch Africa on the path of socioeconomic development or will they subject Africa to further dependence, a new form of Western imperialism?' Or could the idea of technology as an instrument, which can be manipulated, act as a golden mean between extreme optimism and extreme pessimism? These three views of technology will be discussed below, with specific reference to ICT.

Information technology seen as the ultimate liberator

The perspective of authors who see technology as the ultimate liberator has been described as 'technological optimism', or the idea of a 'technological utopia'. This view regards technology as something that improves people's circumstances and can solve its own problems. 'Cyber-utopians believe that the Internet ..., can subvert hierarchy, promote and revitalize democracy, reduce racial and national conflict, and lead to planetary interconnectivity, unity, and holism' (Goldsborough 2003; Drees 2002:602-603).

It is believed that modern ICT can be used to overcome many of Africa's problems. 'Although there are many problems, there is a realization that improved information and communication facilities are the keys to overcoming many of the acute problems from which African countries have been suffering' (Chowdury 1998:20). According to the African Information Society Initiative (AISI) 'Information and knowledge, disseminated throughout Africa, would give rise to free markets and would ensure freedom of speech and freedom of cultural and religious expression' (Chowdury 1998:20).

Nassimbeni (1996) refers to the role of ICT to complement the liberation process in the new South Africa: 'The right to vote did not automatically confer freedom from poverty, unemployment and deprivation'. It is believed that a good ICT infrastructure will promote participation in government and enhance effective and transparent government, and will even stimulate economic growth. The leader of a project that makes all documents used in drafting the new constitution available on the Internet hopes 'that the project will be the start of a revolution that will ensure that democracy is spread to every citizen in the country'.

However, others warn against such unbridled optimism. 'It is wrong to perceive the new communication technologies as the magic solution to Africa's problems' (Obijiofor 1998:461). Right on the other side of the scale are those who see technology as the ultimate oppressor.

Information technology seen as the ultimate oppressor

The view of technology as the ultimate oppressor has been called 'technological dystopia', and its supporters 'neo-Luddites'. According to this view, 'technology promotes uniformity and efficiency, undermines social networks, and increases possibilities for tracing and manipulating individual behavior'. Neo-Luddites are people who 'see computers and the Internet as conflicting with matters of the spirit' (Goldsborough 2003; Drees 2002:602-603).

Although Postman (1997, 2001) acknowledges the positive side and the benefits of technology, he wishes to put technological optimism into perspective. He believes that technology that is not restrained by either science or religion becomes a god that enslaves people, making an empty promise of providing meaning to the 'information glut' brought on by advances in communication. Technology has become America's deity, its 'ultimate concern'. the American culture organises itself to accommodate the requirements of technology. It serves and obeys the will of technology, it believes that 'technological innovation is synonymous with human progress', and that it 'offers the
best solution to our most profound human problems'. The 'great god of technology', the offspring of the science-god, offers heaven on earth, but it demands absolute devotion - it is monotheistic and sovereign; yet 'the covenant we made with technology is each day being shredded' because it 'gives no profound answers in the bargain'. Postman calls this situation a 'technopoly', and pleads that we return to retell the two great metanarratives of science and religion to help us to make sense of the universe.

Such a view of technology can also be called technocracy - however, not in the sense of 'government by an elite of technical experts' (The Concise Oxford dictionary (1991)), but in the sense of 'the government or control of society or industry by technology' (Oxford American dictionary of current English (1999) via Oxford Reference Online Core (2003)). IT or ICT specifically referred to in this way, may be called itocracy or ictocracy. The word itocracy already exists as the name of a business (cf the Google search engine), but in the Oxford Reference Online it is not recognised as a noun. We use the word itocracy to avoid confusion with the Greek word ichthus, which literally means 'fish', 'an early emblem of Christianity' (Oxford Reference Online) - ichthus is also an abbreviation for Iesus Christos Theou Iou Soter, 'Jesus Christ Son of God Saviour'.

Itocracy (the control of society by information technology) goes hand in hand with globalisation. Globalisation is sometimes viewed as a 'new and insidious form of economic and cultural domination' or 'postmodern colonialism'. While information technology can be regarded as a product of modernity, its result, the 'information society', is typical of the postmodern era (Lenta 2001:178-179):

Postmodernity is identified with mass forms of communication and the commodification of intellectual products and symbolic forms ... Postmodernity reflects a lack of collective participation by individuals except as consumers, and the effacing of substance by surface, fragmentation, and diffusion.

Itocracy will force us to adopt to the needs and wishes of ICT, for example, adjusting laws and regulations to be 'more consistent with the direction of global technological innovation' (Odendaal 2003).

Information technology seen as a neutral instrument

A more balanced view is to regard technology as an instrument that is constructed and used by humans 'in a way that is dependent on the human context'. Technology is not regarded as a force in itself, and the responsibility stays with people. This view is called 'technorealism', which is defined as 'thinking critically and realistically about the role information technology plays in history and society' (Goldborough 2003; Drees 2002:602-603).

One example of such a neutral view is that of Goldborough (2003:41, 44): he says that computers and the Internet can be 'both aids and impediments to those who are looking for spiritual sustenance'. On the positive side, IT can be used to facilitate the study of religious texts or as an electronic platform for religious information and spiritual discussion and growth. Sites are available that cater for Jews, Christians, Muslims, agnostics and atheists. Africans could also use the Web to cater for traditional African religions or for the African versions of other world religions. In fact, a number of such sites are already available, for example, http://www.angelfire.com/realm/blackcatholics; http://www.seekgod.ca/bantu.htm; http://www.mahmoodiyah.org.za; http://www.unitarian.co.za; http://www.sacredtexts.com/afr; and http://islamonline.net/English/artculture/2003/06/article08.shtml. However, no dedicated sites catering specifically for ancestor-worship, or even for the ZCC, a large independent African church, could be found.

Lenta (2001:178) agrees that 'the machinations of globalisation are ethically ambivalent'. He quotes Wolch (in the Net, 1999):

The Internet serves as an example of the ethical ambivalence of the technology and culture of postmodernity: it
offers possibilities for lobbying, learning, participating in the struggles of others and permitting timely and effective communication. On the other hand, the spread of 'computer mediated communication' in developing countries such as South Africa produces an insidious English language corporate 'MacCulture'. The Internet's commercialism will continue to exist in dynamic tension with its pioneering role in supporting freedoms.

Postman (2001:28) pleads for 'technological atheism': we should not assign absolute autonomy or dominion to technology, neither should we believe that technological progress cannot be reversed. In compliance with this wish, we now discuss humanity in Africa and propose that the concept of 'ubuntu' should be used to prevent an incipient in Africa, because, with Lenta (2001:180), we believe that ubuntu 'would seem to provide a source of values to counter the aggressive individualism of neo-liberal capitalism which characterises globalisation'.

THE AFRICAN HUMAN PERSON: RELIGIOUS OTHERS AND THE SOCIAL DIMENSIONS OF IT THROUGH THE CONCEPT OF 'UBUNTU'

Having introduced our hypothesis, discussed the relation between science and technology and also the philosophy of technology, we now focus on the African human person. We do this in order to critically assess the extent to which the religious and social dimensions could serve as bases for the enhancement of the integrity and well-being of the African person in his/her encounter with information technology. We consider the concept of 'ubuntu' (Mbigi & Maree 1995; Broodryk 1997; Louw 1997) a potentially useful unifying concept within the African context. Central to our discussion in this section is therefore ubuntu and how it is helpful in characterising the African person, while at the same time serving as a link between the religious and the social dimensions of information technology.

The title of our paper begs a response to the following question: What does/should information technology mean to an African person? We respond to this question by showing and discussing a relationship between six sub-topics, namely

- the African human person and the concept of 'ubuntu'
- the African human person, religion and ubuntu
- the religious dimensions of information technology through the ubuntu lens
- the social dimensions of information technology through the ubuntu lens
- the due-process model in introducing IT into a group or community
- a description of an attempt at building ubuntu into information technology

The African human person and the concept of 'ubuntu'

In his Sapiens controversy, Van Driemelen (2003) quotes Tobias as having said that humanity was a gift from Africa to the world, indicating further that DNA studies are in agreement and that Tattersall reviewed the evidence of the origin of mankind in Africa. In this paper it is not our intention to take these controversies any further than providing the relevant sources. We mention them here as a salutation of the fact that Africa is not short of a rich heritage. The concept of 'ubuntu' provides an example of this. African and other scholars describe the concept in various ways.

Mbigi and Maree (1995) explain 'ubuntu' as a figure of speech that describes the importance of group solidarity on issues that were pivotal to the survival of the African communities, who, because of poverty and deprivation, have to survive through group care, and cannot rely on individual endeavour alone.

'Ubuntu' is a Zulu word meaning being humane. It has the same meaning as a Pedi word 'botho', and serves as the spiritual foundation of African societies (cf Louw 1997; Lwane 1990). It is a unifying world-view enshrined in the Zulu maxim umuntu ngumuntu ngabantu, or the Pedi maxim motha ke motha ka botho, that is, 'a
person is a person through other persons'. The maxim articulates a traditional African emphasis on respect and compassion for others. It can be interpreted as both a factual description and a rule of conduct or social ethic. It both describes human being as 'being-with-others' and prescribes what 'being-with-others', should be all about (cf Louw 1997; Liwane 1990).

Liwane (1990) points out that ubuntu plays a significant role in African value systems, since it derives from the African mores: 'I am human, because you are human'. I am, because you are. African people are collectively united through their religious experience. Issues of strategy and ideas should try to make reference to the African religious and cultural experiences (Liwane 1990).

While Liwane (1990) and Mbigi and Maree (1995) are in agreement that not all principles underlying ubuntu, such as collective unity, caring, sharing, compassion, warmth, humanness, etc., are new or exclusively African, it is suggested that ubuntu serves as a distinctly African rationale for these ways of relating to others (Louw 1997).

Although various authors point to more virtues in ubuntu, there are some unresolved issues and questions as well. For example, Liwane (1990) enquires about a possible missing link and dimension of ubuntu in postindependence Africa. He identifies the link as that of 'citizenship' – the ability to live for one's country, the ability to take personal accountability and responsibility for improving one's situation. It is our view that this missing link perhaps is the most crucial one in terms of the empowerment of the African person. It could be the very link that resonates with colonial undertones and dependency, leading to all kinds of labels that serve to undermine the integrity of the African person. Strauss (1992) disagrees, and calls an enduring myth that Africans lack the ability or the will to improve their lot themselves. He argues that the continent teems with intellect, skill and eagerness – but that most are blocked by either tyrants from above or pagan jealousy from below – and their frustration is yet another African tragedy.

The African human person, religion and ubuntu

Louw (1997) points out that the concept of 'ubuntu' adds a distinctly African flavour and momentum to what he calls a 'decolonized assessment of the religious other', whose fundamental presupposition is a respect for the other as a religious other. He also points out that while Western humanism tends to underestimate, or even deny, the importance of religious beliefs, ubuntu, or African humanism, is resiliently religious. For the Westerner, the maxim 'a person is a person through other persons' has no obvious religious meaning, while in ubuntu, there is an inextricable bond between man, ancestors and the Supreme Being. Ubuntu therefore implies a deep respect and regard for religious beliefs and practices.

The religious dimensions of information technology through the ubuntu lens

Archbishop Desmond Tutu built a theology around the concept of ubuntu. Through the lens of ubuntu, we can see a way to 'do life' in such a way that God is glorified in and through our very humanness. Human existence is inextricably bound up with God's creation, and a solitary human being is a contradiction in terms. In his recent inaugural address of the Beyers Naude's lecture series at the University of Pretoria (15 Aug 2003), Archbishop Tutu said, '...the Scriptures say that if you want to see God, then look in the eyes of your sister or brother'. This is difficult to understand for a North American Christian, who has been 'socialized into' and through a world-view where personhood centers on the lone individual whose essential characteristic is that of self-determination (Greater Milwaukee Synod 2003). Faith is often tied to this reverence for individuality. The existence of human and religion cannot be separated (Miyake 2002). So, it is not an exaggeration to say that 'religion is the earliest information business'. Religious passion (fear of the supernatural, dedicating things to the dead) is what distinguishes human beings from other animals. Protestant theology (Martin Luther's Reformation) was made possible through print media. Without the invention of the printing press by Johannes Gutenberg, most people would not have had a Bible, the
phenomenon that enabled Luther’s protestant theology in 1517. The spread of television led to televangelism, and the Internet enabled marginalised religious groups to be heard (Miyake 2002).

The social dimensions of information technology through the ubuntu lens

The African human person can therefore be characterised by ubuntu, which, as we have just seen, cannot be separated from religious beliefs and practices. Ubuntu is therefore a social practice through which the African person could be better understood. This could assist one to better understand the ‘human environment’ (Du Plooy 1998) within which information technology can be introduced in support of the person, her humanness and her humanity. We know this to be a difficult area for people to understand, not only by those outside the Information Systems field, but also by those within. Du Plooy describes the human environment for the adoption and use of information technology as determined by the social forces in the environment within which information technology is used. He emphasises that information-technology adoption and use has to be created in an organisational context arising from the interaction between information technology and its human environment. According to Du Plooy (1998), the notion of a human environment integrates six characteristics into a single whole:

![The Human Environment Model](image)

The human environment of information-technology adoption and use (Roode 2003, adapted from Du Plooy, 1998)

Although each side of the cube expresses a different dimension of the social context of information-technology adoption and use, these dimensions cannot be isolated and considered on their own (Du Plooy 1998:241). They are bound together by their social contexts. If ubuntu is assumed to permeate the various social contexts, then nurturing this human environment would imply the nurturing of ubuntu, resulting in a meaningful information technology for the African person.

The due-process model in introducing IT into a group or community

Roode (2003) uses the notion of a ‘due process’ from Latour’s (1987) actor-network theory to discuss how the introduction of IT into a group or community could be described. He explains that in planning for the introduction of new ICT into a group or community, a due process may be followed with the intention of achieving a successful outcome – a black-boxed and irreversible technology. He points out that this would entail that we consider the existing collective of actants and the
existing (stable) network in the group or community and introduce a new candidate actant, the information technology, to the network. This causes a degree of `perplexity': What is it? How do we use it? How does it affect me? Who and what else are affected? Then follows a consultation or debate process concerning the legitimacy of the candidacy of the new IT by the other actants, after which the relative importance of the new IT in the hierarchy of things in the network must be established. Only then may the candidate (the new IT) become accepted through `institutionalisation'. If this due process is circumvented, by jumping from perplexity to institutionalisation, an unstable network that is liable to disintegration may emerge. The due process described above can be presented as follows:

**Figure 2**

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New ICT
Perplexity → Consultation

Institutionalisation
Hierarchy
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Due-process model
(Roode, 2003, adapted from Latour, 1987)

A description of an attempt at building ubuntu into information technology

It is widely acknowledged in the information-systems literature that computer systems reflect the societal interests and values of their Western developers (Walsham 1998). They could therefore not be expected to be effortlessly at harmony with the concept of `ubuntu'. Alternative ways of introducing these technologies into African societies, over and above the well-known technology-acceptance models, are needed. These alternatives should enhance, but could also be enhanced by, the concept of `ubuntu'.

At the risk of oversimplification, we present, in figure 3, a schematic description of our attempt at building ubuntu into IT, and vice versa, in line with both the human-environment model (Du Plooy 1998) and the due-process model (Roode 2003), the figure is descriptive, rather than normative.

**Figure 3**

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Ubuntu

The African human person

Building IT into ubuntu through a due process model

Building ubuntu into IT through the nurturing of the human environment
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A simplified model of information technology and the human person in an African context

A brief description of the figure could be as follows: The African human person represents any human being seen from an African point of view. Such a person derives his/her context from ubuntu. The model suggests that in order to build IT into ubuntu (the context that is already understood by the African person), the due-process model could be followed. The result would be a better understanding of the context that informs the African person and his/her human environment, which could in turn be incorporated into both the use and design of new information technologies.
In the spirit of both the due-process model and the human environment model, the model we propose is not normative, but descriptive. It describes one way in which information technology could be made more sensible and helpful to an African human person.

CONCLUSION: THE ICT ROAD AHEAD FOR AFRICA

Now that we have identified the building of ubuntu into IT as a way to prevent an itocracy in Africa, we may suggest a few practical ways in which this can be done. If we accept the assumptions that ICT is at present a carrier of mainly Western values and that Africa cannot completely go back to an ICT-less situation, the solution is to accept that a process of acculturation should take place, in which we embrace the new technology, but use it to enrich the information society by promoting African values and extending the content of the Web with bilingual sites in English and African languages. Websites in indigenous languages will stimulate Internet use in Africa, while the English versions will carry the African culture to the rest of the world. Such an approach could shield Africa from passing from colonialism over into an itocracy.

If it is true that ubuntu is ‘a virtual form of community’ (Lenta 2001:180) the concept of virtual communities in cyberspace should be quite acceptable to Africans, and can be used to heal the fragmentation of people on the African continent. People that were separated by artificial borders or by commuting long distances for work can come together on the Internet.

A third example is to build some of the African cultural aspects into software. Modern ICTs should be used to ‘promote Africa’s cultural heritage, including the modern cultural sector of its rich and growing film and music industries’ (Chowdyr 1998:17). Obijiofor (1998:455) discusses the difference between the concept of communication in Africa and the West. In Africa, the messenger is as important as the content of the message itself. Communication involves social networks. In the West, the content of the information is the most im-

important thing (‘don’t kill the messenger’), and this is what is carried by modern ICTs such as the Internet. Therefore, Obijiofor thinks that the telephone will be accepted by Africans because it poses the least threat to existing sociocultural practices. However, if the Internet can be Africanised, it could be as acceptable as the telephone. To build ubuntu into IT, African websites should have to provide information about the messenger (the owner or source of the website) and his/her credibility. If Africans can adopt the Internet in such a way to serve African culture, it can become an acceptable platform to disseminate information on Africa intercontinentally, and to the whole world.

Building customised software for the requirements of Africa is a fourth example of ubuntuising ICT. ‘Development of indigenous information resources, based on user needs, is ultimately the yardstick by which the effectiveness of the information society in Africa will be judged’ (Chowdyr 1998:16).

The idea of building ubuntu values into Western cultural products is not new. The same concept has been proposed for the law.

Ubuntu has the potential to upwardly re-evaluate repressed African identity and to re-introduce previously marginalised legal traditions. On the other hand there is a danger that indulging in nostalgia about African colonial cultures will reinforce the myth that there is a single African culture and that the continent lacks diversity in its difference (Lenta 2001:189-190).

It should be noted that so far, the process of building ubuntu into South African law so far has not been very successful. Kroeeze (2002) indicates that ubuntu has been used as a constitutional value in only one court case, where it was separated from its context and equated with the Western liberal concept of human dignity.

In order to create an Africanised information society we need enough skilled Africans to do the job. This necessitates a revision of educational practices. To enhance Africans’ participation in ICT, changing
attitudes should be addressed from early childhood onwards. In a study about women’s participation in ICT, Fountain (2002) says the following:

Science and education policies designed to reduce gender inequity in post-secondary and graduate study miss critical periods during childhood and adolescence that later constrain education and career decisions. In other words, attitudes that relate identity, gender and technology are acquired early in life.

The same can be said about race or culture groups. If Fountain’s suggestions for girls are adapted for African children, the following steps can be taken to change attitudes:

• computer games designed for African children
• chat rooms and interactive websites for African adolescents can ‘promote a sense of identity and independence, while simultaneously building confidence in computing’
• exposure to African role models in these fields
• mentoring, support, guidance and encouragement

However, Postman (2001:30) warns against blindly adopting learning technologies to make education more efficient. Educators should first clarify their reasons and aims for education. ‘And such reasons are to be found in places where machines do not dwell and where gods of a different order speak their words.’

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Integral self-appropriation and the science-religion encounter: Lonergan's methodological mediation

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INTRODUCTION: ARE SCIENCE AND RELIGION REALLY IN DIALOGUE?

My overall aim is to show the relevance of Lonergan’s philosophy of consciousness to the ongoing science-religion debate, including the unfolding of the debate in an African context. I argue that if the debate is to be effective and worthwhile there is need for a philosophical framework capable of mediating between the two sides of the dialogue. However, not every approach to philosophy is able to facilitate a dialogue that must ultimately involve both interdisciplinary and intercultural communication. Hence my focus on Lonergan’s philosophy of self-appropriation. I argue that Lonergan’s nuanced account of integral self-appropriation, an account of how we come to a heightened awareness of the nature and dynamism of consciousness, of the patterns of experience in which consciousness flows, of the levels of consciousness and of the cognitive structure relating these levels, and of the differentiations of consciousness that unfold in history and culture, provides unique resources for facilitating dialogue between the realm of science and the realm of religion. It does this by identifying points of contact between science and religion within the conscious intellectual operations of scientists and theologians.

Such a far-reaching claim needs to be argued for in stages. I begin by setting out the complex problematic concerning the science-religion debate, asking whether or not any common ground may be identified.