Low-data mobile apps: Latest Innovation Frontier for Community Radio Stations in Rwanda

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Abstract

This paper examines the motivation of audiences to participate in the programming of community radio; the readiness of community radio stations' management and their audiences to embrace mobile applications; whether Rwanda is a conducive environment for the deployment of mobile applications in community radio; and finally issues of affordability and availability of the internet. The study is qualitative and draws on interviews with community radio audiences as well as unstructured in-depth interviews with local technology experts and community radio representatives. Uses and gratification and diffusion of innovation theories guided the analysis. The study found that the pursuit of recognition within their communities is the main motivator for audiences to participate in community radio programming. The management and audiences of the four community radio stations who participated in this study understand the importance of mobile technologies for community engagement and are interested in adopting them. Rwanda is a conducive environment for the deployment of mobile apps in the community radio sector. Audiences can afford to use these services at least once a week, despite ongoing issues of unreliability of the internet. Further studies may investigate issues of adoption and affordability by the wider community as this paper focused on highly engaged community radio audiences.

Key words: Community Radio, low-data mobile apps, Diffusion of Innovations, Development Communication.

Introduction

Mobile phones and related technological features have become part of everyday life worldwide (Westlund 2013). In Africa, use of mobile phones has seen a great proliferation in recent years, to the extent that some scholars have called Africa the fastest growing mobile market (Forenbacher, Husnjak, Cvitić & Jovović 2019). In Rwanda, many industries including the public sector workplace have embraced mobile phone technologies (Nduhura and Prieler 2017). In addition to calling and texting, mobile phones are used to respond to various needs within the Rwandan population. Among these needs are accessing the internet, including social media platforms and mobile apps, as well as services such as paying utility bills (Nyataya & Ukwimanishaka 2017). Although radio is still the most accessible medium, some developing nations, such as Sierra Leone, have seen mobile reach catching up with radio reach of 83 percent countrywide (Wittels & Maybanks 2016).

Journalists have also adopted these mobile phone technologies, including mobile apps and social media, as professional tools (Jordaan 2013). Despite the increase of mobile telephony and associated technologies in Africa, studies of the impact of these technologies on journalism in Africa are still scarce (Salmond, 2009; Atton and Mabweazara 2011; Mabweazara 2013; Paterson, 2013) leading scholars to propose more research into how journalistic practices are changing with the advent of new technologies (Mabweazara 2013). As Mabweazara (2013) argues, context is paramount where the issue of rolling out technology is concerned. In Africa, he contends, journalists must deal with limited resources, which has an impact on how they use technology. Despite limitations, journalists on the continent have devised novel ways of utilising technology to overcome limitations and meet their needs (Accone 2000).

To determine whether low data mobile apps are the next frontier for community radio (CR) in Rwanda, this paper seeks to answer four questions:

(1) What motivates audiences to participate in the programming of CR stations and how do they participate?
(2) Are CR stations and their audiences ready to embrace mobile applications?
(3) Is the Rwandan context a conducive environment for the deployment of mobile applications in CR?
(4) Can the audiences afford the necessary technology to access information on mobile applications?

Low-data mobile apps in this study include 'lite' versions of apps available on the iOS App Store and Google Play. They also include apps specifically created for data-starved areas and populations. WhatsApp is one of the best options among other messaging apps for communication (Pinngle 2018) and it is widely used in broadcast journalism in Rwanda (McIntyre & Sobel 2019).

This paper reviews relevant literature to set the scene. It then elaborates on the methodology used to gather data from CR stations in Rwanda and describes the radio stations considered in this study. The presentation and analysis of data is thematically organised in line with the four research questions that are framed by diffusion of innovation theory and uses and gratifications theory. So too are the conclusion and recommendations drawn in detail at the end of the paper.

Literature review

Scholars have defined CR as radio owned and operated by the community and whose main objective is improving people's lives through empowerment, promotion of fundamental freedoms, rule of law, and advocacy for populations so that basic needs are met (Jennings 2015; Coyer 2006; Fraser & Estrada 2001). The concept grew from the idea that community interests that are overlooked in mainstream and commercial media should be asserted in local debates. CR stations create spaces where disasters are mitigated, and information flows enhanced in restricted areas such as refugee camps and prisons. Ideally, for better efficiency and sustainability, CR stations should be independent and entirely funded and operated by the communities they serve (Jennings 2015). Usually CRs depend on up to seven sources of income including, support from communities they serve, financial support from bigger entities, advertising and sponsorship, grants, service contracts, support from Non-government organisations (NGOs), as well as government support (Gordon 2016). In Rwanda, CRs were initiated by local NGOs or associations. They are promoted by civil society organisations and the government which, for instance exempts them from paying taxes (RGB 2016). The establishment of CR services in Rwanda happened after the 2002 press law allowed licensing for private broadcasters (Graham 2009).

CR in East Africa has been characterised by its dependence on donor money. Donors therefore exert political and economic influence over audiences through a medium that is meant to be for and by the community. This leaves the community feeling relegated to a recipient role rather than an acting role in an independent space for meaningful conversations of marginalised people, (Conrad 2014). It should also be noted that in East Africa, donors have historically been instrumental in developing CR policies and launching radio stations (Jallov 2007). Widely idealised notions of community media therefore "have limited resonance with what can be accomplished in practice" (Fritz and Menocal 2007, 549). Research in other parts of Africa has also demonstrated that radio content is often dictated by economic imperatives rather than local motives. For instance in Ghana, lack of funding means that to stay afloat, CRs sell airtime to NGOs and political actors among other airtime buyers, who use CR to reach their audiences (Keefer and Khemani 2011); therefore the wider the audience the more the interest of donors which means marginalised communities, who are often small in numbers are most likely

forgotten (Conrad 2014). Moreover Manyozo (2009, 9) contends that, although CRs may have some autonomy, access to their communities is always "mediated and negotiated through donor funding", which leads to an unexplored terrain of the impact of donor money on the essence of participatory communication of community broadcasting (Nassanga 2009; Salazar 2009). Despite all these challenges, CRs still do a lot of good for communities (Conrad 2014).

This reality contrasts with the community media that has been theorised to be independent from the commercialised, professionalised, centralised and/or state owned media (McQuail 2000) which are small in scale and aimed at serving the best interests of the communities they serve; as well as being aids to participatory democracy because the communities they serve control management, funding and daily operations (Howley 2010). From this perspective, community media "questions the view of development as an externally-driven process" and "posits that communities should be the main protagonists of processes of social change rather than 'passive beneficiaries' of decisions made by foreign experts" (Waisbord 2008, 507). Based on this contrast, and in accordance with Nassanga's (2009) idea that there are different types of community media, this study used theories that usually do not speak to community media.

Incorporating new technologies in community media in developing nations
Radio remains a preferred communication platform by many people even after the advent of the internet. This is due to the cheaper costs of accessing information via radio compared to, for example mobile internet and live streaming and data costs, and other factors such as hardware costs and mobile phone battery life. Online streaming is also costly to radio broadcasters. The more people who stream live radio, the more it costs the broadcaster to provide the service. For listeners, accessing broadcast radio on a cell phone radio app uses less battery than live streaming and does not use costly mobile data (Cridland 2013). However, just as books are still available in print as well as electronically, there is no cause for fear that internet live streaming will replace traditional radio broadcasting.

Another reason why, in the developing world, radio and TV are still the primary sources of quality educational and health related information, is because illiteracy are high among audiences. For this reason broadcast radio and TV remain channels through which audiences debate issues that are important to them, conduct activism, and promote peace and social cohesion (Locksley 2009). Owing to its affordability, reach and viability, radio programming by talented and passionate radio professionals is still relevant even in the digital era (Berry 2014).

Nonetheless, the internet provides as an opportunity to enhance the radio experience. This is seen through program production and distribution, and through building a richer and more intimate relationship between radio broadcasters and their listeners. The internet, through social media and other apps, provides opportunities for radio broadcasters to build and maintain listenerships by integrating visual and other kinds of content to improve the experience of the audience. The same content can be adapted and distributed to the same audience through different channels and devices (Locksley 2009). The internet is seen as an opportunity to tell better stories, to engage and interact better with audiences, and to offer services such as videos, graphics and images that broadcasters could only dream of before the internet (Berry 2014). In advanced media markets, managers need to add more tools to their toolkit. These include online streaming, as well as technologies that allow broadcasters to mine data, analyse it to assess audience behaviour, and strategise accordingly (Jennings 2015). This diversification is particularly appealing to younger generations.

Radio program managers meet the expectations of the generation that grew up with digital technologies by offering them a multi-platform experiences, or an extra screen that prolongs the

conversation offline after the online program has ended (Berry 2014). The internet is therefore not a platform that duplicates what is done on radio. Rather, it focuses on enhancing the radio experience by engaging the audience and leveraging other features inherent to the web to conduct analysis based on data and distribute branded content (Berry 2014).

Younger people in developing countries are adopting digital technologies quickly, leapfrogging some steps developed nations passed through. Some of these adoptions include creation and distribution of user-generated content, including audiovisual storage on mobile devices. It has been observed that developing nations might take the lead in the usage of new technologies (Locksley 2009). Among other examples, this demonstrates that there is ample room for the integration of new media technologies in the CR sector to increase audience participation and interaction. These technologies include mobile apps (Android, Windows and iOS), digital and social media platforms, and mobile messaging apps used to increase or maintain audiences. Innovation will help CR fulfil the traditional roles of broadcast media: informing, educating and entertaining, culture preservation, and exchange of ideas for community well-being in a more democratic media environment (Dutta 2014). The possibilities of incorporating mobile technologies enable us to predict a better future for the CR sector.

Those who will harness the benefits of the internet are those who approach it with a new way of thinking rather than relying on older business models (Berry 2014). The environment is conducive, as mobile reach has increased tremendously, catching up with radio, renowned for being the number one platform in Africa. This suggests many opportunities for leveraging mobile phone technologies in developing countries to reach more audiences with digital content (Wittels & Maybanks 2016). Falling costs of new technologies, increased access, and rules less restrictive than those of traditional media will allow content creators in the developing world to assert their presence within the international digital media space (Locksley 2009). This is an opportunity for job creation, as more talent will be sought, and more skills needed to adapt to ever increasing technological changes (Berry 2014).

Challenges of deploying digital solutions in community radio
Although developing countries including Rwanda have put in place various policies to ease access to ICT, there are still challenges related to connecting the rural areas to the internet, leading to what is commonly known as the digital divide (Locksley 2009). Other factors that contribute to the digital divide include illiteracy; little or no online content in indigenous languages; insufficient or inadequate infrastructure; and community members' lack of financial means to purchase devices such as radios, mobile phones or computers (Jennings 2015). For instance, some people still use basic feature phones, while other members of the community, mainly women and the elderly, need assistance to use them. Less than half of mobile users have access to the internet using their mobile devices, making broadcast programming the best way to reach wider audiences. It should be noted that there is a difference between mobile access and mobile ownership, access being higher than ownership (Wittels & Maybanks 2016). Other challenges include a lack of interest on the part of private mobile internet providers/operators in investing in poor communities from which they do not expect high return (Jennings 2015).

Financial constraints and organisational barriers often hinder CR stations from innovating and experimenting with new technologies. There is a real need of guidance and support in order to integrate new media technologies with radio programming for the benefit of communities these stations serve (Jennings 2015; Dutta 2014). Moreover, even though there is no doubt that CR plays an important role, there are still challenges in securing means to support the deployment of all the necessary new media technologies. Although donors provide their input, media is not yet

one of the main development priorities in many developing countries. As such, ICT for development (ICT4D) still has a long way to go (Locksley 2009).

Some solutions for challenges related to internet access
African governments are devising policies aimed at bridging the digital divide among other access issues (Locksley 2009) and providing infrastructure such as electricity and fibre optics (Newengo 2015). At the continental level, initiatives such as Mawingu, that place solar powered routers in rural communities to ease access to the internet (Mawingu 2019) and charging shoes that help people charge their batteries without access to electricity (Answers Africa 2019), are home grown solutions that address issues of internet access. Another example is the 'UshauriKilimo' mobile app, developed in collaboration with Kilosa CR in Tanzania, in support of the agricultural sector. Although there have been challenges, benefits of this sort of development have been commendable. These included increase in production, collaboration with agriculture experts and increased cooperation amongst farmers (Sanga 2018).

Methodology and study design
The study included interviews with six CR managers four of which were retained for this study. Two IT specialists were also interviewed and selected through a purposive sampling method. Purposive sampling is viewed as instrumental in gathering data from experienced and knowledgeable sources (Tongco 2007). The CR managers were interviewed on the professional use of social media and other IT tools as well as their readiness to embrace mobile apps as part of their daily activities.

The study also conducted semi-structured interviews with CR audience members to find out how radio stations could better engage them using available technology, and their readiness to embrace new technologies, should CR stations adopt them for further community engagement. Audience members were recommended by CR managers, and efforts were made to ensure these participants were diverse in terms of varied geographic locations, gender, and age, in order to ensure a plurality of opinions from the listenership. Before each interview consisting of open-ended questions and some demographic questions, respondents were briefly told the aim of the study. The author reached saturation after 23 interviews. This means that after these interviews, respondents were providing similar answers, which confirmed that these responses represent actual trends in CR listenership. All interviews were audio recorded with permission. They were then listened to and analysed to find the emerging themes.

Profile of community radios
This study focused on all four CR stations in Rwanda: Radio Izuba in the Eastern Province, Radio Huguka based in the Southern Province, Radio Ishingiro based in the Nothern Province and Radio Isangano based in the Western Province. The study also used the example of the African Renewal Energy Distributor (ARED), a social enterprise start-up that enables rural and low-income communities to access the internet among other digital services and products. Huguka and Isangano are owned by associations with the same name while Ishingiro is owned by the Byumba Development Association (ADEB) (Reporter 2019) and Izuba was launched by ADECCO (a French acronym for the Community Development Association though Communication). According to representatives of the four CRs interviewed for this study, there is no external funding. The stations raise money through selling airtime for various programs and announcements; service contracts with government, civil society and NGOs; grant funding; and outreach activities. Each of these organisations is profiled in a more detail below.

Radio Ishingiro
Established in 2010, Radio Ishingiro is one of the largest of Rwanda's independent CR stations. Based in the Northern Province, its broadcast reach extends to every province in Rwanda and to Kigali City, with its main listener base in the Northern and Eastern Provinces. Radio Ishingiro has a reputation among government and international organisations for implementing communications campaigns and community outreach activities countrywide.

Ishingiro Community Radio has a mission to provide community-centred informative and educational radio programs, as well as community enterprises that socially and economically empower, inspire and motivate the community. For instance, as part of an ambitious development strategy, the management set out to play an active role in supporting the most vulnerable members of the community. This resulted in paying health insurance for hundreds of individuals. Others were assisted in rehabilitating their homes or meeting other urgent needs affecting their wellbeing.

Radio Huguka
Radio Huguka is a CR station initiated by Huguka Organisation in 2010. Broadcasting from Muhanga District, Southern Province, on 105.9 FM, Radio Huguka is a forum for information, and debate on the rural world. It exclusively promotes 'Agricultural Extension' and rural development. Although there is no universal definition of Agricultural Extension, it can be understood as providing rural farmers with informal education so that they may make informed decisions as they address their issues with the objective of increasing their productivity for better livelihoods and resilience (FAO 2019). It aims to be non-political in character but also promotes local governance, democracy, freedom of expression and opinion, gender equality and human rights. Radio Huguka technically covers more than 60 percent of the country. Radio Huguka has a hybrid telephone which facilitates interaction with listeners by making available seven call-in lines. In addition, it has a Facebook page, WhatsApp number and Short Message Service (SMS) to receive feedback.

Isangano Community Radio
Since 2011, Isangano Radio has alleviated the isolation of the population of Karongi district in the Eastern Province of Rwanda and has quenched thirst for information. The radio has a wide coverage of about 50 percent of the Rwandan territory, mostly in the Western and Southern Provinces. It also shadow-covers some parts of Kigali and the Eastern Province, together with parts of the Democratic Republic of Congo (DRC) and Burundi. Isangano Community Radio does not align itself with any political party. Its editorial policy focuses on local social, economic, cultural, political and public policy issues. Through its programs, Radio Isangano attracts mostly the youth and farming communities. This pushes it to deepen its programming in talk shows that promote the interests of these communities.

Izuba Community Radio
On July 6th 2004, Izuba Community Radio was launched by ADECCO. The leadership of the former Kibungo Prefecture in the Eastern province of Rwanda, in consultation with other stakeholders, concluded that CR would be a good channel to promote good governance, unity and reconciliation. The editorial line focuses on good governance and rural development.

African Renewal Energy Distributor (ARED)
Local initiatives in Rwanda include the African Renewable Energy Distributor (ARED), an effort by telecom companies to put on the market affordable gadgets to enhance the adoption and use of internet by citizens with low income. ARED is also unique because its mobile kiosks combine the provision of multiple digital services for rural areas, and for low income areas in urban

centres. ARED claims to be the only 'one stop shop solar kiosk' in Africa, providing a wide range of e-services to customers (ARED 2017).

Theoretical framework
The analysis and discussion of data collected in this study is guided by uses and gratification and diffusion of innovation theories. Uses and gratification theory examines what audiences do with media. It is based on the tenet that people expose themselves to, or use, media to meet their goals (Katz, Blumler & Gurevitch 1974). Various themes of the theory have been identified as relevant to this study. These include but are not limited to social interaction, information seeking, communicatory utility and convenience utility (Whiting & Williams 2013).

Diffusion of innovation theory encompasses patterns of adoption and popularisation of ideas including technologies, until the innovation reaches critical mass: in other words, when the rate of adoption of the idea can guarantee its sustainability. This relies on four elements: the innovation, communication channels, time and social networks. While innovation and communication channels are self-explanatory, it is important to shed some light on time and social networks or systems. Time refers to how quickly audiences adopt the innovation. Social systems refer to the systems in which opinion leaders, change agents and various gatekeepers regulate the flow of information while exerting influence. This is what is referred to as diffusion. Adoption strategies include using opinion leaders or starting from a group that would be most likely to adopt the innovation.

Five categories of adopters have been identified, namely:
(1) Innovators: these are ready to take all the risks to adopt the innovation. They can usually afford the latest technology even though this might be likely to fail.
(2) Early adopters: these enjoy the position of opinion leaders, have disposable income to spend on gadgets, are known to be highly educated, and are more judicious in their adoption.
(3) Early majority: these people also enjoy a relatively high social status and have contacts with early adopters, after whom they adopt the innovations.
(4) Late majority, whose adoption behaviour is characterised by scepticism. They adopt innovations after the average person or the majority of society have already adopted them. They tend to have little or no disposable income and do not enjoy a particularly high social status.
(5) Laggards: these are the last people to adopt innovations. They are known to have aversion to change, to be of an older age, to have low income and to be attached to traditions. They tend to be in the lowest social class and have a limited social circle (Rogers, 2003).

The choice of theories was informed by the reality of CR in East Africa. Diffusion of innovation theory has been selected to guide discussion and analysis of data because funding donors usually intervene in the programming and technology choices, and staff recruitment and training (Conrad 2014). In other words, how donors drive the adoption of mobile app technologies is understood through the frame of diffusion of innovation. How audiences adopt the technologies and adapt them to meet their needs is understood through the frame of uses and gratification.

The use of social media and mobile apps by community radio in Rwanda
WhatsApp and similar mobile messaging apps are growing at a speed surpassing 'traditional' social networking sites such as Facebook and Twitter (Newman et al. 2017). Moreover, research has indicated that WhatsApp, among other messaging apps and social networking sites, can increase audience participation (Matthews 2016; Pindayi 2016). It is in this context that this

section focuses on WhatsApp. This, however, does not mean that other social networking sites are not important.

Community radio stations in Rwanda employ WhatsApp for various purposes, including informal communication and to plan social activities for employees such as wedding and birthday parties. Posts on social media and WhatsApp status messages are used to advertise upcoming shows and to collect audience feedback and participation on air when audience members send voice notes or text messages to the presenter in the studio. These on-air interactions may later be used to develop new story lines. Journalists use WhatsApp in news gathering practices, such as negotiating interviews with their audience and sometimes conducting short interviews. At times, interviewees may send voice notes that can be incorporated in programs. Journalists also send pictures, text and audio from the field on WhatsApp.

The app also plays a big role in administration by facilitating conversations between peers at various administrative levels (such as management and newsroom) for the purpose of planning or organising their work.

WhatsApp is also used as a means of communication between CR stations in Rwanda. Technicians from the four CR stations use a WhatsApp group to coordinate joint efforts. At a higher level, there is also a WhatsApp group used by the Rwanda Community Radio Network where joint activities are discussed.

Listener groups and radio ambassadors have their own WhatsApp groups, where they share information in their own time. According to the four interviewed radio representatives, these operate as peer-to-peer WhatsApp groups and are not moderated by the stations.

Motivations for audiences to contribute to community radio programming and discussions

All audience participants identified sharing constructive ideas as the main motivator for participating in CR. The great majority of audience participants also mentioned that calling the radio station gives them a sense of importance and respectability within the community, as their ideas are used to change people's lives. Many of the respondents shared that contributing to radio programs allow them to be advocates for their peers. They are more respected in the community and some even enjoy the 'stardom' that comes with it. The term 'stardom' is used instead of other similar and widely theorised terms such as *celebrity*, *microcelebrity* or *influencer*, in order to draw attention to the particularities of perceived benefit of citizen participation in Rwandan CR programming. This choice is discussed in further detail towards the end of this paper.

> I want to be a star, it helps me to be known, I became a role model, and I am interested in the fact that people who call in often are at times called for trainings and they become even more famous. *Izuba6*

Isangano2, female, twenty-three years old, employee in a courier service, was also vocal when it came to stardom:

> When a radio station is new in your area, you want to have some fame. I wanted to be known as someone who contributes with great ideas. I never requested songs. I wanted to give ideas on various topics of interest to my community. I wanted my neighbours to know that their neighbour gives constructive ideas. *Isangano2.*

All audience participants in this research reported that they all prefer calling in, as this allows them to get their voice heard on the radio. Many also said they liked calling in because it allows live interaction. Other means of feedback used by radio stations are SMS or short text message and WhatsApp – text or voice notes.

Other audience participants seek stardom and leverage it for personal gain, such as promoting businesses. Isangano3 and Ishingiro3 expressed this motivation in very clear terms:

> …sharing made me proud and famous, local media make us happy when we can hear our own voices. Leader at the local level even national level who visit our area get to know me. I feel important. When people hear you are a journalist they come to you and give you news. Being a journalist helps me in my business (tailoring) as people come to me because they know me, especially young people. *Isangano3*.

> …When I give ideas people get to know me and I get more clients in my small corner store. *Ishingiro3*.

Participants from Huguka Community Radio who are also part of farmer promoter listeners' clubs have a totally different motivation. They were trained in meteorology and their aim is to share their expertise with communities and use the radio to disseminate such information:

> Radio is like a school for us, when we give ideas it helps people in other districts of the country that is why I think it is important to give ideas. *Huguka2*

Some of them also hope that the more they volunteer as correspondents or the more they share ideas on the airwaves, the more the chances increase that they will have the opportunity to attend training organised by the nearest CR station. These training sessions are important for them as sources of income, as they are offered a per diem payment to participate. Many of these participants also hope to eventually earn a living as radio journalists or program producers.

These opportunities mean that the audiences of CR radio stations are motivated to participate in radio discussions. This research also sought to understand if they would be interested to embrace novel ways of interaction.

Readiness to adopt mobile apps used by community radio stations to engage communities

Respondents in this study were interested in adopting mobile apps because they allow faster and easier access to information. They believed they could retrieve past shows from the radio station, and even expected to see images. They hoped that the apps could be used for them to interact with the radio station a more technologically advanced fashion:

> 'Touch' would allow us not to travel far to access services. Also they allow us to not only talk to people who are far away, but we can also see them at the same time. Touch screens therefore help us save time and money as we can have access to all sorts of information without leaving our homes. *Huguka5*

This comment was shared by Huguka5, a 62-year-old lady who demonstrated an understanding of benefits of smart phones, which she referred to as 'touch'. She also understood the benefits of video conferencing, although she did not have the vocabulary for it. This is was good illustration that even those who are usually marginalised are happy to embrace the technology.

> The current way used a lot of time, ink and paper but mobile apps will be environment friendly to share ideas. *Izuba5*

Apps would allow me to know more news and also share more than what I usually share. *Ishingiro2*

At times many people call at once. This will enable us all to give our ideas and it will therefore ensure the plurality of voices and feedback on our community radios. *Ishingiro5*

Technology would enable us to send stories to the radio and we would even be able to see images. *Huguka2*

The representatives of all four CR stations in Rwanda said that they are ready to use new technologies if they are given proper guidance and training. They all understand that in the era of disruption, they need to adapt to the changes that are happening, and that there is no such thing as too many channels to reach, increase, engage and maintain their audience.

One of the radio representatives had a long list of mobile apps that could be used in collaboration with partners to help in Agricultural Extension under elaboration to better engage the communities in rural areas, for whom agriculture is the main profession and source of income:

…'5Qs' is an application, if conceived, would help us engage farmers by asking them five questions. This will enable us to have a better understanding of our audience. 'Smart Nkunganire' is another app we are hoping to deploy. It targets agro-dealers and will mainly focus on purchasing fertilisers and collecting quick feedback. We are also thinking about a virtual marketing app that aims to bring together agriculture producers and those who buy agricultural produce. We have dreams but we do not have means. *Huguka Representative.*

Representatives of CR stations also expressed an understanding of how mobile apps would help them create a richer relationship with audiences, although many of them expressed a need for further training about how mobile-based technologies can help them engage audiences:

It is important to engage people through other channels [to] allow us to have feedback and know where we stand compared to our objectives. Moreover, this allows us to know how to engage partners, it gives us a say as we have tangible data. For instance, on TuneIn we can mine data on listenership. We have many ideas but means are still limited to implement them. *Huguka Representative.*

Not using latest technology to engage audiences is like being against vaccination. We need to strengthen what we have so that we do not lose momentum, but we also need to find novel ways to engage audiences at a higher level including mobile apps. *Ishingiro Representative.*

…apps can definitely allow us to engage audience using multimedia content, which we would not be able to do using broadcast radio. This may eventually help us increase the audience and engage them better. With time, technology evolves [and] we are committed to keep up with technology as much as we can. *Isangano Representative.*

Community Radio representatives also identified hindrances to the deployment of mobile apps. These include lack of financial means on the part of CR stations, lack of awareness of the latest technologies, and high prices of data and devices. This means that even though audiences may be motivated to embrace low data mobile apps, issues of affordability might be an issue for the wider community. Despite these difficulties, there are opportunities in the country.

To make sure CR stations in Rwanda utilise ICT adequately, donor organisations, in partnership with the government of Rwanda, implemented a project aimed at equipping CRs with ICT skills to ensure the best possible outcomes. The three year project (2015-2017), funded by the Swedish International Development Cooperation Agency (SIDA) through the United Nations Educational, Scientific and Cultural Organisation (UNESCO), also aimed at improving programming and connecting CR stations in Rwanda with relevant stakeholders (UNESCO 2019). The government of Rwanda has also made sure that the administrative office of each of Rwanda's 416 administrative subdivisions, or 'sectors', offers internet connectivity. Respondents find this helpful, but they also mention that at times agents at the sector's office do not provide the password. Moreover, this internet is not always reliable. To address issues of affordability and availability, every input counts. It is in this sense that this study also considered solutions provided by a start-up, as well as a corporate company that deals in internet provision.

As a start-up, African Renewable Energy Distributor (ARED) came up with the novel idea of using mobile kiosks so that consumers might have services such as electronic charging, virtual top-up, and WiFi and intranet connection. ARED claims to be the only "one-stop shop solar kiosk" in Africa, providing a wide range of e-services to customers. Affordable WiFi in rural or low income areas, as well as localised cloud for users to have access to content with no mobile data charges (ARED, 2017), are among other solutions CR stations can leverage to increase audience engagement by addressing issues of connectivity and affordability. In addition to this, people in rural or low-income areas have access to free health or education related information on their digital devices that companies push through the ARED platform to target various audiences. ARED could, moreover, provide income generating activity to the local population and this company could easily work with CR stations to provide income generating activities or employment. Each kiosk needs an operator who would work as a franchisee. Due to this conducive environment, results can be seen, although there are still challenges. This is very helpful in the sense that it would allow community members to be familiar with the digital space to interact with radio stations and their peers.

One of the leading telecom companies promoting internet-enabled gadgets for people with low income, MTN Rwandacell, is commercialising a smart feature phone aimed at revolutionising access to the internet, especially social media, giving discounts to customers on purchased data plans. Much more than a basic feature phone, it is a fully-fledged smart phone targeting low income earners (MTN Rwanda 2019). Solutions like these are increasingly paving the way to a situation where even people in remote areas may enjoy digital opportunities.

Respondents also commented on the relationship between smart phone ownership and internet access.

The majority of participants said that it is easy for them to use the internet. For instance, five out of six Izuba respondents said they have smart phones, although one mentioned experiencing issues of reliability. Some, however, do not have devices to access the internet. For instance, four agriculture promoters we interviewed for Huguka Radio do not own smart phones and still use simple feature phones. The same applies to women listener groups, who also use simple feature phones. For Ishingiro Radio, two of six respondents do not use smart phones, and therefore do not have access to the internet. Three out of six Ishingiro respondents do not have smart phones. Two of the three respondents who do not have smart phones are women. This is how they present issues of Internet access and reliability:

> Yes I do have access to the internet but the network is not reliable. I bike for two kilometres one way to get to the court office where I can have access to reliable WiFi. *Izuba3*

It takes me up to two hours to send a news story (audio) over the phone using WhatsApp. *Izuba5*

I have a small telephone, low capacity device [that] hinders me from enjoying the internet fully. *Ishingiro6*

Affordability of mobile technology for community radio audiences.
Respondents in this study asserted that they could spend between 500 – 1000 RWF a week on data bundles to access the internet. To give some perspective, the price of beans, the main staple food in Rwanda, varies between 650 and 1200 RWF a kilo depending on the place of purchase and the season (Kimenyi 2019). The most spenders amongst the respondents pay up to 3000RWF a week and the least spenders can only afford 250RWF a week.

People can spend as little as 100 RWF for daily social media access, and ARED provides internet at 50RWF for 5 minutes up to 250RWF per hour. Henri of ARED said that on the kiosks people use the internet mainly for simple messaging solutions such as WhatsApp, even though some of them browse the internet and consume audio visual content on YouTube and other platforms.

It should however be mentioned that the sample population of this study is not representative of the rural community as they were the most active in engaging with radio programs and many of them can afford to volunteer even if it means spending both their time and their money. The women listener group of Huguka CR for instance were chosen amongst opinion leaders in their village, some of them also play administrative roles at the local level.

Discussion
The discussion of this paper analyses collected responses through the lenses of uses and gratification and diffusion of innovation theories. This study has shown that listeners of CR stations use CRs for 'stardom' and prestige within their communities. It should be noted that there is a rise in celebrity culture in modern societies (Daley 2013) and individuals' aspiration to fame are increasingly seen as realistic, particularly through participation in certain media platforms. Fame is therefore seen as achievable by each and everyone and not exclusive to the elite or those with extraordinary talent or prowess (Turner 2014). This study sees 'stardom' as the ability for an individual to perceive themselves as famous, seek and attract attention as well as manage the audience that comes with that attention which is a skill that people might need to have in modern times (Marwick, 2015). Other scholars have referred to this as microcelebrity (Jerslev 2016; Mavroudis & Milne 2016; Senft 2008) which people may pursue as a means to achieve social and economic benefits (Page 2012). Relevant to this study, audiences use CR to achieve stardom in order to reap social and economic benefits.

Among other uses and gratifications, respondents mentioned education, such as English classes, meteorological knowledge important for agriculture, and entrepreneurial skills with which some of them were able to start businesses or even think of novel business ideas.

Some female respondents discussed the importance of CR to awareness of issues to do with social cohesion and knowing one's rights in order to fight issues of injustice and domestic violence in the community.

Although it is hard to determine whether stardom is more important than other practical uses and gratifications, it is important to mention that it was one of the first motivations voiced by

almost all participants. It was only upon probing that respondents voiced other benefits of participating to CR programming.

Diffusion and innovation theory helps to extend analysis of respondents' input about the adoption of low data mobile apps by Rwandan CR professionals and their audiences.

During discussions, all the radio managers were motivated to adopt low data mobile apps to further engage their audiences. Their understanding, although not always up to date, is on par with available literature in the field. Audience members were also motivated to embrace these new technologies, even though some of them experienced issues of internet unreliability or not having the necessary devices. Surprisingly, many of them had the means to afford internet bundles at least once a week, while others used it constantly.

Consistent with Whiting & Williams's (2013) use of uses and gratification theory, respondents in this study reported that mobile apps would enable them to interact faster and better with their CR stations (communicatory utility), to access more information (information seeking), and to interact with peers from the convenience of their homes (social interaction and convenience utility). Coming to the diffusion of innovations theory (Rogers 2003), this paper revealed that respondents were innovators and early adopters, who enjoyed the status of community role models. They can be instrumental in popularising low data mobile apps, provided this increases their social prestige or stardom within their communities. This can lead to the adoption of the innovation by the critical mass.

Conclusion and recommendations

This study examined the interest of four CR stations in Rwanda in adopting low-data mobile apps in their everyday work to meet audiences' expectations. The study demonstrated that WhatsApp, a low data mobile app, is widely used for various purposes. On issues of readiness to adopt new mobile based technologies to increase engagement, both radio stations managers and audiences are interested. They not only understand the importance of mobile apps in engaging audiences; some have also made plans to implement them. Despite this enthusiasm, CR managers need funds, partnerships, and more knowledge so that these dreams may become a reality.

The study also demonstrated that, despite challenges, the environment in Rwanda is conducive for the deployment of mobile apps in CR. Initiatives of ICT stakeholders at different levels are making the environment more conducive to the deployment of mobile apps in the sector. Respondents of this study understand the importance of the technology, they can afford the technology, and adopt it faster if trained on its specific applications to improve their daily lives.

Before formulating recommendations, this study briefly presents some of the major issues that hinder some audiences from accessing and using new technologies. Socioeconomic norms that limit some members of the community, such as women, from enjoying the benefits of new technologies also represent an ongoing challenge. These disenfranchised groups are often the most in need of the information provided by CR stations in order to lead better lives in society (Jennings, 2015). Further studies should address how to circumvent socio-cultural aspects that hinder some members of the community from accessing the internet.

Once issues of internet access are solved, the next challenge will be developing policies governing content creation. This will require galvanising creative industries through appropriate regulation, investment and training (Locksley 2009). Even though challenges are many, this paper asserts that new media technologies present opportunities for community media growth in

general and CR stations, in particular. Governments, organisations and individuals are devising novel ways of addressing these challenges.

When applied to the data gathered for this research, the theoretical frames of uses and gratifications and diffusion of innovation have helped to clearly identify the gaps and opportunities that these recommendations address. However, as the discussion of stardom produced in the context of Rwandan CR also points to important local variations in the uses and gratifications obtained from participating in CR programming. The following four recommendations arise from the findings of this study:

1. More studies should be conducted to include all categories of adopters.
2. Interactions and partnerships between tech innovators and CR managers should be encouraged to make sure the latest available technology is put at the service of the community.
3. Radio management should be equipped with more fundraising skills to increase income.
4. Communities should be trained on how to use cooperatives to afford devices that would help them transform their lives.

The data collected for this research presents the views and attitudes of highly engaged CR audiences. Further studies may investigate issues of adoption and affordability by the wider community as technology continues to have an increasing influence on daily lives of the Rwandan population.

Acknowledgements

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