MOBILE NETWORK OPERATORS' NEEDS IN COLLABORATIVE MOBILE MONEY SERVICE PROVISION

Azza Z. Karrar[1,2] and Azizah Abdul Rahman[1]
[1] Universiti Teknologi Malaysia, Johor, Malaysia
[2] University of Khartoum, Khartoum, Sudan
E-Mail: zkazza2@live.utm.my

ABSTRACT

Recently, the developing countries are considering the development of mobile money ecosystems that supports more inclusive financial systems to overcome the high financial exclusion of their population. Such ecosystems can be enabled by facilitating the collaboration between diverse stakeholders from different sectors: financial, telecommunication, regulatory bodies and IT service providers. This development of mobile money ecosystem emphasized on the identification of main stakeholders' needs and conflicting interests. The aim of this paper is to understand mobile network operator's needs when participating in collaborative mobile money ecosystem. The Sudanese national mobile money project was used as case study in this research. Qualitative interpretive interviews were conducted to collect data from different stakeholders in different sectors in Sudan. The data was analyzed using qualitative data analysis approach. The results of the analysis focus on representing the multiple perspectives of stakeholders on each mobile network operators' (MNO) need. Findings contribute toward better understanding to the mobile money ecosystem in Sudan from MNOs' perspective. This understanding can facilitate building successful value propositions between mobile money stakeholders which can results in better financial services.

Keywords: mobile money, collaborative service provision, stakeholders needs qualitative analysis.

INTRODUCTION

Mobile money is the use of mobile phone to access financial services by unbanked users who do not previously connected to formal financial services [1]. In the basic mobile money scenario, users use the stored air time at their mobile phones as electronic money that can be transferred to other users' mobile phones. This electronic money can be used as substitute to cash. Users need to deal with agents to convert from electronic money to cash (cash in) or vice versa (cash out). These agents are normal retail stores or individuals who are representing the mobile money service provider.

Many governments in developing countries are paying special interest into providing national wide mobile money ecosystems that can help in reduce the high number of its financially excluded populations. These ecosystems are referred to as inclusive mobile money ecosystems. mobile money ecosystem is defined as " the networks of organizations and individuals that must be in place to mobile money services to take root, proliferate and go to scale" [2]. The financial exclusion problem in developing countries is caused by many factors such as literacy, poverty, weak banking sector penetration and lack of other ICT infrastructure. In the recent years many mobile money deployments were initiated in different developing countries because mobile phones are highly penetrated between unbanked users unlike any other alternative ICT tool. Consequently, the needs of different stakeholders in mobile money ecosystem are different from others in developed countries because the aims of these ecosystems are to support more inclusive financial systems to overcome the existing financial exclusion problem.

In 2011 the Sudanese government represented by the central bank of Sudan (CBOS) declare its new vision about developing a national wide mobile money ecosystem where different stakeholders such as banks, mobile network operators (MNOs), microfinance institutions (MFIs) and other government agencies will participated in. The new suggested ecosystem should provide different roles to each sector to guarantee the support for the scope and scale of the services as well as limiting the competition drawbacks and help in delivering number of financial services with good quality to the biggest number of user as previously supported by different authors [3-5]. However, in a previous study about the different stakeholders in mobile money ecosystem in Sudan, [6] shows conflicting interests of different stakeholders and their resistance to the national project due to unconsidered needs and existing issues in collaborative mobile money service provision. Also the study shows how the definition of stakeholder's needs is isolated and not considers the other stakeholders point of view. Specifically the MNOs as new actor in mobile financial service provision were not sure about their needs to participate in collaborative national mobile money provision. Therefore, this paper aims at filling this gap by provide an understanding to the MNOs' needs when participating in collaborative mobile money ecosystem taking multiple stakeholders perspective.

In this paper a case study on Sudanese mobile money national project is presented and an empirical data was collected to assist in understanding the current and future mobile money MNOs' needs. Interpretive interviews were used to gather qualitative data by interviewing representatives of main mobile money stakeholders. Then data was systematically analyzed to determine what the main MNOs' needs are. This paper main contribution is to provide comprehensive

www.arpnjournals.com

understanding and analysis for mobile money ecosystem MNOs' needs in Sudan.

This paper organized as follow: Section 2 presents a brief summary to the current Sudanese mobile money situation and highlights for the future national project are introduced. Section 3 provides a description to the research methods used in data collection and analysis are provided. In Section 4, the findings of the analysis are presented and discussed. Finally, conclusions and directions for future work are provided.

RELATED WORK

Building mobile money ecosystems must be national wide process that enables the inclusive finance were financial services to the unbanked are supported at all level of the financial system : micro, meso and macro level [7]. Connecting the unbanked population to financial services can improve their lives and make them able to prevent them self from economic tension as they will be able to increase their income, saving and have some form of micro-insurance. The provision of mobile money platforms can enable new innovative business models and business processes that define new actors in the new inclusive finance era [8]. To provide interoperable mobile money ecosystem with wide range of financial services an introduction of new roles and actors in the new ecosystem must be studied in a way that guarantee the most benefits to the customers as well as the win-win outcomes to the participating stakeholders.

Current mobile money deployments where lead by either a mobile network operator (MNO), bank or third parity. In some cases collaboration between bank and MNO is introduced. Although collaboration between different stakeholders to provide an inclusive mobile money ecosystem is emphasized by many authors such as [9-11], however the essence of such collaboration between stakeholders is still not clear [12-15]. Different stakeholders have different perspectives regarding the collaboration and these perspectives needs to be understood and considered [16]. Currently there is a need to understand how value can be jointly co-created in mobile money ecosystems by different participated stakeholders [10, 12, 15, 17, 18].

CURRENT SITUATION IN SUDAN

Current mobile money practices in Sudan are led by mobile network operators (MNOs) but for limited range of services such as prepaid and postpaid reloads. MNOs uses a franchising business model that involves licensing of trademarks and methods of doing business with small number of direct agents for cash in and their services used mainly for remittances. MNOs customers are using the current available services from their operators and MNOs reports that the number of transactions done per month is huge compared to other similar deployments in other developing countries due to the unavailability of formal financial services in rural areas and the immigration of many citizen to urban areas leaving their families in their home villages and need to send regular remittances to them.

MNOs customers use the scratch cards to cash in but for cash out they have to pay a high commissions (up to 10%) in each transaction which considered very high. Moreover, the cash out agents are informal agents where no legal regulations are used to protect customers. In the current situation the methods of cash out are not yet standardized. Another issue for the customer is the absent of interoperability between MNOs so transfers must be done with in the same network.

The current banking sector in Sudan is focusing on additive mobile banking models [19] where mobile is used to retain the existing bank customer by providing additional channel to access customer accounts. The banked customers who are connected to the formal financial system are small compared to the large customer base of the MNOs' customers. The distribution of bank branches in urban areas not rural one and the requirements for know your customer (NYC) make it difficult to attract the unbanked. Also the banks are not interested in providing retail financial transactions. Retail financial transactions usually have high transaction processing fees due to its low volume and frequent use. With the possibility of mobile money platform banks may consider to join the new ecosystem for new customer acquisition but will faced with the dominancy of the MNOs with the already existing customers, distribution networks and experience in service provision.

Current microfinance and other financial institutions is representing a small sector with no assets to participate - as mobile money service provider- but may participate in future as using the planned ecosystem to improve its services and to get a new business opportunities as agents for cash in and cash out.

In 2011 the MNOs starts a new business with the Sudanese national electricity corporation (NEC) to sells electricity to customers using their mobile phones and this raised a serious issue of money creation, due to the absent of the regulations and standards for mobile money control by central bank of Sudan (CBOS) who starts to realize the importance of developing a speed solution to this problem.

The banking system in Sudan is controlled by CBOS. In May 2011 an initial approval from (CBOS) to start a project for Sudanese unified mobile money platform that is consider as a new era of banking in Sudan. The new project aims to provide a mobile money ecosystem that is interoperable and consist of all the banks, MNOs, MFIs and any other institutes that willing to enter the market of mobile banking service provision. A steering committee for the national project is initiated. Currently the committee in the phase of defining complete electronic banking and mobile money business model that define each player's role as multiple entities are involved. The basic idea is to keep the overall process same as the current working system where central entity act as controller (CBOS) and the current switch operator for the banks (EBS) as the executive of the new mobile money platform.

METHODOLOGY

An explorative case study [20] was chosen as strategy for this research. This choice based on the nature of mobile money ecosystem for IFS context as it is relatively new and it needs an in-depth investigation. The investigation targets demarcation of the main aspects of collaboration between the main stakeholders and their interrelatedness using a multiple sources of evidences. The case design was single case with multiple embedded design contains mobile money for IFS in developing countries as the overall case context. The research focused of a specific case: "the Sudanese national project for mobile money for inclusive financial systems" as single case to be studied. The unit of analysis is inter-organizational collaboration practices between main mobile money service providers. The embedded case design was chosen because the nature of this study where collaboration is involving multiple mobile money service providers. Each stakeholder has its needs to be fulfilled as well as the overall national goal (IFS) to be met. So targeting a single national level (Sudan) as a case and embedding multiple unit of analysis (collaboration practices in different sectors) enable the researcher from capturing the multiple perspectives of different stakeholders as well as the two level representations.

The Sudanese mobile money national project was chosen as a single case to focus on for the following case selection criteria's [20, 21]: First few cases in developing countries applying mobile money at national level where multiple stakeholders are involved and the IFS is the goal of the government. Second, the feasibility of accessing the case materials due to the researcher background and previous work experience which enable the access to the top level national committee members and decision makers in the Sudanese context which is not feasible in other countries.

A qualitative approach is used for data collection and analysis. Interviews was the primary source of evidence with two other supportive sources of evidences to realize the data source triangulation as recommended by [20, 21]. The supportive sources were institutional documentation (annual reports, administrative documents and meeting minutes) and archival records (organization charts and website information). Interviews are considered by [22] as the suitable source of evidence in qualitative case studies because it enables the researcher from directly access the participants' interpretations about the current events and actions as well as expressing their goals and other participants views. Consequently, qualitative interview [23] is used as data collection method in this research. The selection of interpretive case was imposed by the necessity to understand the stakeholders' needs in collaborative mobile money ecosystem base on the different involved participants' interpretations. The different interpretations facilitate the shared understanding between stakeholders and highlight the conflicting interests. A mental framework is developed by the researchers and reflected by designing an interview

protocol which contains a set of main interviewing themes. Details of these main themes are provided in Table-1.

In total, 8 case cites representing different involved stakeholders' sectors were selected. Interviewees were selected based on their positions and expertise in different fields and sectors that represents the supply side stakeholders mainly: the financial service provision, Telecommunication, financial services regulators bodies, IT service provider.

The research adopts an iterative flexible purposeful sampling strategy. Flexible and iterative research designs and sampling support the qualitative research reflexivity and better results [24]. In purposeful sampling strategy the researcher actively selects the most productive sample that can answers the research questions [25].

Table-1. Main interviewing themes.

Main Theme	Description
Current practices	The current existing practices of mobile money in the institute
Existing barriers	The existing barriers of the current practices
Current activities	The main activities that the institute carry it on to provide money service to its customers
Current products	The current mobile money products or services that the institute provide to its customer
Future opportunities	The institute's future opportunities of mobile money
Expected partners	The expected stakeholders in a national collaborative mobile money service
Expected roles	The institute preferred roles in the national mobile national collaborative mobile money service
Available resource	The strength of the institute in terms of important available resources
resource Needs	The weaknesses of the institute in terms of important needed resources

To do such a selection a number of criteria's are defined to assist the informant's selection process. The researcher was looking for a key informant sample with specific experiences in mobile money and inclusive finance in general and in the national mobile money projects specifically. To identify those key informants a snowballing approach [26] is applied where gatekeeper recommends set of experienced other informants in different sectors who in term become a gatekeepers and recommends others. A total of 17 interviews were conducted in 3 months period and faced with obstacles represented in long time required to prepare for each interview as most of the interviewees were in sensitive and senior positions and always busy and hard to reach. Summary to the interview respondents' profile is shown in Table-2.

www.arpnjournals.com

The study sample size (8 case sites and 17 respondents) is considered acceptable base on many previous qualitative research sampling guidelines [27-29]. Moreover, Creswell's guideline where followed as the selected sectors in the analysis was represented with small number of case sites and respondents number were minimizes but the length and depth of the interviews were increased.

Table-2. Included stakeholders interviewing profile.

Respondent position	#Interviews	Stake-holder
Project manager	1	Regulators
Information technology directorate	1	
General manager	2	
Business solution specialist	1	MNOs
Business planning and Strategy-Senior Manager	1	
Information security specialist	1	
Products & services senior manager	1	
Business development director	1	
Switch manager-it department	3	Banks
Switch manager-it department	1	
General Manager Main gatekeeper	4	IT Switching
Total	**17**	

To insure the ease and comfort of the interviewees, all the interviews conducted using Arabic language (Arabic is the Sudanese national language) to avoid the loss of important meaning and expression. During the data collection phase interviews were transcribed then uploaded in NNivo 10 which was used as assistive computerized qualitative analysis tool. The data reduction and display were continues and iterative where the researcher codes the interviews' transcripts following a descriptive coding process. Then thematic coding is applied to categorize the identified stakeholders' needs and other related issues. Final stage of the analysis was carried on a relational analysis of these categories were their interrelation is identified. The results of the analysis process are described in the following section. Figure-1 summarizes the step-by-step process of this research as it reported in this paper.

FINDINGS

The qualitative data analysis results are classified mainly using the beneficiary stakeholder from fulfilling the need and the needed resource provider. In general six MNOs' needs were identified by the case respondents and can be fulfilled by the collaboration process in future. These needs are: regulated m-money service, interoperability, avoidance of taking financial obligation,

value added services, liquidity management and distribution network business model. Table-3 summarizes these needs and their attributes. The beneficiaries are MNOs or group of other stakeholders (multiple). These needs' providers vary from government regulators (GOV), banks, IT switching services (SWT) and a multiple provider (Multiple). Multiple providers means the need must be fulfilled be the outcome of the collaboration between more than one stakeholder.
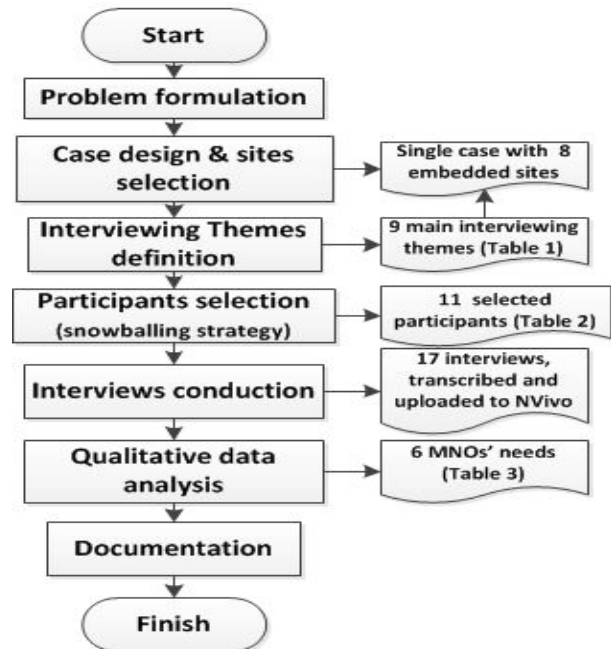

Figure-1. Research process summary.

Figure-2 graphically summarizes the different MNOs' needs ordered based on their number of sources and number of coding references that provided by NVivo software. Number of sources summarizes the number of NVivo's sources –interview or institutional document- that the need mentioned in.

Table-3. Different MNOs' needs as identified by the case respondent.

#	Need	Beneficiary	Provider
1	Avoidance of taking financial obligation	MNO	Bank
2	Distribution network BM	MNO	Multiple
3	Interoperability	Multiple	SWT
4	Value added services	MNO	Bank
5	Liquidity management	MNO	Bank
6	Regulated m-money service	Multiple	GOV

On the other hand, coding reference summarizes the number of times segments are coded in specific node. Both numbers help in ordering the needs and gave them

sense of priorities where a need with a greater number of sources and coding references is having a higher priority than the other need.

Figure-2 shows that regulated m-money service, interoperability, avoidance of taking financial obligation are the most mentioned MNOs' needs in the interviews. Consequently, these needs are considered as the most important needs for the MNOs to be fulfilled by the collaboration process.
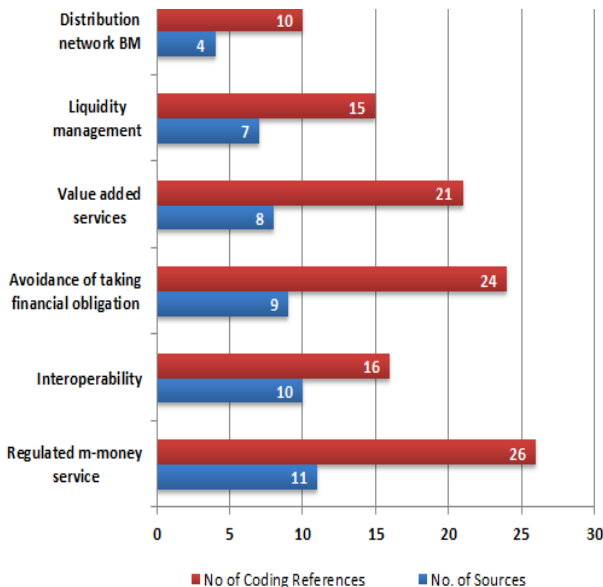

Figure-2. Summary of stakeholder needs based on NVivo number of coding references.

Similarly, Figure-3 summarize the different MNOs' needs base on their resources provider and the number of coding references provided by NVivo software. The colors of the box indicated the resource providers to fulfill this need (by sector): blue for banks, red for government and yellow for switch provider. The size of each box is representing the number of coding references provided by the NVivo software and it helps in visualize the importance of the need and consequently the power of each collaborated stakeholders. For example many needs of MNOs could be fulfilled by a bank (multiple blue big boxes) which indicates the importance of the collaboration between the MNOs and banks to fulfill those important needs. Likewise the big red box indicates that single but important need to be fulfilled by the government. Similarly the big yellow box indicates that a single but important resource is needed by MNOs from the switch provider to provide interoperability.
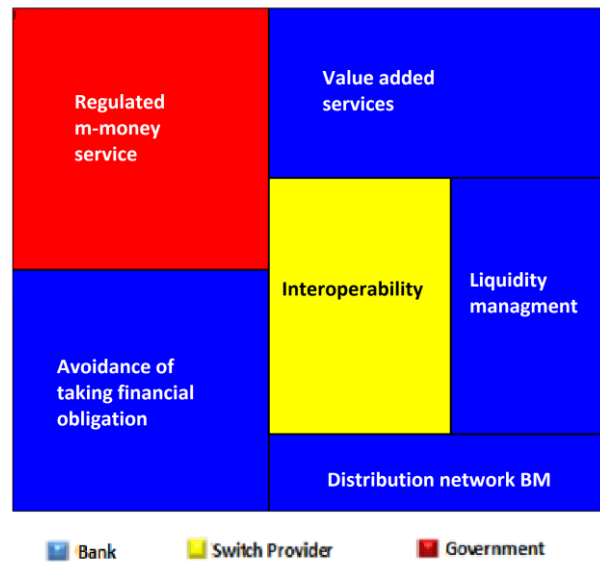

Figure-3. Summary of needs classified by the needed resource provider.

Figure-4 summarizes the different stakeholders' needs classified by their NVivo coding attribute (Sector). This help in reflecting the multiple perspective of the main stakeholder on each need. For example the regulated money need get a great attention from MNOs and all the others stakeholder compared to the need for a value added service which do not mentioned by the banks respondents although it could be a main partner to satisfy this need.
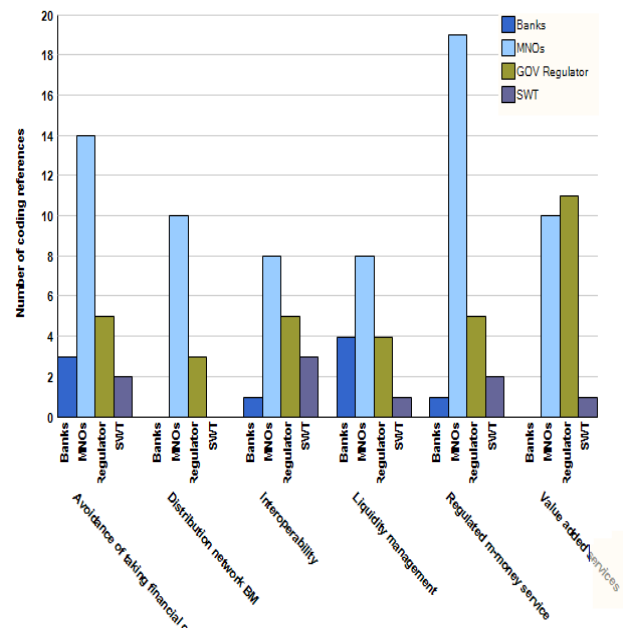

Fugre-4. Stakeholders' needs coding per sector.

Finally, Figure-5 summarized the results of the defined needs and their fulfilling resources inter-relationship base on results provided by NVivo matrix coding query. The figure enables understanding of the

inter-relationships between different needs and the possible most important fulfilling resources from other sectors. It answers the question of what are the needed resources from other service providers that can fulfill each defined MNOs needs.

Figure-5 help in suggesting future possible service provision side collaboration practices (value exchanges) between MNOs and other involved stakeholders that can be realized by the collaboration process. It shows that m-money regulations, financial license, experience in financial management and switching platform are the most important resources that can fulfill the identified MNOs' needs.

In the following paragraphs details about each identified need is presented with support of quotes from the case data. Whenever applicable multiple quotes are used to highlight the different stakeholder's perspective on specific MNO's need.
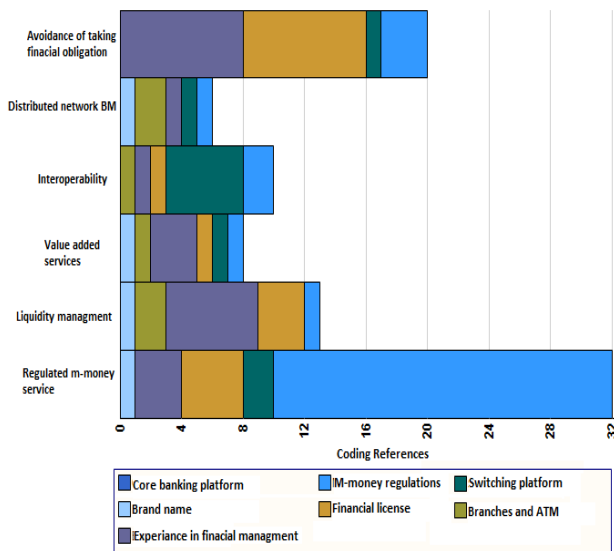

Figure-5. Interrelationship between MNOs' needs and other stakeholders' resources.

To keep the identity of respondents anonymous labeled are used to reflect the sector but not the identity of each respondent such as: RESP-REG-A represent an opinion from first respondent representing the regulator and RES-MNO-B represent an opinion of the second respondent representing the MNOs.

1. Regulated m-money service

The need for a regulated mobile money service is the most important MNOs' need which was the most cited need (26 times by 11 respondents). Mainly MNOs needs regulations for governing and organizing the cash-out process, settlement between different participated stakeholders and liquidity management. This need must be fulfilled by m-money regulations resource which owned by the government. Also government's regulators strengthen this need by adding regulations for organizing electronic money creation. Similarly, government

emphasized the need for regulations for disputes management to protect mobile money customers which is main area of risk in mobile money service provision as highlighted by RESP-REG-C:

"As a regulator the money has to be contained to avoid the financial risks like one of the operator's broke people customers will affected negatively we have to be saved so we need its formulation"

Also MNOs realize that a regulated m-money service can enable them from providing a value added service (VAS) to their customers which is one of the important needs identified by the MNOs as will be discuss later. This relation between the regulated m-money need and the VAS is emphasized by MNO's respondent RESP-MNO-E:

"In the current Me-to-You service we're not making a profit, it's not business opportunity for us at all, it's a services that at the end we will consumed as an air time. We have huge amount of money that we're not benefit from it. But if it is regulated and legalized customer will trust us and puts his money with us then will do his transaction and use the different value added services that I can provide to him which means new business opportunities to me and I can easily make him top up to my services and will become more connected to me this is the main idea".

2. Interoperability

The interoperability as a need is defined as the second most cited need in term of number of resource (16 times by 10 respondents). Interoperability as a need regards making use of bank branches and ATMs of any bank which refer by the MNO's respondents as banks interoperability model. MNOs welcome this kind of interoperability between banks so they can collaborate with more than one bank so they can use more branches to support their distribution network liquidity management. In addition, this facilitates the achievement of more penetration as benefit. Consequently, the MNOs are welcome the regulator business model that can create shared account. Banks is also aware of the importance of such interoperability model to support their weaknesses as addressed RESP-BANK-A:

"The need for the interoperability of the service is due to the weakness of the proliferation of bank branches in the different states and the distribution of the telecommunication market between different MNOs, therefore this may be determinants for the bank or telecommunications company for example if MNO wants to partner with Bank but in the particular state they find its spread is weak then it is necessary that to be able to cooperate with other bank. This may be one of the deployment determinants of the targeted platform"

3. Avoidance of taking financial obligation

The need of MNOs to avoid taking financial obligation and focus on their main area of expertise in mobile communication provision and customer serving as emphasized by RESP-MNO-E: "We have huge amounts

of money that untapped and present in the banks. Banks are not taking credit of that huge money and we do not take advantage of it., We we're not interested on the financial part of this service for sure and it definitely the bank will be always, the financial investor. All the financial services such as the services of micro-finance and the saving, investment, the transactions of banked account to unbanked account and so on all will be running by our financial partner. The role of our financial is the serving the customer related financial need which is their pure business".

This need is the second most important cited need in term of coding references (24 times by 9 respondents). It is regarding the need for financial experience to manage and design new financial services/products for the customer (value added services). Moreover it regards the need for partner that has a financial license to take care of the e-money creation, investment and management. This need can be fulfilled by the bank resources: financial transaction management and financial license. It also could resolve the government regulators concern about exposing the customers for financial risk by keeping a huge money deposit in MNOs hands. Also fulfillment of this need can help on overcome the government regulators concern about informal money creation.

4. Value added services

The MNOs' need to provide value added services (VAS) is the fourth most cited need (21 times by 8 respondents). MNOs need to provide range of mobile financial services to fulfill their customer needs for VAS. Providing VAS helps the MNOs to gain customer loyalty which results in customer retention benefit as well as new source of revenue for MNOs as highlighted by RESP-REG-C:

"Also the are not aware yet about the new benefits that could be generated by combining this service with a new communication trends in the world were MNOs are no longer just provides a telecommunication services, they will and have to provide/ deliver a content services like: clips, news, football, etc that they will gain new fees from them and their customer will enjoy their use (customer satisfaction). Then the existence of the mobile money platform will enable them from adding more services. They are not yet aware of it"

5. Liquidity management

The need for managing the current existing MNOs' liquidity is the second least cited need (15 times by 7 respondents). The liquidity management need is related to the management of MNO's current distribution network. The MNOs' trade partners have to exchange the prepaid airtime voucher with huge cash deposits that need expert management. Also in the new planned mobile money service liquidity is need to be managed carefully to facilitate the cash-out out process as explained by RESP-MNO-A:

"Bank's branches should be available in large areas, for example, if the super-agent if present in Nyala Bank X in the city must have a large branch then this is the super-agent task is distributed to the dealers belonging to him and the network and between villages, but the relationship between the Bank and telecom company is through the super-agent and the need to ATMs because it is the first biggest step for the customers trust in the service is starts at the dealers".

This MNOs' need is related to the avoidance to take financial obligation need (discussed above). It can be fulfilled by the bank's resources financial transaction management and bank branches and ATM.

6. Distribution network BM

This is the least cited need (10 times by 4 respondents). MNOs needs to provide mobile money to fulfill their distribution network needs by providing good incentives through convenient and new business opportunities as highlighted by RESP-MNO-D:

"In mobile money service we are aim to offer an additional services to meet our customer's needs (Citizen) in the first place and also to meet the needs of our network distribution, these are fundamental needs in mobile money. Taking into account the needs of our distributor's means can be for example to make the right selection of banks with many branches that could link our trade partners"

Satisfying the agent network needs must be done by suitable business models that increase the number of mobile money transactions to provide profitable business (because the transaction fees have to be reduced). To increase the number of transaction VAS has to be enabled to increase the revenue. This is crucial for the project success as emphasized by RESP-REG-C:

"It is distribution of transaction fees in way that guarantee the MNO's agent satisfaction is very crucial and the operators will never accept to be away from it he needs to be part of it. If this is not the adopted scenario then I can say blindly that there is no way to take of off with a successful national deployment no way"

DISCUSSIONS

Understanding MNOs' needs taking a multiple stakeholders perspective helps in identifying the different needs and the priority of its fulfillment base on each stakeholder perspective. As previously highlighted the overall identified MNOs' needs are: regulated m-money service, interoperability, avoidance of taking financial obligation, value added services, liquidity management and distribution network business model. These needs are ordered base on the opinion of all the involved stakeholders from different sectors. It is important to reorder those needs base the priority of each stakeholder to align between those stakeholders' needs and interests for successful collaborative business model. As MNOs is the most powerful stakeholder in terms of already existing resources, alignment between the MNO's defined needs with the government regulators perspective on these needs

is required. As discussed previously, Figure-3 help in differentiate each specific stakeholder perspective on the defined needs. Accordingly, on one hand MNOs' are see their needs priority as: regulated m-money service, avoidance of taking financial obligation, VAS, distribution network BM, interoperability then liquidity management. On the other hand regulators are prioritize VAS, interoperability, regulated m-money, avoidance of taking financial obligation then the others. This different prioritization is justified by the perspective of MNOs' which focus on business revenue increment while the regulators perspective focus on increasing the IFS national wide. The MNOs needs focus on getting a possibility of making revenues by investing the huge money through having a regulated m-money service through outsourcing the burden of financial management to their partner. Then they plan to retain their customers by providing them a VAS which consequently can keep their distribution network happy through increasing their revenue by more transaction volume. The government regulators focus on VAS to increase the usage of the financial services, interoperability to provide more access and outsource the financial management to banks to protect the customer as well as contribute toward the national economy. Increasing the usage, access and quality of the financial services are basic dimensions for better financial inclusion.

Understanding the possible relationship between the defined MNOs' and their fulfilling resources can guide the suggestion of possible value propositions between different stakeholders. First, possible value proposition between banks and MNOs is suggested to fulfill four different defined MNOs' needs: avoidance of taking financial obligation (can be fulfilled by bank's resources: experience in financial management and financial license), liquidity management (can be fulfilled by bank's resources: financial transaction management and bank branches and ATM) and distribution network business model. The liquidity management need is related to the management of MNO's current distribution network. This is immediate need that regulators can start with it to please the MNOs. This need fulfillment can generate a healthy situation where the huge deposits of the MNOs trade partners can be saved as deposits in banks and consequently banks can apply their experience in financial management to use this deposits for investments and loans which contributes to the national economy. To satisfy the distribution network business model, stakeholders have to increase the number of transaction by providing more range of financial services. This is linked to the value added services need and the need of customer for reduced service fees. Consequently, when provide many services and increase the transaction number this will increase the revenue. This is crucial for the project success as well as achieving the support to the usage dimension of the financial system.

An interesting point in the findings was: although this discussion shows the strategic role that bank can play in fulfilling the most important MNOs needs, banks are not aware of the importance of these needs. For example, based on Figure-3, banks do not mention VAS nor distribution network business model at all. This suggests that financial regulator should increase the banks awareness to their future role in the national system.

Understanding the meaning of the defined MNOs' needs and the interrelation between them can result in some implications on the collaboration design and regulation formulation. First collaboration should start by fulfill the needs that its resources already exist as the main point from suggesting the collaborative service provision is to reduce the establishment cost. This implies defining an initial stage where the regulated m-money, liquidity management, the avoidance of taking financial obligation and the interoperability can fulfilled first. Thus the initial stage will provide more access to financial services and contribute to the national economy. After the initial stage, a later stage should started immediately to try to increase the overall platform usage and keep the customers and agent interested to join and continue in the financial system. This should achieve through the provision on range of VAS to the customers and fairly distributed the incentives between the distribution network agents.

When comparing the defined needs in this study (see Table-2) with other deployments in other developing countries the need for interoperability is consider as main difference. In Kenya for example, although the M-PESA is regarded as successful mobile money experience, it suffer from main basic weakness [15, 30-32]. The Kenyan market is monopolized by single mobile network operator Safaricom which is M-PESA main provider. The M-PESA is un-interoperable service where customers have to be M-PESA customer to receive money sent by other M-PESA user. This single provider scenario makes it difficult to other mobile operator in Kenya such as Zain and MTN to compete with Safaricom and provide competitive financial products. Furthermore, if interoperability is offered in the Kenyan context the existing platform of the single provider M-PESA will not be open enough to interact with different other provider's platforms. This consequently limits the future possible innovative financial services that can be offered by other providers. So, although VAS is common need, interoperability is needed to be provided to fulfill the VAS need. So the suggested national interoperable inclusive mobile money ecosystem can overcome the M-PESA weaknesses. Similarly, recent GSMA report shows that some mobile money main stakeholders such as banks and MNOs realize the benefits of interoperability to their customers' convenience as well increase the volume of transactions and possibilities of new revenue stream generation [33].

CONCLUSIONS

This study focuses specifically on understanding the MNOs' needs to participate in collaborative mobile money platform. The study provided a set of needs that can form a base for possible recommended value exchanges that can guide the collaboration process between different stakeholders. The study shows that the

MNOs needs to participate in national interoperable system to fulfil their needs on regulated interoperable service as well as to provide future value added services to retain their customer and survive the expected high competition in its sectors. Also the findings show that MNO need to have financial management to their partner to fulfil their distribution network needs.

Future work will focus on translating the findings of this paper into action plan to the telecommunication regulator regarding future implementation of the collaborative mobile money service provision policy. Moreover the relationships between the identified needs and other collaboration aspects such as expected benefits and existing issues must be studied to enable the complete definition of the possible value propositions between different stakeholders. Also future work will use the service science and value network concepts to design business to business (B2B) collaboration that can grantee value co-creation between different stakeholders and means for governing and controlling their interactions. Also the value network modelling techniques and analysis approaches can be used to create a set of mobile money reference models that can be used in similar development of future mobile money ecosystems.

REFERENCES

[1] GSMA. 2010. Mobile Money Definitions. ed.

[2] B. Jenkins. 2008. Developing mobile money ecosystems. Washington, DC: International Finance Corporation and Harvard Kennedy School.

[3] J. Firpo. 2009. Banking the Unbanked: Issues in Designing Technology to Deliver Financial Services to the Poor. in New Partnerships for Innovation in Microfinance. I. Matthäus-Maier and J. D. Von Pischke. Eds. ed: Springer Berlin Heidelberg, pp. 194-206.

[4] G. Ivatury and I. Mas. 2008. The early experience with branchless banking. ed: Consultative Group to Assist the Poor (CGAP), pp. 1-16.

[5] B. Must and K. Ludewig. 2010. Mobile money: cell phone banking in developing countries. Policy Matters Vol. 7, pp. 27-33.

[6] A. Z. Karrar and A. Abdul Rahman. 2013. A Stakeholder Analysis for Collaborative Mobile Money Service. Jurnal Teknologi. Vol. 64, pp. 57- 65.

[7] M. Hamada. 2010. Financial Services To The Poor: An Introduction To The Special Issue On Microfinance. The Developing Economies. Vol. 48, pp. 1-14.

[8] B. Helms. 2006. Access for all: building inclusive financial systems. ed: World Bank Publications.

[9] K. Tsuji. 2013. Advancing Financial Inclusion to Improve the Lives of the Poor. in CGAP ANNUAL REPORT. ed. Washington DC: CGAP, pp. 1-52.

[10] T. K. Omwansa and T. M. Waema. 2014. Deepening financial inclusion through collaboration to create innovative and appropriate financial products for the poor. in KBA Centre for Research on Financial Markets and Policy Working Paper Series. ed: Kenya Bankers Association. Vol. 6, pp. 1-36.

[11] S. d. Castri. 2015. Is regulation holding back financial inclusion? A look at the evidence. ed. Mobile Money for the Unbanked (MMU): GSM Association. Vol. 2015.

[12] G. Camner. 2012. Expanding the ecosystem of mobile money: Considerations for interoperability. ed. London, UK: GSMA–Mobile Money for the Unbanked.

[13] D. F. Horus. 2011. Study For The Establishment Of Pro-Poor Branchless Banking In Sudan. ed. Khartoum, Sudan Central Bank Of Sudan.

[14] N. Cámara, D. Tuesta and P. Urbiola. 2015. Extending access to the formal financial system: the banking correspondent business model. 15/10 ed. Madrid, Spain: BBVA Group. Vol. 15/10, pp. 1-24.

[15] M. Bourreau and T. Valletti. 2015. Enabling Digital Financial Inclusion through Improvements in Competition and Interoperability: What Works and What Doesn't? in CGD Policy Paper. 065 ed. Washington DC: Center for Global Development. Vol. 065, pp. 1-30.

[16] K. P. Donovan. 2015. Mobile Money. in The International Encyclopedia of Digital Communication and Society. ed: John Wiley & Sons, Inc, pp. 1–7.

[17] M. Ceccagnoli, C. Forman, P. Huang and D. Wu. 2012. Cocreation of Value in a Platform Ecosystem: The Case of Enterprise Software. MIS Quarterly. Vol. 36, pp. 263-290.

[18] M. M. Gandhi. 2013. Role of banks in financial inclusion in India: issues, challenges and strategies. International journal of applied business and economic research. Vol. 11, pp. 163-183.

[19] A. Dermish, C. Kneiding, P. Leishman and I. Mas. 2011. Branchless and Mobile Banking Solutions for the Poor: A Survey of the Literature. Innovations: Technology, Governance, Globalization. Vol. 6, pp. 81-98.

www.arpnjournals.com

[20] . E. Stake and R. Savolainen. 1995. The art of case study research. ed: Sage publications Thousand Oaks, CA. Vol. 95004979.

[21] R. K. Yin. 2003. Case study research design and methods third edition. Applied social research methods series. Vol. 5,

[22] G. Walsham. 1995. Interpretive case studies in IS research: nature and method. European Journal of information systems. Vol. 4, pp. 74-81.

[23] R. K. Yin. 2010. Qualitative research from start to finish. ed.

[24] D. Cohen and B. Crabtree. 2006. Qualitative research guidelines project. ed.

[25] M. N. Marshall. 1996. Sampling for qualitative research. Family practice. Vol. 13, pp. 522-526.

[26] P. Biernacki and D. Waldorf. 1981. Snowball sampling: Problems and techniques of chain referral sampling. Sociological methods & research. Vol. 10, pp. 141-163.

[27] J. W. Creswell. 2012. Qualitative Inquiry and Research Design: Choosing Among Five Approaches. ed: SAGE.

[28] Y. S. Lincoln and E. G. Guba. 1985. Naturalistic inquiry. ed: Sage. Vol. 75.

[29] M. B. Miles and A. M. Huberman. 1984. Qualitative Analysis A Source Book of New Methods. ed: SAGE Publications

[30] I. Mas and D. Radcliffe. 2010. Scaling mobile money. ed: Bill and Melinda Gates Foundation, pp. 1-16.

[31] L. Chaix and D. Torre. 2015. The dual role of mobile payment in developing countries. ed. University of Nice Sophia Antipolis: Groupe de REcherche en Droit, Economie, Gestion (GREDEG CNRS). Vol. 2015-01.

[32] J. Kendall. 2011. The Poor Need Better Payment Services. ed: CGAP. Vol. 2012.

[33] C. Scharwatt, A. Katakam, J. Frydrych, A. Murphy and N. Naghavi. 2014. State of the industry 2014: Mobile financial services for the unbanked. in GSMA Mobile Money for the Unbanked (MMU) program. ed: GSM Association, p. 76.