Mobiles for Development – A Comparative Analysis of Business Decisions

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ABSTRACT
Much research on ‘mobiles for development’ focuses on outcomes and impact of services. This paper focuses on the underlying business models. It draws on two case studies as part of a UK Aid funded evaluation of the GSM Association led mNutrition programme. Vodafone Farmers Club in Ghana provides agricultural and nutrition information via SMS and Wazazi Nipendeni in Tanzania is a maternal and child health SMS service. The paper presents the salient points of the two contrasting business models, highlighting the strengths and weaknesses of both. The merits of the different approaches depend on the principle motivation, but when it comes to delivering positive outcomes among the poorest, the weight of evidence appears to be in favor of an independent, third party driven model.

KEYWORDS
Mobiles; business models; development policy; agriculture; health

Introduction

Research on mobiles for development (M4D)

Most research on the potential of ‘mobiles for development’ (M4D) value added services (VAS) focuses on the outcomes of the service (Ahmed, Gagnon, Hamelin-Brabant, Mbemba, & Alami, 2017; Baumüller, 2018; Coleman, 2018; Emeana, Trenchard, & Dehnen-Schmutz, 2020; Iribarren, Cato, Falzon, & Stone, 2017; Marcolino et al., 2018). M4D VAS covers the use of mobile for delivering context specific information and transactions relating to agriculture, health, governance and combinations of them for foci such as nutrition and climate change (variously called mAgric, mHealth, mNutrition, etc.) (Agarwal et al., 2016; Day, 2018; Duncombe, 2018; Opoku, Stephani, & Quentin, 2017; Siddique, 2017). The study of such systems also results in research and commentary on broader social concerns such as gender inclusion (Faith, 2018; Hoque, 2016; Thamizoli, Balasubramanian, Onyango, Kamaraj, & Rengalakshmi, 2018). Indeed, within the Mobile For Development website run by the GSM Association (GSMA, the trade association of mobile network operators) we see that diversity mirrored, with studies on M4D (GSMA, 2020a), mHealth (GSMA, 2018), mAgric (GSMA, 2017), climate change (GSMA, 2019) and gender (GSMA, 2020b).

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For all this recent study, it is rare for authors to refer to the underlying construct of the business and to describe the partnerships and business models used to deliver the VAS sustainably. Loudon (2016) considers the underlying platforms of M4D delivery, while Partey, Nikoi, Ouédraogo, and Zougmoré (2019) presents how a VAS service provider can implement a Business to Business (B2B) model and Velu (2017) illustrates the complexity of most VAS business models. Velu (2017) concludes that there is a need for balance in the models used but discusses it at a relatively high level. Models commonly involve partnerships between service providers and a mobile network operator (MNO), and although GSMA (2016) do discuss partnerships, the question is reduced to 3 pages of bullet point advice.

To date then, the focus has been on the outcomes of the service, not the underlying business models, and tends to omit discussion of the costs of customer acquisition, the structure of the business and the business model. So while research into the outcomes of a service is helpful, there remains a need to understand the business structures and motivation behind M4D services.

Study methods

In this paper we present two case studies and consider features of the different business models that shed light on a dilemma faced by VAS developers. The case studies are drawn from an independent study carried out by a consortium of researchers from Gamos, the Institute of Development Studies, and the International Food Policy Research Institute. The mixed methods study investigated two case studies from the GSMA’s mNutrition portfolio – the Vodafone Farmers Club in Ghana, and Wazazi Nipendeni in Tanzania. The evaluation used a theory-based mixed methods approach with three interlinked components:

1. a quantitative study that employed randomized controlled trials (RCT);
2. an in-depth qualitative study with three rounds (baseline, midline and endline reports); and
3. a business modeling and cost-effectiveness assessment (baseline and endline reports).

Data collection took place from October 2016 until March 2019. The study addressed five research questions (Barnett, Batchelor, et al., 2020), including “How commercially viable are the different business models for a mobile phone-based platform and how cost effective are they?”

The mNutrition programme as a whole was designed to exploit mobile phone technologies to improve access to information on nutrition, health and agricultural practices, especially for women and farmers. The programme supported a number of

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1Billings, Gilligan, Hidrobo, Ledlie, and Palloni (2018), Billings, Gilligan, Hidrobo, Palloni, and Tambet (2020), Gilligan, Hidrobo, Ledlie, and Palloni (2018), Gilligan, Hidrobo, Palloni, and Tambet (2020).
2Barnett, Srivastava, and Gordon (2017, 2018), Barnett, Faith, Mitchell, and Sefa-Nyarko (2019), Barnett, Faith, Gordon, Brockerhoff, and Medardi (2019), Barnett, Faith, Gordon, and Sefa-Nyarko (2019), Barnett, Faith, et al., 2020.
3Batchelor, Scott, and Clements (2020), Batchelor, Scott, Clements, and Jones (2019), Batchelor, Sharp, and Scott (2018a, 2018b), Scott and Batchelor (2020), Scott, Batchelor, and Sharp (2018a, 2018b), Scott, Batchelor, and Jones (2020).
mobile nutrition and agriculture information value added services (VAS) designed to provide users with the knowledge needed to effect positive behavior change. A key feature of the programme was developing partnerships between private sector actors to take mobile initiatives to scale. The sustainability of business models that emerged from these partnerships was of particular interest and is the subject of study for this paper. The programme was present in ten countries across Africa, and four in south Asia.

Information was collected from multiple sources, including qualitative interviews with stakeholders and alternative service providers, and commercial data provided by stakeholders. It also draws on data gathered by both the quantitative and qualitative evaluation components within the study team. The key limitation of the paper is that it covers only two case studies so general lessons drawn are presented with caution.

**The key dilemma**

One VAS developer asked the study team: *"Is it better to go with a Mobile Network Operator for lots of numbers, or stay independent?"* The question was predicated on a dilemma faced by VAS developers. A M4D VAS developer can create a service, including context specific content with enticing ‘extra value elements’, but this is only worthwhile if they can sustainably acquire and retain users. In terms of business models there are some key strategic decisions to be made.

VAS developers offering services designed to help alleviate poverty in developing countries have the option of keeping their own brand and delivering a cross network offering, in which case they are faced with the prospect of marketing their products themselves. One option is to sell directly to customers, but the cost of acquiring customers can be significant (particularly in rural poor areas). However, once the customer is acquired, learning from business studies across many services and products suggests that retention occurs when a suite of services and products is offered. The VAS provider therefore either has to develop an attractive suite of services or make alliances in order to provide a more comprehensive and holistic service. From this point of view, it is often better to align oneself with other field organizations (e.g. health providers, extension services, supply chain agents, non-governmental organizations (NGOs)). Therefore, many developers prefer to offer a VAS to institutions engaged in field level development programmes. The weakness of this approach is that unless the developer can sign up with a national extension service (whether that be health or agriculture) the service can get trapped into being available only within limited geographical areas.

The alternative is to align the product with a Mobile Network Operator with national coverage, which offers an easier route to scale by marketing the service to all subscribers on the partner network. The cost of customer acquisition potentially drops, as low cost marketing strategies like SMS blasts can be used, and the service can be integrated into existing MNO marketing strategies.
The Vodafone Farmers Club (VFC) offered customized agriculture and nutrition information via multiple channels: SMS (text messaging) for local weather updates and market prices; recorded voice messages with agricultural and nutrition tips; an expert call center to answer farming and nutrition-related queries; it also offered discounted tariffs, and free calls and SMS to other VFC members. The business model is presented in Figure 1, based on the business canvas framework (Osterwalder & Pigneur, 2010). During the study, VFC was offered under two models: the mNutrition case studies.

**Figure 1. Proposed business model for Vodafone Farmers Club.**
• Freemium (free access to information and closed user group (CUG) calls, upselling of airtime): financial modeling shows that this was not financially sustainable, but if the product could be marketed to a slightly higher status market segment (with higher ARPU\(^4\), this would be enough to make a freemium model financially attractive.
• Subscription: financial modeling shows that this was not financially sustainable at the subscriber levels achieved.

Esoko Ghana, a mobile phone-based rural information service, curated the message content and operated the platform to send tailored SMS and recorded voice messages to member farmers and also operated the Farmer Helpline call center. GAIN, a partner to the mNutrition programme, created 312 crop-specific nutrition messages with information on topics including food preparation, food hygiene, safety and storage, and processing. In 2017 the Grameen Foundation developed 26 additional nutrition messages focused on animal sourced foods including eggs, dairy, fish and meat. VFC subscribers received both general nutrition tips and crop-specific nutrition tips according to their profiled crop.

Vodafone invested in the VFC service with the aim to increase penetration in rural Ghana through new subscriber acquisitions. The VFC service was launched in June 2015 with a dedicated Farmers’ Club SIM\(^5\) card that was promoted by Vodafone agents. The monthly subscription fee for VFC was initially GHS 2 (USD 0.45). However, the agent-led model resulted in slow acquisitions and difficulty retaining active usership of the service. By November 2016 there were only approximately 130,000 registered members, but fewer than 20% were active (Palmer & Darabian, 2017). In December 2016 Vodafone added existing rural Vodafone customers to the service increasing the VFC subscription rate to over 200,000. In addition, Vodafone made a strong push to increase acquisitions by temporarily dropping the monthly subscription fee from October 2016 to June 2017. In June 2017 the monthly service fee was reinstated at GHS 0.5.

VFC resembles a Business to Business to Consumer (B2B2C) model, whereby Esoko provides services to Vodafone, who then deliver services to customers. However, VFC does not really fit this model because of the way both partners provide services directly to customers. Only Vodafone generates benefits directly from customers, either through direct revenue, indirect revenue, or both. Esoko revenue is determined by a contract with Vodafone, and is tied directly to the success of the product through the number of users, so both parties shoulder a share of risk associated with the product.

Variations of B2B2C business models are determined by the nature of the relationship between the two businesses, and how they interact with customers. At one extreme, the information provider can be regarded as a sub-contractor, who provides content that the MNO then delivers to customers – a contractual relationship. At the other extreme, the MNO simply provides a platform that a third party can use to deliver a VAS to customers, by opening up application program interfaces (APIs) to VAS developers. VFC is closer to the former of these.

\(^4\)Average revenue per user.
\(^5\)Subscriber identification module.
Wazazi Nipendeni

In Tanzania, the mNutrition programme supported the ‘Healthy Pregnancy, Healthy Baby’ (HPHB) SMS programme, also known as Wazazi Nipendeni (WN). The programme was run by the mHealth Tanzania public–private partnership (PPP) initiated in 2012 by Tanzania’s Ministry of Health and Social Welfare. The service offers customized health and nutrition information through SMS to improve knowledge and practices around childcare and nutrition. WN was not a stand-alone intervention but was strongly informed by government policies, actively promoting the use of government services for additional support (e.g. regular antenatal care visits during and child growth monitoring).

The HPHB SMS service sent free text messages with healthcare information to four categories of users: pregnant women, mothers with newborns, male supporters, and general information-seekers. The SMS messages were sent in Swahili, to women up to 16 weeks post-partum on a range of pregnancy and early childhood issues, timed to coincide with the stage of the pregnancy and the age of the child. This period of engagement was extended under the mNutrition programme by adding nutrition messages for children up to 5 years of age. Anyone interested in receiving healthy pregnancy information can text the word ‘MTOTO’ (child) to the short code 15,001. Nutrition-related content was a small component of the original HPHB SMS service but was expanded substantially with the addition of the content contributed through GSMA under the mNutrition programme. WN is available to households in all regions of Tanzania, on all the major mobile phone networks. Participating individuals receive the text messages free of charge. The business model is presented in Figure 2, using the canvas framework and can be regarded as a multi-sided platform business model. It provides a means of making a product free to one group of customers, while another

Figure 2. Proposed business model for Wazazi Nipendeni.
Table 1. Comparing business models from case studies.

| Vodafone Farmers Club                      | Wazazi Nipendeni                                      |
|-------------------------------------------|------------------------------------------------------|
| Subscription (2.0 GHS/subs/month)         | Free                                                 |
| Free                                      |                                                      |
| Single MNO                                | Available via 4 MNOs                                  |
| Target new customers (original proposal)  | VAS for existing customers                           |
| Complex product (SIM, airtime, free calls (CUG), SMS & OBD information, call center | Simple – SMS information                            |
| Stand alone                               | Integrated with field programmes                     |
| Government verified content               | Government as invested partner; health highly regulated |
| Agriculture as commercial activity        | Health as public good                                 |
| Competing services – other operators and VAS developers provide agricultural information services. | mHealth Tanzania PPP is the ‘go to’ institution for mHealth services. |
| MNO responsible for product development   | mHealth Tanzania PPP developed product                |
| Commercial                                | Donor funded                                          |

Group pays. WN brings together two groups, providing a link between funders, who pay for the service, and users who receive the service free of charge. Funders with a health mandate, such as the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) and the Centers for Disease Control and Prevention (CDC), benefit from improved health outcomes achieved by users. Field level partners that provide the additional support mentioned earlier cannot really be considered a third side to the platform because they already have their own link to users through their field presence.

Comparing the two business models

Key differences between the two case study offerings are summarized in Table 1. During the initial and latter stages of its operation, the VFC business model included direct revenue generation from subscription fees. A key activity under the WN model was networking and negotiating partnerships across different stakeholder groups including health sector agencies working on the ground. Providing a face to face presence in the field was valuable in encouraging people to sign up, assisting with registration, and affirming the messages when these were reinforced by field agents. MNOs who donated SMS messages to WN as part of their charitable activities saw a return on this investment in terms of increased ARPU, yet this was not evident among subscribers to VFC, which was a commercial product.

VFC was an MNO led product, for which technical and agricultural expertise was contracted in from a third party (Esoko). WN, by contrast, was a service developed over many years and many partnerships by the mHealth Tanzania PPP. M4D developers have the technical expertise and passion to evolve their products, but typically market their services to individual agencies with limited reach. WN is an interesting and possibly unique hybrid, as the service is made available to MNO customers and at the same time the mHealth Tanzania PPP has entered into agreements with agencies implementing health programmes on the ground.
Impact on development outcomes

The evaluation found a number of factors impeded the reach of both VFC and WN. Both studies found that women (and poor farmers) had limited access to mobile phones, including gendered barriers to access. Other factors included limited network coverage, poor access to electricity to charge phones, and customers losing registered SIM cards, which was a consequence of managing multiple SIMs in simple handsets.

The quantitative impact evaluation found that being offered the VFC service or having used it at least once had no impact on households’ and women’s dietary diversity, agriculture production and income, or nutrition or agriculture knowledge or practices, although the subset of farmers who engaged with VFC for at least several months made at least some changes in their agriculture-related behaviors and practices.

Access to WN had small positive impacts on infant and young child feeding (IYCF) knowledge, especially among men, and on dietary diversity among both children and women. However, these positive impacts did not translate into an improvement in nutritional status among children.

Features of business models

Product development

GSMA has concluded that an agile and user-centric product development process is key to success. ‘Successful services require a robust product team, including a core team of dedicated staff and cross-functional links to other departments’ (Palmer & Darabian, 2017). Responsibility and incentives for product development were very different in the two case studies.

The small team in Vodafone had cross-functional support within Vodafone, at least for the duration of the grant period, but it lacked internal user experience (UX) expertise, agricultural expertise, and content platform resources. These were resourced through contractual-type partnerships. However, the contractual relationship with Esoko provided little incentive to innovate (and take risks).

While VFC was introduced as a new product, WN was an established service. The mHealth Tanzania PPP can trace its roots back to 2001, although the WN information service was launched in its current format in 2012. A follow-up campaign ran from July 2013 to February 2014, during which field partners promoted the service and assisted with registrations. It can be argued that crucial testing and development of the product was carried out during this period and with the support of international donors and health agencies. Evolution of the customer facing product has been minimal since then, notwithstanding an expanding content base and changing partnerships behind the scenes.

Rapid staff turnover is a feature of the information and communications technology (ICT) industry in particular. This was observed within MNOs involved in both case studies, but structural differences meant that the implications were different. Vodafone Ghana experienced multiple changes of management at the most senior level, at the level of managers with responsibility for VFC, and at the level of product managers. This led to
a lack of continuity of ideas discussed with partners to develop the VFC product. Shifting responsibilities for VFC, changing priorities, changes in the locus of decision making authority, poor performance of VFC, and a lack of expertise within Vodafone all contributed to the lack of development of the VFC product and the failure to make progress with a proposed follow-up product.

It should be pointed out that when Vodafone won the mNutrition Challenge Fund award, VFC presented as a strong value proposition with strong partners with all the skills needed for agile product development. In time, key personnel moved on and the residual levels of interest and the contractual nature of relationships led to an inability to mobilize these skills.

When staff moved on within MNOs that partnered with WN, the mHealth Tanzania PPP were able to invest the time and effort needed to build new relationships, reestablish trust, and address changing priorities. For example, changes in leadership at Tigo linked to its acquisition of Zantel meant that responsibility for WN was transferred to a completely new team. The CSR priorities changed to education and financial inclusion, so they planned to discontinue support for WN as it no longer fitted these criteria. The mHealth Tanzania PPP, with the support of a nutrition officer from MoHCDGEC, lobbied the new Tigo team and eventually secured an agreement to continue their support.

**Face to face presence**

Although M4D VAS are driven by the potential to reach large numbers of people, field partners play a crucial role in providing a face-to-face presence that supports users with getting registered, reinforcing messages, and enhancing the effectiveness of the service.

**Onboarding – customer acquisition**

Face-to-face contact is highly valued by famers, especially in terms of building trust, but on-the-ground marketing activities were universally found to be prohibitively expensive. VFC initially sub-contracted marketing (e.g. roadshows) to field agents but struggled to find incentives that got them to adhere to complex onboarding processes (e.g. profiling multiple crops). Almost all the agricultural services supported by the mNutrition programme initially had difficulty with registration and onboarding processes, especially around the profiling of farmers. They all went on to devise some form of single click registration (including VFC).

VFC was a complex product. Not only did it provide users with multiple types of information (e.g. agriculture and livestock tips, weather, nutrition tips, market prices), but it was more than a VAS – it was a bundle or customer plan. Customers struggled to understand a complex product, especially when agents had a poor understanding of the product and tended to sell it as a low-cost airtime product (SIM) rather than an agricultural VAS package. For example, the study found that only 36% of users had used the call center and the main reason for not using the call center was simply not knowing that it was available. A product that is both a SIM and a VAS serves two potential purposes, which led to perverse incentives among agents and left some customers confused (i.e. unaware of VFC features).
Registration for maternal support services, in contrast, requires only the stage of pregnancy (or age of newborn) in order to tailor the sequencing of messages. This means that users can sign up by themselves, although registration can be assisted by community and facility health workers. WN was originally launched as part of multimedia campaign. The 2015 Tanzania DHS survey (MoHCDGEC [Tanzania Mainland], Ministry of Health [Zanzibar], NBS, Office of the Chief Government Statistician, and ICF, 2016) found that 53% of people had heard of the WN campaign. However, up to 83% of users were registered by field partners. This highlights the importance of the face-to-face presence that field partners provide in getting users onto the system. People may lack a sufficiently detailed understanding of the product to convince them to register for themselves, whereas some personal contact can help get them signed up.

Assimilating information and changing behavior
Agricultural extension and advisory services should employ multiple methods in integrated approaches that reinforce messages through various channels. Davis and Franzel (2018) concluded that mobile phone-based systems are not best suited as a primary source of information and suggest that mobile phone systems tend to be most useful where they reinforce more conventional face-to-face interventions. When considering the role of mobile phones in agriculture, Batchelor, Scott, Manfre, Valvarde Lopez, and Edwards (2014) also found that face-to-face contact with extension workers and peer farmers was crucial to the uptake of innovative practice and proposed an actor-centric model for agricultural information exchange.

A face-to-face presence when working with women is important for achieving positive behavior change. The study confirmed that WN messages may play an important role in reinforcing and supporting the efforts of health workers. Messages acted as reminders to reinforce information provided by health workers, and to reinforce mothers’ existing knowledge. Even though people trusted information received by text messages, they were still most likely to get information from health workers that they have personal contact with.

TFNC hypothesized that women who were assisted with registration might have a stronger commitment to the service, stay on the service for longer, be more likely to read the messages, and be more likely to adopt improved behaviors. Drop out rates were much lower among users who had been registered by partner agencies (0.3%) compared with those who self registered (42%), which provides some evidence to support this hypothesis.

User numbers
Achieving sufficient subscriber numbers (hundreds of thousands) is crucial for the success of a commercial business model. Although the B2C model in Ghana (VFC) failed to maintain sufficient subscriber numbers, similar models in other countries succeeded. Three of the six agricultural services supported by the mNutrition programme achieved over 250,000 users in Sri Lanka, Bangladesh, and Pakistan. These were all services developed and offered by a single MNO. WN was offered by all four of the major networks in Tanzania and achieved over 500,000 users.
Aside from issues associated with the value proposition of the product, achieving viable user numbers is a function of the size of the market (population of the country) and the market share held by operators. For example, Telenor have 27% of a balanced market in Pakistan (Pakistan Telecommunication Authority, 2019), which is a large country (population 121 million (The World Bank, 2019a)), but Dialog are the dominant provider in a relatively small country (population 22 million (The World Bank, 2019b)).

Providers of pro-poor services are particularly concerned with reaching into under-served areas where customers tend to have access to only a single network, but that network may be different in different parts of the country. In this case, entering into partnerships with multiple MNOs would be ideal (as WN did) but, given that MNOs prefer exclusive agreements, VAS developers more commonly achieve this simply by buying SMS messages from multiple MNOs.

The nature of the service in question also colors the choice of staying independent or going with a single operator. There are non-financial constraints that an MNO would face if implementing an in-house mHealth VAS. These pertain to relations with government and NGO partners. In the case of WN, the Tanzania Food and Nutrition Center (TFNC) was instrumental in securing approval of the messages. Any government body would need to be seen to be scrupulous in its dealings with a private sector organization and would be keen to avoid accusations of partisanship. While a government agency might be keen to support an enterprise that is clearly for the public good, it may be more measured in its support for a private sector venture.

**Cost of sales**

If a service is to be offered directly to customers (B2C), especially those on low incomes, then minimizing costs becomes crucial. In the VFC case study, the cost of sending SMS messages (based on retail prices) was the largest single component of operating costs. While the true cost to an MNO of sending an SMS message may be subject to debate, there is evidence that the marginal cost of delivery is small (Keshav, 2009). Nevertheless, it is clear that any third party delivering an SMS service independently of any partnership with MNOs will need to pay a real cost of buying SMS from MNOs.

The cost structure of the WN business model was quite different. Fixed costs associated with running the mHealth Tanzania PPP and running the technology platform were dominant. Again, the cost of sending SMS messages was the largest single variable cost component, based on retail prices. However, it can be argued that these costs are effectively zero, given that the messages were donated by MNOs.

Customer acquisition can be expensive. VFC initially spent a lot of money on targeted marketing (e.g. roadshows) but found this proved too expensive. Under a B2C model, an MNO can use their existing agent network for customer acquisition at minimal cost. However, the VFC experience was that the management of agents was not flexible enough to deal with such a complex product. WN ran their own campaigns but relied on field partners for customer acquisition. Whilst the mHealth Tanzania PPP invested time in training partners’ staff, the field costs of customer acquisition were born by the partners.
Direct and indirect benefits

The business model adopted by WN in Tanzania is different to that originally envisaged by the mNutrition programme. The business model has been shaped by political pressures. National policies in many African countries state that health services should be made available for free at the point of delivery and, after intense negotiations, the government agency in Tanzania insisted that health information should be made available to citizens free of charge. Furthermore, the service has also been made available free of charge to field partner institutions running behavior change interventions within Tanzania. This means that no direct revenue is generated from users. However, the study showed that women became more familiar with mobile phones as a result of using the information services, leading to over 10% increase in ARPU. Although subject to regulatory approval of agricultural and nutrition content, VFC was permitted to charge users, so the VFC business model was intended to generate direct revenue both from subscription fees and ARPU from new subscribers.

Note that none of the increase in ARPU was shared with WN. This illustrates that in an MNO led model, any increase in ARPU (and revenue from upselling other products) returns to the MNO, giving greater flexibility in pricing, e.g. it can still be commercially viable even if made available free of charge.

The attrition rate of subscribers (churn) tends to be low in rural and underserved areas with poor connectivity where customers tend to feel ‘trapped’ in their choice of MNO by limited network coverage and signal availability. VAS business models based on reducing churn will struggle in these areas.

The cost of acquiring a customer is high, so offering a range of products can increase revenue. In a commercial model, revenue can be generated through upselling, so information services should be linked with additional services such as mobile money services. However, this has to be balanced with the need for simplicity in B2C services. In a public good model, additional benefits can be generated by integrating information services with complementary field services, and this is the role that the WN field partners play. The face to face presence provided by field partners also means that they can help customers access more complex products.

Engaging with MNOs

VFC, like all of the other agriculture information services supported under the mNutrition programme, offers a service to customers of a single MNO under a B2C model. In principle, it is possible for a VAS platform provider to make an information service available via multiple operators, as the mHealth Tanzania PPP has with WN. This increases the potential reach of a VAS, but it instantly eliminates one of the indirect benefits of VAS – reduced churn. There is no incentive for a customer to stick with a given operator if a service can also be accessed on other networks. For this reason, MNOs are generally only interested in entering into exclusive agreements, as Vodafone did with Esoko.

The WN case study provides an example of an interesting indirect benefit to MNOs. Telecommunications companies in Tanzania have come under increasing pressure from the government as it continues to exert pressure as part of its anti-corruption campaign.
Companies have been required to make shares available to the Tanzanian public, and several mobile companies have been charged with a range of charges such as tax evasion. Support for WN provides political capital in this context, and operators have now signed agreements directly with the ministry rather than indirectly with the mHealth Tanzania PPP.

**Sustainability**

One of the premises of the mNutrition programme was that business models should be financially viable. This is often assumed to mean that users should pay for the service, and there is a view that offering information for free is not sustainable. However, in other agricultural services supported by the mNutrition programme, MNOs have been able to make services available to farmers at zero cost under a commercial B2C model.

Where information can be regarded as a public good, a donor funded model can also be viable. If either government agencies or NGOs have a mandate for service delivery, in which mobile services can play a part, then they can finance the service provider. The principal vulnerabilities of the WN business model are to funding from donors (principally CDC), and the free SMS messages provided by MNOs. Though not yet secure, the prospects for future funding from international donors and government look good, and the mHealth Tanzania PPP continues to enter agreements with new public health programmes. Robust evidence of a substantial increase in ARPU also provides an incentive for MNOs to maintain their support for WN.

**Poverty focus**

Implicit in any donor funded programming is an intention to achieve positive development outcomes, e.g. improved nutrition. Even though activities within the mNutrition programme focused on MNOs, the objectives of the programme focused on the poor.

VFC was actively targeted at rural farmers through marketing activities in rural areas, and the removal of users whose patterns of behavior did not match selected criteria. On the other hand, WN has no poverty focus. As a service that is available nationally through multiple networks, it is available all across the country, wherever there is network coverage.

However, making the WN service accessible to customers on all of the major networks is a key feature. This increases reach among the extreme poor who tend to live in underserved areas where customers have no choice of operator as they can access only one network in their geographical location.

The WN partnerships with health service providers were also key to reaching the poor. Registrations were assisted by field partners, who were running programmes that tended to focus on communities with greater needs, e.g. lower income and education levels.

Literacy clearly presents a barrier to accessing SMS based services. Voice-based services can overcome literacy and language constraints but are prohibitively expensive. Minimizing cost of sales is important in any B2C model, especially if the service is to be available for free.
Conclusions

The paper compares MNO led, and independent, third party led business models, focusing on features that have proven to be important to the viability of the M4D case studies. There are arguments in support of both approaches, but when it comes to delivering services in a way that is likely to lead to positive changes in development outcomes among the poorest, the weight of evidence appears to be in favor of third party led models.

Delivering an M4D service through an MNO is an attractive proposition primarily because it offers the potential to reach large numbers of users at low cost. It can do this by direct marketing to an existing subscriber base, and by exploiting existing marketing networks. By entering into partnerships with field agencies, a VAS developer can effectively unload much of the cost of customer acquisition, but without any partnership with an MNO, they will have to pay market prices for SMS messages. This is an area where an MNO led service can be less costly. Perhaps the most important feature of an MNO led service is that any financial benefits are returned to the MNO, which can make it a commercially viable product in its own right.

Emerging financial and data based services are financially attractive to MNOs and, whilst they undoubtedly have the potential to improve agricultural and health practices, they are likely to exclude the extreme poor who have low levels of digital literacy. This is an important point because the sustainability of M4D services needs to be considered from a poverty impact point of view. In this light, independent developer led models offer a number of advantages centered around behavior change, reach, and issues related to the development and delivery of M4D services.

Behavior change

Key to the mNutrition theory of change, and almost any development intervention including M4D services, is getting people to change their behavior.

- Whilst the evaluation was able to show that some farmers in Ghana had changed their practices, and some families in Tanzania had improved their diets, these changes were modest. Field partners with a mandate to work on development outcomes play a crucial role in providing a face-to-face presence that supports users by getting them registered and by reinforcing messages. Access to information alone is insufficient to prompt the level of behavior changes needed to result in a change in primary outcomes. For example, farmers may need complementary access to financial or marketing services and mothers may need assistance to adapt advice and to learn techniques such as breast feeding.
- Customer acquisition is expensive. Working in partnership with field agencies maximizes value by enabling users to access additional services provided by these agencies.
- The face to face presence provided by field partners means that they can help customers access more complex products, and there is evidence that more complex services including financial and transactional services are needed to make a real difference to farmers.
Reach into vulnerable communities

- Third party providers can make services available on whatever networks they choose, simply by bulk buying SMS messages. This extends reach among those in remote, underserved areas which have only a single network coverage.

Pro-poor product development

- MNOs can resource product development by bringing in a comprehensive range of expertise from across departments. mNutrition projects other than VFC have shown it is also possible to develop in-house agricultural expertise within a few years. However, while MNOs work to shorter timescales and can be subject to rapid changes in leadership and commercial priorities, independent companies can take a longer term view of product development and are better placed to navigate a rapidly changing technical and commercial environment, e.g. negotiating new partnerships.
- Information services are generally subject to some kind of regulatory control or authorization, e.g. health messages have to be approved by the government. In some countries, government endorsement of messages can be an asset. This kind of support is more likely to be given to public good services rather than commercial services.
- Public good services that complement government policies or donor priorities can access funding from these kinds of donors, rather than solely from customers (either from subscription fees or sales, e.g. increased ARPU).

Rather than user numbers, it is the personal support and the intensity of contact that can be achieved by field workers that are at the core of the argument. Small, agile, developers are well suited to negotiating partnerships with like minded NGOs delivering field services. In principle, there is nothing stopping an MNO from entering into partnership with field agencies, but brokering the complexity and diversity of partnerships involved is not a trivial achievement and negotiating with a multitude of small, not for profit, development organizations is not within the skill set of most MNOs.

The analysis highlights features of independent third party led business models that suggest they are better suited to achieving an impact on development outcomes. Having said that, neither of the case studies implemented this type of business model so further research is required to explore whether M4D services tailored to work with field agencies rather than as generic services to be delivered by MNOs are indeed more effective in achieving positive development outcomes.

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