Becoming an information and knowledge society: Rwanda and the Village Phone project

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Abstract

Many countries around the world have visions or dreams of becoming information and knowledge societies. These countries wish to benefit from the many advantages that such societies offer, including improved communication, better education and the reduction of poverty, to mention but a few. However, many countries and communities around the world (especially in Africa) are not part of the information and knowledge society yet, due to barriers such as the digital divide (Holmner 2008). Authors such as Webster (2002), Britz et al (2006) and Holmner (2008) have identified criteria that define an information and knowledge society. These criteria address economic, Information and Communication Technology (ICT) infrastructure, physical infrastructure, and social and human intellectual capacity aspects. Based on these criteria, it is clear that Rwanda, which forms the subject of this study, is not yet an information and knowledge society. This article presents facts on how mobile phone technology such as the Village Phone (VP) can help Rwanda become an information and knowledge society. Qualitative research methods were applied in the form of a literature review and semi-structured interviews which were conducted with the VP users in five Rwandan districts. The results of the study showed that while the adoption of the VP may assist Rwanda to adhere to some criteria of the information and knowledge society (namely the economic and the ICT infrastructure criteria), while slightly assisting adherence to the social criterion, adoption of the VP is not assisting Rwanda to adhere to the physical infrastructure and human intellectual capacity criteria at all. The study further found that if the VP were used in a different manner it could meet more of the required criteria to help Rwanda become an information and knowledge society.

KEYWORDS

developing countries, information and communication technology, information and knowledge society, information society, mobile phone, Village Phone

1. INTRODUCTION

Many countries around the world have visions or dreams of becoming information and knowledge societies. In as early as 1993, Dordick and Wang and later Van Dijk (2005) postulated that information has become one of the most important commodities of contemporary society, and can been seen as an independent source of productivity and power. Lor and Britz (2007) agree, adding that the information society is currently being transformed not only by information and knowledge, but also by the use of information and communication technologies (ICTs). Authors such as Webster (2002), Lor and Britz (2007) and Britz *et al* (2006) have identified various criteria or pillars that countries/communities need to comply with, to be regarded as information and knowledge societies. These criteria include economic, social and ICT criteria, physical delivery of infrastructure, human intellectual capacity and useable content. The developed world (Europe and North America) complies with the criteria that constitute an information and knowledge society, and benefits from being part of this type of society. In sharp contrast are many of the countries in the developing world, such as Rwanda, that are still far from becoming information and knowledge societies (Holmner 2008). These countries are still in the process of developing and are struggling to become part of the new society. Authors such as Van Dijk (2005) and Holmner (2008), amongst others, note that the digital divide is the main barrier which prevents countries and communities in the developing world from becoming information and knowledge societies. According to Van Dijk (2005), the digital divide can universally be defined as the gap between those who do have access to computers and the Internet, and those who do not.

By narrowing the digital divide, many countries will benefit from the use of ICT, and that will be evident in the day-to-day lives of their people. Although Rwanda is determined to take full advantage of the use of ICT, the country still has a long way to go to improve its ICT situation. The current internet penetration rate in Rwanda is only 7.04 per cent (RURA 2012). Mobile phone penetration does, however, look considerably better and is currently at 57.3 per cent (RURA 2013). This means that mobile phones are one of the ICTs that can be used in the developing world to help bridge the digital divide. This article reports on a study that investigated a specific mobile phone initiative introduced by MTN Rwanda, the '*Tel'imbere*' Village mobile phone programme (hereafter VP). The aim of the programme was to narrow the digital divide across Rwanda, and, at the same time, to help to ameliorate the standard of living of the population. The study further investigated whether the mobile phone initiative could be used as a tool to aid Rwanda in becoming an information and knowledge society.

2.   METHODOLOGY

To obtain the necessary information to complete the abovementioned study, the authors followed a qualitative approach. Authors such as Babbie and Mouton (2001), De Vos et al (2005), Denzin and Lincoln (2008), Creswell (2009) and Flick (2009) indicate that qualitative research describes life from the point of view of the people who participate. It seeks to understand social realities by studying participants' knowledge and practice. The semi-structured interview method was used as data collection instrument to collect information from VP clients. De Vos *et al* (2005) define semi-structured interviews as interviews in which a researcher gains a detailed picture of a respondent's beliefs about a particular topic or his/her perception of that topic. Semi-structured interviews were conducted in Kinyarwanda (mother tongue) with VP users in five Rwandan districts, namely, Bugesera (Eastern Province), Nyabihu (Western Province), Gakenke (Northern Province), Ruhango (Southern Province) and Gasabo (City of Kigali). The data from the semi-structured interviews were translated into English in order to analyse it and make it broadly understandable. The study used convenient sampling as a non-probability sampling method. Struwig and Stead (2001) indicate that the convenient sampling method refers to the selection of cases that can be easily obtained. This study sample, chosen from among VP users in all five districts that the researchers visited, comprised 58 VP users. Qualitative content analysis was used to analyse the data obtained from semi-structured interviews. Zhang and Wildemuth (2009) indicate that qualitative content analysis involves a process designed to condense raw data into categories or themes based on valid inference and interpretation. The semi-structured interviews were transcribed, the raw data were then condensed into categories and themes, before being more easily analysed and interpreted. The selected themes were based on the criteria of the information and knowledge society. From those themes, different issues were developed which helped the authors describe the data obtained under each theme.

3.   LITERATURE STUDY

A study of the existing literature was needed in order to ascertain the definition of an information and knowledge society, its criteria, and how those criteria could be applied to Rwanda to determine the country's information and knowledge society status. A literature review was also needed to inform on how ICTs can be used for development purposes, specifically by focusing on how mobile phone technology can help narrow the digital gap and can meet the criteria of the information and knowledge society.

3.1   AN INFORMATION AND KNOWLEDGE SOCIETY DEFINED

According to Ricci (2000) there is no generally accepted definition of the concept of an information society. In older literature, authors such as Bell (1974), Martin (1988),

Feather (1994), Webster (1995) and Martin (1995) define an information society as a society where there is an increase in information. Martin (1988, 1995) elaborates on this by postulating that in an information society quality of life, as well as prospects for social change and economic development, depend increasingly on information and its exploitation. In newer literature, the concept of the information society is often criticised as being too limited due to its primary focus on ICT in information processing and distribution (Britz et al 2006; Lor & Britz 2006). These authors, who introduced the element of "knowledge" into the concept, argue that knowledge is not simply the result of collecting and processing information, it also requires a measure of judgement. Thus, the newer concept of the "knowledge society" has become "fashionable" and is increasingly replacing the term "information society" (WSIS 2003). Accordingly Lor and Britz (2006), a knowledge society can be defined as

> a society that operates within the paradigm of the economics of information. It values human capital as the prime input to production and innovation. A knowledge society is well connected via modern ICTs to the dematerialized economy, and has access to relevant and usable information. A highly sophisticated physical infrastructure underpins this economic model and allows the delivery of the material objects that are accessed and manipulated in the dematerialized world of modern ICTs.

This definition is more operational than the aforementioned versions, as it includes a new element, physical infrastructure, which is lacking in other definitions (Holmner 2008). From this definition the authors were able to identify the criteria a country needs to become an information and knowledge society. These criteria are discussed in the following section.

3.2 CRITERIA OF THE INFORMATION AND KNOWLEDGE SOCIETY

As mentioned previously, Britz et al (2006) and Lor and Britz (2007) identify and discuss four pillars of the information and knowledge society: 1) ICT infrastructure; 2) usable content; 3) physical infrastructure; and 4) human intellectual capacity. According to Martin (1995) and Webster (2002), the economic, social, technological, occupational, spatial, cultural and political facets are important criteria of an information and knowledge society. In this article, the authors concentrate on the following criteria: economic, ICT infrastructure, physical and social infrastructure, and the human intellectual capacity criterion. In order to determine whether a country or community is an information and knowledge society, its compliance with these criteria as regards the information and knowledge society must be measured using measurable indicators of each criterion.

3.2.1 The economic criterion

With regard to the economic criterion in an information and knowledge society, economic stability is of the utmost importance (Britz et al 2006; Holmner 2008; Webster 1995).

According to Holmner (2008), the following are indicators of economic criteria: work opportunities (measured through a country's unemployment rate), standard of living (measured in terms of income inequality), the poverty rate, and the real income per person. The final indicator of a stable economy is measured through the gross domestic product (GDP) and the inflation rate of that particular country (Holmner 2008).

According to the National Institute of Statistics of Rwanda (NISR 2012), Rwanda has a low national unemployment rate of 0.9 per cent. However, the unemployment rate differs from urban to rural areas. In urban areas such as Kigali, the unemployment rate is much higher, at 8.9 per cent, while in other urban areas the unemployment rate decreases to 3.9 per cent. In rural areas the unemployment rate is much lower – only 0.6 people out of 100 are unemployed (NISR 2008). As regards the standard of living, Rwanda, like many developing countries around the world, has a high level of income inequality of 50.8. This, according to the Gini index, is high compared to that of information and knowledge societies such as Norway, which has an income inequality of 25 (*CIA World Factbook* 2010). Norway was chosen as comparison point since it is ranked number one in terms of human development on the United Nations Development Programs' Human Development Index (HDI) (UNDP 2013). Norway's number one ranking has been unchanged for at least five years (UNDP 2013).

As for the poverty rate, according to the 2012 Statistical Yearbook (NISR 2012), 44.9 per cent of the population in Rwanda live on less than US$ 1 a day, whereas 83.7 per cent of its people live below US$ 2 a day. Rwanda thus has a high poverty rate compared to Norway, where only 4.5 per cent of the population live below the poverty line (Fisher 2011). Rwanda's GDP per capita rose to USD 644, increasing from USD 593 in 2011 (Republic of Rwanda 2013). This GDP is very low compared to the GDP per-capita of developed countries, and of information and knowledge societies such as Norway, which has a GDP per-capita of US$ 40034.85 (Tradingeconomics 2012). Rwanda's inflation rate is also very high, at 8.5 per cent (*CIA World Factbook* 2013a).

Based on the above facts it can be seen that the economy of Rwanda is characterized by a low unemployment rate, high-income inequality, and high poverty rate, as well as low income per person, low GDP and high inflation rate. Therefore Rwanda does not comply with the economic criterion of the information and knowledge society.

3.2.2   Physical infrastructure criterion

With regard to the physical infrastructure, the criterion can be measured by looking at the following indicators: accessible roads, number of airports, railways, and number of warehouses. Nation Master (2009a) reports that Rwanda has only two motor vehicles per 100 people, which is an insignificant number compared to Norway which has 494 motor vehicles per 100 people. The total length of roadways in Rwanda is 14 008 km, with only 2 662 km of paved roads and 11 346 km of unpaved roads (*CIA World Factbook* 2011). According to the *CIA World Factbook* (2011), Rwanda had nine airports in 2010,

of which only four had paved runways while the remainder were unpaved. This a very small number, compared to Norway which has 98 airports (*CIA World Factbook* 2010). It is also important to note that Rwanda is among 17 African countries which do not have a railway system at all (UNECA 2007). Concerning storage facilities, Rwanda has only two warehouses, namely MAGERWA (UN 2006) and DSV Transami (Ngarambe 2008). These are not well suited to the needs of perishable horticultural exports such as fruits, vegetables and flowers (Friend & Frohmader 2000; Ngarambe 2008) and are too small in terms of space.

It is clear that Rwanda's physical infrastructure criteria are characterised by a low number of motor vehicles, few accessible roads, few airports and warehouses, and no railways. Therefore, Rwanda does not comply with the physical infrastructure criteria of an information and knowledge society.

3.2.3   Social criterion

The social criterion of the information and knowledge society is measured through good health indicators which include mortality rate and life expectancy, number of practising physicians, and health expenditure as a share of GDP (Holmner 2008). It is also measured in terms of those modern public services which are comprised of e-government initiatives and e-health. According to the *CIA World Factbook* (2013b), in 2012, the general death rate in Rwanda was estimated at 9.48 deaths per 1 000 of the population. However, the infant mortality rate is higher if compared to the general death rate cited above. In 2012 there was an estimated 61.03 per 1 000 deaths, per 1 000 live births registered. Rwanda is among the top 25 countries in the world as regards high infant mortality rate (*CIA World Factbook* 2013a). With regard to life expectancy, a new-born baby can expect to live until the age of approximately 58.85. Worldwide, Rwanda is among the countries with a low life expectancy rate, ranking 196th out of 223 countries (*CIA World Factbook* 2013a). The high mortality rate and low life expectancy in this country can be attributed to the low number of practising physicians in Rwanda, which has only 0.6 practising physician per 10 000 people (WHO 2013). As for health expenditure, the World Health Organisation reports that the total expenditure on health in Rwanda in 2012 was estimated at 10.4 per cent of the GDP (WHO 2013).

With regard to e-government, according to the United Nations e-government survey, Rwanda is ranked 140th in the world (UN 2012). E-government is one of the modern public service indicators that falls under the social criterion. Compared to the 8th ranking of Norway, Rwanda's position is less favourable. When looking at e-health, Frasier et al (2008) indicate that the government of Rwanda has made some effort to promote e-health. This can be seen in the many e-health initiatives available in the country, namely TRACnet, Telemedicine and Health information management system, to name but a few. Unfortunately, both e-government and e-health initiatives in Rwanda are inhibited by the low Internet penetration rate of 7.04 per cent.

From this discussion on the status of indicators of the social criterion, the authors can infer that Rwanda is characterised by a high mortality rate and a low life expectancy rate; a low number of practising physicians; a high level of health expenditure as a portion of GDP, and low scores on e-government initiatives, as well as an insufficient number of e-health initiatives. Therefore, the authors are of the opinion that although Rwanda has a long way to go, its government is on the right path to achieving compliance as far as the social criterion is concerned. Rwanda thus complies with certain aspects of the social criterion of an information and knowledge society, but not all.

3.2.4   Human intellectual capacity criterion

When looking at the human intellectual capacity criterion, three indicators have been used to measure this, namely years of compulsory education, literacy rate and e-learning initiatives (Holmner 2008). According to the Ministry of Education in Rwanda (MINEDUC 2009) and Goodsir et al (2009), since 2008 Rwanda has shifted from six to nine years of compulsory education. This period of compulsory education places Rwanda above the world average of 8.8 years (Nation Master 2009b). With regard to literacy rate, in Rwanda in 2012, the male youth (15–24 years) literacy rate was estimated at 77 per cent, while the female rate was at 78 per cent (UNICEF 2012). The adult literacy rate is below the world average, which is set at 82 per cent (CIA World Factbook 2009).

As for e-learning initiatives, Rwanda has an e-learning centre at the Kigali Institute of Education. The centre is connected to well-known universities and institutions in India (KIE 2009). The Centre for Instructional Technology (CIT) is an e-learning centre that operates under the e-learning Unit of the National University of Rwanda (NUR 2011). The main aim of the NUR e-learning unit is to bridge the existing gap between the advanced technology-enhanced teaching, and learning methods in Europe and Rwanda (NUR 2011). **W**ittrock (2009) postulates that the government of Rwanda believes e-learning can succeed through establishing a partnership among key stakeholders including content providers, academia and telecommunication operators/Internet service providers.

Based on the discussion above, the authors can deduce that the human intellectual capacity criterion in Rwanda is receiving attention. Rwanda has an acceptable literacy rate and has tried to introduce several e-learning initiatives. Moreover, Rwanda is on the right path in terms of increasing the years of compulsory education. Therefore, the country partially complies with the human intellectual capacity criterion.

3.2.5   The ICT infrastructure criterion

Since the mid-90s, the information and knowledge society has been transformed by the use of ICT (McColgan in Nassimbeni 1998). According to Batchelor et al (2003), ICTs are seen as a developmental tool which can help to reduce poverty. The ICT

infrastructure of a country can be measured by looking at personal computer usage per 100 inhabitants; the number of Internet subscribers and users per 100 inhabitants, and telecommunication penetration per 100 inhabitants (ITU 2012). According to the ICT Development Index (ITU 2012) the levels of access to and penetration of ICT services in Rwanda are amongst the lowest in the world. Rwanda is ranked 133rd of 155 countries. However, due to improved access and use statistics, Rwanda is the only least developed country (LDC) to be among the most dynamic ICT Development Index countries, climbing seven ranking places in one year. In 2011, the percentage of households with both a computer and Internet access almost doubled, to two and five per cent respectively. With regard to telecommunication penetration rates, the fixed telephone line penetration rate is low at 0.41 per cent (RURA 2012). However, in Rwanda mobile phone penetration was highest at 57.3 per cent during the first quarter of 2013 (RURA 2013), but is still low compared to Norway, where mobile phone penetration was 115.62 per cent in 2011 (ITU 2011).

It can thus be seen from the above discussion that Rwanda is characterised by few people having access to PCs; a low level of access to telecommunication services, and a low number of Internet subscribers and users. Therefore, Rwanda does not comply with the ICT infrastructure criterion of the information and knowledge society.

3.3   MOBILE PHONES FOR DEVELOPMENT

According to Jagun (2007), mobile phone technology is one type of ICT that can successfully be used for development in various areas such as business, education, health, etc. Bhavnani et al (2008) supports this idea by referring to mobile phone telecommunication as a substantial driver of economic growth. In this way, mobile phones can help businesspeople increase their productivity by

- increasing awareness of opportunities for trade;
- shortening the time taken to meet orders;
- reducing communication costs in terms of time spent traveling, transportation costs, and the opportunity cost of income foregone when traveling; and
- reducing travel-related risks (see Heeks & Jagun 2007).

Hulme and Traxler (2005) indicate that the mobile phone can also be used in education through mobile learning (m-learning) initiatives. They define mobile learning as the possibility of learners being able to engage in educational activities without the constraints of doing so in a delimited physical location. Accordingly, mobile learning is spontaneous, portable, ubiquitous, personal, informal, contextual and pervasive (Hulme & Traxler 2005). With regard to the use of the mobile phone for health-related purposes, Saran (2009) is of the opinion that mobile technology has the possibility to transform healthcare in developing countries, particularly in the area of health awareness schemes

and in the training of healthcare professionals. To harness the development potential of mobile phones, Rwanda launched the Village Phone Project in 2006. The following section reports on this mobile phone development initiative.

3.3.1 *Tel'imbere* **The Rwandan Village Phone Project**

The Rwandan Village phone project, introduced in Rwanda in April 2005 and officially launched in Bugesera, a district of the Eastern Province in June 2006, is based on the Grameen Village Phone programme introduced in Bangladesh in 1999. That programme is one of the mobile phone's major success stories (ITU 2006; Melkote & Steeves 2001). The Rwandan VP programme, known as "*Tel'imbere*", operates throughout the country. "*Tel'imbere*" is the Kinyarwanda word for "telephone forwards". The project is a joint venture between the Grameen Foundation, MTN Rwanda and three indigenous microfinance institutions – Vision Finance, Urwego and Care (Stanley 2005). Later, other local microfinance institutions such as Inkingi, Duterimbere, and < > UCT partnered with the VP initiators (Grameen Foundation 2009). According to Rutagengwa (2010), the Operations Manager for *Tel'imbere*, the number of village phone operators (VPOs) in Rwanda was estimated at 6 253 people by the end of February 2010. The increased number of VPOs in Rwanda has contributed to a rise in local telephony access rates from 50 per cent to over 90 per cent, as confirmed by Futch and McIntosh's (2009) research: these researchers found that VPOs in Rwanda receive a loan of US$ 261 payable over a period of six months, at US$ 43.50 per month. As the average monthly profit of VPOs in Rwanda is only US$ 30.50, the VPOs are unable to repay the loans solely from VP revenues (Futch & McIntosh 2009). Thus, they have to source the rest of their monthly repayment from other sources of income. On a community level, the VP is helping to transmit news between villages, help in arrangements to transport harvests to markets, and in establishing communication between the population and the police, thus heightening security (Futch & McIntosh 2009).

4   RESULTS AND DISCUSSION

An empirical study was done to find answers to the research question which asks how the VP contributes to meeting the criteria of an information and knowledge society in Rwanda. It is important to note that respondents used the VP in two different ways: only nine (16%) used it for mobile phone airtime top-ups, while 49 respondents (84%) used it for communication purposes. Some of these 49 respondents used the VP in social communication (90%), business communication (53%) and education communication (4%). With regard to the way the VP contributed to the economic criterion, the researchers posed this question only to those 25 respondents (53%) who used the VP for business communication purposes. The researchers established that 16 respondents out of 25 (64%) used the VP to communicate with their suppliers when they needed them to deliver goods, or to obtain prices and new product information. This helped

them make informed decisions prior to buying and reselling their products. Forty per cent used the VP to communicate with clients, while 36 per cent of respondents used the VP to communicate with their business partners. All 25 respondents (100%) who used the VP for business affirmed that it was suited for this purpose. The reason they provided is that the VP is a cheap and affordable communication method which helps them increase their profits and therefore helped their business grow. The researchers are of the opinion that the profits the respondents made from their improved business methods have helped to work towards alleviating poverty in Rwanda in general, and in the respondents' households in particular. The data analysed also showed that the VP helped the respondents save in two different ways: they saved time (40%) as well as money (86%). However, some respondents (10%) reported that the VP did not help them save at all. The analysed data showed that where respondents noted that the VP had helped them to save, it was in terms of travel costs (60%) and communication expenses (57%). Sixty per cent of respondents reported that rather than travelling long distances to see clients or service providers, they would visit commercial centers to use the VP to phone ahead. A number of respondents (57%), whom the VP helped to save on communication expenses, reported that making a call via the VP is much cheaper than using a private mobile phone. The VP charges RWF 10 per minute (US$ 0.01), whereas use of a private mobile phone costs up to RWF 1.50 per second (RWF 90 per minutes [US$ 0.15]) (MTN Rwanda 2011).

Based on the data analysed in this section, the researchers can summarise that the VP improved the businesses of most respondents in the identified districts. By using the VP, respondents were able to communicate easily with their clients, suppliers and business partners. Moreover, the VP aided 57 per cent of respondents to save on communication expenses, and helped 60 per cent of respondents save on travel expenses. Therefore, the VP partially helps to meet the economic criterion of the information and knowledge society status of Rwanda.

In terms of how the VP assisted Rwanda in adhering to the ICT infrastructure criterion, the analysed data showed that a significant number of respondents, 54 out of 58 (93%), did not use a computer or the Internet at all when visiting the VP at a commercial centre. There were different reasons for this: lack of skills (78%); unaffordable prices (22%); unavailability of computer/Internet at the centres (18%); used computer/Internet in cyber cafés (13%). Only seven per cent used the computer and Internet facilities at commercial centres when they went to use the VP. The VP is connected to the computer as a modem. According to the respondents, using the VP as a modem is much cheaper than instances where the computer is connected to another modem. The analysed data also indicate that 57 respondents out of 58 (98%) confirmed that the VP has increased the number of people with access to a telephone. The VP thus gives people who do not have any other telephone facilities an opportunity to access a phone. As the respondents deemed the VP an affordable telephone, many people used it – especially the poor. Furthermore, the respondents indicated that the VP has motivated many people to buy

their own, private mobile phones, because they are assured of paying affordable airtime on the VP system. According to them, with the VP airtime is available from RWF 100 (US$ 0.16), whereas the cheapest normal airtime card costs RWF 500 (US$ 0.83).

From this discussion it is thus evident that although the VP did not increase the number of respondents with access to a computer and/or Internet facilities, the statistics indicate that the VP increased the number of respondents with access to telecommunication facilities. Therefore, the researchers are of the opinion that the VP has partially contributed to an improvement in Rwanda, as regards the ICT infrastructure component of the information and knowledge society.

In terms of physical infrastructure, the aim here is only to indicate the current status and condition of roads around the VP centres, since this factor could influence the use of the VP. It is important to note that the VP does not have a direct influence on the physical infrastructure criterion. The data analysed indicated that the majority of respondents (84%) walked to commercial centres to use the VP, taking 19 minutes on average; 14 per cent used bicycles and only two per cent used mini-buses. A large number of the respondents (93%) reported that no taxis or buses were available in the vicinity of commercial centres. This is because most of the roads passing the VP centres are not paved, and are therefore not suitable for taxi/bus traffic. The analysed data confirmed the literature findings, namely that Rwanda is among those countries in the world with a low number of motor vehicles (two vehicles per 100 people), and very limited road system. Based on this data, the researchers are of the opinion that the VP is not currently contributing to the physical infrastructure criterion of the information and knowledge society in Rwanda.

On the question of whether the VP contributed to the social criterion, the researchers posed the related questions only to those 49 respondents who used the VP for communication purposes. The analysed data showed that the VP was used in a limited way for health purposes – only 14 per cent of those respondents used the VP to contact a nurse/health councillor, while only four per cent used it to call a doctor. The respondents noted that they did not use the VP to contact a doctor, because there seldom was a doctor at their health centre. The shortage of doctors in the various health centres within the identified districts correlates with findings pertaining to the low number of practising physicians in Rwanda. The analysed data also indicated that the majority of the respondents, 36 out of 49 (73%) did not contact local leaders to gain access to government public services. Only 13 respondents out of 49 (27%) managed to contact their village leaders at least once, to check his/her availability at the office/at home; report an incident that took place in the village; solve repayment problems between villagers; ask for building permission; obtain information about new ID documents/request administrative documents; obtain information about the voting list in the upcoming presidential election (August 2010). From the analysed data it is clear that the VP at present only helps respondents access government public information in a very limited way. Therefore, the researchers are of

the opinion that the VP is currently not contributing adequately to the social criterion of an information and knowledge society.

To test whether the VP helped Rwanda comply with the human intellectual capacity criterion, different questions were asked to find out whether educational programmes are offered at those commercial centres where people use the VP. Unfortunately, no such programmes exist. Therefore, the VP is currently not helping to enhance human intellectual capacity in Rwanda. It is important to note that the only educational use the VP has had, was of an administrative nature – parents only rarely used the VP to contact the school. The administrative use of the VP would not greatly increase Rwandans' human intellectual capacity. The researchers are of the opinion that the VP currently has no impact on human intellectual capacity at all.

5   CONCLUSION

This study indicated that Rwanda is not yet an information and knowledge society. Even though Rwanda is trying its best to meet the criteria for becoming such a society, it still has a long way to go. This study also indicated that the VP is currently helping Rwanda to adhere to certain criteria, namely the economic and ICT infrastructure criteria, and is only slightly helping in terms of the social criterion. However, it was found that the VP does not assist Rwanda in meeting the physical infrastructure and human intellectual capacity criteria at all. Indications are that if the VP were used differently, it could conceivably assist Rwanda to become an information and knowledge society. For example, to help Rwanda comply with the economic criterion, the VP can be used in the mobile money service of MTN, by having VPOs act as authorised MTN mobile money agents. This service will reduce costly journeys for those who travel to take money to a friend/family member in need. To help Rwanda comply with the ICT infrastructure criterion, more VPs could be used as modems to connect computers to the Internet. This will grant more villagers in Rwanda access to the Internet, and at a low price. To enable Rwanda to improve the physical criterion, the ICT centres where people can access computers and the Internet can be built at the same commercial centres where the VPs are available. If such VP centres are created, it can help to attract more people which could, in turn, lead to improvements in physical infrastructure. The VPs can be used to help Rwanda comply with the social criterion, if nongovernmental organisations assist the Ministry of Health in distributing the VPs to community health workers. In that way, people who do not have access to telephones can establish contact with health professionals. As for the way in which the VPs can help Rwanda build human intellectual capacity, various skills training programs could be launched at those commercial centres where people access VPs. This will motivate VP users to participate in skills training programmes. Thus, if utilised to its full potential, the VP is a tool that can help Rwanda become an information and knowledge society.

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