



## Stakeholder Management in a Community mHealth Initiative in Malawi

Mphatso Nyemba-Mudenda\*, Wallace Chigona

University of Cape Town, Cape Town, South Africa

**Background and Purpose:** Varying interests and expectations of different stakeholders have implications on successful implementation of Information and Communication Technologies for Health (ICT4H) interventions. Research has shown that proper management of stakeholders' interests has a positive bearing on the effectiveness and sustainability of Information and Communication Technologies for Development (ICT4D) initiatives. However, there is a dearth of studies on stakeholder management in ICT4H research, especially the mobile for health (mHealth) domain. This could be due to the mHealth field still being in its infancy and many projects being implemented for a short period without being evaluated. This paper reports on management of stakeholders in an mHealth intervention from the community perspective. The study examined how management of stakeholders from the community affected the effectiveness and sustainability of the mHealth intervention.

**Methods:** The case of a Mobile System for Safe Motherhood intervention in maternal health in a developing country context was analysed. The study employed an interpretive approach using qualitative methods. Documentary review and semi-structured interviews were used to collect data, and the data was analysed using content analysis.

**Results:** Different expectations of mothers and other community agents were not given adequate voice and attention in reaching the common good towards achieving the main objectives of the intervention. Stakeholder management from the community perspective was inadequate due to: 1) less consultation of key community stakeholders in some stages of the project; 2) poor communication; 3) lack of formal procedures in operations; and 4) exclusion of tradition information systems.

**Conclusions:** Management procedures such as face to face meetings, training, effective communication using formal channels, and community empowerment would help in building winning coalitions that improve performance of interventions and enhance effectiveness and sustainability.

**Keywords:** mHealth, Community involvement, Stakeholder management

### 1 Introduction

Delivery of healthcare services in developing countries has been beset with a myriad of challenges such as limited resources, inadequate health personnel, lack of records, poor coordination among the health care providers and constraints in accessing health facilities [1][2]. Mobile technologies are perceived as antidote to some of the challenges [3][4]. Consequently, there is an increase in interventions that use mobile technologies such as mobile phones in health care services delivery and promotion of public health [5]. The services for mHealth include SMS, voice calls, voice messages, internet-based videos, and chat systems. mHealth interventions have the potential to support effective treatment of patients, tracking of patients, supply management of drugs, enhancing emergency services response times and providing information for clinical decision making [6][7].

\*Corresponding author: Corner Gwanda Road and Cecil Avenue, PO Box AC 939, Ascot, Bulawayo, Zimbabwe. Email: rodreckdavid@gmail.com, Tel: + (263)-(9) (282 842) Ext 2101  
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mHealth initiatives, like any other Information Communications Technology for Development (ICT4D) interventions, involve and affect different stakeholders. These may include healthcare providers, NGOs, private enterprises, development agents and beneficiaries. The stakeholders represent different interests and stakes. As a result, management of the stakeholders is a complex activity, but vital for the sustainability of an initiative [1][8]. Although the management of stakeholders is important in the ICT4D discourse, there is a dearth of studies on stakeholder management on mHealth. Previous studies on stakeholder management have focused on public ICT facilities [9][10], e-government [11], and local government [12]. To our knowledge, studies on management of stakeholders in mHealth are lacking and there is limited understanding of stakeholder management in mHealth interventions.

Additionally, there are calls for bottom-up implementation strategies to be encouraged in mHealth projects so that communities may contribute toward the processes of realizing outcomes [6][13]. However, the phenomenon of community stakeholders management, especially in the context of rural areas of developing countries, has not been fully researched. This study aims at filling part of this knowledge gap. Therefore this study focused on the dynamics involved in the management of community stakeholders that can affect community's contribution towards the success of an intervention. The study was guided by the research question:

How does the management of stakeholders from the community affect the effectiveness and sustainability of mHealth interventions?

The study used an interpretive case study on a Mobile System for Safe Motherhood (MSSM) intervention in Malawi. The country was selected as a case because it has high maternal mortality and morbidity in sub-Saharan Africa, and a number of ICT innovations initiatives are implemented to improve maternal health care delivery and access. Stakeholders framework [10] was used as a theoretical lens to analyse the dynamics of stakeholders management from the community perspective. The rest of the paper is organised as follows. Section 2 presents the background to the study. Section 3 summarises the theoretical underpinnings of the study. Section 4 outlines the research methodology. Section 5 describes the context and case of the study. The findings and results are summarised in section 6. Section 7 presents the conclusions drawn from the study and implications for policy and practice.

## 2 Literature Review

### 2.1 Mobile Health

mHealth is described as the application of wireless technologies in delivery of health services [5]. Portable wireless devices such as tablet computers, laptops, Personal Data Assistants (PDA), RFDI devices and mobile phones may be used in mHealth [14]. The devices are characterised as being portable (anywhere), supporting immediacy (any time), convenience (easy to access), reasonable cost (relatively low unit cost) and pervasiveness (widely spread) [13]. With the rapid growth in number of mobile phone subscribers, mHealth is considered as an antidote to some of the challenges for health care services delivery in resource constrained areas such as developing countries [7][15]. mHealth services may include diagnostic and treatment support, remote patient monitoring, disease surveillance and data collection, health promotion, disaster crisis response, medication reminder and helpline systems [6][16].

Different stakeholders are involved in mHealth ecosystems and these may include NGOs, government departments, network operators, social welfare organisation, pharmaceutical companies, health insurance companies, software and hardware development companies, regulatory organisations, hospitals, law enforcement agents and beneficiaries [1]. **Table 1** summarises the stakeholders for mHealth and their interest in the projects.

**Table 1.** Stakeholders in mHealth

<b>Stakeholders</b>	<b>Interest in mHealth</b>
Government	Effective health services delivery and effective government
Citizens and patients	Better access to health services and improved health outcomes
Hospitals and healthcare providers	Efficient delivery of health care service, reduced administrative costs
NGOs	Attracting funding and supporting socio-economic development
Hardware and software developer	Revenue generation and building a customer base
Network providers	Increase in revenue and mobile subscribers base
International Development Organisation	Supporting socio-economic development
Regulatory organisations	Protecting the interests of citizens and supporting regulations and implementation of policies

## 2.2 Effectiveness and Sustainability of mHealth Initiatives

In ICT4D initiatives like any other projects, effectiveness and sustainability work hand in hand. The efficacy or effectiveness of an intervention lies in the technology meeting the needs of all relevant stakeholders, especially the beneficiaries [16][17]. Whereas sustainability refers to an intervention meeting the needs of present beneficiaries without affecting the prospects of future beneficiaries [8]. Sustainable mHealth interventions may be projects that are able to provide the services to the beneficiaries over a long period of time and empower the communities. Stakeholders are important for the effectiveness and sustainability of the mHealth projects. The role of stakeholders may be related to the categories of sustainability namely financial, social and cultural, political, technological and institutional sustainability[8][10][18]. The categories are summarised as follows:

- *Financial sustainability*: On-going use financial resources to support activities for the project or return on investment or achieving greater revenues than expenditure
- *Social and cultural sustainability*: support from communities on the impact of the intervention towards development and culture as part of sustainability to ensure that beneficiaries are empowered and that cultural issues have been taken into consideration.
- *Political sustainability*: Support for enabling environment of the intervention obtained through policies and regulatory frameworks.
- *Technological sustainability*: Support for technologies that can serve the needs of the beneficiaries over a long period of time and the capability adapt the changes in technology. For example consideration changes in hardware, software and supplies used in the intervention.
- *Institutional sustainability*: The capacity on prevailing processes and structures that support the intervention over a long period of time. For example sense of ownership, participation and engagement of stakeholders in the project.

## 3 Stakeholder Theory

Stakeholders have been described differently in different contexts. In this study stakeholders are described as “any group or individuals who can effect or is affected by achievement of organisation objectives” [19]. Stakeholders may be classified as primary and secondary depending on their influence on the organisation such as decision-making, power, interest, interrelations or networks and present and future positions [20]. Primary stakeholders are those with high influence on the organisation; if not managed well, the organisation may suffer serious consequences or even cease to survive [21]. On the other hand, secondary stakeholders’ interests directly affect the organisation; and they get to be affected by the organisation, but are not essential for its survival. In mHealth interventions it is vital to recognise the role and potential influence of stakeholders so that organisations actions and aims should be in-line with the interests of the stakeholders [21]. Stakeholders may be differentiated based on their importance and level of influence in the organization [22]. This importance versus influence method illustrates whose

stakeholders' problems, needs, and interests are the priority of the intervention, and influence is how powerful the stakeholder is within the intervention [10].

Stakeholder management theory may also be described based on descriptive, instrumental and normative views[23][24]. Descriptive stakeholder theory view focuses on organisation behaviour, describing the organisations relations with its stakeholders. The normative stakeholder theory concentrates on the moral responsibility of the organisation to its stakeholders. Lastly, the Instrumental stakeholder theory view highlights the role of management to the organisation in achievement of success and competitive advantage. The different theory views present a holistic view of understanding the roles of stakeholders in an organisation; as such they do not work in separation, but are linked [25]. However, it is important to note that stakeholders change all the time and it is vital that they are managed well [10].

### 3.1 Management of stakeholders

Management of stakeholders involves addressing and balancing the interests of each stake in an organisation while maintaining the aims and objectives of the organisation [23]. This process may involve decision, understanding of behaviour of stakeholders, their interactions, their needs, assigning them responsibilities, informing and consulting them decision that affect their interest [19][20]. Management of stakeholders is a complex activity because of diverse interests among the stakeholders [10]. It is, therefore, necessary to ensure that claims for stakeholders are managed in an ethical way while balancing the interest of all stakeholders [23].

Stakeholder analysis may be applied in mHealth interventions to understand the involvement of stakeholders from different perspectives, their importance in the intervention and level of influence; and how they can affect intervention effectiveness and sustainability. Bailur (2006) suggested a stakeholder framework for development projects using the following steps:

1. Identifying stakeholders, understanding and explaining their behaviour and how they might work together
2. Stakeholder management strategies – who to inform, consult, offer partnership and control
3. Determining concessions if previous management strategies do not work

The framework has generic project life cycle stages which may be applicable to ICT4D initiatives. These are identification and analysis of stakeholders, planning, cost benefit analysis and resources allocation, implementation and monitoring and evaluation [10][26]. The steps are summarised as follows:

- *Identification and analysis*: Establish stakeholder for the intervention, their behaviour, needs and potential areas of conflicts
- *Planning*: Identify activities for the intervention
- *Cost benefit analysis and resources allocation*: Analysing the cost and benefits and allocation of resources such as human and financial assets to the intervention
- *Implementation*: Carrying out of activities using the resources
- *Monitoring and evaluation*: Checking the progress and assessing the results and outcomes of activities

In management of stakeholders in the project cycle, strategies used are categorised into four key variables namely informing, consulting, partnership and control. In informing, management provides information to the stakeholders. Management consult stakeholders to have their input on the decisions while in partnership there is collaboration in decisions and action for the intervention. In control there is sharing of power among the stakeholders to influence decisions [26]. This framework is for development projects applicable to ICT4D initiatives including mHealth interventions. This study will use the Bailur (2006) stakeholder perspective as conceptual lens to examine the case of MSSM intervention to analyse the effects of stakeholder management in community mHealth initiatives on efficacy and sustainability of the intervention.

## 4 Research methodology

The study was aimed at establishing in-depth understanding of management of stakeholders from the perspective of the community in their specific cultural and contextual setting. As such it adopted an

interpretive paradigm using a qualitative approach [27][28]. The study used purposive and maximum variation samplings to identify participants with diverse demographics who would provide relevant information to the question being investigated [29]. Using the database for the mHealth initiative, a sample frame of about 100 intervention users, 50 community volunteers, and 40 Health Surveillance Assistants (HSAs) was randomly selected. This sample population was contacted using telephone to get their personal details and location. Further, maximum variation sampling was used based on participants' demographic information i.e. ages, marital status, and tribes to get participants of diverse characteristics. The sample frame for this study included twelve women using the intervention, four community volunteers, four HSAs, and four members of staff from the implementing agency of the mHealth initiative who were actively involved in the management of community stakeholders.

Data collection comprised of open ended questionnaires using semi-structured, face-to-face interviews, annual reports, media reports and correspondences with members of management for the mHealth project through e-mail. The open ended questionnaires were piloted and necessary changes were made. Field notes and participant observation were also used for the data collection. All interviews were audio-recorded with the permission of the participants and transcribed. Data analysis employed content analysis [30][31], and the approach to data analysis was deductive where constructs from the conceptual model on stakeholders management were used [10][26]. The scope of the analysis focused on community stakeholders because most studies overlook community's contribution towards the effectiveness and sustainability of an intervention. Due to ethical reasons we will not disclose the names of the organisation and stakeholders for this study.

## **5 Case description**

### **5.1 Context of the study**

Malawi is located in the South East of South Africa and has a population approximate 15.3 million [32]. The country is ranked 153 out of 169 economies in the Human Development Index, and is categorised under the low human development economy [33]. Malawi is burdened with poverty and other challenges like limited levels of infrastructural development, low levels of literacy, poor healthcare systems, relatively high HIV prevalence, and ultimately high overall mortality rates. The impact of HIV/Aids has also affected the country. It is estimated that 10.6% of adults within the age between 15-49 years are living with the HIV virus. Delivery of maternal health care is also a challenge to the resource constrained government of Malawi. As of 2011, 82% of maternal healthcare consumers reported having at least one problem in accessing healthcare services including finances, long distance to health facilities, lack of resources (especially drugs) in health facilities and transportation to get them to a health facility in time for treatment [32]. In 2010, 95% of women received antenatal care from skilled attendants, thus from a health facility, but only 71% delivered from the health facilities. This contributes to high maternal mortality rates in Malawi.

Malawi, like many developing countries has also experienced an increase in number of mobile phone subscribers. It is estimated that there are 3.3 Million mobile phone subscribers [34]. The subscribers are shared among two mobile operators, Airtel and Telecom Networks Limited. The network coverage for mobile phones covers almost all the parts of the country including urban and rural areas. There is a belief that with such coverage, some of the public services may be provided using mobile phones [35].

### **5.2 MSSM Intervention**

With 632 maternal deaths per 100 000 livebirths, Malawi has one of the highest maternal mortality rate (MMR) in sub-Saharan Africa [36]. The MSSM project is one of the initiatives implemented in the country to reduce the MMR in attempt to achieve millennium development goal number 5: To reduce three quarters of maternal mortality by 2015 [37]. A baseline study of perceptions and practices towards maternal health was conducted and the findings led a national wide competition of ideas to improving maternal health service delivery and utilization so as to reduce the high maternal morbidity and mortality in the country. Two ideas were successful in meeting the needs identified in the communities, and formed the foundation of the MSSM project: 1) the hotline for timely health information and advice; and 2) use

of mobile phone technology for tips and reminders on maternal health issues, together with a booking system and databases at health facilities to improve documentation.

Since 90 % of the population in Malawi live in rural areas [32], the project was piloted in the rural areas of one small district. The main goal of the MSSM project was to maximize healthcare access and utilisation by remote mothers who were faced by so many challenges like walking long distances to access a health facility, resulting in delays in seeking care and unnecessary expenditures. The objectives of the project were:

1. Improve the quality of maternal health case management
2. Improve maternal health-seeking practices
3. Increase community confidence in the health system

MSSM is a toll free helpline and SMS Bulktool system running on one network operator out of three operators in Malawi. Remote women with mobile phones and on this one particular network could access the system for free, other networks needed to pay. The system/project had three main components:

- (a) Toll-free case management hotline
- (b) Tips and reminders
- (c) Community outreach, education and mobilization on maternal health issues

Firstly, the toll-free case management hotline – this hotline was based at the district hospital being handled by qualified hotline workers who were trained in maternal health issues using the HSAs' (Community Health Workers) curriculum to serve the women better. Some nurses helped at the hotline on part-time basis. To register into the intervention women first used the hotline where their personal details were captured, and could enrol for tips and reminders. Upon registration women were told about their expected date of delivery and the current stage of pregnancy based on their last menstruation. In addition, they received protocol-based advice on pregnancy care, nutrition and sanitation. The hotline also provided health information to women who might have been out of reach of HSAs in the community or health centres; and health facility referrals to help prevent avoidable complication or emergencies.

Tips and reminders were a push service for automated tips and reminders for pregnant women through text or voice messages. The voice messages could be retrieved from the toll free line upon authentication using personal details while text messages were delivered straight to private phones. The tips were personalised to the stage of pregnancy, women were told what to expect (normal things) at a particular pregnancy stage and were also warned of danger signs not to be ignored. The reminders were for antenatal appointments and also for prophylaxis medication and supplements taken during pregnancy i.e. Malaria drugs.

Lastly, the intervention also had community outreach, education and mobilization on maternal health issues component. The intervention recruited about 400 community volunteers in the four catchment areas of the pilot project. These are not Community Health Workers (CHW), but individuals in the community with basic literacy, already involved in health promotion and were willing to volunteer time to promote the MSSM intervention in their communities. Each village had at least one community volunteer. Due to poverty and low mobile phone penetration in Malawi [38], the project provided mobile phones to the volunteers in the villages as point of access and usage of the MSSM for women in the communities. The community volunteers' main role was to provide phone access and usage for the intervention, and to demonstrate how to use the system. They also promoted the intervention by educating leaders and community influencers about the intervention and persuaded them to encourage the community to use it. In addition, they were involved in community outreach, holding public meetings with the community. Community volunteers visited the women in their homes for registration and also follow-up on tips and reminders so that the women could listen to their messages.

During the time of data collection the intervention had recruited more than 3000 women from the four catchment areas, receiving between 450 and 600 calls every month. The calls ranged from advice seeking and minor ailments to major complication and emergencies. On average the women called the hotline three times during the whole pregnancy period, and they felt that MSSM gave them sufficient time to explain their problems in detail without being rushed as was the case at health centre due to overcrowding. This resulted in getting proper and accurate advice and medical help specific to their condition. The women received the tips and reminders every fortnight. This helped them to understand the changes going on in their bodies and also the development of the baby. This information prepared

them for childbirth unlike before when they did not have ample knowledge of pregnancy and maternal care. The MSSM intervention proved to be convenient for the women as it provided timely medical advice at home, without requiring women to walk long distances to the clinic unnecessarily for any medical condition, even trivial ones.

## 6 Analysis of the case

### 6.1 Stakeholders for MSSM

The stakeholders for the MSSM intervention included international development agencies, telecommunication providers, Ministry of Health (MOH), hospitals, and health centres, health providers, implementing agency, other NGOs, the community and the beneficiaries. The international development organisations main stakes were supporting maternal and child health by providing financial assistance and technical expertise. One of the NGOs was responsible for designing the system and providing system support and maintenance; and the other one had interest in rigorous research to perceive what works or what not. Telecommunication providers supported the accessibility of the services at an agreeable cost. MOH had interest in supporting the intervention at the district hospital and the health centres. The implementing agency was responsible for the implementation and operations of the intervention. The stake for the beneficiaries was mainly in using the services to address their problems in the communities.

Our study focused on the stakeholders from the community in relation to the beneficiaries of the intervention, mothers. Management of the other stakeholders is out of scope of this paper. The identification process was iterative in an attempt to cover all relevant stakeholders from the community in the intervention [39]. Our initial identification process using the website and some project documents found that at community level only the community leaders such as village headmen and chiefs, community volunteers and pregnant women were the only stakeholders involved. The second round of the identification process, using the interviews and more project and media reports, revealed more categories of stakeholders as shown in **Table 2** which also summarises the stakeholders' interests and roles in the intervention as indicated in the data set.

**Table 2.** Identification of Stakeholders

Community Stakeholders Identified	Roles	Interests
Community leaders	<ul style="list-style-type: none"> <li>Understand the benefits of the interventions and encourage their people to use it</li> <li>Draw policies that support and encourage the use of the intervention and improve health seeking behaviour</li> <li>Select reliable individuals in their village to be volunteers for the intervention (community volunteers)</li> </ul>	<ul style="list-style-type: none"> <li>Positive change in health seeking behaviour of the community</li> <li>Improved health outcomes for the community</li> <li>Improved wellbeing of the community</li> <li>Interests in personal gain i.e. monetary incentives</li> </ul>
Village health committee	<ul style="list-style-type: none"> <li>Promote the intervention</li> <li>Involved in the selection of community</li> </ul>	
Community volunteer	<ul style="list-style-type: none"> <li>Educate community leaders and other influencers about the intervention and encourage its use in the community</li> <li>Conduct community outreach events to promote the intervention</li> <li>Point of access and usage for the community mobile phones</li> <li>Visiting women of the child bearing age group in their homes to promote the intervention even to their influencers, for registration and also follow-up visits with mothers who were already registered to help them listen to their messages</li> <li>Record keeping for all intervention use in their village</li> <li>Attend regular meetings with implementing agency and health providers to discuss operations and new strategies</li> </ul>	
HSAs	<ul style="list-style-type: none"> <li>Promote the intervention in the communities</li> </ul>	
Mothers	<ul style="list-style-type: none"> <li>Register and use the intervention</li> <li>Act on the information given</li> </ul>	
Women in the child bearing age group	<ul style="list-style-type: none"> <li>Promote the intervention</li> </ul>	<ul style="list-style-type: none"> <li>Experiencing healthy pregnancy</li> <li>Giving birth to healthy babies</li> <li>Giving birth with the help of health personnel</li> <li>Raising up health children</li> <li>Empowerment</li> </ul>
Partners	<ul style="list-style-type: none"> <li>Give authorisation to the women to use the intervention</li> <li>Support the women in using the intervention and also in their action</li> <li>Promote the intervention</li> </ul>	<ul style="list-style-type: none"> <li>Improved health outcomes</li> </ul>
Elderly women	<ul style="list-style-type: none"> <li>Influence women decisions and actions</li> <li>Encourage/discourage the use of the intervention</li> </ul>	<ul style="list-style-type: none"> <li>Imparting the local values of sexual and maternal care on young women</li> <li>Continuation of their local womanhood legacy</li> </ul>
Babies under 1 year		<ul style="list-style-type: none"> <li>Improved health outcomes</li> </ul>
Children 2-5 years old		<ul style="list-style-type: none"> <li>Improved health outcomes</li> </ul>

\*Corresponding author: Corner Gwanda Road and Cecil Avenue, PO Box AC 939, Ascot, Bulawayo, Zimbabwe. Email: rodreckdavid@gmail.com, Tel: + (263)-(9) (282 842) Ext 2101

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## 6.2 Stakeholders' Behaviour

According to the tenets of stakeholder management [19], the implementation agency was responsible for managing different interests of all the stakeholders involved; their activities and interactions to ensure unanimity towards achieving project objectives. The implementing agency approached the community leaders as an entry point into the community. When permission was granted, management gave the leaders control to choose reliable people in their villages who could be entrusted with a phone and act as a point of access and usage for community mobile phone, and also volunteer to promote the intervention in the village. The chiefs invited village health committees, and together selected a community volunteer from their village. HSAs become involved in the intervention by the virtue of being part of the village health committee and also due to their affiliation with the health centre as the lowest level of government health workers. These various stakeholders jointly promoted the intervention in the community by calling public meetings targeting women and their partners because they realised that culturally the women could be free to join and use the intervention only when their male partners allowed them to do so [40][41]. Some of the elderly women came to the meetings out of curiosity and many other were reached during house visit by community volunteers.

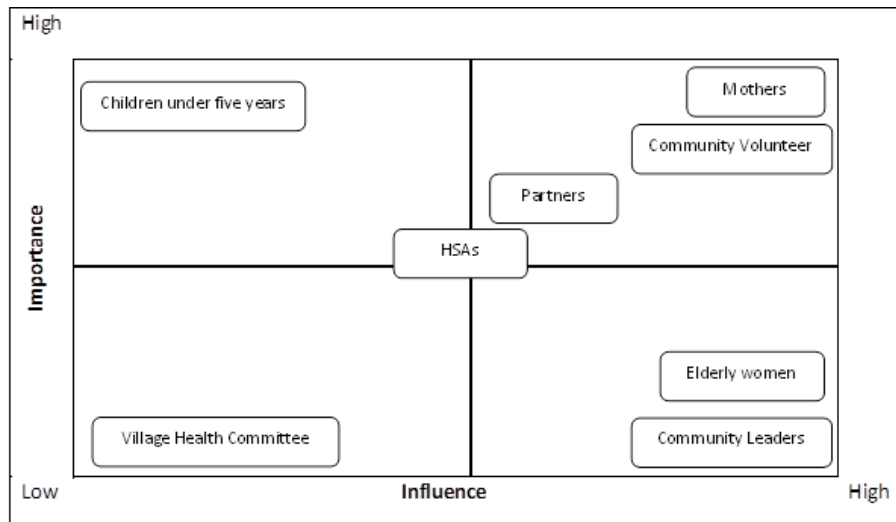
The initial target audience of the MSSM were pregnant women and babies under the age of one year as beneficiaries. Only these could register on the system to talk to the hotline workers (whom they usually referred to as 'doctors'), and received the tips and reminders on pregnancy and child development. Due to poor child health in Malawi, this strategy was later revised to accommodate children under the age of five years. This group was provided with health information and health facility referrals without registering them on the system.

It was found that the average age of the women using the intervention was 26 years. At that age a woman in the rural Malawi would have a number of children already. Management observed that the intervention was not capturing young women since women in rural areas start having children at the age of 15 years [32]. The findings confirmed that young women were not seeking information anywhere else but from the community [42]. Rarely would young women go to a health facility to seek advice on reproductive health, pregnancy and even family planning. Cultural norms such as the influence of elderly women emerged as the main factor hindering young women to seek health information and services, showing that the elderly women had interests and stakes as well in the MSSM intervention:

*"I heard of MSSM from my friends when I was six months pregnant...my mother knew all about MSSM and even the community volunteer in our village but she never told me about it. So I said but mother why didn't you tell me about MSSM all this time. She said that 'I can tell you whatever you want to know about pregnancy'....later she gave me details about MSSM and I joined. And I have learnt much more than I could from home....But when time for delivery came, my mother took me to the nearby Traditional Birth attendant...mmmh...the person does not have enough equipment..." (Mother 1)*

The behaviour of elderly women towards the intervention was that of resistance and negativity. This contributed to most women being sceptical and non-receptive about the intervention and maternal healthcare in general, since rural women in developing countries tend to listen and take advice from elderly women [41][43].

Prioritising the interests, needs and problems of stakeholders show how important they are in the intervention and the power they have to influence its operations and effectiveness [22]. However, the importance and influence assigned to a particular stakeholder changes at different stages of the project. **Fig 1** illustrates the importance of the community stakeholders and their level of influence in MSSM intervention as portrayed in the data set:



**Fig. 1.** Summary of management of community stakeholders

### 6.3 Concession and Bargain

The strategy to approach leaders as entry point into the community brought a sense of ownership to the leaders [17]. As a result, the leaders took it upon themselves to sensitise their people about the interventions and they put together policies to encourage the women to seek health services i.e. family paying a goat to the chief when a woman gives birth in the village or on the way to a health facility:

“Most women used to deliver their babies in the village...but this behaviour has decreased because all the chiefs in this area have set a rule that if a woman delivers in the village or on the way to the clinic then her family has to pay a goat to the chief...and people fear owing the chief a goat, as a result most women are now giving birth at a health facility” (Community volunteer 1)

There were no direct interactions between the implementing agency and the village health committee even though it was involved and had interests in the project. However, the committee was informed about the intervention activities and decisions through informal channels by HSAs and Community Volunteers since they were also managed by it in other projects. The role of HSAs in the intervention was not defined; they involved themselves in the MSSM intervention just like they would with any other intervention on community health in their area. However, it was found that some HSAs expected to receive mobile phones for the intervention like the community volunteers did. Another project implemented by the same implementing agency in another area had distributed mobile phones to all health workers including HSAs in all the health facilities of that area. When the HSAs heard that MSSM was going to be implemented in their area, they assumed that they would receive mobile phones together with all other staff i.e. nurses and clinical officers. When they had not received mobile phones, they became demotivated and not keen to work with MSSM.

Furthermore, other projects in the catchment areas of the MSSM, offered monetary incentives to HSAs, community volunteers and even the beneficiaries working with them. So even though the women had a good understanding of the intervention, how it worked and the benefits it offered, just like the HSAs and the community volunteers they also expected monetary incentives. The women did not have a chance to meet with the implementing agency initially and they got all the information from the community volunteers. As such, they suspected that the community volunteers had received money from the implementing agency and did not share with them. This affected the relationship between them and it also discouraged other women from joining the intervention. Overall, the community stakeholders of MSSM complained of not receiving monetary incentives, as a result some lost interest in the intervention. But they did not put in place procedures to voice out their concerns to the implementing agency, consequently the implementers were not aware of this; the people kept on hoping that things might change one day without doing anything about it. On the other hand, the HSAs and community volunteers involved in outreach events were paid a small amount of lunch allowance, and whenever the implementing agency was meeting with the community volunteers or the mothers, drinks and snacks were

provided. Additionally, the community volunteers had received community phones and t-shirts to promote the intervention in the villages. This motivation strategy though not appreciated by the community stakeholders, since they were used to monetary incentives, worked in motivating the HSAs and CVs to do their jobs and the women to embrace the intervention.

The roles of the community volunteers were properly defined in the project documents. However, the community volunteers felt they were doing much more than what was agreed. The door to door visits to have women listening to the messages in their homes or looking for women to register was like going an extra mile from their assigned responsibilities and all the volunteers interviewed put it as if it was their own initiative not a requirement. The implementing agency trained the community volunteers once at the beginning of the program, and was visiting each facility once a month to meet with them and also address women at the ANC clinic, women who took the initiative to attend ANC on their own. Therefore, the community volunteers felt they did not have enough support from the implementing agency because the implementing agency had never visited the villages to promote the intervention, monitor the operations, or just see how the women were embracing the intervention. As a result, some women in the village did not believe that the community volunteers were working in conjunction with the any implementing agency; and according to the community volunteers this made the intervention lose its credibility [44]. As mitigation, the implementing agency introduced the outreach events with some entertainment activities and they would address the community themselves and assure them that the community volunteers were there to help/serve the community on their behalf. The outreach activities had a positive impact, the number of women registering and using the intervention increased.

The project was beset with technical problems and lack of proper technical support. By the end of first year of the project only 50% of the phones were working. The phones were basic and most of them had problems with key pads and batteries. Due to lack of action plan on mobile phone support and maintenance, the defected phones had to be repaired by individuals who had some skills in the villages. This led to a number of phones being redundant, so the strategy was changed to having the phones repaired at the district town. However, by then most villages had already been left without phones and this hindered on the operations of the intervention. This also demoralised the community volunteers from continuing to promote the intervention to those who could use personal phones.

Despite the fact that most of the community volunteers were dedicated to their jobs, some were rarely available for access and usage of the phones by the women and it affected the operations. It was observed that there were no channels for women to voice out such concerns and no proper procedures to monitor and verify whether the community volunteers were fulfilling their responsibilities or not in their assigned villages.

#### 6.4 Management of stakeholders

The implementers involved the key stakeholders in the community through consultation, informing, partnership and some control [10][26]. Our findings show that there were no formal procedures and strategies for managing the community stakeholders. The implementing agency was responsible for whom to include or exclude at a particular stage of the project. **Table 3** illustrates the involvement and management of community stakeholders throughout the project cycle:

**Table 3.** Summary of community stakeholders' involvement

Project phase	Inform	Consult	Partnership	Control
Identification and analysis		Mothers Partners HSAs Elderly women		
Planning				
Cost benefit analysis and resources allocation				
Implementation	Mothers		Community leaders HSAs	Community volunteers
Monitoring and evaluation		Mothers Community Volunteers		

The data showed that the community was consulted during the identification and analysis of stakeholders stage. This was done using a baseline study with the mothers together with their guardians (either partners or mothers), HSAs and the TBAs representing elderly women. The findings of the baseline assisted in understanding and taking into consideration the local realities of the rural area, and also determining the stakeholder to involve. In planning and cost benefit analysis and resources allocation stages the community stakeholders were not involved in any way. During the implementation stage, the community leaders were approached and offered partnership to work with the implementation agency. As such, the community leaders permitted the intervention into their communities and promoted it using their authority. The community volunteers were selected to work for the implementer as point of access and usage for the system, thus some power was shared with them to control the activities on the ground in the villages. Through partnership with the health facilities the HSAs were involved to promote the intervention in the communities.

In the implementation stage, the intervention was promoted to the mothers and there were given all relevant information to make an informed decision whether to join the intervention or not. Those who joined were kept in the loop for all the improvements that were being made to the system. The mothers were further consulted on the performance and effectiveness of the system during monitoring and evaluation, and so were the community volunteers as they were the facilitators and promoters of the intervention in the community.

## 7 Discussion and Conclusion

This paper examined the effects of stakeholders management on the efficacy and sustainability of community mHealth initiatives in maternal health. The paper analysed how the interests, relations and interactions of community stakeholders using the stakeholder theory [10]. The MSSM project like most other mHealth initiatives undertook both the bottom-up and top-down implementation strategies [13]. The findings show that to some extent the implementing agency consulted, informed, partnered and even shared control with diverse community stakeholders at different project life cycle, but more could have been done to steer the intervention in the right direction so as to enhance its effectiveness and sustainability. In the planning stage, management consulted the local people (community) in two ways:

- (a) Involving them in a competition to ideas on the type of innovations that would improve maternal and child health in the context of Malawi
- (b) Baseline study - the findings assisted in determining the potential stakeholders from the community perspective and also understanding the local realities from socio-cultural to economic dynamics.

This inclusive approach gives communities a strong sense of ownership that drives the development process and direction to the advantage of the initiative's success and sustainability [17].

The iterative process of stakeholder identification revealed some secondary stakeholders that the intervention did not take into account. These stakeholders had either high interests and low power or high power and low interests to influence the performance of the intervention as such they needed to be kept informed and satisfied [19]. The village health committee had interests and expectations for the performance of the intervention, if it was meeting the needs of their people. But the implementers had no interaction with the village health committees as a result the committee did not support the community volunteers selected which led to volunteers feeling they were on their own without the implementers and the village support. This affected the operations and sustainability of the intervention since community volunteers were not accountable to anyone in the village, in addition to not having a formal way of monitoring their jobs.

The implementers did a good job in acknowledging the local realities of the context but the local information ecology for maternal care was overlooked. Most ICT interventions fail because they undermine existing tradition information systems and they are viewed as a challenge to information brokerage role of existing community organisations [45]. The elderly women viewed the intervention as something that had come to eliminate their tradition. The elderly women had low interest in the intervention but high power to influence the decisions of the mothers on using the intervention because in

rural areas the norm is that only elders should provide pregnancy information that guides the pregnant woman's action and conduct [42][43]. Leaving the elderly women out of the MSSM ecosystem was a setback to the intervention as it reduced the number of women registering and also discouraged those registered to seek medical attention, defeating the whole purpose of the intervention.

The role of the CVs and the mothers were defined in the project documents, mainly because they were the key stakeholders in the community. The undefined roles attributed to stakeholders having high expectations of the intervention which affected their behaviour toward the intervention. Failure to meet the stakeholders' expectations by the implementers led to conflict of interests and had a negative bearing on effectiveness and sustainability of the intervention, which flourishes with satisfying stakeholders' needs [46]. The study noted that the misunderstandings and conflicts in the stakeholders' expectations and interests were attributable to less consultation of key community stakeholders in some stages of the project, poor communication, lack of formal procedures in operations, exclusion of tradition information systems. The socio-cultural context of the rural communities where people rarely voice out their expectations and frustrations if their needs are not met exacerbated the conflict of interests, leaving most of the community stakeholders demotivated which affected the performance of the project.

For effective management of mHealth initiatives in rural communities, policy makers and implementers need to involve the communities at every stage of the project so that they do not miss some key stakeholders that can affect project performance even in the background. It would be important to respect and include tradition information systems, especially in sensitive domains like maternal care, so that communities do not feel threatened by the interventions, but a sense of inclusion and understanding that the innovation initiatives enhance and strengthen existing information systems. Stakeholder management using proper procedures such as face to face meetings, training, and effective communication strategies with formal channels build winning coalitions that improve the performance of the intervention leading to effectiveness and sustainability.

## References

- [1] Qiang CZ, Yamamichi M, Hausman V, Altman D. Mobile applications for the health sector. World Bank; 2012 Apr.
- [2] Chudi PI. Healthcare problems in developing countries. *Medical Practice and Reviews*. 2010;1(1):9-11.
- [3] Noordam AC, Kuepper BM, Stekelenburg J, Milen A. Improvement of maternal health services through the use of mobile phones. *Tropical Medicine & International Health*. 2011;16(5):622-6.
- [4] Kaplan WA. Can the ubiquitous power of mobile phones be used to improve health outcomes in developing countries? *Globalization and Health, BioMed Central*. 2006;2(9).
- [5] Lester RT, van der Kop M, Taylor D, Alasaly K, Coleman J, Marra F. m-health: Connecting patients to improve population and public health. *BCMJ*. 2011;53(5):218-9.
- [6] Chigona W, Nyemba-Mudenda M, Metfula A. A review on mHealth research in developing countries. *The journal of community informatics [Internet]*. 2012 [cited 2013 Jun 04];9(2): [about 5 p.]. Available from: <http://ci-journal.net/index.php/ciej/article/view/941/1011>
- [7] Krishna S, Boren SA, Balas EA. Healthcare via cell phones: A systematic review. *Telemedicine and e-Health*. 2009;15(3):231-40.
- [8] Pade CI, Mallinson B, Sewry D. An exploration of the categories associated with ICT project sustainability in rural areas of developing countries: A case study of the Dwesa project. *Proceedings of the 2006 annual research conference of the South African institute of computer scientists and information technologists on IT research in developing countries; 2006; South Africa; 2006. p. 100-06.*
- [9] Chigona W, Roode D, Nabeel N, Pinnock B. Investigating the impact of stakeholder management on the implementation of a public access project : the case of Smart Cape. *South African Journal of Business Management*. 2010;41(2): 39-49.
- [10] Bailur S. Using stakeholder theory to analyze telecenter projects. *Information Technologies & International Development*. 2006;3(3):61-80.
- [11] Flak LS, Nordheim S, Munkvold BE. Analyzing stakeholder diversity in G2G efforts: Combining descriptive stakeholder theory and dialectic process theory. *E-Service Journal*. 2008;6(2):3-23.
- [12] Gomes RC. Who are the relevant stakeholders to the local government context? Empirical evidences on environmental influences in the decision-making process of English local authorities. *BAR.Brazilian Administration Review*. 2004;1(1):34-52.
- [13] Norris AC, Stockdale RS, Sharma S. A strategic approach to m-health. *Health Informatics Journal*. 2009 Sep 01;15(3):244-53.

- [14] Klasnja P, Pratt W. Healthcare in the pocket: Mapping the space of mobile-phone health interventions. *J Biomed Inform.* 2012 Feb;45(1):184-98.
- [15] Free C, Phillips G, Watson L, Galli L, Felix L, Edwards P, et al. The effectiveness of mobile-health technologies to improve health care service delivery processes: a systematic review and meta-analysis. *PLoS medicine Public Library of Science.* 2013 [cited 2013 Aug 15]; 10(1): [about 10 p.]. Available from <http://www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.1001363>
- [16] Michael P, Batavia H, Kaonga N, Searle S, Kwan A, Goldberger A, et al. Barriers and Gaps Affecting mHealth in Low and Middle Income Countries: Policy White Paper. Columbia University: Earth Institute & mHealth Alliance; 2010 May.
- [17] Simpson LE. Community informatics and sustainability: Why social capital matters. *The Journal of Community Informatics.* 2005;1(2):102-19.
- [18] Kumar R. eChoupals: A study on the financial sustainability of village internet centers in rural madhya pradesh. *Information Technologies and International Development.* 2004;2(1):45-74.
- [19] Freeman, ER. *Strategic Management: a stakeholder approach.* Boston: Pitman; 1984.
- [20] Brugha R, Varvasovszky Z. Stakeholder analysis: A review. *Health Policy and Planning.* 2000;15(3):239-46.
- [21] Clarkson ME. A stakeholder framework for analyzing and evaluating corporate social performance. *Academy of management review.* 1995;20(1):92-117.
- [22] Gavin T, Pinder C. Impact Assessment and Stakeholder Analysis [Internet]. *Proving and Improving: a quality and impact toolkit for social enterprise;* 1998. Available from <http://www.proveandimprove.org/documents/StakeholderAnalysis.pdf>
- [23] Mishra A, Dwivedi YK. Stakeholder Theory and Applications in Information Systems In: Dwivedi YK, Wade MR, Schneberger SL, editors. *Information Systems Theory: Explaining and Predicting Our Digital Society.* Springer; 2012; p. 471-88.
- [24] Donaldson T, Preston LE. The stakeholder theory of the corporation: Concepts, evidence, and implications. *Academy of management Review.* 1995;20(1):65-91.
- [25] Kaler J. Differentiating stakeholder theories. *J Bus Ethics.* 2003;46(1):71-83.
- [26] Gosling, L, Edwards, M. *Toolkits: A practical guide to planning, monitoring, evaluation and impact assessment.* London: UK; Save the Children; 2003.
- [27] Kaplan B, Maxwell J. Qualitative research methods for evaluating computer information systems In: Anderson J, Aydin C, editors. *Evaluating the Organizational Impact of Healthcare Information Systems.* 2nd ed. Springer; 2005; p. 30-55.
- [28] Walsham G. Interpretive case studies in IS research: Nature and method. *European Journal of information systems.* 1995;4(2):74-81.
- [29] Sandelowski M. Sample size in qualitative research. *Res Nurs Health.* 1995;18(2):179-83.
- [30] Hsieh H, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res.* 2005;15(9):1277-88.
- [31] Myers MD. Qualitative research in information systems. *MIS Quarterly.* 1997 Jun;21(2):241-2.
- [32] Malawi NSO, ORC Macro. *Malawi Demographic and Health Survey 2010.* Zomba: Malawi National Statistical Office; 2011.
- [33] UNDP. 2013 Human Development Report. New York: United Nations Development Program; 2013.
- [34] ITU. *The Role of ICT in advancing growth in least developed countries (LDCs) trends, challenges and opportunities.* Geneva: International Telecommunication Union; 2011.
- [35] Mtingwi J, Van Belle J. E-Government and M-Government readiness in Malawi In: Mahmood Z, editor. *E-Government implementation and practice in Developing Countries.* IGI Global; 2013; p. 211-41.
- [36] Hogan MC, Foreman KJ, Naghavi M, Ahn SY, Wang M, Makela SM, et al. Maternal mortality for 181 countries, 1980–2008: A systematic analysis of progress towards millennium development goal 5. *The Lancet.* 2010 May;375(9726):1609-23.
- [37] WHO, UNICEF, UNFPA, World Bank. Trends in maternal mortality: 1990-2010 [internet]. World Health Organisation; 2012 [cited 2013 Sep 04]. Available from: <http://www.who.int/reproductivehealth/publications/monitoring/9789241503631/en/index.html>
- [38] Makoza F, Chigona W. The outcomes of ICT diffusion and human development in Malawi. *International Journal of Information Communication Technologies and Human Development (IJICTHD).* 2012;4(4):52-70.
- [39] Pouloudi A, Whitley EA. Stakeholder identification in inter-organizational systems: Gaining insights for drug use management systems. *European journal of information systems.* 1997;6(1):1-14.
- [40] Wilkinson SE, Callister LC. Giving birth: The voices of Ghanaian women. *Health Care Women Int.* 2010 Mar;31(3):201-20.
- [41] Maimbolwa MC, Yamba B, Diwan V, Ransjö-Arvidson A. Cultural childbirth practices and beliefs in Zambia. *J Adv Nurs.* 2003;43(3):263-74.
- [42] Seljeskog L, Sundby J, Chimango J. Factors influencing women's choice of place of delivery in rural Malawi-an explorative study. *Afr J Reprod Health.* 2007;10(3):66-75.

- [43] Lori JR, Bolye J. Cultural childbirth practices, beliefs, and traditions in post conflict Liberia. *Health Care Women Int.* 2011;32(6):454-73.
- [44] Nyemba-Mudenda M, Chigona W. The Dynamics of Involving Intermediaries on User Experiences and Outcomes of mHealth Initiatives: The Case of a Maternal Healthcare Intervention in Malawi. *Proceedings of Health Informatics South Africa (HISA) 2013 Conference*; 2013 Jul 3-5; Port Elizabeth, South Africa. Nelson Mandela Metropolitan University; 2013.
- [45] Gigler B. Informational capabilities-the missing link for the impact of ICT on development. *E-Transform Knowledge Platform*, World Bank. 2011.
- [46] Garvare R, Johansson P. Management for sustainability—a stakeholder theory. *Total Qual Manage.* 2010;21(7):737-44.