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Enhancing public-private partnerships through SMS Vouchers

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Abstract

With the increase in subscriptions and applications for mobile technologies, SMS vouchers introduce a channel to enhance the current paper-based voucher scheme processes of public-private partnerships. The benefits of SMS vouchers stretch beyond efficiency to substantially improve the effectiveness of the program’s operations. SMS vouchers require a strong understanding of the complex relationships amongst the various stakeholders involved in addition to a robust technical implementation.

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1. Introduction

As the estimated penetration of mobile phone subscriptions in developing countries reached 79% in 2011 [1], the level of interconnectedness in regions such as East Africa has grown significantly in the past decade and continues to increase. With this increase, both the public and private sectors are seeking opportunities to leverage this level of interconnectedness by developing innovative uses of mobile technology.

One area where public and private sectors are working cooperatively is in the distribution of commodities via voucher schemes. The majority of voucher schemes are currently paper-based and the high penetration of mobile handsets has unlocked the potential for a new channel. Short Message Service (SMS) vouchers introduce an alternate and complementary approach for voucher schemes by using mobile technology.

This paper intends to increase understanding of the potential to use mobile technology to enhance voucher schemes for public-private partnerships. First, we examine the current landscape of paper voucher schemes. Next, we explore how SMS vouchers solve the challenges of the paper voucher channel and describe the two different implementations of SMS vouchers. Thirdly, we’ll focus on a case study of SMS vouchers in Tanzania used to increase the country’s coverage of mosquito nets. Lastly, we’ll outline the key lessons learned and success factors when developing an SMS voucher program.

2. Transitioning from paper to SMS vouchers

In the past fifty years, more than $1 trillion USD in development-related aid has been transferred to Africa [2]. The transition over time has shifted from the distribution of aid through free commodities to the distribution of aid through voucher schemes and subsidized commodities. Commodities distributed include fertilizer for farmers to food baskets for women and children.

Major gaps in the paper voucher workflow have caused the following challenges:

- Voucher liability
- Voucher fraud and misuse
- Lack of real-time data
- Lack of insight into supply and demand
- Delayed retailer payments

These challenges have led to a number of inefficiencies and ineffectiveness in paper voucher programs and also validate the need for and comprise the main drivers for SMS vouchers as a new channel for solidifying public-private partnerships.

3. SMS vouchers

SMS voucher programs have the ability to control vouchers from a centralized system and constantly monitor the activity of the program at the voucher issuance and redemption levels. The introduction of this channel aims to introduce an automated workflow and address the challenges experienced in the paper voucher channel. SMS voucher programs can address the challenges listed in section 2 through the following solutions:
Table 1. Paper channel challenges and SMS channel solutions

| Paper channel challenge     | SMS channel solution                                                                 |
|-----------------------------|---------------------------------------------------------------------------------------|
| Voucher liability           | Automatic expiration of vouchers and ability to manually void vouchers                 |
| Voucher fraud and misuse    | Randomly generated voucher IDs and automatic system checksum of voucher ID             |
| Lack of real-time data      | Real-time tracking of vouchers across the various voucher states                       |
| Lack of insight into supply and demand | Real-time tracking of voucher issuance (demand) and retailer stock (supply) for each market actor |
| Delayed retailer payments   | Automatic retailer payments using mobile money transfers                               |

SMS vouchers can be implemented in two formats: scratch cards and paperless vouchers.

3.1. Scratch card

Mobile scratch cards are similar to top-up cards used to load airtime onto pre-paid mobile phone subscriptions. Beneficiaries receive scratch cards from government approved locations (e.g. publicly-operated health clinics) and bring the scratch card to a nearby retailer. The retailer redeems the scratch card by exposing the unique voucher ID and sending an SMS containing the voucher ID to redeem the voucher. Once the voucher ID is confirmed, there is a transfer of commodities from the retailer to the beneficiary. Mobile Network Operators (MNOs) in East and Sub-Saharan Africa have operationalized mobile money programs whereby network subscribers can send and receive money via SMS and cash out at participating retailers. Using mobile money programs, the platform automatically credits the retailer’s mobile money balance once the transfer of commodities has taken place.

3.2. Paperless voucher

Paperless vouchers are issued and redeemed via SMS and eliminate the need for paper vouchers. Vouchers are issued to individual beneficiaries by government workers who send an SMS request for a voucher ID. If the request is valid, the platform sends a response SMS to the government worker containing the unique voucher ID. Beneficiaries receive their unique voucher ID written on a national identification card (e.g. clinic card or registration card) and present their voucher ID to a retailer. Subsequently, the retailer redeems the voucher by sending an SMS containing the voucher ID. The commodity exchange takes place and the retailer’s mobile money balance is automatically credited.

4. SMS vouchers for mosquito nets

The Tanzanian National Voucher Scheme (TNVS) was launched in 2004 to make Insecticide Treated Nets (ITNs) available to all pregnant women and infants in Tanzania mainland through vouchers that subsidize the cost of nets at appointed retailers. The main stakeholders in the TNVS program include: the Tanzanian Ministry of Health and Social Welfare as the public partner, AtoZ Textiles as the private partner and manufacturer / distributor of ITNs, and MEDA Tanzania (MEDA) as the logistics partner.
Vouchers are issued at clinics and redeemed at retailers while AtoZ stocks the retailers’ ITNs. To date, there are approximately 5000 clinics and 5000 retailers participating in the program.

In 2010, the National Malaria Control Programme mandated a 60-day voucher expiration period to decrease the liability accumulated for vouchers with no expiration date. In order to meet this requirement and simultaneously address TNVS challenges in the paper channel, MEDA proposed the integration of mobile technologies into the current voucher cycle by adopting the paperless voucher approach.

The pilot of the Electronic Voucher (e-Voucher) program took place in Temeke, Dar es Salaam from October 17 – January 30, 2012. The program went live, expanding into 3 additional regions in Tanzania, on February 1, 2012. Since the launch of the e-Voucher program, the program workflows across the layers of people, processes and technology have experienced substantial improvements.

4.1. Decreased voucher liability

The paper voucher channel imposed a high level of voucher liability due to the lack of expiration dates of the vouchers. With a redemption rate of approximately 70%, MEDA was left liable to a large number of vouchers issued but not redeemed. The e-Voucher channel automatically voids vouchers after a 60-day expiration period which significantly reduces MEDA’s liability to pay out vouchers that may never be redeemed.

4.2. Constant stock of vouchers

The paper voucher distribution process takes 8-16 weeks from the time vouchers are ordered to the time they arrive in clinics. The e-Voucher channel allows clinics workers to issue vouchers on demand by sending a single SMS and reduces the overhead and administrative costs incurred with paper vouchers. At the time of the e-Voucher pilot, many of the clinics in Dar es Salaam had limited or no stock of vouchers. With the launch of the e-Voucher, over 20,000 vouchers were issued in Dar es Salaam that otherwise would not have been issued.

4.3. Insight into real-time data

The e-Voucher channel provides valuable insight into the voucher workflow that is not available in the paper voucher process including: the current state (e.g. issued, redeemed) of a voucher, the location a voucher was issued and redeemed, and the number of vouchers issued and redeemed within a specific time period and location. Real-time data also provides control for fraud and misuse. With the data gathered in the e-Voucher channel, clinics and retailers performing outside the boundaries of their average range of activity are easily identifiable and follow up with these market actors is performed when fraudulent activities are suspected. MEDA has automated alerts that flag vouchers redeemed in a region outside of the region they were issued, clinics issuing vouchers outside of business hours, and retailers redeeming more than 20 vouchers in 10 minutes.

4.4. Improved supply chain processes

Using the e-Voucher channel, MEDA is able to gather valuable information to improve supply chain processes. Information on the number of vouchers issued by a clinic can be used to forecast the demand of ITNs at nearby retailers and ensure that they have adequate stock to meet the demand of vouchers issued at the nearby clinic(s). Conversely, a list of retailers who have not been redeeming vouchers due to a lack of stock can be generated and this list can then be used to prioritize deliveries of ITNs.
4.5. Ease of Use

To issue a voucher, clinic workers send an SMS containing two parameters: the code for the voucher type (infant or pregnant woman) and the beneficiary’s clinic card number. Retailers send an SMS containing three parameters: the voucher redemption keyword, along with the voucher ID and the barcode ID of the net to be traded. The majority of clinic workers and retailers are comfortable sending SMS messages; therefore the e-Voucher program has simplified and decreased the administrative activities involved with issuing and redeeming vouchers. One user’s feedback was to “now help me to have many applications on cellphones”.

5. Lessons learned and the way forward

As foreign aid continues to flow into developing countries, the need for successful public-private partnerships also continues. The SMS voucher has proven to be a technologically-feasible channel which enhances the overall processes of voucher schemes. The following sections outlines the key lessons learned and success factors when developing SMS voucher solutions.

5.1. Leverage existing processes

The e-Voucher workflow was designed by leveraging the current paper voucher workflow in order to maintain a level of familiarity for those adopting the new channel. The strong establishment of the TNVS paper voucher channel was a key factor in the success of the e-Voucher channel. “A substantial amount of time – often years – is needed for people to understand and use a voucher program so multiple communication channels are essential” [4]. SMS vouchers should be introduced as a complementary channel where paper voucher channels exist. Mobile technology should be considered an enabler, not a solution; therefore, whether a paper-based process is in existence or not, an in-depth analysis and user-centred design research should take place to evaluate the appropriateness of an SMS voucher program.

5.2. Find the intersection of various mobile applications

A landscape analysis of the current SMS applications used by stakeholders should be performed prior to the deployment of SMS voucher programs. The landscape analysis will determine other SMS programs in which market actors are currently participating in as well as potential partnership opportunities with other organizations or private companies. Partnerships such as automated mobile money transfers at the point of voucher redemption demonstrate the immediate benefits of the program for retailers and stimulate private sector participation in the program.

5.3. Develop strong relationships with mobile network operators

SMS voucher programs are completely dependent on the network availability of the major Mobile Network Operators (MNOs) in the country. In addition to network availability, the message delivery and response time must also occur in a timely manner. Countries such as Tanzania experience major delays or outages of SMS messages services every 2-3 months during which SMS voucher programs are interrupted. In a study of the SMS delivery time and reliability, “occasional dropped messages show that safeguards need to be in place if SMS is used for critical applications” [3]. Network signal strength also varies throughout the urban and rural regions of a country, making it technologically difficult for some regions to participate in the program. Strong professional relationships should be developed within each of the MNOs to ensure timely and dedicated program support in case of a network availability problem.
Strong professional relationships will also identify opportunities for partnership and collaboration for program enhancements.

5.4. Focus on urban regions without overseeing rural regions

Tanzania has an estimated population of 44 million [5], and the Tanzania Communications Regulatory Authority reported only 24 million mobile subscriptions at the end of September 2011 [6]. Due to the low level of mobile subscriptions, it is not feasible to implement SMS vouchers in every region of countries such as Tanzania. Feasibility studies should take place in rural regions to identify if an SMS voucher program can be achievable or if the paper voucher process is the ideal solution. Furthermore, if both paper and SMS-based voucher channels will be available in a country, the technical and business requirements should determine the logistical details of the having both channels operating in the program.

6. Conclusion

Mobile technology has the capability and capacity to enhance voucher schemes and increase the benefits to both parties involved in a public-private partnership. More critically, the beneficiaries and recipients of vouchers will experience the benefits of the SMS-based processes and the distribution of foreign aid will be optimized. SMS vouchers are the digitization of an existing paper-based process and are the way forward for the enhancement of public-private partnerships.

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