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CYBER SECURITY IN UGANDA'S DIGITAL FINANCIAL SECTOR; CHALLENGES AND POTENTIAL SOLUTIONS FOR FINANCIAL INCLUSION

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Introduction

Digital Financial Services (DFS) hold a promise to deliver financial inclusion, poverty alleviation and inclusive growth in developing countries. Evidence shows that digital financial platforms increase access to a broad spectrum of financial services among the unbanked population and employment in the informal sector (Omar & Inaba, 2020). With growth in the internet and telephone usage, Uganda's digital financial landscape looks promising. More specifically, between the years 2010 and 2020, mobile phone penetration grew by 107.1 percent to 26.5 million users while internet usage steadily increased by 60 percent to 20 million in the same period of review (UCC, 2020). The COVID-19 pandemic despite its adverse impact on the economy presents a unique opportunity to digitalize financial transactions and consolidate the financial gains in the country.

Notwithstanding this positive outlook, growth in the use internet and digital platforms in the financial sector has created new gaps of perpetrating cybercrime which costs Uganda enormous financial losses. Notably, the Serianu 2017 Cyber Security[1] report revealed that cybercrime cost the Uganda's economy an estimated USD 42 million (UGX 155 billion) with the financial sector, the most vulnerable. Worse still, less than 5 percent of the perpetuated crime is reported and investigated by police (UPF, 2020). The increased prevalence of cybercrime weakens consumer trust and confidence in the usage of digital financial services posing a threat to the long-earned gains in financial inclusion.

Evidence shows that whereas cybercrime is rampant in developed countries, these countries have since built cyber resilience causing cyber criminals to target developing countries like Uganda with emerging digital financial solutions to exploit their vulnerabilities (Yazbeck et al., 2019). More so, the financial sector in developing world suffers the consequences of a weak regulatory and legal environment that fail to mitigate cybercrime acts (Adomako et al., 2018). Considering these gaps, this article seeks; to examine the trends and extent of cybercrime in Uganda; assesses the current enabling environment in terms of the legal, policy, institutional framework put in place to mitigate cyber security; and draw from the proven models in other countries to recommend strategies that can mitigate cybercrime in Uganda's financial sector.

1. Approach and Methodology

This article adopts a mixed method approach based on qualitative and quantitative data. To analyse the trends of cybercrime in Uganda, we use quantitative data on cybercrime cases reported to Uganda Police Force specifically, the annual crime report for the years, 2017- 2019. Although the report underestimates the incidence of cybercrime (declares only reported cases), it provides insight into the trends and incidence of cybercrime in Uganda. The study also adopts a desk review of the various

[1] Serianu (2017). Demystifying Africa's Cybersecurity poverty. https://www.serianu.com/downloads/UgandaCyberSecurityReport2017.pdf

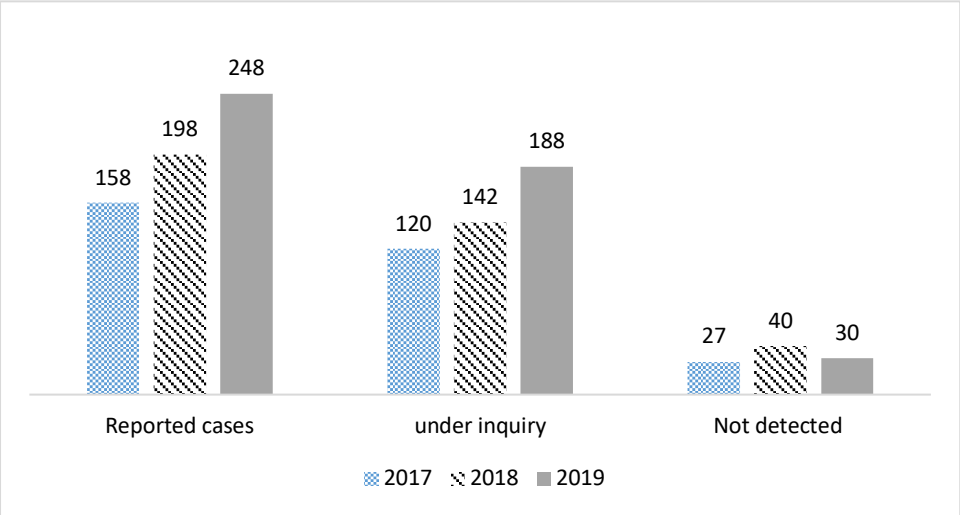
government documents; policies, laws and acts and interventions to assess the enabling environment for cyber security in Uganda with a special focus on the financial sector. Additionally, we review the related literature in the context of developing countries to recommend tested and proven interventions that can mitigate cybercrime in Uganda.

2. Findings

Trends cybercrime in the Uganda's financial sector

The land scape for the cybercrime shows a general increase in the reported cases to the Uganda Police Force. For instance, between 2017 and 2019, the reported cyber cases to Police steadily grew by 25.2 percent from 158 to 248 **(Figure 1).** This growth in cybercrime was driven by electronic fraud (internet banking and mobile money payments) due to weak internal controls, limited training on cyber security in banks and telecom companies (UPF, 2020). For instance, a telecom company and two large commercial banks in Uganda lost a total of UGX 1.7 billion through internal collusion fraud in 2019. The data further shows that most of the reported cases remain under inquiry or go undetected due to limited evidence to support prosecution of the cases.

Relatedly, the Uganda Police Annual crime report (2020) confirms this finding that the force is faced with limited capacity to conduct forensic investigations to address cybercrime. Uganda lacks enough Certified Emergency response Teams staff (CERTs) to respond to cyber-attacks compared to her African counterparts – Uganda has 300 CERTs compared to Kenya (1,500) and Rwanda (400) yet cybercrime is on the rise in Uganda (Adomako et al., 2018).



Source: UPF (2020)

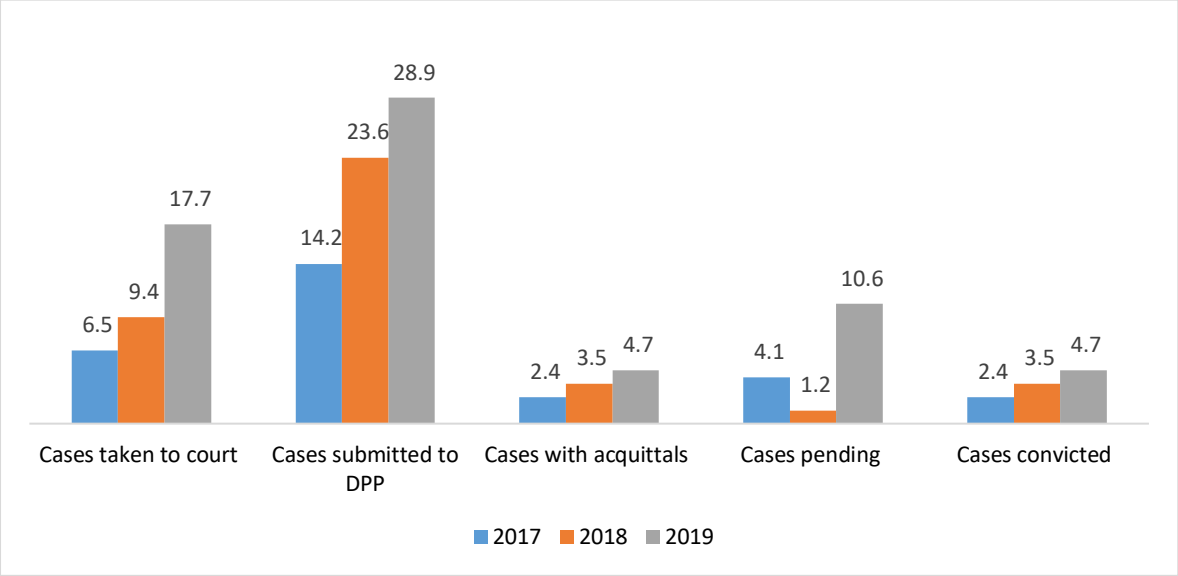
Figure 1: The annual performance of cybercrime cases reported to police, 2017-2019

Despite the rising trend of cybercrime, the share of cybercrime cases forwarded to court is substantially low. The share of cases prosecuted is still very low, although it has increased from 6.5 percent in 2017 to 17.7 percent in 2019, and the convicted

cases have increased from a very low 2.4 to 4.7 percent (**Figure 2**). This conviction rate still fell short of the 10 percent international requirement for effective cyber law enforcement[2].

Further, a substantial share of cybercrime cases are not submitted to Office of Director public prosecutions (ODPP). Notably, only three in every ten cases (28.9 percent) reported to Police are submitted to the ODPP for prosecution. This could be explained by inadequate specialised judicial staff trained in handling cybercrimes; particularly in investigating of cybercrime cases to the detail. Notably, Uganda's judiciary does not have strong witness system to facilitate the prosecution of cybercrimes given the sophisticated nature of cybercrime.

Figure 2: Prosecution of cybercrime in the courts of law (%), 2017-2019



Source: UPF (2020)

The Ugandan economy incurs enormous losses on account of cyber-crime. Data from the annual crime reports shows that money lost through cybercrime substantially grew from UGX 0.16 billion in 2017 to UGX 11.1 billion in 2019 **(Table 1).** The increasing trend of economic loss points to the improved adoption of electronic payments as a medium for transactions that has heightened the risk of perpetrating cybercrime in Uganda. More so, only a smaller share of the money lost through cybercrime is recovered.

Between 2017 and 2019, out of the total money lost to cybercrime, only 0.2 percent, 3.8 percent and 0.5 percent was recovered in 2017, 2018 and 2019, respectively. This is attributed to limited capacity by Police and the affected banks and organizations in dealing with issues of cyber security and crime. It is reported that banks are not punitive enough in applying the current laws to prosecute their internal staff involved

2 Adomako, K., Mohamed, N., Aminata, G., & Saint, M. (2018) Assessing Cybersecurity Policy Effectiveness in Africa via a Cybersecurity Liability Index. https://ssrn.com/abstract=3142296

in cybercrime. Consequently, the liability of perpetrating cybercrime is not deterrent to future cyber-attacks as criminals always find a way of going unpunished.

Table 1: The money lost and recovered in cybercrimes (UGX millions)

Year	Money lost (UGX)	Money recovered	% money recovered
2017	169.5	0.4	0.2
2018	610.5	23.3	3.8
2019	11,145.6	51.9	0.5

Source: UPF (2020)

The Legal and regulatory framework of cybersecurity in Uganda financial sector

Creating an enabling environment to promote access to digital financial services requires a clear understanding of legal, regulatory, and institutional framework that guarantees cyber security to all stakeholders in the financial sector. Accordingly, the Government of Uganda has enacted various bills, acts and policies and established institutions to fight cybercrime in the financial sector.

Firstly, government enacted the computer use act (2011) to prevent the unlawful access, abuse, and misuse of computers. The act spells out the definitions of cybercrime and penalties liable to the perpetrators of the offense. The computer act clearly spells out the procedural measures that law enforcement authorities can use to fight cybercrimes. Relatedly, the government enacted the Electronic Signatures Act, The Electronic Transactions Act, Electronic Misuse Act, the Access to Information Act and the Regulation of Interception of Communications Act 9. However, the enforcement of these laws is weak, characterised by the ineffective implementation due to limited budget and capacity. Moreover, there is limited awareness these existing laws among the stakeholders in the financial sector and the general public.

The Data Protection and Privacy Bill (2015) was enacted to support the data protection on electronics such as computers and mobile phones. Noteworthy, Uganda has not ratified the AU Convention on cyber security and personal data protection which has been ratified by only 16 countries in Africa. Uganda is yet to put in place a national cybersecurity strategy that can directly guide streamlined interventions aimed at fighting cybercrime in the country. Instead, the country has developed a National Information Security Policy (NISP) and a National Information Security Strategy spearheaded by NITA-Uganda which does not directly address cyber security issues. The lack of the cyber security strategy has resulted into adhoc implementation of cyber security interventions. There is no centralized approach and budget for cyber security, but every ministry allocates resources depending on the extent of exposure to cybercrime.

Regarding the institutional framework, Uganda established the Uganda communications commission (UCC) and National information Technology Authority,

Uganda (NITA-U) that are responsible for regulation of the cybersecurity environment in the country. However, these institutions are faced with limited technical and financial capacity to fight the rising levels cybercrime. For instance, these institutions face a challenge of limited budget to conduct country-wide cybercrime awareness programmes.

Additionally, the country has a few Central Emergency response Team (CERTs) professionals to deal with real time responses to cyberattacks in organizations, banks across the country. Regarding enforcement, the Uganda Police has cybercrime unit and electronic and computer measure department which are challenged manpower, capacity and resource gaps limiting their effectiveness and impact in investigating cyber cases given the evolving trends and pace of changes in digital technology and cybercrime.

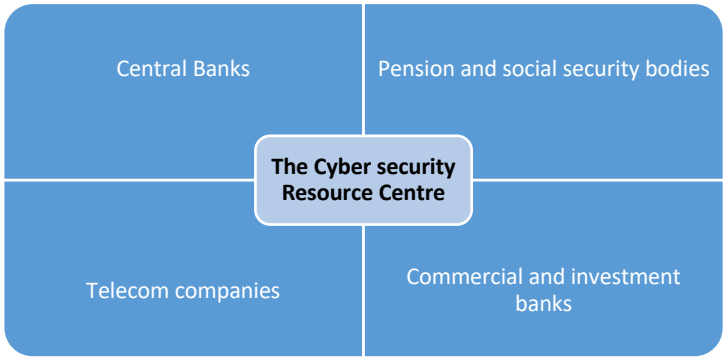
In conclusion, whereas the government has made some progress in providing a conducive environment for digital financial services, more effort is required through; i) increasing public awareness on cybercrime ii) developing the National cybersecurity strategy to guide budgets and structured interventions to mitigate cyber-attacks; iii) increasing the training of more certified Emergency response Team staff, Police personnel and judicial officers in handling cybercrime cases (CERTs); iv) developing communication guidelines between CERT-Uganda and stakeholders in the financial sector to improve response to cyber-attacks; v) improving the legal and regulatory framework so as to increase the number traction of successfully prosecuted cases; iv) and the provision of sufficient budget and resources to support the implementation of the strategy.

Successful strategies to mitigate cybercrime in Uganda's financial sector

The regional cybersecurity resource centre model: The model is based on the fact that developing countries have large human, technological and resource gaps in fighting cybercrime. As such, it is imperative for stakeholders to pool resources for development of shared resources to establish national and regional cyber security resources Centres. These centres allow the public and private sector players to exchange cyber threats, share the lessons to foster innovation and research in cyber security. The resource centres can be specialised for the financial sector stakeholders such as central banks, commercial banks, insurance companies, telecom companies, and pension bodies among others (**Figure 3)**. Given their multi-country context, regional resource centres promote the cross-border sharing of information, operate early warning systems and share regional trends related to cybercrime. The centres can be established with funding from the consortium members however they can be self-sustaining in the long run through their capacity building and cyber support programmes.

A case in point is the Suricate Solutions in Senegal established in 2015 to support financial inclusion in West Africa. The company provides basic cyber security to micro-finance institutions in Senegal and Ivory Coast but also partners with universities to offer job trainings to IT students.

Figure 3: Representation of the cyber security resource centre model



Source: Adopted with modification from the CGAP (2020)

Public private partnerships (PPPs) dialogue approach: Recognizing that cybersecurity is a multi-stakeholder responsibility is key in fighting cybercrimes in the financial sector. As such, cross-sectoral initiatives that promote public-private dialogues are central in mitigating cyber risks. For instance, the Nigeria's Electronic Fraud Forum a public-private dialogue platform promotes the exchange of information and sharing knowledge on fraud among key stakeholders. This platform entails representatives from banks, mobile payment operators, payment system operators, national security and intelligence authorities and the Central Bank of Nigeria. The forum meets every two months for facilitate collaboration on mitigating cybercrime and fraud and restoring public confidence in card usage and electronic payments.

The customer awareness and education campaigns approach. External communication to mobile money and banking agents as well as customers is a very important preventive tool in the fight against cybercrime. Creating awareness among customers equips them with the requisite knowledge to avoid the risk of fraud and handling customer scams when they occur. A case in point is the Safaricom M-PESA in Kenya which has invested significantly in customer awareness campaigns. The company found that customer awareness through clear communication messages as the most effective preventive control tool of fighting customer scams. To reach M-PESA customers, the Safaricom uses a multiple awareness programs. Specifically, the company uses SMS texts, radio announcements in local dialects, local skits, and newspaper adverts to empower customers to identify cyber threats, prevent cyber-attacks and seek correct redress to mitigate cyber threats.

1. Conclusion and recommendations

The digital finance services landscape in Uganda depicts a positive outlook due to increased internet and mobile telephone usage coupled with growing digitalization in the wake of COVID-19 pandemic. However, this growth presents the financial sector with heightened risk of cybercrime which costs Uganda's economy an estimated USD 42 million annually. The high incidence of cybercrime has weakened consumer trust and confidence in digital financial platforms and could roll back decade gains in financial inclusion. Although laws have been enacted to counter cybercrime, these enforcement measures have been by hampered due to limited awareness among the

stakeholders to hold the offenders to account. Additionally, there is not clear strategy and budget allocation to implement cyber security interventions in the sector. Regulatory bodies including UCC, NITA-U and Bank of Uganda lack specialised technical and budget capacity to timely detect and mitigate cybercrime given that digital technology is evolving. Even for the reported cyber cases, only less than 4.7 percent of the total cases are prosecuted in the courts of law due to limited capacity by Police and Judiciary to investigate cybercrime given the sophisticated nature of cybercrime.

To mitigate cybercrime for increased usage of digital financial services. there is need to;

Conduct customer awareness and education on cyber security: There is need for Government and digital financial service providers to sensitize customers on the various cyber laws as well as tricks used by cyber fraudsters. This is because customers (individual and SMEs) are the most targeted victims in cyber-attacks due to their limited knowledge in fighting cybercrime These campaigns are also critical for customers to acquire knowledge on data protection and privacy as well as the use of defence software to protect them from cyber-attacks.

Develop the cyber security strategy to guide interventions: To address the technical and resource gaps in fighting cybercrime, there is need to develop the cyber security strategy to streamline interventions and budgets aimed at fighting cybercrime in Uganda. Relatedly, the strategy should also provide for a specialised department in government responsible for spearheading the fight against cybercrime.

Invest in specialised training of personnel and forensic investigation in cybersecurity: Given the rising levels of digital technology, there is need to train specialised staff with the contemporary skills in cybercrimes for instance increasing CERT certification and IT professionals in the financial sectors while providing basic skills to all employees in commercial banks. Importantly, the staff in the justice, law, and order sector such as police, Office of Director of public of prosecutions and judicial officers should be trained in handling cybercrime cases.

Develop and increase the capacity of the judiciary to effectively prosecute and hold accountable the responsible people: With cybercrime rising but without a pre-requisite increase in the number of cases successfully prosecuted, the message of deterrence in respect of cybercrime is not made – there are really no or low consequences now. The judiciary must be purposely enabled to successfully prosecute and hold accountable the perpetuators of these crimes, with consequences as guided by the law.

Establish Public Private Partnership initiatives to fight cybercrime: Fighting cybercrime is a multi-sectoral responsibility that requires joint investment by public and private players. This is so because whereas the private sector is highly endowed with the latest digital technology, it is more vulnerable to cyber-attacks. On the contrary, the government regulators and enforcement bodies in most cases lack the latest

technology to fight cybercrime but have leverage over the law to fight cyber-attacks implying that partnerships between two parties are needed to harness each other's strengths to fight cybercrime. Public partnerships can be in form of joint ventures such the cyber security resource centres and regular dialogues aimed at fighting cybercrime.

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FINANCIAL INCLUSION FOR ENHANCING THE GROWTH OF THE AGRICULTURAL SECTOR IN UGANDA THROUGH THE ADOPTION OF VARIOUS FINANCIAL SERVICES A CASE OF RURAL AGRICULTURALISTS

by

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1.0 Introduction

Financial inclusion is a key enabler to reducing poverty and boosting prosperity. Financial inclusion means that individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered in a responsible and sustainable way.

The study examined how Financial Inclusion as a strategy used by the Ugandan Financial Sector shall fundamentally change and revolutionize the current practiced business models, as a result of the dynamic Technological Developments. Financial Institutions in Uganda and their stakeholders are now being challenged to change their ways, methods, instruments, and tools of transacting their Financial Services by being flexible, amending their financial regulations, offering their services around the clock, making sure that everybody and entity is financially inclusive.

This therefore calls for a revolution in respect of the Financial Services offered by Financial Institutions, especially for enhancing the growth of the rural agricultural sector in Uganda, under the Fourth Industrial Revolution (4IR by Schwab (2016). Prior to the 4IR, there was The Third Industrial Revolution (3IR) by Rifkin (2011), who sounded a warning to all people worldwide, by advising them to adopt new ways of doing things, and stated that, *"The old ways of creating wealth just don't work anymore, and politicians the world over are struggling to cope with the convergence of financial meltdown, huge debt, rising commodity and energy prices, accelerating climate change, and food and water shortages.* In the same vein, Schwab (2016) in his book: The Fourth Industrial Revolution (4IR), further emphasized that, *"the current technological developments will fundamentally change not only business models, but also governance, economics, indeed all of society and even the individual".* The question is, can the operators, regulators and even the individuals who offer and take advantage of these financial services, bend or change without breaking their institutions, resources, and hopefully not breaking themselves as individuals?

Financial Inclusion and Financial services

The African continent at Global Policy Forum (GPF, 2011) of the Alliance for Financial Inclusion (AFI), adopted the Maya Declaration on Financial Inclusion, which was followed by The African Financial Inclusion Policy Forum (AFIPF, 2012), that made a recommendation to scaling up of financial services through mobile technology. This was endorsed, hence leading to the development of the National Financial Inclusion Strategy 2017 - 2022 (AFI, 2011; BoU & MFPED, 2017). As per documentary review, it was noted that, no headline target was set for financial inclusion in terms of the minimum and maximum number of people's livelihood, expected level of productivity, percentage growth of a particular sector, e.g., agriculture, expected transformation from rural to urban. Even the monitoring and evaluation, motivating the agricultural communities, via offering low interest rates and subsidies, training, mode of collaboration, were not stated for guidance and accountability purposes. Noting some of these gaps which have continued to limit "financial inclusion", this study proposed the adoption of a "holistic financial inclusion

model" that will use the Farmers Mobile App (FMApp). This model will bring various agriculturalists, policy makers, financial institutions, and other stakeholders on board (Table 1).

Technological Development of the Financial Sector

The digitalized financial revolution stems from the Theory of Superior Financial Technology and Aggressive Marketing, that was advanced by Robert Fieleke (1976). It was also during this period that, Society for Worldwide Interbank Financial Telecommunications (SWIFT) was initiated and implemented. Financial Institutions in Uganda have adopted SWIFT, which has been supplemented by Real Time Gross Settlements (RTGS) and Electronic Funds Transfer (EFT) which facilitate any type of payments from one place to another within the country under special arrangement, to other countries worldwide via correspondent banking (Chorofas, 1988, OECD, 2006 & BoU, 2017).

The e-financial services offered under the digitalized financial revolution, inter alia, include Internet Banking and Automated Teller Machines (ATMs) by Commercial Banks; Point of Sale (POS) by both the Commercial banks and merchants and E-money (Mobile Money) and Telephone Banking by Telecommunication Companies like Airtel and MTN. Among all the noted Financial Service Providers, it is the Telecommunication Companies that have greatly extended financial services to both the urban and rural areas of Uganda.

According to Murungi (2021), it is estimated that, more than 23 (61%) million mobile money wallets are served by mobile money operators via their telecommunication companies, compared to 14(39%) million bank accounts, being served by the banking sector. The mobile money revolution which fits well in the 4IR, has partly, but not wholly contributed to Financial Inclusion among some of the industrial sectors in Uganda, though the rural agriculture sector, has to a certain extent been financially excluded. According to Schwab (2016), technological development can cause and bring innovative changes while doing businesses, i.e., offering financial services to rural agriculturalists. This calls for agricultural and financial innovativeness, if organizational and institutional transformation of the existing Financial Services, geared towards Financial Inclusion of the Agricultural Sector in the Rural Areas of Uganda, via the adoption of Financial Technology. (Dev, 2006; Rifkin, 2011, World Bank, 2017; Zhao, Tsai & Wang, 2019).

Problem Statement

According to the documentary review, financial inclusiveness in rural areas is still a challenge. It was noted that, the initiated programs by various stakeholders do not emphasize support to small holder commercialization of agriculture (Seidel, et. al., 2013 &Turvey, 2017). Through the responses from the respondents, it was noted that, the rural agriculturalists are financially illiterate, do not have collateral to access agricultural credit, and when available the cost of borrowing is high. They also face unpredictable weather

conditions during the seasons. The majority live in remote distant areas, which raises the transport costs for their own travel and products. Some products due to lack of technological know-how decay, go bad and are thrown away leading to low sales and low liquidity, for the developing their rural areas (IFC, 2012). The statistics for agricultural share in GDP show 22.75% (2016), 23.45% (2017), 23.24% (2018) and 23.05% (2019) (World bank Reports). The study via interviews noted the rural agriculturalists' lamentations of their inability to educate their children, access health care facilities and poor livelihood. The problem which this study addressed, is low financial inclusion and low agricultural production in the rural areas of Uganda (Iwumbwe, 2015).

Significance of Financial Inclusion

The evolved economic programmes geared to the rural agricultural sector by various stakeholders for financial inclusion, aim at increasing the wellbeing, income, standard of living of the rural agriculturalists, leading to reducing poverty and enhancing macroeconomic stability (Beck *et al.,* 2004; Andrianaivo & Kpodar, 2011; Sarma & Pais, 2011; BoU, 2012., Han & Melecky, 2013; Kim, 2016). A financially inclusive population is key to reducing income inequality and poverty, and will contribute to enhancing the household livelihoods incomes, productivity, development, and economic growth in terms of the country's GDP. hence leading to money creation in the economy. It should therefore be in the interest of BoU, in a bid to managing its monetary policy, to monitor all the money circulating in the country if it is channeled through the banking system and accounted for by the involved financial institutions.

THEORETICAL REVIEW

The literature survey and the reviewed models on this study, identified many national and international studies on financial sector operations, which covered financial inclusion, financial institutions, financial services and agriculture (Dev, 2006; International Finance Corporation, 2012; Kasekende, 2016; ; World Bank, 2017&Oz-Yalaman, 2019) , but none addressed the issue of how financial services offered by the financial sector through the adoption of financial inclusion strategy can enhance the growth of rural agricultural areas in Uganda, a case of rural agriculturalist, a gap which this study addressed.

Financial Sector

Uganda's financial sector comprises of the financial institutions (depository and non-depository), credit markets (money and capital markets) and financial instruments (currencies, debt, cheques, shares, stocks, bonds, futures, and options contracts). It is regulated by various regulatory frameworks (acts, statutes, codes, policies, principles, practices, guidelines), that create a conducive environment, that facilitates and enables the exchange and settlement of any legal financial transactions. The financial sector is charged with providing financial services to the country and its populace, especially the households,

business community and Government. It is worth noting that, financial institutions which are the majority, are charged with risk transformation, aggregation of funds, maturity transformation and transfer services. They also act as intermediaries to outsiders and foreign financial institutions (Saunders & Cornett, 2003; Mayes, 2014; Mishkin, 2016 & BoU,2017). The challenge faced by Uganda's financial sector is delivery of its financial products and services to all parts of Uganda, though it has been in existence for a century.

Financial Services

These are to a limited extent offered by the entire financial sector in Uganda by the financial institutions, credit markets and financial instruments. Noting that, the credit markets and financial instruments are limited to few corporate clienteles, and they are not spread all over the country, the study concentrated only on the financial institutions.

The scope of this study therefore covered the financial institutions because by 2020, they had 14 million bank accounts for their clientele, with 11 000 banking agents countrywide (Murungi, 2021). Noting that the majority of the financial institutions' business is banking, these financial institutions establish accounts for individuals and corporate clientele for effecting various domestic and international banking transactions. The bank accounts are therefore established for that purpose, based on the motives and choice of their clientele. These accounts include, but are not limited to savings, current (checking), investment, credit/ loans accounts, mortgages, guarantees, leasing, insurance, foreign exchange, stocks and shares, real estate finance, letters of credit, trade finance, agricultural finance, as well as electronic visa debit and credit cards.

Other accounts for electronic payments are affected via Society for Worldwide Interbank Telecommunications (SWIFT), Real Time Gross Settlements (RTGS) and Electronic Funds Transfer (EFT) and internet banking, plus the mobile money transactions. Though this study specifically analyzed how the financial institutions can promote financial inclusion for enhancing the growth of the rural agricultural sector, it also briefly analyzed how the credit markets and financial instruments can also be explored and incorporated in the operations of the Ugandan financial sector for promoting a holistic financial inclusion. This therefore requires the adoption of mobile money banking platform, that will connect with the Uganda commodities exchange, when it comes to the operations of the credit markets.

There are various Financial Inclusion Models (FIM) which have been adopted by various Financial Institutions, which include Microfinance, Agency Banking, SACCOs, Mobile Money, Internet Banking, Village Banks, and Government Programme like Entandikwa, Kulembeka, Bonna Baggawale, Operation Wealth Creation, Emyoga and the Parish model. Their contributions towards enhancing the productivity and incomes of the rural agriculturalists needs to be improved. Some of the respondents expressed their concerns, that these programmes were political, because they do not concentrate on the economic development of the communities, but they appear to be handouts and do not yield any sustainable return, which should one of the goals of financial inclusion.

Holistic Financial Inclusion

Financial inclusion is one of the policy tools or strategies used by the Ugandan Government, BoU, Financial Sector and stakeholders, that enable access, availability, and usage of the offered or to be offered financial services in appropriate form (Sarma, 2008; MFPED, 2017, &Oz-Yalaman, 2019). This being a qualitative study, that used critical thinking skills, excogitated on the latter definition, and explored that, it was devoid of some content, hence making it not fit for the purpose, because it does not reflect the "holistic financial inclusion", a gap which this study closed. According to this study, financial inclusion should therefore, encompass a comprehensive economic and financial measures that shall start with money transactions changing hands or / and crediting it on one's account, thereafter, putting it in the system where it can produce or generate other products or money. Then have it re-invested to earn more money.

The invested money shall then be withdrawn or transferred on demand to buy or pay for certain goods which will later be sold or produced at a higher rate. The earned money shall again be re-invested or put on a bank account through the banking system. This process if followed shall ensure a sustainable "holistic financial inclusion", which this study has recommended. This process will guarantee productivity and continuous savings, which is not the case with the previous programmes, that have promoted financial inclusion. The operationalization of the proposed holistic financial inclusion will depend on the legal and regulatory framework in place, that will require the approval of BoU, then go through Parliament, so that every Ugandan citizen, at least those participating in rural agricultural areas are documented, sensitized, and motivated to be part of the sustainable holistic financial inclusion.

Rural Agriculturalists

Rural Agriculturalists, who are at times, known as subsistence farmers or smallholder farmers, practice both crop or/and animal husbandry on an average farmland area of at least two hectares. They engage in livestock, poultry, crop farming, beehive, and fisheries, and are usually not aware of the type of financial services offered and how to access them (Dev, 2006; Ochieng, *et al,* 2016; Pedrick, 2018). The World Bank (2017) while commenting on the significance of the rural agriculturalists, who are the smallholder farmers, stated that: "Smallholder farmers manage 80% of the farmland in Sub-Saharan Africa and Asia, and provide up to 80% of the food supply in the region". In Uganda, there are three million smallholder subsistence farmers, who account for over 70% of Uganda's export earnings and who also provide materials for the agro-based industries, hence making a major contribution as the country's food basket (World Bank, 2017).

This shows their significant role as rural agriculturalists, hence need to sensitize them to join and be counted in the holistic Financial Inclusion drive. The rural agriculturalist face challenges of getting land titles to pledge as security in case they wanted money from the formal financial institutions for agricultural production, mechanization, tractor hire services,

training, insecticides, oxen- ploughing, livestock restocking and procurement of quality seeds (World Bank, 2017 & International Finance Corporation, 2012). This study is in agreement with Dev (2006) &Kasekende (2016), who support financial inclusion for those seeking diverse financial services like credit facilities as well as, for increased productivity and sustainability of their farms. The latter requires these agriculturalists to be motivated via subsidies and low interest rates on agricultural loans, which they think can be offered by the AGRICOOP Bank which is not yet in existence.

Mobile Money

The presence of various Mobile money services via MTN Uganda, Airtel Uganda, UTL, Africell, M-Cash, Ezee Money and Micrpo Pay have not contributed much to the rural agriculturalists, because they their business motives, focus and perceptions, do not match with the ones expected from the agriculturalists. However, responses from the urban populace stated how they had benefited irrespective of the used mobile platform. But the rural agriculturalists wished to have a mobile platform that suits and serves their interests and needs, hence the recommended ARBM. Preference was given to the use of mobile money compared to banks because the usage of mobile money was not expensive, hence affordable, no account closure despite having a zero balance, does not require any identification documents or signature on deposit, withdrawal and transfer and above all, it is cheap and accessible, because it has branches and agents scattered all over the country; and above all, its operators or staff are available around the clock.

In addressing the issue of the need for various Financial Services for the rural Agriculturists, consideration was given to the agriculturalists who yearn for credit and want to secure their investments. The financial institutions on the other hand want to capture the agricultural market via penetrating the unbanked areas. This requires a needs assessment for ascertaining those who will embrace financial inclusiveness through segmentation, targeting and positioning. That is why the model requires the agriculturalist to undergo the registration exercise by the MAIIF. This is in line with adhering to KYs Practices, especially “Know Your Customer” and “Know Your Money”, hence need to identify those individuals and corporates, who should be targeted for financial inclusiveness as prospective customers.

In analyzing the extent to which Financial Institutions have availed their Financial Services to the to the rural Agriculturists in Uganda, documentary reviews and interviews were undertaken. Almost every bank offered savings, current (checking), investment, credit/ loans accounts, mortgages, guarantees, leasing, insurance, foreign exchange, stocks and shares, real estate finance, letters of credit, trade finance, agricultural finance, as well as electronic visa debit and credit cards. Some banks extend their services to the Small Medium Enterprises (SMEs), who mostly engage in services and trade, hence neglecting the agricultural sector, especially that in the rural areas. (Ssonko, 2010).

On the effectiveness of the various Financial Services offered, the study focused on examining how Smallholder farmers had been assisted, as far as their investment in agriculture as a business is concerned. Due to lack of records this was not established.

The use of physical cash was important to them, rather than thinking of the cashless transactions, due to the cash culture. It has been noted that, out of the 355 million adults in developing countries that reported having a bank account, they still resort to remitting money by cash or over the counter. For a bank account to be relevant in these peoples' lives, it must be useful and function as a gateway to other financial services which can improve their overall economic welfare (Technology HQ (n.d). Some banks like DfCU, Stanbic, Centenary and Equity, operate the largest number of branches totaling to 240, supplemented by 491 ATMs. Their services do not reach the rural agriculturalists. It was with this background that the "Agriculturalists Registration Banking Model (ARBM)" was developed, to cater for the unbanked rural areas. This model's success will however depend on the establishment of the proposed AGRICOOP Bank, that will develop a Mobile Farmers App (MFApp), which will link to the rural agriculturalists, for transacting their financial transactions. This is a gap which this study set out to close.

METHODOLOGY

This was a cross-sectional study, that adopted the Qualitative approach, that considers subjective and non-numerical data, which was generated via documentary analysis and during the interviews. Purposive, Convenience and Snowball Sampling Techniques were used, whereby responses from open-ended and conversational communication, were applied. Their Adoption helped the researcher to understand the opinions, perceptions, and experiences of the respondents. It was therefore easy to perceive, what they thought and why they thought so. Being a qualitative study, the minimum sample size of 15 to reach data saturation (Clarke & Braun, 2013; Guest, Bunce, & Johnson, 2006) was deemed fit, so a sample size of 60 was deemed sufficient for this study. The researchers applied analytical research design, that called for application of critical thinking skills, that discovered critical information, especially the recommendations that led to the FIIM. The analytical research helped in carrying out a thorough in-depth investigation, that makes this study reliable (Feingersh, (2020).

These methods, further helped in data collection and made it easy for the researcher to get responses from the affected respondents who had experience and resided in some of the unbankable areas, especially the rural agriculturalists.

In accessing the documents and respondents, a letter from Nkumba University, stating that, this study was for research purposes, and that any information given will be kept confidential was obtained and presented or/and read to the respondents where applicable. The study covered a period of two months and was interrupted by COVID-19 Epidemic, but this was addressed by using internet, telephone, and face to face interactions.

FINDINGS

Interest in embracing new technology

This study having been carried out during the COVID-19 Epidemic period (May-June 2021) gave the researchers the opportunity to interact with the youth in Arua (Northern Region) and Kyenjojo (Western Region), who were at home due to the closure of their schools and other institutions of higher learning. These youth were helping their parents on the land and were able to interact with the researchers, since they are the future agriculturalists. They showed interest in agriculture and were interested in using phones, though some never had smart phones and other e-gadgets. Three out of five who were in a focus group, expressed their interest to market their parents' agricultural produce via telephones and internet. One mentioned of having called a neighbor with a motorcycle who delivered their five cocks to the customer who had deposited his money on the parents' mobile phone. This was easy, faster, and convenient, because the saved time, was committed to helping his parents with other manual work and gardening at home. If the youth are facilitated, they will be able to teach some of their parents and impart the e-skills to the rest of the rural communities, in accessing e- financial services and effecting e-marketing services.

Motivation of the Agriculturalists

The rural agriculturalists expressed their need and interest in transforming the way they are operating since they want to achieve more production and increased income from their investments. The study notes that, smallholder farmers can engage in agricultural commercialization if given at least 50% support in terms of investment like mechanization, insecticides, hybrid seeds and products, irrigation, and risk management techniques. The latter will, cause change from the rural to urban, leading to enhancement of the growth of the rural agricultural sector, hence contributing to the country's GDP as advocated under the 4IR.

RECOMMENDATIONS AND POLICY IMPLICATIONS

The study established some of the recommendations which will have policy implications on the policy makers, BoU as a regulator, Government Ministries, and other stakeholders, who will need to act swiftly in addressing the issues related to the financial inclusion and enhancement of the rural agriculturists in Uganda. These include, but not limited to the Establishment of the Agricultural Cooperative Bank (AGRICOOP), Developing a Holistic Financial Inclusion Model for Rural Agriculturists in Uganda.

Establishment of the Agricultural Cooperative Bank (AGRICOOP)

Interviews with some of the former members of the Cooperative Unions and Cooperative Associations of Kigezi, Bugisu, Kakumiro, East Mengo, Bunyoro, Nyakatonzi, and West

Nile Growers Cooperative Unions, who are agriculturalists, expressed their 100% support to have the Agricultural Cooperative Bank (AGRICOOP) established.

Holistic Financial Inclusion Model for Rural Agriculturists in Uganda.

Various models from other countries namely the Branchless Banking Model in Brazil, the M-Pesa in Kenya, Community Bank in Nigeria, The Village community Bank in Tanzania, the Self-Help Groups in India do not address the Agricultural facilities for promoting Rural Agriculturists in Uganda. Even Local Model the developed Stanbic bank and Equity bank, Microfinance, SACCOs have not gone dipper to assist the rural agriculturalists. It is therefore with this background that the study is proposing the Holistic Financial Inclusion Model for Agriculturalists in Uganda.

The study proposed the "Agriculturalists Registration Banking Model" (ARBM) in Fig 1, as depicted in Figure 1, which will first need approval from BoU and policy makers for its implementation. This will need the establishment of the AGRICOOP Bank, which will develop a tailor-made Mobile Farmers' App (MFApp), that will link to the agriculturalists (farmers), who will be in a position to pay, invest, withdraw, or transfer their money anywhere, anytime, without any delay and bureaucracy. The adoption of the ARBM (Fig 1 and Table 1) will bring the rural agriculturalists into the banking sector, hence achieving holistic financial inclusiveness.

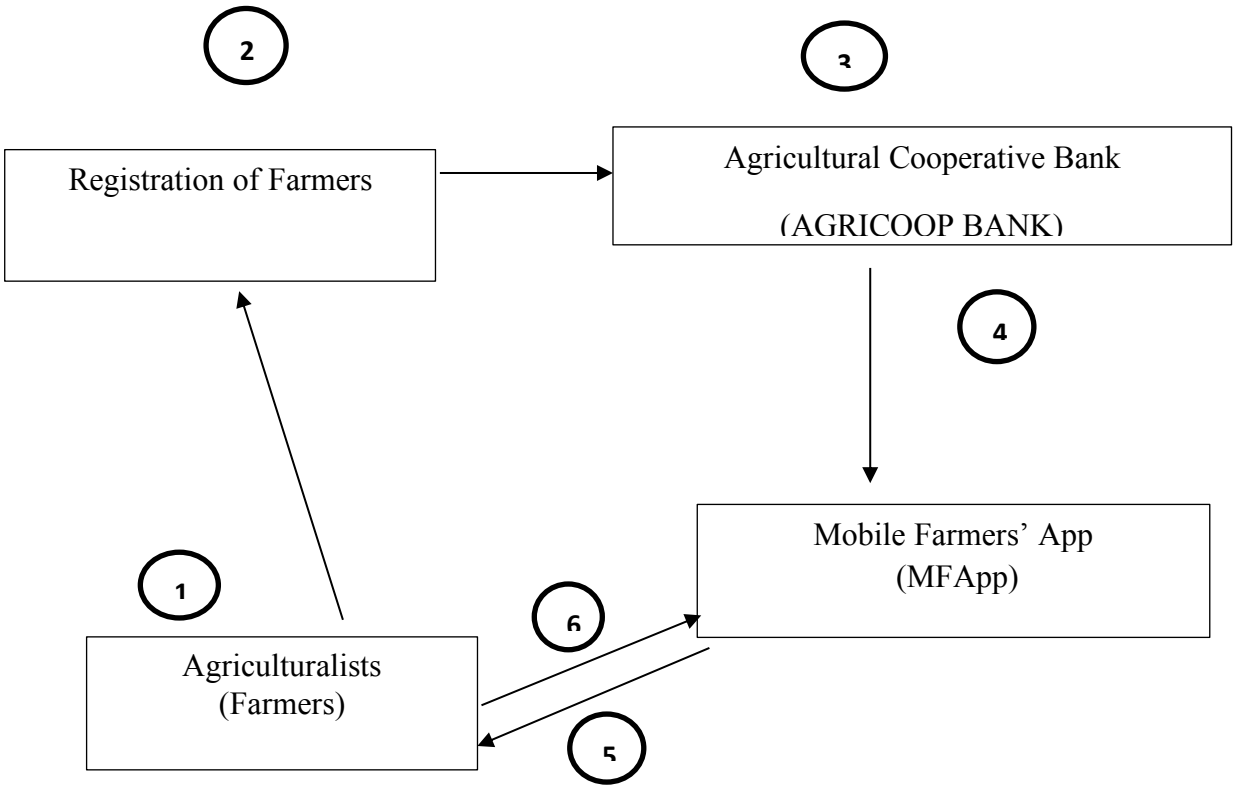

Figure1: The Agriculturalists Registration Banking Model" (ARBM)
Source: Developed by the Researchers, Nkumba University, June 2021.

Table 1: ARBM MODEL DEPICTING STAKE HOLDERS AND ROLES

ACRONYM	STAKEHOLDERS	ROLES
A-Agriculturalists	Rural farmer engaged in: Crop, livestock, fisheries, beekeeping, poultry, piggery	Production, procurement of inputs, processing, selling, and marketing
R-Registration	MAAIF, NIRA, MICT, UBOS, Farmers Associations, Agricultural Cooperative Organizations	Creation of Farmers Databank, Sales, Production, identification of type of business sectors
B-Banking	AGRICOOP BANK, MFPED, MAAIF, BoU, UDB, WB, IMF, IFAD, IFC, UBA, Enterprise Uganda, Private Sector Foundation, Uganda Investment Authority	Agriculture financing, ordination with other stake holders, soliciting for funds, risk management
M-Mobile App	MTN, AFRICEL, M-PESA, MICT, UBOS	Savings, Payments, Money Transfers, Investment

Source: Developed by the Researchers, Nkumba University, June 2021.

CONCLUSION

Uganda's financial sector is committed to the Maya Declaration on Financial Inclusion for *scaling up its financial services through mobile technology. In this regard, BoU* developed the National Financial Inclusion Strategy 2017 - 2022 which is a good indicator for promoting financial inclusion. In promoting a holistic financial inclusion strategy as a means of bringing the financial services to the rural agricultural sector in Uganda, the proposed Agriculturalists Registration Banking Model (ARBM) should be supported. Finally, the financial sector should embrace the digitalized financial revolution which evolves from the Theory of Superior Financial Technology and Aggressive Marketing that was advanced by Norman Fieleke in the (1976) and which have of late led to discussions on the 3IR by Rifkin and 4IR by Schwab, who all advocate for innovative Financial Technologies, that will bring positive institutional and organizational changes in the governance of the Financial Sector.

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HOW BANKS CAN LEVERAGE ON ARTIFICIAL INTELLIGENCE CAPABILITIES TO EFFICIENTLY EXECUTE THE AGENT BANKING MODEL AND ACCELERATE FINANCIAL INCLUSION.

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1.0 Introduction

Pre-independence, there were four major banks in Uganda including Barclays, Grindlays Bank, Standard Bank, and the Bank of Baroda.[1] By mid 1990s the number of commercial banks had increased to twenty. However, the introduction of moratorium on banking licenses and closures of a few banks decreased the number to fifteen.[2] Today, the country boasts of twenty-five commercial banks, five credit institutions, and four microfinance deposit taking institutions (MDIs).[3] The industry has been growing steadily and most of the banks now have a geographical footprint covering key major cities and towns.

Despite the growth in the financial sector, 7.7million adults are still unserved and 76% of the unserved adults are rural based with limited access to the financial system.[4] It should be noted that financial exclusion is a systemic and a global challenge. It is estimated that 1.7 billion adults are unbanked and financially excluded worldwide[5] and governments from low- and middle-income countries in Sub-Saharan Africa and Asia are adopting programs to address the problem. The challenge has opened doors to financial innovations such as agent banking model which is becoming popular at enabling the access to financial products and services to the unbanked population, especially in the rural areas. In Malawi, a study revealed that branchless banking is feasible in the unbanked rural setting.[6] While in Kenya, technological advancements and financial innovation that enabled customers to perform a range of financial transactions through a third party was redefining the financial markets.[7]

Agency banking, a model with similarities to mobile money, empowers commercial banks to appoint agents to provide banking services such as account opening, cash deposits,

[1] "The First Bank in Uganda," Daily Monitor, February 28, 2015, https://www.monitor.co.ug/uganda/news/insight/the-first-bank-in-uganda-1602198, accessed on 02 July 2021.
[2] "The Financial Sector in Uganda," ABC Capital Bank Uganda, December 12, 2017, https://www.abccapitalbank.co.ug/the-financial-sector-in-uganda/, accessed on 02 July 2021.
[3] Bank of Uganda. "Annual Report," 2020, https://www.bou.or.ug/bou/bouwebsite/bouwebsitecontent/publications/Annual_Reports/All/Annual-Report-2019-2020.pdf, accessed on 02 July 2021.
[4] Financial Sector Deepening. "Informal Financial Inclusion in Uganda," 2018, https://fsduganda.or.ug/wp-content/uploads/2019/02/FinScope-2018-Informal-Financial-Inclusion-Report.pdf, accessed on 02 July 2021.
[5] The World Bank. "Global Findex Report," 2017, https://globalfindex.worldbank.org/sites/globalfindex/files/chapters/2017%20Findex%20full%20report_chapter2.pdf, accessed on 02 July 2021.
[6] Augustine Mtambalika et al., "Branchless Banking in Rural Malawi: Potential Customers' Perspective on Bank-Led Mobile Banking," *2016 IST-Africa Week Conference*, 2016, https://doi.org/10.1109/istafrica.2016.7530701 , accessed on 02 July 2021.
[7] Moses Mwenda Muthinja and Chimwemwe Chipeta, "What Drives Financial Innovations in Kenya's Commercial Banks? An Empirical Study on Firm and Macro-Level Drivers of Branchless Banking," *Journal of African Business* 19, no. 3 (2017): pp. 385-408, https://doi.org/10.1080/15228916.2017.1405705, accessed on 02 July 2021.

cash withdrawals and more on their behalf.[8] In many developing nations, agency banking has been instrumental in enhancing the penetration of banking services in unbanked markets. It has accelerated access to a full range of banking products within a less than formal setting, demystified banking among low income populations and placed beneficiaries on sure path towards become financially secure.[9] In Uganda, the Parliament passed the Financial Institutions Amendment Act, 2016 to make provisions for Agent Banking and it is governed by Agent Banking Regulations 2017.[10] The agent banking proposition was followed with the launched of the Shared Agent Banking System (SABS) in 2018, a technology platform that enables financial institutions collaborate towards reducing financial exclusion.[11]

Benefit of Agent Banking Model

Customer	• Ease of access • Flexible hours • Cost effective
Agent	• Increased income through commission • Increased customer traffic hence more business to the shop
Bank	• Cutting cost • Increased product penetration • Wide customer base

Source: Agent Banking Company

Figure 1. List of benefits from the agent banking model

In this paper, we discuss how technology is accelerating banking services in the unserved communities. The paper outlines a conceptual framework of using artificial intelligence to efficiently execute the agency banking model. It hypothesizes that by augmenting SABS technology with AI capabilities in a collective fashion, can greatly improve customer experience, increase product penetration in the unbanked population as well as promote efficiency in the financial sector. Through this proposed model, financial institutions shall

[8] "About Agent Banking," Agent Banking Company, accessed July 2, 2021, https://agentbanking.co.ug/.

[9] Dorine Ayuma Barasa and Fred Mugambi Mwirigi, "The Role of Agency Banking in Enhancing Financial Sector Deepening in Emerging Markets: Lessons from the Kenyan Experience," *European Journal of Business and Management* 5, no. 21 (2013): pp. 19-21. 02 July 2021.

[10] "About Agent Banking," Agent Banking Company, accessed July 2, 2021, https://agentbanking.co.ug/.

[11] Uganda Bankers' Association, "Uganda Bankers' Association Annual Report," 2019, http://ugandabankers.org/UBA%20Annual%20Report%202019.pdf, accessed on 02 July 2021.

listen to the voice of the customer in the unbanked population through data and efficiently respond with the right solutions.

Today, everything that involves technology seems to have some element of Artificial Intelligence (AI). AI is considered an engine of productivity and economic growth. It can increase efficiency and vastly improve the decision-making process by analyzing large amounts of data.[12] AI is defined by Andrew Ng as a huge set of tools for making computers behave intelligently and in an automated fashion. This includes voice assistants, recommendation systems, and self-driving cars.[13] The concept of AI is not new in the Uganda scene. In 2020, Absa Bank Uganda launched "Abby" to its customers. "Abby" is a 24/7 digital personal banker powered by AI technology. It is designed to support Absa bank customers who intend to make payments, purchase airtime, access account information or answer general queries.[14] As more transaction activities migrate from the traditional brick and mortar system to low cost channels such as agents, financial institutions can now collect invaluable data from the unserved population. Such data shall be useful in strategic decisions making to penetrate the 7.7million of the unbanked population.

This paper is structured as follows. Firstly, a brief background on financial sector and financial inclusion, financial inclusion through technology, and agency banking model. Secondly, conceptual framework on how augmenting SABS with AI capabilities will improve customer experience, increase product penetration in the unbanked population as well as promote efficiency in the financial sector. Thirdly, a discussion and recommendation of the proposed concept in the financial services sector in Uganda.

1. Background

1.1. Financial Sector and Financial Background

Over several decades, financial institutions in Uganda have facilitated economic development through financial intermediation. Even in 2020 a year that was challenging majorly attributed to the pandemic, financial institutions were able to post remarkable

[12] Szczepanski, M. "Economic impacts of artificial intelligence (AI)." *European Parliamentary Research Service (PE 637.967)* (2019). accessed on 02 July 2021.
[13] "Andrew Ng," Wikipedia (Wikimedia Foundation, June 13, 2021), https://en.wikipedia.org/wiki/Andrew_Ng, accessed on 02 July 2021.
[14] "Abby Is Your Virtual Assistant," Absa, accessed July 2, 2021, https://www.absa.co.ug/personal/digital-solutions/abby/

performances. Albeit the asset quality of the banking system deteriorated partly attributed to the slowdown in economic activities occasioned by the shocks due to coronavirus, the sector remained adequately capitalized and maintained adequate liquidity buffers.[15] Financial institutions were among the few organizations in Uganda that continued serving the public at the peak of the first wave of the pandemic. Given their existence of nearly 115 years,[1] 7.7million adults are still excluded from the financial system and 7 out of 10 unserved adults live in remote locations in Uganda.[4]

Financial inclusion is defined as the ability to empower all individuals in the economy to access financial services such as insurance, loans, current accounts, savings products.[16] Empowering every Ugandan citizen in the economy with the ability to make financial decision is a driving force to inclusive growth which leads to sustainable economic development. Today, a growing body of research reveals a strong correlation between financial inclusion and economic development exist, and this is attracting the attention of low and middle income countries to delve on the benefits of financial inclusion because developed nations have made gains.[16] For many decades, governments from industrialized countries have accelerated economic growth by providing well-functioning financial systems to enable financial institutions to provide affordable credit and other financial services to many citizens.[17] This has enabled growth of existing businesses leading to the advent of new ones. From a household perspective, functioning financial system has facilitated a balance between spending and savings thus improving the quality of life of individuals.[17]

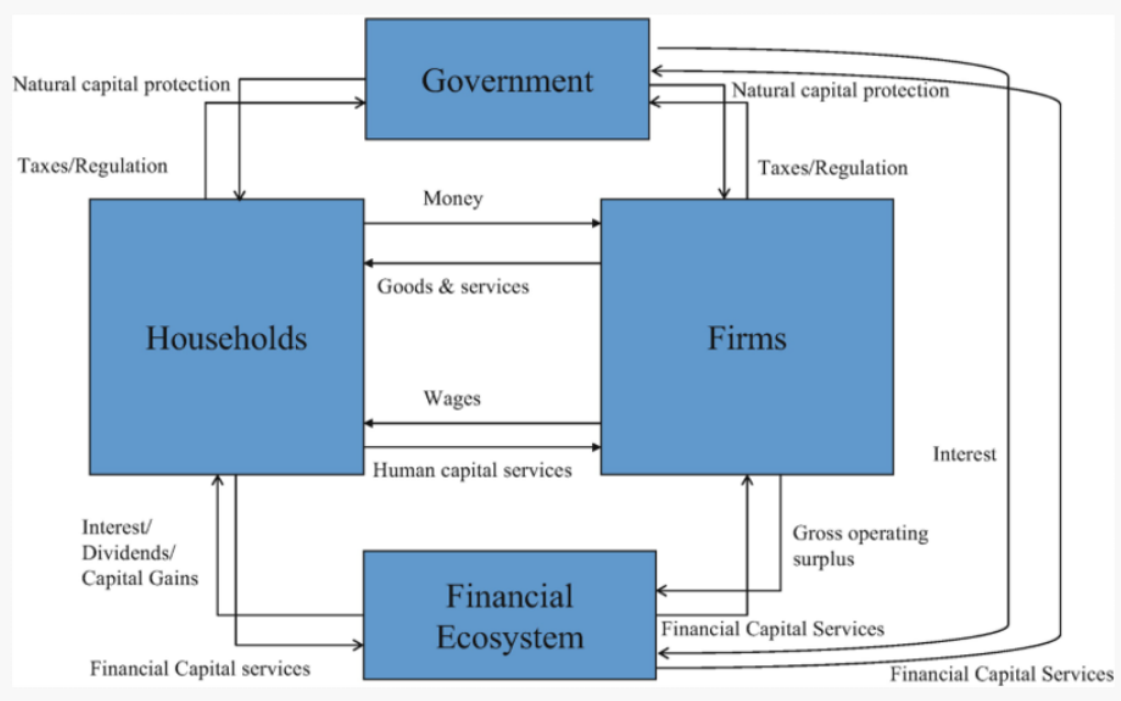
In the Uganda context, the government has committed itself through the third National Development Plan 2020-2025 (NDP III) to develop financial sector and its infrastructure in an effort to mobilize long term savings and investments. These aspirations will be achieved by involving the banked and unbanked population in Uganda. The World Bank (2017) estimates approximately 8 million Ugandan adults have access to an account at a financial institution[17]. While FinScope (2018) report revealed that 3.7 million Ugandans are using informal financial services and 4 million have been excluded from the financial system.[4] Through the Financial Sector Development Strategy (FSDS), the government of Uganda

[15] Bank of Uganda, "Annual Report," 2020, https://www.bou.or.ug/bou/bouwebsite/bouwebsitecontent/publications/Annual_Reports/All/Annual-Report-2019-2020.pdf, accessed on 03 July 2021.

[16] Khac Hieu Nguyen and Thi Anh Nguyen, "Impact of Financial Inclusion on Economic Growth: GMM Approach," *2020 5th International Conference on Green Technology and Sustainable Development (GTSD)*, 2020, https://doi.org/10.1109/gtsd50082.2020.9303088, accessed on 03 July 2021.

[17] The World Bank, "Step by Step Let's Solve the Finance Puzzle to Accelerate Growth and Shared Prosperity," 2017, https://documents1.worldbank.org/curated/en/662191486394023103/pdf/112621-WP-P161699-PUBLIC-UEU-8TH-edition-final-for-web.pdf, accessed on 03 July 2021.

has outlined 4 strategic interventions to be implemented. Among them is increasing access to and use of finance and agent banking is at the forefront to mitigate the unbanked challenge.[18]



Source: Satyajit Bose, Guo Dong, and Anne Simpson, "The Financial Ecosystem," Palgrave Studies in Impact Finance, 2019, pp. 19-46, https://doi.org/10.1007/978-3-030-05624-7_2

Figure 2. Financial Ecosystem

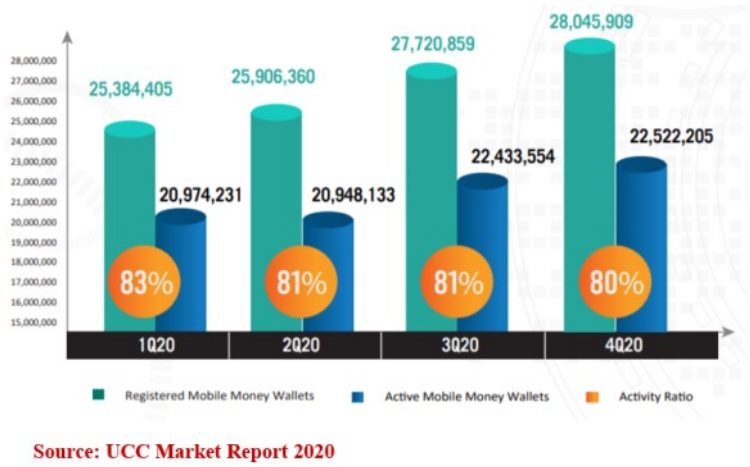
1.2. Financial Inclusion Through Technology

Recently, mobile phone technology has been challenging the role of traditional players in promoting financial inclusion. While financial institutions have been engaged in meeting the challenges of inclusive growth, the emergence of mobile phone technology is sweeping across the continent[19] and mobile money has become a preferred channel for transacting by many in recent years. In Sub-Saharan Africa, mobile money is one of the common technologies of financial management which is not operated by the formal financial

[18] National Planning Authority, "Third National Development Plan (NDPII) 2020/21 – 2024/25" (Kampala, Uganda, 2020).

[19] Anupam Mehrotra, "Financial Inclusion Through FinTech – A Case of Lost Focus," *2019 International Conference on Automation, Computational and Technology Management (ICACTM)*, 2019, https://doi.org/10.1109/icactm.2019.8776857, accessed on 03 July 2021.

sector.[20] The continent is now known as the epicentre of mobile money and it is growing exponentially yearly.[21] In Uganda there are 22.5 million active mobile money users being served by 235,790 agents. The 2020 transaction volume and value from the user base grew by 3.1billion and ugx79.7 trillion respectively.[22]



Source: UCC Market Report 2020

Figure 3. 2020 Mobile Money performance in Uganda

The growth in mobile money activity is attributed to the increasing investments from telecommunication giants such as MTN and Airtel Uganda. In March 2021, Rise Fund announced plans to invest $200 million in Airtel Africa's mobile money business, at $2.65billion valuation with a determination to build a dynamic payment ecosystem on the African continent.[23] Additionally, Airtel Money Africa delivered a revenue growth of 35.5% in 2020. The growth in revenue was driven by increased transaction value, expansion of exclusive distribution network of kiosks, mini-shops, and Airtel money branches to enable for customers to access their cash with relative ease.[24]

[20] Maria Yohana Kirana and Shinta Amalina Havidz, "Financial Literacy and Mobile Payment Usage as Financial Inclusion Determinants," *2020 International Conference on Information Management and Technology (ICIMTech)*, 2020, https://doi.org/10.1109/icimtech50083.2020.9211157, accessed on 03 July 2021.

[21] Adeleye AwakanAuthor E-play Africa, "How Africa Became Epicenter of Mobile Money-Kenya and Ghana Stands out: E-PLAY Africa," E, January 26, 2021, https://e-playafrica.com/how-africa-became-epicenter-of-mobile-money-kenya-and-ghana-stands-out/, accessed on 03 July 2021.

[22] Uganda Communications Commission. "Market Performance Report" (Kampala, Uganda, 2020).

[23] Airtel Africa Plc, "London Stock Exchange," 07:00:05 18 Mar 2021 - AAF News article | London Stock Exchange (London Stock Exchange, March 18, 2021), https://www.londonstockexchange.com/news-article/AAF/the-rise-fund-invests-in-mobile-money-business/14904342?showDisclaimer=true, accessed on 03 July 2021.

[24] "Africa's Leading Provider of Prepaid, Postpaid Mobile, & 4G Services. Recharge Your Prepaid Mobile & Pay Your Postpaid Bills Online.," Airtel Africa, 2021, https://airtel.africa/investors, accessed on 03 July 2021.

1.3. The Agent Banking Business Model

It is a known fact that the continuous growth of mobile money in Uganda is disrupting retail payments from financial institutions. However, through agent banking model, the financial sector in Uganda has been equipped to deliver financial products and services to more consumers and to areas banks could not afford to establish branches. In Uganda there are 15,716 agents and according to a 2020 report compiled by Uganda Bankers Association, the sector posted a total commission income of UGX 2.552 billion out of which UGX 1.814 billion (71%) was paid out to agents.[25] It is evident that the agent model where local businesses double as more convenient, lower cost alternatives to formal branches is proving to be a game changer for financial institutions in providing financial services to the unserved population. This, therefore, requires more innovative solutions to be deployed in the model to ensure agent banking is a preferred transactional channel among the low-income groups and the unserved communities.

A study conducted by Cull (2018) revealed that transactions were high in low income and densely populated areas and further suggested that the agent model was effective provider of basic financial services among the poor communities who lack suitable alternatives however in his findings, he claims that agents' personal characteristics were not important factors to be considered.[26] Kilonzo (2017) argued that there was a strong positive correlation between agency characteristics and use of agency banking, agency banking products and operating hours and the banking products were statistically significant in predicting the use of agency banking channel.[27] The two authors have divergent views about agents characteristics. However, their findings endorse the view that transactions are high in low income groups and there is a strong relationship between agency banking model and the banking product, services and it lends itself a motivation to further research. Though, Palaon (2020) in his study emphasises the importance of financial service institutions to improve agents' skills in serving customers effectively.[28] Palaon (2020) findings identifies a critical area of focus for financial institutions and highlights one of the key areas this paper is delving. However, his study does not provide

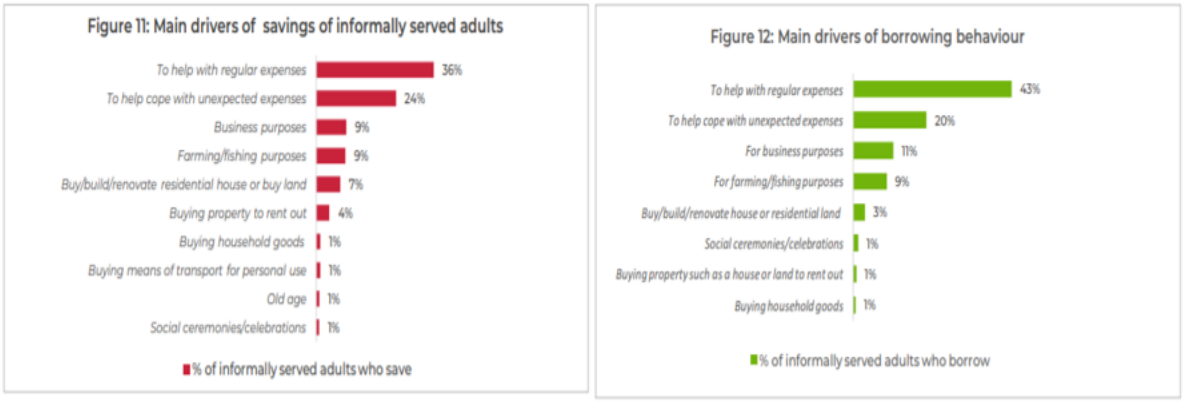
[25] Uganda Bankers' Association, "Uganda Bankers' Association Annual Report," 2020, http://ugandabankers.org/UBA%20Annual%202020%20Report.pdf accessed on 03 July 2021.

[26] Robert Cull et al., "Agent Banking in a Highly under-Developed Financial Sector: Evidence from Democratic Republic of Congo," *World Development* 107 (2018): pp. 54-74, https://doi.org/10.1016/j.worlddev.2018.02.001, accessed on 03 July 2021.

[27] Eric Muendo Kilonzo, Jared Ariemba, and Joash Migosi, "Factors Influencing the Use of Agency Banking by Bank Customers in Makueni Sub-Country," *International Journal of Finance & Banking Studies (2147-4486)* 6, no. 4 (2018): p. 28, https://doi.org/10.20525/ijfbs.v6i4.823, accessed on 03 July 2021.

[28] Hilman Palaon, Sudarso Kaderi Wiryono, and Taufik Faturohman, "Branchless Banking Agents: Business Satisfaction, Continuity, and Viability," *Cogent Business & Management* 7, no. 1 (January 2020): p. 1823585, https://doi.org/10.1080/23311975.2020.1823585, accessed on 03 July 2021.

an effective methodology of establishing agents who are victims of poor service and requires skilling. Additionally, improving agent's skills is not substantive enough to target the unserved population. Effective agent models should target all aspect of bank offering and among them are improving customer experience, redefining the service quality and product delivery for the unbanked population in real time. Therefore, this study attempts to bridge the research gap by proposing a conceptual framework on how augmenting SABS with AI capabilities will improve customer experience, increase product penetration in the unbanked population as well as promote efficiency in the financial sector.



Source: FinScope-2018-Informal-Financial-Inclusion-Report

Figure 4. Savings and borrowing needs of informally served adults

2. Methodology

Secondary data was collected from various conventional sources such as journals, books, internet, and other important reports. Other publications, such as magazines, newspapers, conference papers from Bank of Uganda, Uganda Bankers Association, Uganda Communication Commission were used. The study also relied on data analysis from previous researchers and applied data triangulation techniques to increase the validity and reliability of the results.

2.1. Proposed Model

The proposed solution takes advantage of the fact that it is now possible to consume, understand and process data at volumes and speeds as never before. AI technology is where computers are fed with vast datasets to learn from the patterns in the data, without human input. This enables systems to adapt and improve based on their experience, without human intervention. AI insights are generated by computer algorithms for consideration and action. These insights range from detecting economic opportunities to detecting unusual trends that could cause problems in the future. Hence, the proposed AI algorithms will be used to create a computation engine that mimics a human supervisor for the country wide agent banking network.

Below are the functionalities and benefit of the proposed model.

- Identifying service gaps and resolve them to improve customer experience
- Generate ideas to design market fitting products and services
- Detect knowledge gaps and help determine where agent training is needed
- Draw real time heat maps to guide resource allocation decisions in real time.
- Generate predictive analytics about customer behaviour and how it will impact business.
- AI algorithms will determine optimal locations to setup new agents using optimal resource allocation
- AI algorithm will be able to detect and identify sales opportunities for retail and business banking segment.
- Customised analytics and performance reports for larger agent businesses

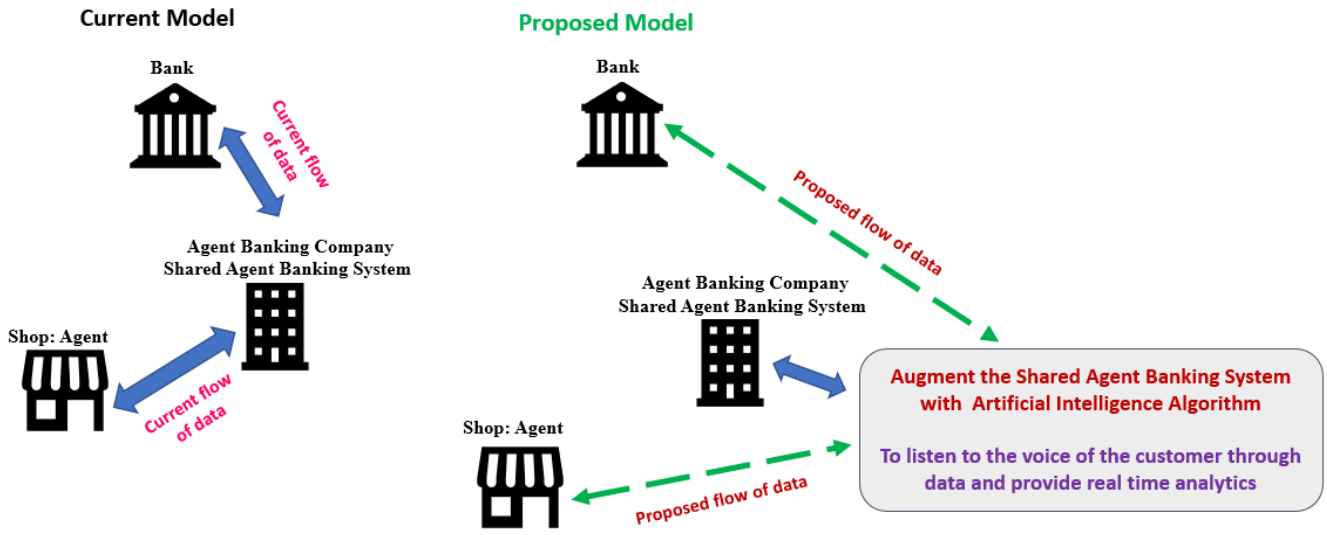


Figure 5. Proposed model (SABS plus AI algorithm)

3. Discussion and Conclusion

Financial Institutions have existed in Uganda for nearly 115 years and many of the players have geographical footprint covering major cities and towns. However, 7.7million Ugandan adults are still unbanked. Additionally, the emergence of mobile phone technology is questioning the role of traditional players in promoting financial inclusion which is leading to disruptions of retail payments from financial institutions. A key enabler for Uganda's economic growth will be empowering unbanked adult population gain access to the financial system. This paper presents a conceptual framework of using artificial intelligence to efficiently execute the agency banking model. It does so by augmenting SABS technology with AI capabilities to improve customer experience, increase product penetration in the unbanked population as well as promote efficiency in the agent banking ecosystem. The AI algorithm in agent banking model will add value by de-risking the unserved population, a segment that has great potential but has been ignored for long. And this will create opportunities for financial institutions and businesses doubling as agents. While this paper presents one opportunity amongst others in this space, by taking on board strategies like this, Uganda and many developing nations can start a journey towards attaining more inclusive and impactful economic growth. And this is in line with increasing access to and use of finance an FSDS that is outlined in the NDP III.

The following is a limitation to this paper that provide grounds for further research. The approach taken in this work was an exploratory methodology prior to a proposed next step of testing through quantitative methods. Testing this approach out in the agent banking ecosystem in Uganda or a similar developing country would be an appropriate next step.

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MANAGEMENT OF CREDIT FACILITATION FOR AGRICULTURAL COOPERATIVES IN UGANDA; EVIDENCE FROM A COLLABORATIVE APPROACH.

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1.0 Introduction

Uganda is an agro-based economy because of the critical contribution of agriculture to employment, national food security, industrialization, and export earnings (MFPED, 2018). Agriculture contributes 24% to the GDP, and accounts for over 47% of export earnings (UBOS 2010; EMF World Bank, 2019). With over 65.5% of Ugandan workers in the agricultural sector, it explains why the sector provides the first job for 75% of Ugandans aged between 15 and 30 years, and this group accounts for 60% of the Ugandan population (UN DESA, 2017). The sector is dominated by small-scale farmers (SSF); estimated at 89% of the entire sector, and these SSF account for approximately 80% of the Ugandan agricultural output (FAO, 2018a). The small-scale farmers hold approximately one (1) hectare of farmland, and this has gradually been shrinking; for instance, from 2006 to 2016, the share of household farms of size less than one hectare increased from 75% to 83% (World Bank, 2018).

This discussion even though portraying the importance of agriculture to the Ugandan economy, equally emphasizes decline tendencies in the sector. The decline in the sector can be attributed to the use of undeveloped technology with respect to productivity increment and farming practices enhancement - this gap is attributable to the agricultural financing challenge that is inappropriate access to agricultural finance of the right tenor, cost, magnitude, and timing for the small-holder farming communities in Uganda.

This is due to the low-risk appetite of financers driven by challenges of land tenure, the Ugandan financial architecture amongst other factors. This leaves, the SSFs forced to borrow from agricultural cooperatives which are comfortable with their risk appetite and understand their business and models. However, these agricultural cooperatives are struggling financially due to limited financial resources and constrained decision-making mechanisms in their credit facilitation process among others, yet with enhanced decision making, cooperatives could easy access financing from the commercial banks and other supervised financial institutions.

This study therefore looked at how the University collaborated with the Government and the Agricultural Cooperatives to develop a credit facilitation tool to mitigate credit facilitation decision challenges thus making the cooperatives bankable to ably receive support from commercial banks and other regulated financial institutions.

The paper question - How can the credit facilitation for agricultural cooperatives in Uganda be managed utilizing collaborative approaches had two specific objectives that guided the study as follows:

a) To examine the credit facilitation decision challenges that affect agricultural cooperatives in Kamwenge and Sheema districts.

b) To design a DE credit facilitation tool to mitigate the decision challenges.

In addressing these objectives. The paper contributed to documentation of empirical evidence on credit facilitation decision challenges suffered by these rural based Agricultural Cooperatives and credit facilitation decision tool that can mitigate these decision challenges. This developed decision tool once implemented would enhance the credit process thus easing transparency of what cooperatives do to easily access credit from commercial banks and ither supervised financial institutions. All this new knowledge created was done in the confines of a collaboration between University, Government, and the Agricultural Cooperatives.

2.0 Methodology

A design science paradigm advanced by Hevner and Chatterjee in 2010, which suggests three main stages in conducting a study was adopted. Stage one was the relevance stage, which emphasized investigation of realities of the credit facilitation decision challenges in Agriculture Cooperatives in Uganda. Stage two was the design stage which entailed translating the DE requirements generated in relevance stage into case scenarios that suggested better means of making credit facilitation decisions and these were presented in user case diagrams. The design of the user case diagrams was done using the Unified Modified Language (UML). Stage three was the knowledge base, in this stage the study concerned itself with highlighting the contribution that the developed artifact was making to the body of knowledge.

3.0 Results and Discussions

The results are presented by objective; the results indicated that ill-structured decision-making evidenced across the credit facilitation process. This study confirmed the relevancy and perception of credit facilitation decisions by the stakeholders around credit capital sourcing at 83%, credit terms and screening at 71% and credit reporting 65%. The study too confirmed ill-structured decision-making evidenced by limited involvement of all stakeholders in the credit capital sourcing decisions determination due to distance and lack of an external credit selection guide.

- 75% of Agricultural Cooperatives lacked an optimal mechanism for selecting a feasible source of credit capital.
- 65% of the Agricultural Cooperatives lacked a chronological format to determine optimal credit durations.
- 71% of the Agricultural Cooperatives lacked a strong mechanism for enforcing credit collections.
- Agricultural Cooperatives too lacked a notification guideline to keep track of credit extended and therefore, it was difficult to effect constant remainders to the debtors and creditors which was a great disadvantage to credit collections and credit payments for the loan financiers of the SACCOs.

All the above results presented decision challenges that affected the current credit facilitation process in Agricultural Cooperatives. This therefore gave basis for extracting a list of requirements for a Decision enhancement.

This was the entry point for addressing objective two. A set of functional requirements were those translated from the challenges, and these are the Decision Enhancement (DE) should support:

- support the process of deciding on the cost of the membership subscription and equity sales. The DE should provide a structured step by step flow in deciding on the external borrowing while capturing the different decisions of manager loan initiation, board approval, loan requirements verification and review of repayment structure.
- support determination of the credit duration for the respective credit giving based on the major considerations of the cooperatives meetings and funds review.
- support the determining of the lending rate for cooperative credit with input from the manager and cooperative AGM while reviewing the credit capital available.

Further, the Decision Enhancement (DE) should:

- assist in setting credit limits based on the considerations of expected harvest and cooperative meetings.

- be able to enable users to check for standardization of the applications based on adherence to membership requirements, authenticity of information provided and adherence to the set credit limit.
- provide an optimal technique for credit approval, basing on the credit purpose, credit history and adherence to the membership requirements.
- provide a mechanism for setting monitoring guidelines based on credit repayment schedule and reviewing credit limit.
- enable users to check on credit repayment compliance based on payment schedules and value of collateral security.
- be enable easy credit notification procedures for the members that have borrowed and could send warning notification to borrowers.

These Decision Enhancement requirements were used to diagrammatically present different sub-process scenarios (user cases). Each of these sub-process user case formed a basis for the different suites of the DECFA. People were at the center of the design as the service systems often operate to link networks between the different users. The users of the Decision Enhancement Credit Facilitation Approach (DECFA) are summarized in the Table 4-1.

Table 4-1 DECFA Users

Use case	Users
User Management	• Managers • Members • Administrators • Government Board representatives • AGM representatives • External Lenders
Internal capitalization	• Managers • Members • AGM representatives • Administrator
external capitalization	• Managers • AGM representatives • Board representatives • External Lenders • Administrator
Credit Terms	• Managers • Board representatives • AGM representatives • Administrator
Credit Screening	• Members • Managers • Administrator
Credit Reporting	• Managers • Members • AGM representative • Board representative • Administrator • Government Cooperative Officers

The aspect of technology was relevant to the design science as it emphasized the development of technology-based solutions. Technology provided multiple types and levels of support directed to enhancing credit facilitation amongst the different stakeholders. The enabling technologies for developing DECFA included internet, different telecommunication networks, and personal computers, among others. Specifically, these technologies provided a facilitative and collaborative environment (in the form of tools, hardware, and software).

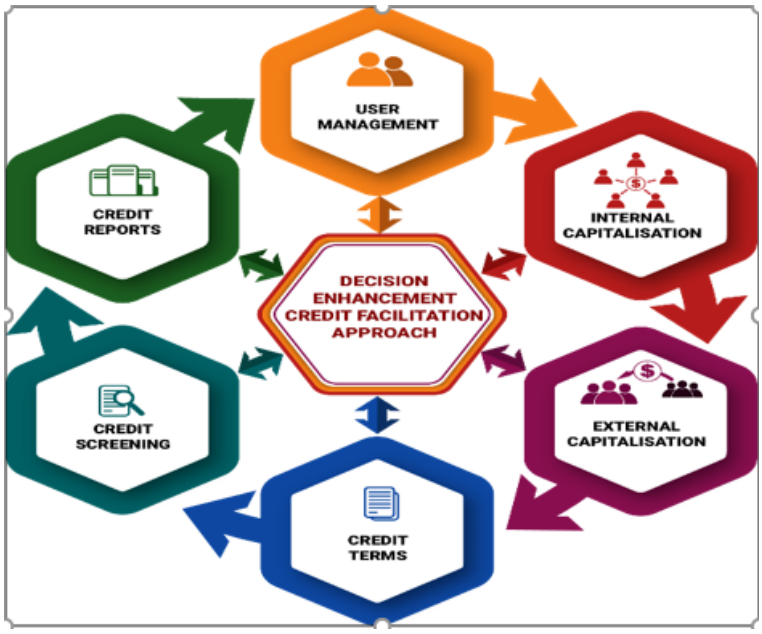
The developed DECFA scenarios, illustrates different scenario functionalities and how these are:

Scenario	**Roles**	**Functionalities and services**
User management	Membership recording, access management and records management	• Facilitates data capturing, recording and storage of users • Facilitate the specification of user log in capacity • Enable display of information in the system
Internal Capitalisation	• Discussion forum • Membership setting • Subscriptions	• Facilitates invites and storage of online meeting. • Facilitates discussion on the overall credit facilitation budget • Facilitates discussion and decision making on the subscription to be paid by the members • Facilitates discussion on raising the balance of credit capitalisation • Facilitates registration of a member' subscription payment • Facilitates recording of paid subscription • Facilitates reporting on the members' unpaid up subscription
External capitalisation	• Lender options/ companies • External Credit Terms • Discussion Forum • Borrowing Report	• Facilitates recording of lender options. • Facilitates determination of external credit terms • Facilitates discussion of optimal lender • Facilitates recording of loan borrowed and its payment procedures • Facilitates reporting on the total credit capital available per season.
Credit Terms	• Internal Credit Terms • Loan Application Form	• Facilitates determination of the credit duration, interest rate and credit limits for the respective seasons. • Facilitates accessing the loan application Form • Facilitates expressing the principal amount required • Facilitates the computation of the interest rate based on the cost of external borrowing

Scenario	Roles	Functionalities and services
	• Loan Application	• Facilitates recording of the collateral security and its value in form of cash • Facilitates recording of the reference' contacts • Facilitates the loan application report that expresses internal capital versus loan applications.
Credit Screening	• Screening Report	• Facilitates a summary on: ▪ Member and loan requested ▪ Interest rate charged ▪ Expected Repayment amount ▪ Collateral Value ▪ Expected Harvest Income ▪ Total Membership paid • Facilitates decision basis on qualification or non-qualification for credit applied for • Facilitates decision on approve or disapprove credit application
Credit Reporting	• Internal Loans status • External Loan status	• Facilitates a summary on: ▪ Borrower name ▪ Principle and interest rate ▪ Total Repayment made ▪ Loan Balance • Facilitates decision on compliance based on payment Status (on track or deficit payment) • Facilitates viewing of individual repayment schedules. • Facilitates comparative decision making through viewing the details on: ▪ External sourcing provider ▪ Principle and Interest rate ▪ Update Repayment ▪ Balance due ▪ Loan period

Out of this process we submit that a five suited model called the DECFA was birthed which is a credit facilitation tool shown below. This tool expresses how the various credit facilitation sub- processes flow and are chronologically connected to each other.

DE Credit Facilitation Approach (DECFA)



4. Conclusions

Considering the research question, this paper concludes to several stand points about the specific objectives:

In regard to objective 1. This study confirmed the relevancy and perception of credit facilitation decisions by the stakeholders. These decision challenges in the credit facilitation processes confirmed were a demonstration of new knowledge tabled. They were evident to why financial institutions' have low risk appetite to extend credit to them. As a result, this offered a trigger for stakeholders' in-depth understanding of Agricultural Cooperatives to advocate for systemic change utilizing collaborative technology.

Regarding objective 2, the study concludes that based on the credit facilitation decision challenges confirmed in objective 2, their solution was a credit facilitation tool developed from the user needs which were the challenges. The different challenges were translated into requirements transformed into their respective suites demonstrated using decision activity diagrams. All emphasized how better decisions could be made contrary to what was happening before.

For figures, there was demonstration of how the Government and key stakeholders in the financial sector ecosystem have role to play in connecting the Agriculture Cooperatives with a world of information and opportunities which was not previously known. This role would enable the Cooperatives to make informed decisions on financiers' expectations and thus improving on their bankability which is currently a challenge. The well respective suites connected demonstrated how the Agriculture Cooperatives should operate an optimal credit facilitation process through mitigating the credit risk challenge identified in the theory thus contributing to extending the theory.

Lastly all the connected suites for credit facilitation birthed a five-stage tool called the DE credit facilitation tool that was designed to achieve a purpose as per the research question and improve organizational management (Venable et al, 2012). This credit facilitation tool qualifies as a purposeful artefact as it profiles means in which it will bring decision stakeholders in credit facilitation to collaborate thus creating new evidence of how university, Government and Agricultural Cooperatives can work together to solution community problems.

For future studies, the study recommends a replica of a similar tool in other sectors that support the Ugandan economy like tourism given the effectiveness this can have on enabling and building lasting collaborations acceptable a national and community levels with the support of the Universities the hub of knowledge development.

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NATURAL LANGUAGE PROCESSING AND THE BANKING SECTOR IN DEVELOPING COUNTRIES

1.0 Absract

This paper attempts to explore the application of Natural Processing Language (NLP), a sub-field of Artificial Intelligence that experienced noteworthy growth in recent years, pervading different industries, including finance. In the context of the financial domain, the catalyst of NLP applications has been the weighty pieces of finance data found in written form in documents, texts, websites, forums and so on. NLP tasks, such as sentiment analysis, question-answering, chatbots, document classification and topic clustering are used to work with unstructured financial data to extract insights that support making of informed decisions on a real-time basis. This paper argues that despite advances in NLP use-cases in the developed and middle-income financial sectors, the banking sector in developing countries can only harness the power of computers to process huge amounts of natural language data and interpret the meaning of words, sentences and paragraphs in context, if that context is provided. Banks and other financial institutions must invest in building data sets representative of the market they serve to gain meaningful insights that will enable the provision of the expected value from the said market.

2.0 Introduction

AlphaGo, a computer program, in 2016 defeated 18-time world champion Lee Sedol at the complex board game of Go, demonstrating intuition, imagination, and strategic thinking. The exhibition of these abilities distinctly considered human hitherto, stimulated the advancement of artificial intelligence (AI) technologies across industries (Biswas et al., 2020). While the banking sector has long been technology-dependent and data-intensive, data-enabled AI technology has the capability to drive innovation at an unprecedented rate (Deloitte, 2020). Furthermore, it is estimated by McKinsey that AI technologies could potentially deliver up to one (1) trillion US dollars of additional value each year to the global banking sector (McKinsey, 2020).

The advanced abilities and value notwithstanding, many banks are struggling to move from pilot use cases to scaling AI technologies across the organisation (Cam et al., 2019). Drudging to deliver on the investment for a long-term Return on Investment (ROI) while generating value for customers in the short term. Although over the years all banks despite size continually adapted the latest technology innovations, for instance, the introduction of ATMs in the 1960's; electronic and card-based payments in the 1970's, and; the mobile-based "banking on the go" in the 2010s, lack of a clear strategy for AI, an inflexible and investment-starved technology core, fragmented data assets, and outmoded operating models, have hampered the financial sector's progress in harnessing the power of AI technologies (Biswas et al., 2020; Deloitte, 2020). It is thus essential that banks and financial institutions move beyond the hype and consider the practical application of AI.

This paper discusses the practical application of Natural Language Processing (NLP) in the banking sector in a developing context. NLP is a sub-field of AI encompassing various techniques and algorithms to analyse and structure raw textual data, which can be used to extract meaningful insights. The groundwork on how to make computers understand and use natural language derives from various fields including linguistics, neuroscience, mathematics and computer science (Senyuk, 2021). In recent years, certain NLP use cases have gained prominence in the financial sector, with chatbots in the front office and anti-payments fraud in the middle office the most mature (Lagi, 2019).

However, these cases are mainly in the developed and middle-income contexts, like Bank of America's Erica, HDFC's (India) EVA, HSBC's (Hong Kong) Amy or SEB's (Sweden) Aida (Day1Tech, 2021). These applications use historical customer transaction records, account

details, and other facets of data in order to train the model behind the chatbot to learn to converse with customers and assist on services such as product discovery, loan applications, and customer support. The application of these chatbots thrives in the context where the customer being assisted has enabling technology to access, interact and maintain the session (Day1Tech, 2021; IPsoft, 2017) . In addition, anti-payment fraud often based on anomaly detection uses an individual's digital footprint to form a baseline sense of normalcy upon which any deviations can be detected (Columbus, 2019; Mejia, 2020).

As Conforti et al. (2020) noted, use of these NLP applications in a developing context could be challenging due to high rates of illiteracy, less access to technology, unreliable internet connectivity and the exclusion of the vast majority from the formal financial system.

This paper uses a use case of *Automatic User-Perceived Value (UPV) Classification* to demonstrate how the above challenges can be overcome by building representative corpora upon which the financial institutions can build context specific NLP applications. The study aims to introduce and expound on the use of UPV classification in building corpus for the banking sector in developing countries. The study is exploratory and interpretive in nature with an attempt to illuminate on fact that despite multiplied growth of data from various sources like- Internet, electronic devices, social media, etc, the uniqueness of the financial market in developing countries necessitates financial institutions to build their own corpus to harness the bountiful opportunities data-enabled AI technologies offer.

3.0 Natural Language Processing (NLP)

Research shows that more than 80 percent of the data in the financial sector is unstructured (Gangwar, 2019). Data present in the form of excel files, SQL databases, stock information, relational databases are denoted by structured data. This data can be utilized with the help of advanced analytical programs and algorithms which reveal the patterns. The challenge is not to manage and utilize this remaining 20 percent of the structured data. But the real challenge is managing and using the ocean amount of unstructured data which is present in the form of interview text, audio and video files, social media posts, PDF files, and similar files. To drive out value from this data, financial institutions are moving to NLP.

Most used NLP methods work by applying machine-learning or deep-learning models to some textual input. In most industrial applications, including in the financial domain, the system's output - which, depending on the type of task (classification or generation) might be a class or a sequence of text - is usually the product of a more complex pipeline, which encompass a range of smaller tasks: these can include, for example, part-of-speech tagging, or named-entity recognition (Conforti et al., 2020).

NLP tasks can be roughly divided into two main sub-fields, *Natural Language Understanding (NLU)* and *Natural Language Generation (NLG)*. NLU involves taking unstructured text and speech input from humans and converting it to structured formats that computers understand. For example, when one asks iPhone's Siri or Google's Alexa for a weather update, it uses natural language understanding to figure out what was said.

Similarly, NLG turns structured data into text and speech that humans understand. Using the previous example, Siri or Alexa uses natural language generation when they respond 'It is sunny today. Would you like to place an order for sunglasses?' (Shroff, 2019)

Various AI methods such as neural networks, deep learning and optical character recognition are often used in NLP. In general, these methods assist in processing text, classifying words, clustering similar words and associating words and phrases with meanings. Alongside these methods are various techniques used to determine grammar rules and word meanings. For instance, *Syntax analysis* involves determining grammar rules for words and cluster them according to similarity, while *Semantic analysis* involves deriving meanings and is used to generate human language. Semantic analysis is challenging because human language rules are complex. Words and phrases take on different meanings in different contexts. This is exacerbated by colloquialisms, idioms and sarcasm (Lutkevich, 2021; Shroff, 2019).

The complexity of human language rules necessitates that context specific data sets are generated and processed. In the context of the financial sector in developing countries, this implies that institutions cannot use insights from data sets generated from developed or other countries to guide financial services and product decisions. Rather institutions need to invest in listening to their current and prospective customers and using NLP techniques and algorithms to extract useful and actionable insights.

The next section introduces the User Perceived Value Framework and Automatic User Perceived Value Classification as a use case.

4.0 User Perceived Value (UPV)

4.1 Identifying end-user needs.

The digitalisation of the banking sector has also been its democratisation. The introduction of user-friendly, mobile-based banking apps has shortened the distance between customers and their money (Biswas et al., 2020). This is an indicator of a larger financial trend: most people now want to be actively involved in their finances. Customers want a bank that they feel is '*theirs*', hence institutional success is dependent on the extent to which personalisation and ownership is integrated into every interaction (Varadarajan, 2021). Personalisation and ownership go far beyond mobile banking apps and annual spending roundups. Banks have to offer products and services that converge to enhance the end-users' lifestyles, not just their finances (Dupas et al., 2018; Varadarajan, 2021).

This is the foundation of Hirmer & Guthrie, 2016 User Perceived Value Framework. The framework developed after several years of research aims to understand the reason why something is perceived by the end-user to be important. Although the concept of user-perceived value is not new in marketing and product design literature, often referenced in terms like Consumer Value Proposition (CVP), the novelty of Hirmer (2018) lies in the identification of values by allowing sentences (storytelling) gathered through market research to be categorised under certain values based on the underlying key phrases.

In theory, the UPV is grounded in motivational theories that classify basic needs, ranging from two to five classifications. The popular Maslow's comprehensive hierarchy defines five categories: physiological; safety; love/belonging; esteem; and self-actualization (Maslow, 1943). Each of these classifications houses a number of basic needs such as food, shelter, health, respect for others and mortality. Hirmer & Guthrie (2016) argues that each individual has the same 'need' categories; however, the extent to which these needs persist depends on the degree to which they are already satisfied, as well as whether or not they are recognised. A 'need' is therefore more generic and refers to a theme/category of requirement, for example, hunger requires food. In contrast, a 'want' refers to a specific object that suggests an

individual's preference, for example, beef. Therefore, to satisfy a customer who is hungry (need) and wants beef, the provider must seek to convince the consumer that their existing 'need' (hunger) can be satisfied by a specific 'want' (beef from Meat Packers – the product) through messaging that appeals to the existing values of the consumer, for example, time saving [fast delivery], affordability [low cost] and appealing [taste]. In other words, the user-perceived value is the link between the needs and the wants and is defined as follows: "the extent to which a good or service is perceived by its user to meet his or her needs and wants" (Bishop et al., 2010; Hirmer & Guthrie, 2016)

In practise, the UPV Framework deploys the UPV 'game' to collect end-user stories. The 'game' encompasses 50 items [stimuli] illustrated on cards that represent needs and wants tailored to the study sample. The participants are asked to select a given number of items and also an opportunity to add additional items. The item selection is based on the respective importance to the participant. The participant then proceeds to rank their selection in order of importance [Ranking]. Lastly, the participants give reasons as to why these items are most important to them personally [Why-probing]. The 'why-probing' allows participants to reflect on their personal lives generating individual stories [Storytelling] (Hirmer, 2018). It these stories that are used to train NLP models and from which actionable insights are extracted to inform decision making. Figure1 below shows the deployment of the UPV method in the field in rural Uganda.

(a) (b) (c)

Figure 1: Collecting interviews in rural Uganda using different settings: individual (1a), group of people belonging to the same gender (1b) and mixed group (1c) interviews[1]. (Hirmer et al., 2021)

4.2 Automatic User-Perceived Value Classification

Hirmer (2018) developed a UPV classification set of 58 labels. The classification consists of structuring the stories (qualitative interviews) by labelling each sentence using an annotation schema developed with the specific focus on Sustainable Development (UNESCO, 2019)

The UPV labels define values which are perceived by the interviewers, and these values are categorised into 4 tiers as follows:

1. Tier 1 represents the high-level value cluster including: Emotional Value; Epistemic Value; Functional Value; Indigenous Value; Intrinsic Value; and Social Significance Value.

Practical Application

Figure 2 shows potential of NLP across different bank areas. Two of the highlighted areas are illustrated in detail in the subsections below.

Figure 2: Potential of NLP across different areas in a banking organisation (Deloitte, 2020)

5.0 Customer experience and growth

The digital era has seen banks invest more than ever in personalization of services offered to customers. This has been driven primarily by competition and enabling technologies.

Deloitte (2020) found that more than 50 percent of bank customers believe personalized services are one of the key factors for them to have trust in their banks, while only 35 percent of traditional banks offer personalization that meets customers' needs at the appropriate time and place (Deloitte, 2020).

To personalise services, banks need to understand the needs of their customers. Not only their financial needs but also their challenges, barriers, aspirations and motivations that drive or constrain their access to financial services (Trivelli et al., 2018; van Kleef et al., 2005).

Banks must employ data-driven AI capabilities to conduct micro segmentation of existing customers and prospects. This level of granularity can help banks more accurately predict customer and prospect needs and behaviours. For example, HSBC reported a 40 percent increase in reward program usage after deploying data-driven AI to predict customers' redemption preferences. Speaking about Maritz Motivation Solutions and HSBC partnership that helped achieve this, Jesse Wolfersberger, Maritz' chief data officer, said,

> "*The future of this is about being more tailored, it's not just that you know you want a Starbucks gift card, but that you know you want it at 4 p.m. on a Friday because that's when you're dragging."*(Macheel, 2018)

A data-driven bank will offer propositions and experiences that are intelligent (i.e., recommending actions, anticipating and automating key decisions or tasks), personalized (i.e., relevant and timely, and based on a detailed understanding of customers' past behaviour and context), and truly omnichannel (seamlessly spanning the physical and online contexts across multiple devices, and delivering a consistent experience) and that blend banking capabilities

with relevant products and services beyond banking (Biswas et al., 2020) as demonstrated in Figure 3 and 4

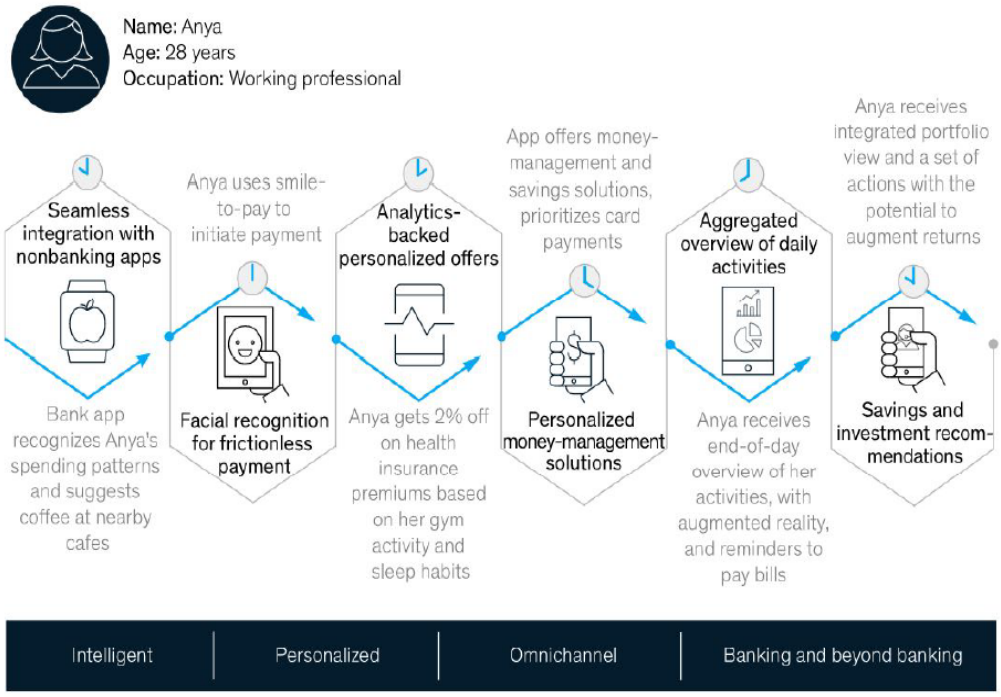

Figure 3: Illustration of how such a bank could engage a retail customer throughout the day (Biswas et al., 2020)

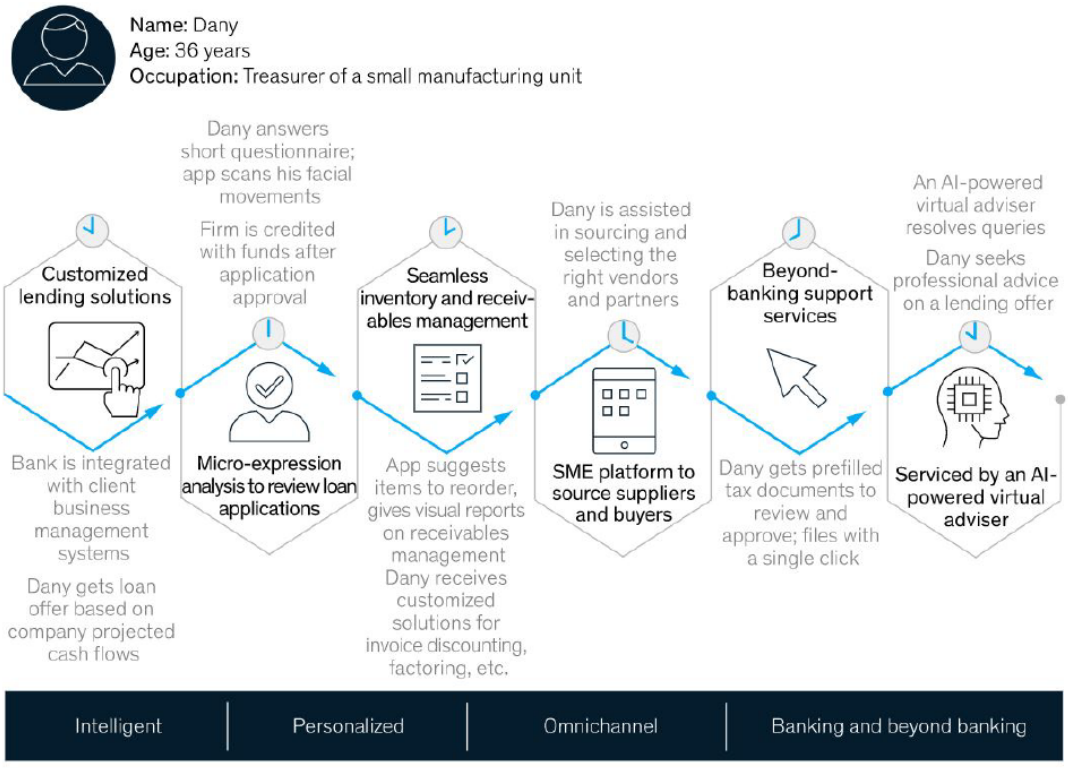

Figure 4: An example of the banking experience of a small-business owner or the treasurer of a medium-size enterprise (Biswas et al., 2020)

To achieve this level of granularity in developing countries, the banking sector must identify people who are currently outside the banking system (Bin-Hamam, 2017). The practice of surveying clients and studying current transactions only limits banks to people who already have financial access. Methods like the UPV 'game' can be used to reach those excluded from the banking systems and those more difficult to reach through the usual channels like wage payments, remittance channels as well as saving accounts.

Furthermore, financial institutions must understand and confront social norms that constrain particular demographics from accessing and utilising financial services. For instance, often women are not expected or encouraged to have financial independence(Bin-Hamam, 2017; Watkins et al., 2012; Yamada et al., 2018).

Dupas et al. (2018) experimental test on the impact of expanding access to basic bank accounts in Uganda, Malawi, and Chile, found that most of the study participants store their money in cash and rely on personal networks or loan sharks to meet their most basic financial needs. They noted that the pattern that emerges, is that different features matter for different segments of the population, with no “one size fits all”; that few products appeal to more than a small minority. In Uganda, the experiment particularly observed that low bank account usage in the Uganda samples was attributed to either having low resources or the bank accounts were simply not well tailored to the customer' needs or habits (Dupas et al., 2018).

Service Optimization

Conversational AI agents can engage in personalized discussions by tapping into data sources that include UPV profiled data, customer data, social media, current economic conditions, historical customer information, call centre patterns, and more. In addition, AI can help improve operational efficiencies in areas such as routing customer calls and calculating appropriate customer hold times. Many major banks in developed countries have already launched some form of conversational interface that can assist customers with routine requests, such as making payments or getting details about their accounts (Bharadwaj, 2019; Brandessence, 2021; Senyuk, 2021).

The COVID-19 pandemic exacerbated online and telephone wait times for customers. Traditionally, call centres often hire supplemental staff during peak traffic times, but banks should adopt AI technologies to manage call volume fluctuations.

In a developing context, where the vast majority still lack access to appropriate technology, understanding the users' constraints and exploring new partnership to address these constraints can help retain and attract new customer segments (Grundmann & Lesueur, 2019; Sebudde, 2017; Trivelli et al., 2018). In Uganda, the mobile phone has been touted as the latest game changer that could radicalize rates of financial inclusion. Yet, according to the 2018 Financial Sector Deepening Uganda report on Banking the number of Ugandans without bank accounts or some form of structured and legal financial services currently stands at 89 percent or 16.5 million of the 18.6 million adult population of Uganda, an indication that there's need to continuously develop banking services that meet customer's needs across all age groups (FSD Uganda, 2019). Financial institutions need to reach this untapped market by embedding customer journeys in partner ecosystems and platforms, so that they can engage customers at the point of end use and in the process take advantage of partners’ data and channel platform to increase higher engagement and usage (Sebudde, 2017). ICICI Bank in India embedded basic banking services on WhatsApp (a popular messaging platform in India) and scaled up to one million users within three months of launch (ETBFSI, 2020).

6.0 Recommendations

NLP techniques are used to partially automatize and to speed up the data analysis process, and to extract insightful patterns. NLP algorithms have become much more reliable and scalable in recent years and are equipping financial decision makers with a comprehensive understanding of the market (Biswas et al., 2020).

NLP is being utilized to decrease the amount of manual routine work, to accelerate trades, assess the risks, understand the financial sentiment, and construct portfolios while automating auditing and accounting. These advances are achieved with the help of sentiment analysis, question-answering, chatbots, topic clustering and document classification.

The core of all these advances is the presence of data. Banks and other financial institutions must:

a) Aim to build a foundation - invest in building representative data sets of the market they serve or intend to serve.
b) Proactive focus on risks and ethics - Traditionally, risk, compliance, legal, and ethical reviews are usually thought of in the last phase of an implementation life cycle. With NLP implementations, these reviews should take place early in the process, starting with the strategy phase. Trust must be at the centre of any organisation implementing AI models and processes. Banks should ensure that their AI models and processes are ethical and regulatory compliant.
c) Compatibility - Can the solution integrate with the company's existing or future ecosystems? Organisations need to ensure that adopted solutions integrate with current steams and processes to ensure business continuity. For example, if a model that is built to assess creditworthiness is not strictly integrated into the underwriting process as one of the inputs, it will not help achieve the goal of reducing risk for a bank. Employing AI models, integrating them with current processes, and fine-tuning them as business processes change is key to ensuring firmwide (and potentially broader) scalability of models.
d) Business value - Does the projected business value still hold true after scaling up? Adopting advanced capabilities for the sake of AI can be the fastest route to failure. Banks should not feel pressured to keep up with current market trends without any long-term adoption plans or clear path to value realization. Defining relevant use cases and prioritizing them into a road map can help banks stay focused during implementation and help achieve the goals defined during the strategy phase.

7.0 Conclusion

The paper explored the application of NLP to the banking sector in the developing context. In particular, the discussion focuses on the User Perceived Value (UPV) and the task of automatic UPV classification, which forms part of a bigger framework on NLP-enhanced community profiling. In this context, the researcher attempts to explain the concept and the underlying theories upon which the classification is done and how the resulting schema can be used to understand not only the needs of end users but also their constraints, challenges, values and beliefs.

The discussion centres on the hypothesis that although many advances have been made in the developed context in the use of data-driven AI applications, in the developing context we need to start at the point of collecting relevant data upon which AI applications can be used to extract actionable insights. The techniques and algorithms behind the AI applications can

stimulate human understanding, however, they are brittle in that they can only stimulate a behaviour they have encountered before. Deploying data analytics techniques on data sets that are not representative of the market being served will fail to harness opportunities from the unprecedented processing power and storage capacity of the fourth Industrial Revolution (4IR) technologies, such as, artificial intelligence.

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2. Tier 2 represents value clusters, embracing a set of values within the same value definition. For example, the Epistemic Value has two value clusters of Information and Knowledge.

3. Tier 3 represents the main value codes as demonstrated in the two interview extracts below [in **bold**].

Example 1

Baluku a man from a village in the Rwenzori Mountains chose a TV because **[TV]:** "I have a television; I can get first class news around the world **[Access to information] [Quality].** I can start up a business of showing football to people. It becomes a source of income for me and my family **[Income Generation]** and also entertainment to my family as well **[Entertainment]**. In my village having a television, you are referred to as a rich person **[Reputation]**. So that's why I chose it."

Example 2

Women in a village in the West Nile Region discussing why the Men in their village may have selected corrugated iron sheets **[Corrugated Iron Sheets].** Their reason is as follows: "Reason is the suffering they face from using grass which can be eaten by termites and rats, they make holes on the roof where sun rays and moon lights go direct into the room. When it rains, the water wets everything in the room including people who sleep there **[Comfort] [Reliability]**. Iron sheets are durable **[Durability]**; accidents of fire are common and it gets grass-thatched houses, everything in the house can just burn into ashes within shortest time **[Safety].**"

4. Tier 4 are key phrases used to tag the different values (Tier 3).

The schema developed is used to process large volumes of stories to provide insights that can allow the banking sector to offer personalised content, personalised advice or guidance, behaviour profiling, recommendations systems and explore other ways of bringing information and data together specifically for the benefit of an individual (Walch, 2020).

The next section departs from the technical side to provide practical examples of applicability of the UPV-NLP enabled analysis. While the examples are by no means exhaustive, they demonstrate that data-driven AI can be used in many ways to generate value across a banking organization.

The effect of the Covid 19 Pandemic on the performance of Saving Groups – Lessons for the banking industry
Annual Bankers Conference (ABC) 2021

Peter Lugemwa, Susan Mucyo, Felix Idraku and Robert Ntalaka

1.0 Absract

Saving groups have been credited for promoting financial inclusion in developing countries by availing convenient and a proximate source of finance when formal options are unavailable. They have altered the development equation in marginalized communities worldwide by providing members with the means to cope with emergences, build capital and recreate social dynamics that support genuine self-reliance. They also form an important link to formal financial services. It has however been argued that there are some inherent weaknesses within the saving groups model, that curtail the effective financial transformation of saving group members and to address covariate risks with suggestions that creation of linkages between saving groups and formal financial institutions would address some of those weaknesses. The emergence of the Covid-19 pandemic in March 2020 alongside the accompanying prevention restrictions including lock downs provided an opportunity to reexamine the efficacy of the saving groups model.

Using case studies of savings groups in two sub counties Loro, and Nkozi, this study sought to understand how the performance of saving groups in Uganda was affected by the lockdown conditions and the implications for financial inclusion.

The study showed that Saving Groups and their members were adversely affected by the pandemic though they had greatly contributed to financial inclusion; by increasing access to financial services, increasing financial literacy of members and nurtured financial discipline. Saving groups also contributed to the achievement of some objectives of the national financial inclusion strategy. The study however also exposed weaknesses in the saving groups model, which included: the inability to address covariate risks and raise sufficient funds for the effective financial transformation of members.

It was concluded that there need to consider linkages with formal financial institutions to access external funding. It was argued that Financial Institutions could have access to more savings, a more financially literacy clientele and lowered costs of managing credit. Mobile Network Operators could also benefit from the generation of mobile money transaction fees and access liquidity for agent network management.

2.0 Introduction and research problem

Saving groups are playing and important role in the financial inclusion of poor people especially in rural areas. They have been credited for promoting financial inclusion (Imai, Arun and Annim, 2010) by availing convenient and a proximate source of finance when formal options are unavailable (Melinda Gates Foundation, Bankable Frontier Associates, Equity Bank and M Pesa, 2014); providing members with the means to cope with emergences, build capital and recreate social dynamics that support genuine self-reliance (Self and Turk, 2019; Rippey and Fowler, 2011); and availing members with credit for income generating activities, consumption purposes or when unanticipated income shocks arise (Melinda Gates Foundation, Bankable Frontier Associates, Equity Bank and M Pesa 2014).

However there has been a debate to the effect that the saving groups model needs to be revised to create linkages between saving groups and their members with formal financial institutions. It is argued that this would contribute effective financial transformation of saving group members. It's being thought that the effective financial transformation of saving group members is curtailed by some inherent weaknesses within the saving groups model, including: (i) the fact that saving groups offer restricted savings cycles of less than a year which means that members often cannot save enough for the important lump sum purchases such as of housing, land, business assets, and educational fees etc. (BMGF, 2013); (ii) The use of metal lock boxes to store excess savings which poses a risk of theft, particularly given the conspicuousness of such boxes and fairly discernible periods of Saving Groups liquidity accumulation (BMGF, 2013); (iii) the model being effective in mitigating only idiosyncratic risks, (such as illness or loss due to theft of individual members) but not be effective for other shocks that are covariate. Covariate shocks, such as droughts, pests, and even pandemics, affect all households within a certain radius. When such shocks occur, community-based risk protection mechanisms, such as those offered by saving groups may be insufficient to protect households (BMGF, 2013).

It has been argued that the creation of linkages between saving groups and formal financial institutions would go a long way to address some of those weaknesses. For example, linkages with formal financial institutions could avail more secure saving services which would alleviate the fear of theft; enable longer saving cycles; avail more money to saving groups for members to access credit that will have better economic impact; offer longer loan repayment periods, and enable members to borrow when they need and not as a way of redistributing the money saved (Melinda Gates Foundation, Bankable Frontier Associates, Equity Bank and M-Pesa 2014).

Questions however still remain of what would incentivize the other parties i.e., the financial institutions and the Mobile Network Operators to engage, to invest and have a sustained involvement in such linkage partnerships. Some writers have suggested that banks could benefit from such partnership through the accumulation of considerable funds, the creation of convenient points to access clients, access to client with a nurtured financial behaviour, and lowered cost of client acquisition. Mobile network organizations could benefit from the generation of mobile money transaction fees and liquidity for agent network management (Melinda Gates Foundation, Bankable Frontier Associates, Equity Bank and M Pesa 2014).

In the wake of the covid pandemic, and the accompanying lockdowns, it becomes of interest to understand how saving groups are affected, and the lessons that can be learnt in an effect to make saving groups more resilient and more effective in financial transformation of the poor. Lockdowns have been implemented as the first line of defense to limit the spread of Covid 19 (Malik et al., 2020). These lockdowns brought many businesses to a halt, resulting in both supply-side shocks with people unable to go to work to supply or produce goods and services, and demand-side shocks, with households and businesses unable to buy goods and services for extended periods (Malik et al., 2020; Tripathi, 2020). Emerging evidence suggests that lockdowns have more adversely affected owner's micro and small businesses, informal workers, farmers and microentrepreneurs and more especially in developing countries (CGAP,2020; IPA 2020, Tripathi,2020).

3.0 Methodology

The study sought to analyze the effect of lockdown conditions on the performance of saving groups in Loro sub-county (Oyam District) and Nkozi sub-county (in Mpigi District) in Uganda in the period of January to March 2021. The study took a cross-sectional qualitative inductive research design to be able to collect and analyze the experiences and opinions of members of saving groups. The qualitative approach was selected to enable researchers hear the experiences of members of savings groups. This was key in giving a better understanding of the effect of lockdown conditions on the performance of saving groups, the performance of businesses belonging to these members, the overall effect on their livelihoods and the nature of help needed by members to recover their businesses or establish new businesses or undertake new careers if necessary.

The population in this study consisted of saving groups in Oyam and Mpigi districts in Uganda. The study used a stratified random sampling approach. Whereas the groups studied were purposively selected, members that participated in focus group discussions were randomly selected.

A sample of 25 saving groups from each sub county was randomly selected making it 50 saving groups. From each group ten members were selected for focus group discussions and fifty group leaders were interviewed. There were therefore 550 respondents in all.

Focus group discussions and interviews were conducted to collect primary data. Participants in the focus group discussion were members of saving groups, this data collection technique was deemed best in soliciting personal experiences of saving groups members. Interviews were conducted with saving groups leaders. These were deemed important in proving more authoritative information about saving groups.

The data was qualitatively analyzed by drawing inferences from submissions of the respondents

4.0 Findings

Most members of savings groups surveyed indicated that their businesses were adversely affected by the COVID 19 crisis. Lockdown conditions affected businesses in various ways such as the disruption of food supply chains as Local markets were closed, drop in the number of traders who sell food to cities and neighboring countries and the few traders who remained taking advantage of this situation to offer lower prices, failure to access credit to purchase inputs which affected crop yields. Members in service sectors such as teachers, transport operators (especially motor bike cyclists - Boda Boda riders), saloon business owners, restaurant owners and bar owners lost their cashflows because their activities were banned. A ban on gatherings also affected the brewing business because bars were closed. Shop keepers experienced a general drop in income as demand for many household products fell. Food Traders were affected by the fall in prices, which also affected the returns on their trade.

Saving activities were also affected by the drop in members incomes and the ban on all forms of gatherings which limited members access to savings facilities even when

they intended to save. Some groups also reported that some of their members abandoned the groups because they could not raise money for saving regularly, which has affected the savings. However, most groups continued to save amidst the restriction and reduction in income. Some groups confessed to have continued to meet in hiding. Members were concerned that if they didn't continue saving, they would find a challenge meeting some livelihood needs such as hospital bills, children's' education etc. in the future. To sustain saving group activities some saving groups came up with incentives for saving such as dropping fines for not saving or for not attending meetings. However, for other groups the fines were retained and they were credited for having motivated members to continue saving even though the amount dropped.

Members access to credit was affected by lockdown conditions. In some cases, it was reported that members who wanted to borrow did not have access to credit because meetings were suspended; in other cases, lending was suspended because the level of saving had dropped and the amounts available for borrowing diminished; and yet in other groups credit was only available to those members with big savings. Some groups retained credit only for cases of emergencies and in such cases, they did not ask for interest. In other groups it was reported that credit was kept available to all members, but demand for it remained low largely because of the then prevailing uncertainty. Yet in other groups some members argued that they could not borrow during this period because the activities they could borrow for were closed.

Those groups that continued with lending faced challenges of recovery arising from the drop in members incomes. This was largely attributed to the drop in prices of agriculture products; the loss of income for those group members who worked in "non-essential sectors" that were locked down; and some members who took advantage following the directive of governments to Financial Institutions to give a grace period to borrowers. The groups that were able to recover most outstanding loans attribute their success to the stringent recovery measures they employed; waivered interest on loans for their members for some time to incentivize their member to pay and that this affected recovery; flexible recovery mechanisms that allowed smaller instalments but without wavering the interest rate; payment of interest only for the loans that were outstanding before the lockdown; and exempting members from paying interest for some months. There were however other groups where members who were perceived to genuinely not to have any income had their loans written off as bad debts.

Whereas no group admitted using digital financial services in saving and lending activities, there was a consensus among members that such services would have played an important role in overcoming the constraints imposed by lockdown conditions. Members believed that access to savings services and credit would have been made easier. However, members expressed fear over the use of such systems due to the likely transaction costs that would be created, the low levels of financial and technological literacy among members to use such facilities, the lack of trust in such services and the possibility of fraud.

Members indicated that they had financial needs for them to recover from the effects of the pandemic. Individual members indicated that they needed funds for the recapitalization of their businesses. For example, some traders indicated that they needed money to restock their businesses; and some farmers indicated that they needed money to invest in production activities such as tractor services and labour. It

was suggested by some farmers that they needed support to purchase agriculture inputs such as fertilizers, pesticides, fungicides and herbicides, short maturity seeds, animal drugs, hoes, oxen and ox-ploughs as well as value addition machines etc. Some members especially those working with sectors that were suspended such as teachers indicated that they needed capital to startup new businesses. Yet other members suggested that they needed support to meet livelihood needs such as; educating for their children.

In almost all groups the need for external funding was identified as one way to enable saving groups recover since there were not enough savings for groups to meet the post covid demand for credit. Almost all groups also indicated that they planned to establish group businesses to supplement their incomes. They stated that they needed capital to create such group businesses, but which capital saving groups couldn't provide.

5.0 Relevance for deepening access to financial services through financial inclusion

The findings throw more light to the need to explore the use of mobile network operators to establish linkages between saving groups and formal financial institutions. This would enable saving groups and their members have a chance to access formal financial services. There is evidence of the need for external funding to bolster the resilience of saving groups and enhance their ability to better influence the financial transformation of their members. The saving groups model is less resilient to covariate risks as evidenced by the fact that the groups failed to provide the financial remedies members required when their economic activities were disrupted, and their savings reduced in the short term.

Saving groups again could not raise sufficient funds for the jointly owned businesses that are emerging in saving groups despite the strong desire and intention by member to start such businesses. This demonstrates the reality that saving groups may need external funding. The readiness among saving groups members to embrace digital finance services also demonstrates the possibility to use of mobile network operators to establish linkages between saving groups and formal financial institutions.

The findings also indicate that a business case exists that would incentivize financial institutions to engage, invest and get involved sustainably in such partnerships. Financial Institutions can for example benefit from the financial discipline, a saving culture and risk management abilities cultivated by saving groups over time. The fact that savings groups members continued to save even amidst adversity, including in hiding, is testimony that the membership to saving groups over the years has cultivated the saving culture among members.

This is an opportunity for financial institutions to mobilize saving as the model gets replicated all over the country. In addition, Banks and other financial institutions could benefit from skills cultivated in managing credit as demonstrated by members ability to analyze the risk situations and come up with recovery strategies which proved to be effective to a certain degree. Such skills could help in reducing credit management costs. Furthermore, the increasing demand for external funding both by individual members and saving groups themselves may be an opportunity which financial

institutions can take advantage of. Linkages with saving groups could furthermore give a chance to Banks and other financial institutions to increase their outreach across the country.

Again, a business case exists for mobile network operators. These could benefit from the generation of mobile money transaction fees and access liquidity for agent network management.

The saving groups model is contributing to the achievement of the National Financial Inclusion Strategy 2017-2022. The objectives of this strategy include: the reduction of financial exclusion and access barriers to financial services which saving groups have contributed to by increased saving and lending activities in village communities; empowering and protecting individuals with enhanced financial capability which saving groups have contributed to through enhanced financial skills of group members; and building out the digital infrastructure for efficiency which linkage partnerships could contribute to.

6.0 Conclusion

Saving groups have contributed to financial inclusion by increasing access to financial services, increasing financial literacy of members and nurtured financial discipline. They have financially supported members engage in productive economic activities, improved their incomes and bettered their livelihoods. Saving groups have also contributed to the achievement of some objectives of the national financial inclusion strategy including: (i)the reduction financial exclusion and access barriers to financial services and (ii) the empowerment and protection of individuals through enhanced financial capability. However, members economic activities, incomes and livelihoods have been badly battered by the pandemic. Weaknesses in the saving groups model have been exposed by the pandemic which include the inability to address covariate risks and raise sufficient funds for the effective financial transformation of members. This highlights the need for external funding and therefore the need to consider linkages with formal financial institutions. Saving groups could benefit from such linkages by accessing formal financial services to bolster members financial transformation. Financial institutions can benefit from accessing more saving, access to a clientele with improved financial knowledge and discipline and lowered costs of managing credit. Mobile Network Operators could benefit from the generation of mobile money transaction fees and access liquidity for agent network management.

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POST CONFERENCE PUBLICATION

URSB - SIMPO

Movable Property as Alternative Collateral

On May 31, 2019, the Security Interest in Movable Property Bill was enacted into law, becoming the Security Interest in Movable Property Act No. 8 of 2019. The Act established the Security Interest in Movable Property Registry System (SIMPO) the first online movable collateral registry in Uganda and on September 18, 2019, SIMPO was successfully deployed for public use.

The new law and SIMPO were designed to facilitate access to affordable credit for individuals, and Micro Small and Medium sized Enterprises (MSMEs), that were constrained in obtaining finance for investing in their projects because many of them could not meet the collateral requirements ordinarily requested for by the lenders. In trying to access loans and other credit facilities, many financial institutions often required immovable assets like land and buildings, as collateral, and borrowers that owned other valuable movable properties such as vehicles, farm produce, equipment, inventory, intellectual property, account receivables, investment securities, documents of tittle among others remained underserved.

With a better regulatory framework and functional credit infrastructure (SIMPO) in place, movable assets can maximally be used as alternative types of collateral, while mitigating the risks of movable asset-based lending.

SIMPO is a web-based registry which contains registered security interests in movable properties. It is accessible 24 hours a day and 7 days a week on www.simpo.ursb.go.ug. Registrations are done by authorized creditors like banks, microfinance institutions, SACCOs and moneylenders, or their representatives, and the information entered is available to the general public for searches using the prescribed criteria.

This registry presents immense benefits to the lenders through boosting their confidence while lending over movable property. By registration of the security interest in SIMPO, the whole public is notified about the lender's interest. This gives the lender confidence that the money advanced will most likely be repaid and if not that the law will offer protection. It also curbs the practice of multiple borrowing that is prevalent in our society. To the borrowers it gives one confidence and comfort in knowing that the asset pledged as security is under the protection of the law and will not be fraudulently acquired by a lender as is in some unfortunate cases. The loan processing time is significantly reduced as registration of an interest is remotely accessed and an instant action. To the general public, buyers of used goods are advised to search the registry

prior to buying a movable asset to ascertain that there are no pending third-party interests from a certain lender. They also generally need to be armed with knowledge on how they can generate value from assets that they own, this can come in handy when accessing credit or even making investment decisions. With these benefits, interest rates are expected to lower given the decreased risk associated with lending over movable property as facilitated by the SIMPA,2019.

SIMPO was rolled out in September 2019 and currently boasts of over 8,872 registrations, 8,213 searches conducted and 11,804 collateral registered. Motor Vehicle being the most used asset as collateral to access credit with 8,321 registrations. As this law is being implemented particular attention is being paid to addressing the challenges that hinder access to affordable credit and partnering with relevant financial market players to neutralize the same. URSB is also committed to conducting mass sensitizations and trainings aimed at popularizing the registry and consequently increasing household incomes in accordance with the NDP III.

URSB commenced the sensitization drive in 2019 to introduce SIMPO and SIMPA to lenders, and train them on how to use the registry. On site trainings were done for commercial banks, credit institutions and microfinance deposit taking institutions, while workshops were held for tier IV non-deposit taking institutions and money lenders. As a result of the Covid-19 pandemic, online trainings were adopted to ensure continuity. URSB also creates awareness through Television and Radio talk shows, adverts on billboards, street poles, Taxis and social media platforms, documentaries, and print media.

Why should collateral be the basis for lending, where collateral registration is not well developed? Other economies use various predictive scoring models – Robert Magala

Uganda established a modern movable collateral registry called Security Interest in Movable Property Registry System (SIMPO) with the aim of having a single centralized data source for all security interests in movable property to reduce the credit risk for the lenders and increase access to credit by SMEs, Youth, and women. The registry is maintained by Uganda Registration Services Bureau (URSB) with 11,804 movable collateral registered. Other African countries that established modern collateral registry include Burundi, Ethiopia, Ghana, Kenya, Lesotho, Liberia, Malawi, Nigeria, Sierra Leone, Zambia, Zimbabwe among others.

Predictive scoring models can only be used where there is availability of quality data, Something Uganda is still grappling with in all sectors. Data collection, analysis, management, and sharing was one of the widely discussed topic in the Annual bankers' conference 2021 to enable financial services sector to thrive in the era of the 4th industrial revolution.

Q&A

Credit Reference Bureaus

1. How relevant is an offering like that of Raxio data centre in the face of players with large economies of scale like Amazon web services, Microsoft Azure and Google cloud? – Paul Ntegeka

Amazon Web Services, Microsoft Azure and Google Cloud operate differently from Raxio Data Centre in that they offer cloud services whilst Raxio provides the physical and technical environment with stable power and efficient cooling for customer equipment. There are some of Raxio's local and international customers who provide public and private cloud services to the market.

2. How can Raxio data centre help banks concentrate on what they are best at doing and make significant revenue margins without huge costs of maintaining their individual data centres? Damalie Elizabeth

Every day, banks grapple with tonnes of data and are constrained in many ways by their in-house data centers. The value proposition that Raxio provides to banks is both on capital and operating expenses. It provides an opportunity for the banks to re-use their capital expenditure for their core business and make savings on their operating expenditure. Raxio is providing Colocation and Cross Connect to banks and other enterprises with 24/7 security and a network operation centre. The environment is designed and kitted with state-of-the-art equipment which is particularly deployed for the best power use effectiveness and cooling efficiency.

3. How sure are we that Raxio may not lock us in once we join them? And has any of your customers ever experienced unpleasant surprises? - Ken Ouko

Raxio Data Centre is a purpose-built tier III data centre designed to global best practices with a no objection from the regulators in the country and operating with industry SOPs. All our clients are protected by the master services and service level agreement which is negotiated and agreed upon between Raxio and the client. We believe that contract or vendor lock-ins can be a serious impediment to growth and therefore allow as much negotiation as possible. We have not had any bad experiences with any client, and we don't foresee this in future – Any challenges that may arise would be handled amicably based on the business relationships built, and fostered.

4. When you take a scan of Uganda, data contributors to the bureaus are currently limited to supervised financial institutions under the Bank of Uganda purview, leaving out a huge quantum of data critical for credit risk exploration and MFI data, SACCO data, retail stores, utility services, etc. all missing information – leading to information asymmetry reducing the authenticity of decisions made on the limited data sources. How is Raxio working with key stakeholders to accelerate data aggregation to really increase relevance of the data centres? – Joshua Dhuani

We do realize that big data and big data analytics will play the biggest role in the 4th Industrial revolution because it is the basis for Artificial Intelligence. However, it requires Cloud computing as the repository for all the data collected from multiple organizations. What we are doing with key stakeholders is advising them on how to bring data together in an organized and systematic form. Once this is done, the question would be the how and where this data is stored.

5. Big data-based credit reference systems gradually attract wide attention due to its advantages in remedying the shortages of traditional credit reference and dealing with new challenges arising from financial credit management. Has Experian tried to adapt to this new trend? – Ken Ouko

Absolutely, in many of our global bureau markets we leverage alternate data, open banking technologies, utility data, telco usage data, retail data, transactional data, geolocation data and even consumer own shared data to boost credit profiles. Countries like Uganda have some way to go to adapt to the use of these broader data sets, but we are hopeful that the stakeholders that are reviewing the regulatory reforms in Uganda are considering the global direction to allow Uganda to improve, much as even Kenya has done.

6. How can Experian or any other credit reference bureau, supporting data collection and sharing for MSMEs to enable B2B or B2P credit transactions. We observe that their operations are limited to financial institutions only – Robert Magagala

The data centers house data with loan performance data and CRB profiles, and Identification data. By simple example they don't have a customer deposit system, or a cheque account platform, etc. The infrastructure such as servers, firewalls, routers, VM's etc that a bank needs to run its back-end systems while technically the same would need to be sized and configured differently for the bank specific applications and hence could differ significantly.

The only reason the licensed CRB's in Uganda are restricted to reporting data on financial institutions is related to limitations in the law and regulations thereto. The law itself was changed in 2016 to allow a broader set of data to be collected to overcome this but the regulations have delayed and have not been implemented thus preventing the CRB's from serving these sectors and collecting data from them.

7. One of the justified concerns around data relates quite simply to security of data. As more players generate more data for use in the decision-making processes, more data

needs to be secured. Examples include fintech data, utility, payments, data, telco data, online shopping type behaviors, etc. Should regulators be looking to regulate all data across generators of data, or should regulators be using the existing structures e.g., credit reference bureaus that are already supervised to safeguard the industry's data – Michael Malan

The proposed Data Protection and Privacy Policy/Act (DPPA) is designed precisely for both scenarios. The objective of the Act is to protect the privacy of individuals by regulating the collection and processing of personal information in Uganda and outside Uganda if the information relates to Ugandan citizens; to provide for the rights of the persons whose data is collected and the obligations of data collectors, data processers and data controllers; as well as to regulate the use or disclosure of personal information. Depending on how a given entity fits within the policy, we will all be required by law to comply and play our part which ensures that customers data is protected and not misused.

Even with the DPPA in place in Uganda this does not ensure the protection and security of the data at the standards prescribed for CRB's. Many players are starting to create data for possible consumption in their credit models (which is good) but lenders (and consumers) and regulators should be concerned about the safe harbour concepts of who is looking after that data and with what attention to security.

FSDU – Joseph Lutwama

1. If we don't have money, where is the role for the formal financial institutions to enable people make money? – Robert Magala

Each one of us have ideas that can be transformed into viable businesses which can enable us to earn an income and make money. So, while we may be short of money, we are not short of business ideas. Therefore, what is lacking in our financial sector are financial institutions and entities that provide risk financing for ideas. These are institutions and or individual and angel investors are willing to bet on ideas before they become fully fledged businesses which are attractive to the risk averse commercial banks. So, besides the commercial banks we are all familiar with, we need a niche in risk finance to develop and emerge within our financial system similar to the Silicon Valley in the United States to specialize in financing business ideas and nurturing them into fully fledged business entities. We also need an active mergers and acquisitions (M&A) market that which will provide a viable market for these budding ideas. There needs to be large and mature companies that are willing and in position to snap up innovations in the market.

2. Do you think the financial sector needs to go back to the drawing board and rethink about the approaches to financial inclusion as the current ones have not yielded much? – Fatiah Nassali

Yes, we need to think beyond giving access to bank accounts and or mobile money accounts. Emphasis needs to be placed in channeling funding to the real economy so that jobs can be created. It is only then that we will see an upsurge in the demand for financial services because the people will now have a reason for banking. They will be earning an income and acquiring assets all of which are precursors for a more sustainable market for financial services. Financial institutions exist to provide a service to those who are earning and have assets.

3. You talked about financial institutions having shared infrastructure in terms of identity, data, and payments. I would like you to speak to the issues of breach of confidentiality of our client's information, given the era of cyber insecurity – Juliet Nanzala

No doubt as the adoption and use of digital financial services increases, the risk of cybercrime and violation of data privacy will increase in tandem. Therefore, equal efforts and focus needs to be put into securing the digital infrastructure that deliver these financial services.

4. How do you balance data protection with data sharing as you suggested? - Stephen Muhangi

At the core of data protection is empowering the customer to better manage the use of the information about them and how to engage the different data vendors. Therefore, in addition to securing the technology platforms, focus needs to equally be placed in educating and empowering the data owner to better manage their information.

5. Despite the several partnerships, what we have seen is that the cost or fees remain high in the banking sector. What is being done to address these concerns? – Joseph Kwizera

It will take a multiplicity of issues to be addressed for the cost of credit and banking services to come down. First, the market structure of Uganda's banking sector does not favour a competitive environment with more favourable rates. Uganda's banking is sector is an oligopoly with a few big banks controlling the market, in this way they dictate the prices in the market and have a higher bargaining power than the customer. Until this market moves closer to a perfect market where the customers' bargaining power matches that of the banks, the high interest rates are unlikely to come down even in the face of increasing efficiencies within the sector. We hope that the

emergency of the FinTech sector that is increasingly taking on the traditional roles of banking could bring us closer the reality of a more perfect market.

6. As much as financial institutions have provided basic financial literacy and education to a considerable number of users, I still see a challenge with uptake of digital solutions. What is the plan towards digital literacy? – Nickson Kamugisha

You are right, digital literacy is as important as the development of the digital tools themselves. However, this will require a multistakeholder approach where both the public and private sector are involved.

7. With all the strategies in place by different players to further the financial inclusion agenda, does it pose any risks? All speakers seemed optimistic – Simon Bugembe

Simon, you are right, financial inclusion does come with some risks. The one that comes to mind and a lot of literature has been documented about it, is the risk of a rising debt burden as more vulnerable and poor customers have access to credit courtesy of more efficient and an accessible digital tools and infrastructure. The customer is likely to take on more credit than they can manage which will pose a risk to the social and economic livelihood of the customer but also expose the financial system to systemic/contagion risk akin to the 2008 global financial crisis where loans where advanced to people with no income, no job, and no assets (NINJA). These NINJAs almost brought down the entire global economy and in a digital world that would happen so fast.

Cyber Security – Hosea

1. How much is being done by Uganda's financial services industry to combat cross border international cybercrime that mainly originates from Eastern Europe and is targeted at local smartphone users? - Bernard Busuulwa – Hosea

There seems to be no other place in the global construct where the concept of jurisdiction is difficult to apply like cyber space. Cyber space has NO physical or national boundaries, and it is an ever growing and evolving dynamic space e.g., an attacker using a combination of stolen identity, phishing, a VPN, and a location anonymizer can launch a cyber-attack from North Korea that will appear to investigators to be originating from the US and can indeed only be traced back electronically to the US. The most notable advances in addressing the pervasive nature of cybercrime in financial institutions can be found where effective collaboration has been established e.g., in the work of Financial Services Information Sharing and Analysis Center (FSISAC) a European body that brings together financial institutions

all over Europe in an industry wide consortium dedicated to reducing cyber risk in the global financial system.

In Uganda a related institution is the UBA Cyber Security workstream under the umbrella of the ICT committee that is currently working towards a shared Cyber security capability for the UBA. This work will bring a myriad of security services online that will include (Threat Intelligence, Cyber Incident Detection and Response, Offensive Security, Vulnerability Management etc) for the UBA community and reinforces the concept of working together to jointly address the escalating issue of cyber risk. This is coupled close partnerships with law enforcement e.g. The UP, OCID and Interpol should give us the global reach necessary to push back on perpetrators and/or hold them accountable regardless of geographical location.

2. How can we use the postmortem data of the fraudsters and become proactive thus predict the future occurrence? – Perry Ongom

There is indeed significant value in the incidents that have happened in the past. I believe that all institutions must incorporate a process that consists in a thorough post-incident review specifically paying attention to the ROOT CAUSE e.g. Your typical incident response process might include a) preparation b) detection c) Triage and Assessment (e.g., impact/stakeholders etc) d) containment e) recovery and restoration and most importantly f) post incident review. During the post incident review the focus should consist in isolating the root cause (which specific weakness, logic flaws, design errors and reliability issues were exploited by the perpetrator and threat to cause us loss?). This what would effectively inform the necessary and corrective actions required in the short term and long-term to prevent a re-occurrence. Too often most response efforts end prematurely after restoration of services.

3. How can financial services embrace technology to better up their risk management practices and strategies? – Charles Byansi

This question is addressed it at length with practical measures in the final section (Cyber Resilience) of my article in the Annual Banker's Conference Magazine now available on https://lnkd.in/dA395srv Pages 64-69.

Office of the State Attorney – Caroline Marion Acio

1. Do you have any successes in prosecuting sim card swapping fraud cases and if yes, please share – Moses Kisembo

Sim card swapping has been a very common kind of account take over fraud. We have had several cases reported, and under investigation, but the challenge has always been accessing the required information from the Telecoms and Mobile money providers. We have no record of successful prosecutions, but it's hoped that there shall be great improvement because the Data Protection and Privacy Act, has more stringent provisions relating to protection of personal information, whose breach is the major cause of sim Swap frauds. Additionally, there shall be more improvement since prosecution of such cases shall be done by a specialized unit, under the guidance of specialized prosecutors. It is also hoped that more cooperation and partnerships shall see provision of the required information improved.

2. Kindly appraise us on the capability of our courts to fully appreciate the sometimes tech-complex evidence in financial cybercrimes – Andrew Obara

Cybercrimes are complex and pose challenges not only to law enforcement and prosecutors, but also to judicial officers. As pointed out, the evidence is usually complex and technical. The competence of Courts depends on a number of factors including how well the Attorney has presented his/her case, or how articulate the witness and the various forensic reports may be. Lack of clarity usually lead to more confusion to the judicial officer.

The competence levels vary among individual judicial officers, e.g., there are a breed of tech savvy judicial officers, who are interested in technological advancement, read and research about it. This category is highly competent. And there is a group that is not interested, doesn't use a computer, and only interface with these issues in the cases. This group is less competent, and the Attorney/ Advocate has to do so much to make them understand.

Due to the different interests of the judicial officers, a specialized Court may be highly recommended. The Judicial officers in the specialized Court may be chosen from the pool of those interested. Additionally, continuous trainings is also recommended. Because the rapidly advancing technology go hand in hand with emerging and high technology crimes.

3. The other day some airline workers shared images of family members of a particular politician flying out of the country. Who controls this space in terms of privacy? – Robert Magala

The information shared was personal information of the family. The Airline collected the information for a specific purpose. Protection of Personal Information is regulated by the Data Protection and Privacy Act. If the breach to the information was not justified, then the Airline is liable for the violations of privacy. In terms of who controls the space, that breach was not committed in space, it was by the Airlines, the Data Controller and Collector. However, the Regulator is NITA (U) where the Data Protection Authority (the Regulator) and office is.

Privacy on the web is a going concern. As a rule of thumb, anything that one captures on a mobile device is no-longer secure since cloud computing is a new normal. Nevertheless, different entities have IT policies that probity this kind of behavior from employees. The politician in this case can proceed to institute charges against the aircraft operator and in this case relevant charges under the computer misuse act can be advanced by the UPF to pave way for formal investigations.

Director Forensic Services - Uganda Police Force – Andrew Mubiru

1. In terms of scoping the need for internal staff programs what fraction of the USD 10mn loss is attributed to internal collusions? – Goretti Masadde

In our experience, 90% of losses were initiated by an internal actor. This internal actor who is knowledgeable about the systems and the fail safes will usually collude with external actors who are less knowledgeable but have the necessary networks to cash the money and move it quickly. The latter lie undetected only to merge at the last moment to pull of the perfect "Italian Job". Technical related issues that lead to losses are less prevalent, but product related matters must be addressed in as far as access by users and back-end reception by technical personnel who may be complacent in addressing possible breaches.

2. How can we use the postmortem data of the fraudsters and become proactive thus predict the future occurrence? – Perry Ongom

The postmortem data would be a great aid in the development of strategies to counter future breaches. Unfortunately, not many of these breaches are reported hence the postmortem data is inadequate at best. Most breaches are concealed and those that pop-up are handled by in-house teams to limit damage to the cooperate image.

3. What are the police doing to create awareness and address cybercrimes within the industry? - Josephine Olok – Andrew

Awareness in the industry about cyber-crimes is a collective effort. The Uganda Police Force (UPF) has in the past partnered with UCC to create awareness in the Mobile Network Operators (MNOs) especially on sim swapping and mobile money fraud. The major challenge is to have clear complaint channels where citizens can quickly report breaches without the need to walk into a police station. Swift action would then need to be coordinated across the industry. To this end, the UPF and the industry actors would benefit greatly by undertaking joint awareness campaigns to address cybercrimes.

4. The other day some airline workers shared images of family members of a particular politician flying out of the country. Who controls this space in terms of privacy? – Robert Magala

Privacy on the web is a going concern. As a rule of thumb, anything that one captures on a mobile device is no-longer secure since cloud computing is a new normal. Nevertheless, different entities have IT policies that probity this kind of behavior from employees. The politician in this case can proceed to institute charges against the aircraft operator and in this case relevant charges under the computer misuse act can be advanced by the UPF to pave way for formal investigations. – Copied above (same question to Caroline).

FinTech – Peter Kawumi

1. As we discuss collaborations with fintech players and banks, largely small players with limited governance structures, how do you think the counterparty risk shall be mitigated? – Peter Kawumi – Robert Magala

Fintechs vary in size, experience, capability, risk management and governance levels. Small startups generally take time to build all these up to a level anywhere close to where banks need them to be as they seek partnerships. In recent years, what we have seen banks working with Fintechs with great ideas – but limited capability – to build their capacity as a way to bridging this gap. Where this has been done, both parties generally benefit from a much stronger partnership.

2. One of the justified concerns around data relates quite simply to security of data. As more players generate more data for use in the decision-making processes, more data needs to be secured. Examples include fintech data, utility, payments, data, telco data, Jumia/online shopping type behaviors, etc. Should regulators be looking to regulate all data across generators of data, or should regulators be using the existing

structures e.g., credit reference bureaus that are already supervised to safeguard the industry's data – Michael Malan

Frankly, this is an area that we are all still learning about. Regulators, including those in Uganda, are now moving to regulate the use of data held by private sector players (for example the recent Data Protection and Privacy Regulations), many of whom are yet to comply. There exists opportunities for the regulators to "short-cut" the implementation and adoption of these regulations by working with existing structures; but key to this must be ensuring that these structures actually comply. – Already answered and included in the response from CRBs

Mastercard – Shehryar Ali

1. How does the right to be forgotten intersect with the need to be remembered especially in terms of borrowing behavior? – Julia Oyet

It is a balancing act at best. We are in the era of open banking. Right to be forgotten allows you to pull out of one platform and go to another if you feel you are not being served.

Cyber Security Consultant, NRD Cyber Security - Dr. Vilius Benetis

1. Kindly guide on cybersecurity insurance as applied to the Ugandan Banking/telecom industry. Is there a feasible solution to cybersecurity risk? – Rehema Nabunya

Cyber Insurance business model is not settled yet, especially to big risk of Ransomware; thus, insurance providers must be contacted on individual case to see what is offered. In overall it does not look to be a good solution as protection for cyber incidents, rather probably to reduce the cost of incident handling.

2. If systems are developed by people, then the same people can attack or bypass them. How can the industry remedy this going forward, in a collaborative manner? – George Muga

Sectorial cooperation for cybersecurity resilience is very crucial and working for many countries. Usually, it works with some sectorial guidance and coordination from the regulators or sectorial organization association. In Uganda Banking Association could play a key role, from my understanding.

3. How do we make the digital infrastructure an enabling environment and a basic public good so that companies and individuals that need to invest in some innovations are not bogged back by the huge costs and disruptions on the infrastructure? Just a

couple of months back, the internet was suspended and as we try to encourage the customers to adopt the digital channels, a tax is imposed on the data – John Tumiwne

It works only by leadership of all stakeholders, moving and creating innovations in the country, and ensuring their cybersecurity and balance the rights and expectations of participants.

Laboremus – Timothy Musoke

1. Who will regulate this eKYC data? Will it be NIRA, UCC or NITA and how do we handle the customers who for some reason be it political about their data being used in other areas? - Kenn Ouko

Each entity that owns a subset of the eKYC data is responsible for maintaining the privacy of the data as mandated by the Data Privacy Act of 2021. If a customer does not want their data to be used in other areas or for other purposes, they simply do not give their consent. Following up on breach of consent is the responsibility of the regulator (NITA-U).

2. I am more interested in the eKYC, especially regarding data privacy and protection. Who is in charge of regulating this section of the segment – Nerbert Rugadya – Uganda Radio Network?

The regulator of the Data Privacy Act of 2021, and thus data privacy and protection is NITA-U.

3. We do appreciate coming up with a central database for eKYC. Please highlight whether we will only have one player offering the service or we can have different players to allow for quality offerings and manageable prices? - Kenn Ouko

At this time, there is no central database for eKYC in Uganda and there are no plans in place for a central database for eKYC yet. The NIRA-integration that is being implemented is just part of what makes up eKYC.

Dr. Twine

1. During last year's lockdown, bank of Uganda officially allowed Commercial banks to restructure loans for their customers. However, during the current lockdown Commercial banks claim that BOU is silent about it. What is true and what plans is BOU having concerning people with loans?
2. In this 4th industrial revolution, what is the regulator's plan as far as enabling cloud hosting services for the financial institutions given that storage is going to be key in this ear – Robert Tumwine
3. There are a number of various high-cost unbundled components related to the 4th industrial revolution and provided by private players. How shall pricing to the ultimate user be regulated? – Robert Magala
4. BOU – Given the many non-banking actors in this space, each offering a different service with their own mark up, to what extent shall financial services be made affordable to the last mile consumer> This is also precipitated by the government thirst to tax velocity of money? What is the role of regulation? – Robert Magala
5. Some banks are really doing well regarding digitisation. But some are really a headache. It's very rare to find some banks electronic banking platforms working. Does the regulator have a say in such things, or it is up to is to leave a bank for another one, as they usually say? - Nerbert Rugadya
6. How are regulators going to manage the aspect of affordability given the various private players involved in the ecosystem – Robert Lule.
7. With the emergence of eKYC and data driven credit risk technologies, to what extent is regulation flexible in promoting banks to explore non-collateral-based lending vis a vis using predictive analytics as a basis for lending? – Robert Magala
8. What is our take on decentralized finance and financial inclusion? Are the players ready to support the decentralized finance revolution? – Juma Teko

Data and Data Privacy – Who?

1. In deconstructing data management, what kind of data is at a bare minimum sharable or could be of concern to a data owner in terms of privacy? – Robert Magala
2. I appreciate Paul's insights on a data driven strategy. However, in a market like ours where there isn't a single source of authentic data, where do we actually start? I appreciate there is a lot of data seated in different sects of the financial space but how do we bring all this together – Paul Mutungi
3. Very interesting initiative on big data used for credit. How did you get all the industry players to avail access to their data with all these privacy laws? Was it through a central bank mandate? – Damalie Elizabeth

Climate Change – Who?

1. What are the banks doing about green financing here in Uganda, an opportunity that is under leveraged? From an innovation perspective, what can we start doing differently? Countries in southern Africa are doing well here. What are your views? – Mary Nabunya

Payments – who?

1. Uganda is one of the top recipients of remittances in sub-Saharan Africa. How are members of Uganda Bankers Association tapping into this space to increase the uptake of financial services? – Michael Muwanga

Uganda Bankers Association

1. As an umbrella organization, are there annual targets and procedures put in place for us to know where we are every year on the achievement of financial inclusion? – Benjamin Kawato
2. So many entrepreneurs still do not believe that financial institutions can provide efficient services through mobile and digital platforms. What can we do as financial institutions and other stakeholders to increase uptake of digital solutions? – Nickson Kamugisha
3. We have seen academicians and development partners injecting money into innovations. FSDU, DFiD, KFW, Mastercard, Giz etc. and the money is being directed to very profitable financial services providers. With the kind of such profits that banks make today, why can't they be proactive in making investments into such innovations? Are there institutional barriers that prevent their boards to sanction such innovations? – Robert Magala
4. That you for a great discussion in data driven strategies. The need for financial capital; investment policies and processes in the journey to leveraging the 4th industrial revolution has been well articulated. This almost alienates the smaller players with less financial muscle hence the need for collaboration, integration, etc. What is the need for human capital? Who in an organization needs to be in board? What fraction of staff need to be on the table? Goretti Masadde
5. You talked about dormant accounts. Has the sector recorded more of these due to the pandemic? - To James Onyutta - Fatiah Nassali
6. How are the players addressing the issue of gender inequality since women are the majority of the unbanked? – Anna Nazziwa
7. To what extent are financial services providers exclusive, especially where the profile for persons targeted are those with money, economically active whose identities are formally defined? – Robert Magala
8. When shall our industry think of tiered KYC regimes? – Robert Magala

9. Write to you to express my discomfort regarding to the current state of Ugandan citizens. Many people borrowed money from different banks not forgetting the fact that ever since citizens entered into lockdown, they've never worked again and yet the bank is impounding their properties. some properties as I speak, they're put for auctioning amidst your watch. What policies do you have to address the voiceless people?
10. The Covid-19 Pandemic has increased uptake of alternative Digital Financial Assets among Ugandan Youth such as adoption of Cryptocurrencies especially for Cross Boarder Financial Transaction. Is the banking sector willing to integrate Usage of Cryptocurrencies into their banking systems?
11. The National Financial Inclusion Strategy was launched some time back, how far has the financial sector gone to attain the recommendations in the strategy? Fatiah Nassali