M’chikumbe 212

A mobile agriculture service by Airtel Malawi

CASE STUDY JULY 2017

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CONTENTS

ABBREVIATIONS

AEDO	Agricultural extension department officer
ARPU	Average revenue per user
B2B	Business to business
BI	Business intelligence - using data generated by service users to make decisions about product/service design
CAPEX	Capital expenditure
DAES	Malawi's department for agricultural extension services
IVR	Interactive voice response – a dial in menu which allows users to interact with automated messages by pressing the keypad
MWK	Malawian Kwacha – local currency
OBD	Outbound dialling, also called voice SMS or 'robo-calling'. A pre-recorded message sent over the GSM network
PIW	Product iteration workshop – quarterly workshops which aim to review data collected over the quarter from BI, user feedback from phone surveys and UX–led research and inform the evolution of the service
SMS	Short messaging service – written messages sent to phones with limited character length
UX	User experience
VAS	Value added service

Executive Summary

M'chikumbe reaches out to farmers to improve livelihoods and increase loyalty

Airtel Malawi's M'chikumbe (Farmer) 212 launched in September 2015 in partnership with technology partner and content aggregator, Human Network International (HNI). The product rollout was supported by a matched funding agreement between Airtel Malawi and GSMA under the mNutrition Initiative, funded by UK aid from the UK government (DFID). Under the agreement, the GSMA mAgri Programme has also provided consultancy throughout the product development cycle. As of December 2016, the service had acquired almost 400,000 registered users.

M'chikumbe aims to transform farming using mobile technology and to increase Airtel's subscriber base, revenue and brand loyalty in rural Malawi. The service provides farmers with access to practical information about agriculture and Airtel Money via interactive voice response (IVR) and short messaging services (SMS). The product has been advertised through radio and ground campaigns. Over 1,000 government agricultural agents have been trained to instruct potential users on the product. Users dial 212 to access the agriculture-specific IVR service, or 321-2 to enter the broader 321 educational service provided by HNI. They register for one of 15 crops and thereafter access a crop-relevant menu, with further options for Airtel Money advice, market prices, and weather forecasts. Crop-relevant SMS are sent every Sunday. Access is free for the first three IVR calls each month. The fourth call is charged at MWK 40 (USD 0.06) to provide unlimited access to the service for the rest of the month.

M'chikumbe poster, courtesy of Airtel Malawi.

Key findings

- **Smallholder farmers in Malawi want to run their farms as a business, but they lack the knowledge required.** Early user experience (UX) research found that lack of access to government extension officers in Malawi prevents most farmers from changing their practices. Changes have to be evidence-based, as "seeing is believing". Low literacy levels in the country are a further barrier to disseminating information.

- **M'chikumbe has gained users steadily, but activity levels and repeat usage remain limited due to user experience issues around service navigation and product education.** Less than 40% of the base are active on the service per month. However, indirect benefits for Airtel (including 70% churn reduction and 80% greater average revenue per user (ARPU) compared to the rural base) are still apparent.

- **Most power users have changed their farming practices; the likelihood of reporting changes to land management practices is almost four times higher amongst power users than non-users.** The likelihood that a power user (active repeat user of the service) reports changes in land management practices is 3.75 times greater than for a non-user, while for increased water use the it is 2.21 times greater. Almost 70% of power users reported making at least one type of farm-related change.

- **Power users are almost four times more likely to report an increase in production than non-users.**[1] For all power users surveyed, 53% reported an increase in production, while 33% reported a decrease. The likelihood of power users reporting an increase in production was 3.6 times greater than non-users.

- **Most power users are male farmers living below the poverty line.** Most (79%) M'chikumbe power users surveyed were living below the poverty line. Only 17% of power users were women.

- **Having government extension officers on board to promote M'chikumbe increases user trust in the service.** Agricultural Extension Department Officers (AEDOs) who promote the service generate the most loyal service users compared to other marketing methods. They also report that M'chikumbe makes their jobs easier.

- **Mobile phones are considered a key learning tool for power users.** While M'chikumbe is not the only source of agricultural information for most, 87% of users reported their mobile phone was one of the two main sources of information leading to changes in their practices, compared to just 22% of non-users. Non-users were more likely to report AEDOs as a key source of information than users, suggesting the service plays an important role amongst those with less access to traditional extension.

1. Based on comparative analysis of a matched subset of power users and non-users (n=238)

Country context

Malawi's large agriculture sector provides fertile ground for mobile agriculture

Airtel is the larger of two operators in Malawi, a country with relatively low penetration of mobile technology. M'chikumbe is seen as an opportunity for Airtel to build customer loyalty in the rural market, where over 70% of the population rely on agriculture for their income and to provide food for their families.[2]

Agriculture is the most important sector of Malawi's economy, accounting for over 80% of exports. However, most farmers have less than a hectare on which to grow their food. Soil fertility is declining and access to credit and extension services is limited, leading to low productivity and income levels for smallholder farmers.[3] Most Malawians live below the poverty line (88%).[4] The most commonly grown crops in Malawi are cassava, potatoes, maize, and sugar crops.[5]

Malawi's agricultural extension system was set up by the government in the early 1950s to disseminate agricultural information to farmers to improve farm productivity and food security. However, it has increasingly suffered from lack of funding from the government and donors, leaving insufficient funds to recruit staff. This has resulted in a very low ratio of extension staff to farmers (1:1,500 to 1:3,900) with more remote rural communities unreachable due to large distances and poor roads.

As with many countries in Sub-Saharan Africa, Malawi is suffering the consequences of climate change. After two consecutive years of crop losses due to climatic shocks (including droughts and floods in 2015—16) the outlook for the 2016—17 harvest is bleak.[6] Malawi is facing its worst food crisis in over a decade. The government has been encouraging farmers to diversify their production, in particular, to reduce their dependency on drought-sensitive maize crops.[7] These extreme weather events are driving up prices for maize and other staple crops and increasing the risks of acute malnutrition.

2. International Fund for Agricultural Development (IFAD), 2017, "Investing in rural people in Malawi", https://www.ifad.org/documents/10180/c31ccb11-f0e5-4b56-b0ef-0bd74f1e6e79.
3. IFAD, 2009, "Republic of Malawi Country Strategic Opportunities Programme", https://www.ifad.org/documents/10180/a234504d-8463-4a5f-a26f-d6c8b1df0a41.
4. International poverty line at USD 2.50/day. Schreiner, 2011, "A simple poverty scorecard for Malawi", http://www.microfinance.com/English/Papers/Scoring_Poverty_Malawi_2004_EN.pdf.
5. Averaged over 2000-2014, from the model GSMA, 2016, "Market size and opportunity in digitising payments in agricultural value chains", http://www.gsma.com/mobilefordevelopment/programme/magri/market-size-and-opportunity-in-digitising-payments-in-agricultural-value-chains. Please contact the mAgri@gsma.com for the full methodology.
6. Food and Agriculture Organization of the UN (FAO), 2017, "Taking Malawi farmers a step closer to recovery", http://www.fao.org/emergencies/fao-in-action/stories/stories-detail/en/c/466061/.
7. Government of Malawi, 2015, "2015/2016 National Food Insecurity Response Plan", https://docs.unocha.org/sites/dms/Documents/Malawi%202015%202016%20National%20Food%20Insecurity%20Response%20Plan.pdf.

TABLE 1

Malawi country context at a glance

Number of live Agri VAS (2016)[8]	**3**
Mobile penetration (Q4 2016)[9]	**26%**
% of population living in rural areas (2015)[10]	**84%**
% of GDP contributed by agriculture (2013)[10]	**27%**
% of the labour force employed in agriculture (2005)[10]	**64%**
% of female labour force employed in agriculture (2005)[10]	**70%**
Country population (millions, 2016)[10]	**17**
Target market (millions, 2016)[11]	**0.49**

Airtel's UX lead at work, courtesy of frog design

8. mAgri Deployment Tracker (currently offline). Please contact mAgri@gsma.com to receive the full list.
9. Unique mobile subscribers in Malawi (Q4 2016) as a percentage share of the total market population. GSMA Intelligence.
10. The World Bank Databank, http://databank.worldbank.org/data/home.aspx
11. The number of agricultural workers in Malawi with mobile phones who are likely to pick up VAS. For full methodology see GSMA, 2015, "Market size and market opportunity for agricultural value-added services", http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2015/02/Market-size-and-market-opportunity-for-agricultural-value-added-services-Agri-VAS.pdf

Partnership model

M'chikumbe benefits from a broad cross-functional team and strong links to government

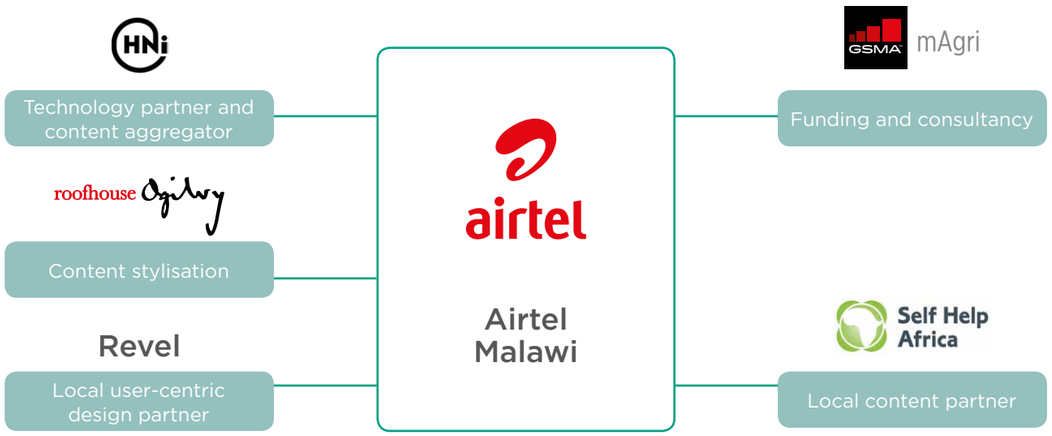
The M'chikumbe product team sits within the Airtel Money department, however, it is managed as a standalone product. The cross-functional team is comprised of the product manager and UX lead from Airtel, as well as a representative from the value added service (VAS) department. All other partners were represented alongside the Department for Agriculture and Extension Services (DAES) and global content partner, Oxfam.

HNI provides the platform for both the SMS and IVR channels and is responsible for recording and testing the IVR content. A strong pan-African partnership between Airtel and HNI was already in place before M'chikumbe, as HNI provides the 321 educational service to Airtel and other operators.[12] The existing platform will be expanded to enable outbound dialling (OBD) in the future. Strong links with DAES has been a key asset of the local content partner, Self Help Africa (SHA). Roofhouse produces stylised content scripts on a retainer basis.

The development and scaling up of the product was supported by a matched funding agreement with the GSMA mAgri programme. The GSMA mAgri programme also provided ongoing support throughout the product development cycle, from implementation to iteration, business intelligence (BI), monitoring and evaluation and content support. The UX workstream was supported by frog design, global design partners contracted by the GSMA.

FIGURE 1

M'chikumbe local partners



12. For example, Madagascar. See GSMA, 2015, HNI Madagascar: Information via Mobile To Tackle Gender-Based Violence.

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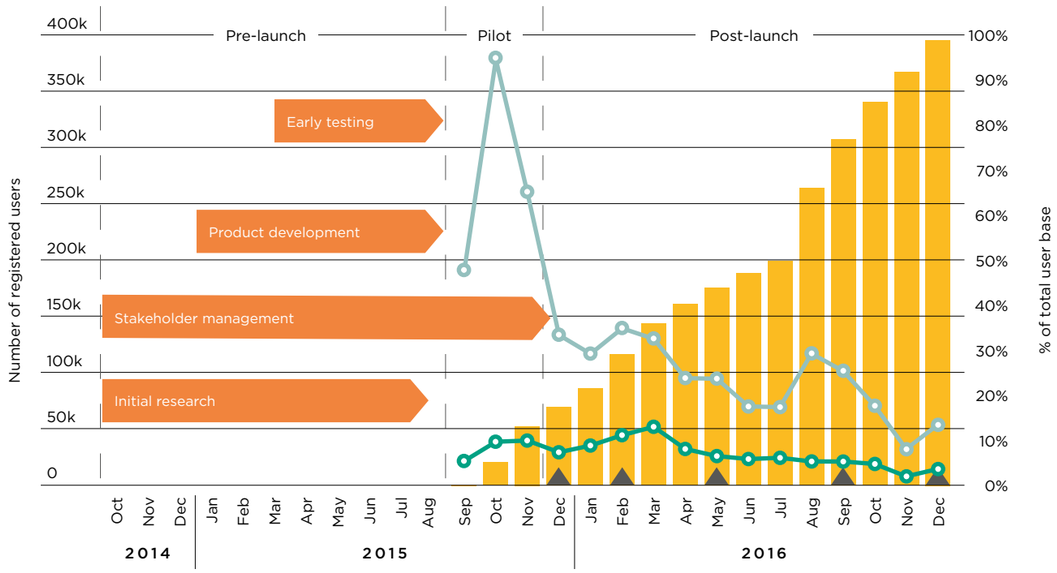
Product timeline

M'chikumbe gained users steadily, but activity levels and repeat usage are limited

The UX research uncovered issues with the service along the customer journey. These included increasing awareness and testing the usability of dynamic content (like weather forecasts and market prices), shortening the time it takes users to get to content, and simplifying the pricing structure. Many of these on going issues were not addressed during the project period.

FIGURE 2

M'chikumbe product timeline



Total number of users: count of all users who have ever been on the platform
Active users: users who accessed the IVR channel during the month
Power users: active users who have accessed IVR content multiple times
Product iteration workshops: quarterly workshops where service data is reviewed and changes planned

Design firm, frog design,[13] accompanied Airtel and HNI into the field for research during Q4 2014. The research team spoke to over 100 participants (including farmers, agricultural experts, and agribusiness owners) and mapped their farming cycles, cash flow, and trusted information channels to understand firsthand the needs of the customers they aimed to serve.[14]

Key insights from the field:

- **Running the farm as a business was commonly cited as a knowledge gap.** Small-scale farmers require additional support to adopt new practices. *"I want to know more about business management. I want to know how to best use my money for farming."* (Grace, Farmer)
- **Adoption of new farming practices and inputs is a constant struggle.** Change requires sustained training and social pressure. AEDOs and lead farmer networks are the primary change agents, but they lack resources.
- **Low literacy doesn't just mean target audience may not be able to read a message.** There are further barriers to *understanding* information, whether written or spoken.

After the pilot phase, five product iteration workshops (PIWs) were run with GSMA and the cross-functional team. PIWs aimed to review data collected over the quarter from BI, user feedback from phone surveys, and UX research. Pain points along the customer journey were identified and solutions were incorporated into the roadmap for the following quarter.

FIGURE 3

Key issues at PIWs

PIW	Date	Selection of key issues identified	Suggested solution	Implemented
1	Dec 2015	Government processes are slowing commercial launch.	Regular meetings with DAES and development of communication strategy.	Yes
2	Feb 2016	New content needs to be added with UX in mind.	Add a second layer to the IVR menu with the sub-layer contents spelled out in the main menu.	Yes
		Large numbers of 'dropped' users (i.e. users dropping prior to registering a primary crop).	SMS/OBD to follow up on dropped users to encourage another registration attempt.	No
3	May 2016	Users don't know about the new content.	SMS broadcasts and network notifications to highlight new crop content.	Yes
4	Sep 2016	The long welcome message is repetitive for repeat users.	Revise welcome message for 2nd and 3rd time callers to get users to content more quickly.	No
5	Dec 2016	Self-registered users (which includes most users) don't have a good product education.	Live radio shows to answer pre-registered/live questions.	No

A selection of identified issues and solutions from the PIWs. Solutions were not implemented because of budgetary constraints or unclear ownership.

13. The mNutrition global UX partner, contracted by GSMA to ensure that user needs and experience were prioritised. https://www.frogdesign.com/
14. For more information on the tools used and stories from the field, see the mAgri Design Toolkit

Commercial sustainability

"Bringing relevance to the lifestyle of the farmer was and continues to be at the core of M'chikumbe. This will in turn build customer loyalty."

Charles Kamoto, CEO, Airtel Malawi

Peak activity occurred during the pilot period. Since then, consistently less than 40% of the total base has been active on the service, with the biggest dip occurring during Malawi's agricultural off-season (September to November). Less than half of active users each month have been power users.[15]

The product team reduced high acquisition and running costs while growing their base. These costs were highest in the first quarter following a nationwide launch of the service; a second, smaller peak was experienced after a marketing push to highlight new content. Costs were further reduced by the self-registration acquisition strategy, and initial capital expenditure (CAPEX) was minimal due to VAS vendor HNI's existing platform.

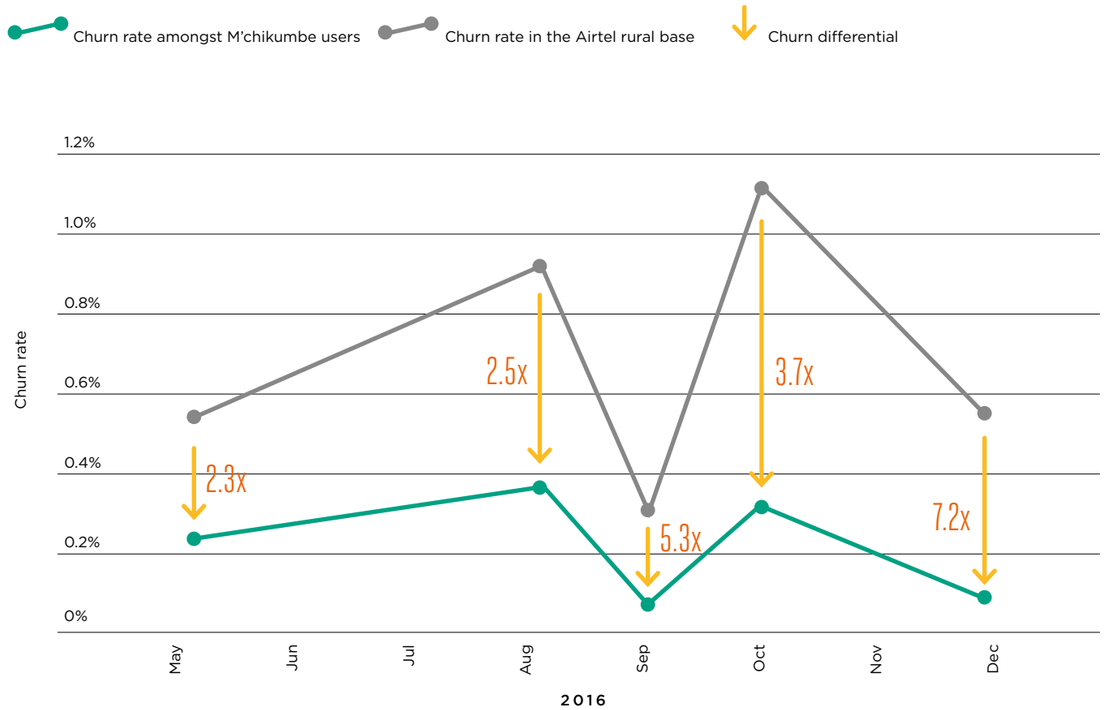
M'chikumbe has grown rapidly. Following a pilot period in two districts, the service achieved steady user growth of approximately 3% per month from June to December 2016, nearly double the target growth rate. The biggest spike in acquisitions followed the release of content for five new crops in August 2016. By the end of 2016, the service had almost 400,000 users, 72% of the target market identified for the year.[16]

Though direct revenues are low, M'chikumbe generates indirect benefits for Airtel. In this nascent market, rural churn is already low — less than 1% per month on average. Given the global trend of increased churn with greater competition, Airtel Malawi was keen to create loyal customers ahead of the curve. On average over five months in 2016, M'chikumbe users churned 70% less than the rest of Airtel's rural base.

15. See The Customer Journey (p.20) for an exploration of why engagement may be low for the product.
16. The target market is defined as the number of agricultural workers in Malawi with mobile phones who are likely to pick up VAS. For the full methodology see GSMA, 2015, "Market size and market opportunity for agricultural value-added services", http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2015/02/Market-size-and-market-opportunity-for-agricultural-value-added-services-Agri-VAS.pdf.

FIGURE 4

Actual versus expected churn in the M'chikumbe user base



Expected churn is calculated using the proportion of the rural base that churns each month and comparing it with observed or actual churn amongst M'chikumbe users. Data is missing for June, July, and November 2016.

Who uses M'chikumbe?

Most users are ordinary farmers, but extension services also benefit

Early design research indicated that ordinary advanced farmers, trained lead farmers, AEDOs and agribusiness owners (e.g. for bulk messaging to contract farmers, not explored in this report) would be the target audience for this service. Most power users interviewed during the outcomes fieldwork were ordinary advanced farmers, with two lead farmers.

Government extension services in Malawi (including AEDOs) are stretched. AEDOs train lead farmers so that they can provide support to other farmers in their area. Through content partner SHA, a strong link was forged between M'chikumbe and government extension services. Over 1,100 AEDOs and other government officials have been trained to use the product and encourage farmers to join the service. There were anecdotal reports that the service makes their jobs easier.

FIGURE 5

Farming archetypes in Malawi

	Farming knowledge	Information access	Information need	
	1 = very low ❙ 5 = very high			
 Ordinary advanced farmer	○ ○ ○ ○ ●	○ ○ ○ ○ ●	● ● ● ● ●	Ordinary farmers who are part of a farmers' club and show willingness to adopt new farming practices and willingness to work hard.
 Lead farmer	○ ○ ● ● ●	○ ○ ● ● ●	● ● ● ● ●	Trained lead farmers who lead farmers' clubs and show a good track record of helping ordinary farmers absorb new knowledge and apply new methods.
 AEDOs	● ● ● ● ●	● ● ● ● ●	○ ○ ○ ○ ●	AEDOs are the most trusted source of information for lead farmers and farmers. However, they have little access to resources and need more effective ways to communicate with farmers in their area.

Farming archetypes in Malawi were identified through design research, supported by frog design, during Q4 2014

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Spotlight

M'chikumbe helps government extension officers reach distant communities

To address the high farmer-to-expert ratio in Malawi, the government developed the Lead Farmer approach, whereby selected farmers (more progressive farmers, respected in their community) are asked to volunteer to offer extension services to fellow farmers. Once trained, they become responsible for passing on important agricultural information to the farming community.

In collaboration with Airtel, over 1,100 staff from regional offices have been trained to use M'chikumbe, who in turn train Lead Farmers. The service helps them learn new agricultural techniques, which they share in regular meetings and training sessions with their farmer groups.

Airtel Malawi's M'chikumbe has been a support tool for both AEDOs and lead farmers. Interviews with extension office staff, lead farmers and ordinary advanced farmers reveal that M'chikumbe is seen as a complement to the extension network. It enables agricultural information to reach a wider audience in more remote rural communities.

"They have these messages with them all the time so they can always refer to them if they want to re-read or re-listen to the message. They do not have to walk or go to where the extension worker resides to ask for help... Farmers are beginning to use conservation agriculture and this is a big shift from what they have believed in and practiced for a long time."
W.N, Simon, Male, Head of Balaka and Bazale Extension Planning Area, Balaka District

"All the messages are generally well aligned to the challenges we face. Not long ago we had a message which said if you saw pests attacking your crop, apply Thyram and Cypermethrin. This means that farmers are being assisted to address issues at hand. Also, the rate of farmers coming to ask what they need to do has gone down."
Head of the Agricultural Extension Development Coordinators (AEDCs) for the Dowa District

Farmers commented about the ease of the service, which provided them with immediate solutions. The appreciation of the service is high as they can use it to obtain information they would otherwise only receive from the AEDO.

"I felt happy, in that I had achieved a direct access to valuable information. For example, by implementing the messages on the service, we can harvest a lot more and fill our granaries."
Female farmer, focus group participant, Lilongwe district

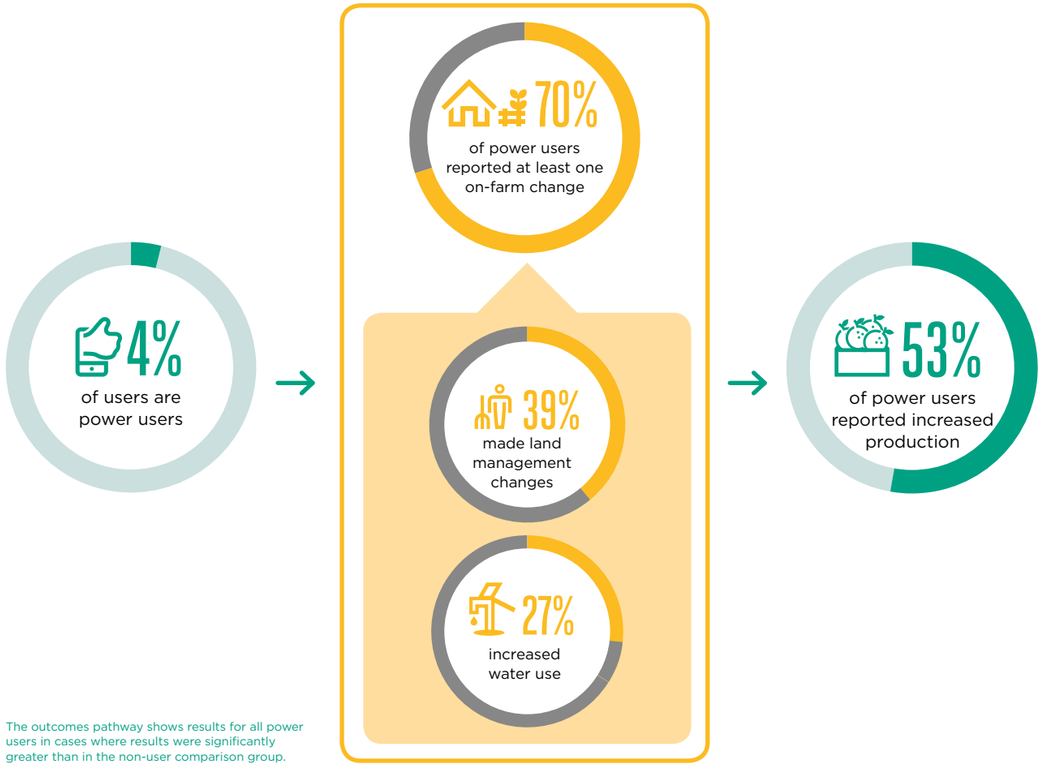
Benefits for users

Phone surveys and field research to explore the benefits of using M'chikumbe took place in January and February 2017.[17] As this was an interim study performed only 14 months after service launch, changes to farming behaviour are tracked (as indicators of possible future benefits) alongside improvements in on-farm production.

Airtel's call centre staff spoke to 473 power users (who had registered at least six months before and had accessed the service multiple times since) and non-users (who registered for the service in the final week of December 2016). The non-user group was selected based on the likelihood they would have similar profiles to the user group, but would not have benefitted from the service during the previous farming season. The 32 respondents interviewed in the field were selected to provide a range of perspectives from different service users.

FIGURE 6

M'chikumbe outcomes pathway



The outcomes pathway shows results for all power users in cases where results were significantly greater than in the non-user comparison group.

17. Please contact the mAgri@gsma.com for the full methodology

M'chikumbe users reported changing their land management practices

Most power users changed their farming practices. Almost 70% of power users reported making at least one type of farm-related change. Almost half (48%) reported a change in planting, 39% reported a change in land management, and 44% reported a change in harvesting or post-harvest practices.

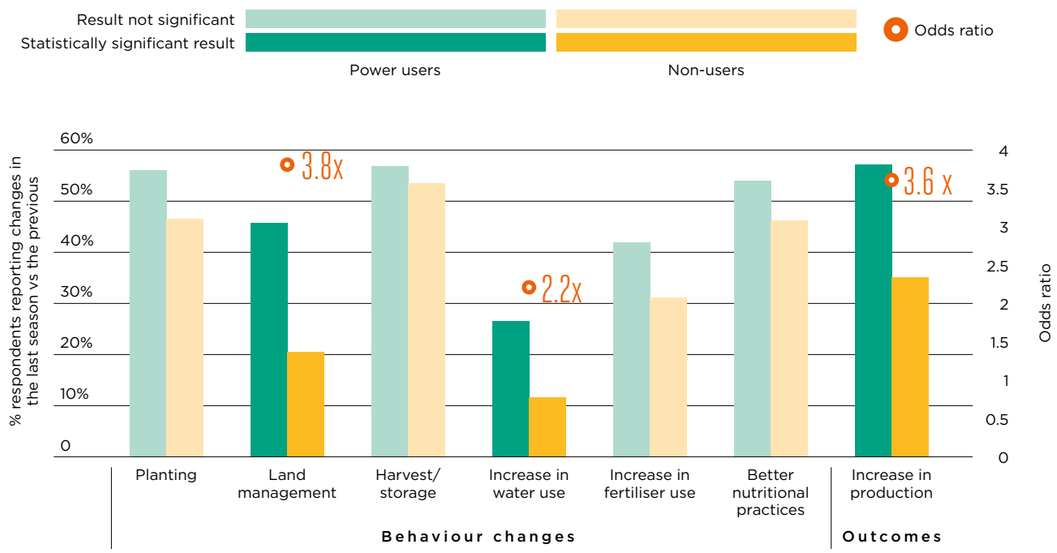
The likelihood of reporting changes to land management practices was almost four times higher amongst power users than non-users. The likelihood that a user reported changes in land management practices was 3.75 times greater than for a non-user, while for increased water use it was 2.21 times greater.

"[...] in my farm I follow the method whereby they say we should plant one seed per planting station and the planting stations should be 25 centimetres apart. And the ridges should be 75 centimetres apart. This is quite a departure from what we are used to. [I got all this information] through M'chikumbe Airtel only."
M'chikumbe user, male, 38, Ordinary advanced farmer, Balaka District

"I stopped planting cotton and I now use that land to plant cowpeas and soya. I also plant one maize seed per planting station and I am practicing conservation farming."
M'chikumbe user, male, 41, Lead farmer, Balaka District

FIGURE 7

Behaviour changes and outcomes



Behaviour changes and outcomes in the matched subset of users (125) versus non-users (114). Results are highlighted and odds ratios (the odds that the change/outcome will occur given exposure to the service compared to the odds of the outcome occurring in the absence of that exposure) are shown where a significant result was found (at the 95% confidence interval). Statistical significance is affected by the sample size and the magnitude of difference between proportions.

In the case of planting, harvesting, fertiliser use and nutrition, adoption rates were marginally higher for surveyed users than non-users. However, these results can only be considered indicative; a larger sample would be required to arrive at conclusive results.

Power users report increased on-farm production

The probability of service users reporting an increase in production compared to the previous season was 3.6 times higher than for non-users.[18] For all users surveyed, 53% reported an increase in production, while 33% reported a decrease. However, there were significant differences across regions. More than half of users in the phone survey in the Southern region (53%) reported a decrease in production.

"I see a big difference in my harvest because I have started using the hybrid seeds only. These ones are doing quite well compared to the local ones. […] I really thank Airtel for introducing the M'chikumbe programme because it's really helping and I find an element of good will out of it."
M'chikumbe user, male, 38, ordinary advanced farmer, Balaka district

"For the season 2015, I harvested 5 bags of 50 kg each while during the 2016 season I harvested 22 bags. […] The increase was due to the advice I got from the service and I implemented it."
M'chikumbe user, male, 35, ordinary advanced farmer, Lilongwe district

Mobile phones are considered a key learning tool. While M'chikumbe is not the only source of agricultural information for most, 87% of power users reported their mobile phone was one of the two main sources of information leading them to make changes in their practices, compared to just 22% of non-users. Non-users were more likely to identify AEDOs as a key source of information than users, suggesting the service plays an important role for those with less access to traditional extension services.

Power users share information from the service with friends, family and the community. Most respondents from the field interviews said that they have shared information from the service with others (21 out of 24 responses). Information is, in most cases, shared with family members, friends and fellow farmers in farmer groups. 16 respondents shared information with an average of 16 people (min = 1, max = 60).

Overall, power users reported a high level of appreciation for the service, noting in particular the relevance, reliability, and usefulness of the information provided. Many of the respondents felt that the service offers very good value for money, with several noting that the value of the information provided is considerably greater than the costs of using the service. Most (81%) reported that they intend to use the service in the future.

18. Based on comparative analysis of a matched subset of users and non-users (n=238).

Most power users are male farmers living below the poverty line

Power users are predominantly male. Only 17% of power users surveyed were women. However, when women become power users, they are no less likely to report benefits from the service or changes to on-farm practices than men.

Field interviews revealed a number of other differences between male and female power users:

- Women farmers and respondents' wives are more likely than men to be a part of village loan schemes and saving groups, often taking on positions as treasurers or secretaries.
- Women report more challenges in acquiring faming inputs. At the same time, they seem to overcome this barrier better, possibly due to the funds available to them thanks to their positions in village loans and saving groups.
- Women are more likely to report making changes to how they apply fertiliser or how they treat produce before storage.
- Women interviewed in the field made more changes to their nutritional practices than men. They also reported being more likely to share their new knowledge with others and to motivate them to subscribe.

Most (79%) users surveyed live below the poverty line.[19] This is slightly lower than the national average at 88%. There was no significant difference in poverty level between power users and non-users.

Most users interviewed made their living solely from farming, as well as growing food for subsistence.

"I can support myself from the produce that I get from my farm […] I can sell my crop produce to earn money and I also keep some for family consumption."
M'chikumbe user, female, 27, ordinary advanced farmer, Dowa district

Less than one in ten power users is under 25 years old. Only 9% of power users surveyed were under 25, compared with 21% of the working age population.[20]

19. Living below the poverty line (at $2.50/day) measured using the Progress out of Poverty Index (PPI) tool for Malawi, Grameen Foundation. Source: 'Outcomes' phone survey (N=473, Jan 2017). National level below the poverty line is 88% (A simple poverty scorecard for Malawi, Schreiner 2011)

20. National data from World Bank staff estimates based on United Nations Population Division, World Population Prospects (2015)

The customer journey

With its strong reach into the target market, M'chikumbe has great potential for reach and impact. User experience could be improved to drive repeat usage.

"Airtel M'chikumbe messages are more beneficial than those from other sources as they are easier to understand"

Service user, Male, Ordinary Advanced Farmer, Lilongwe District, 24 years old

	Marketing, sales, and distribution	On-boarding	Navigation and content	Payment
Product description	Radio campaigns featuring testimonials from service users aired around agricultural programming. Over 1,100 employees from DAES were trained to promote M'chikumbe. The AEDOs yellow vans were also given service branding. Airtel ran an SMS campaign to the Airtel Money user base and added M'chikumbe adverts to the end of balance check calls.	Users dial 212 (or 321-2) to self-register using the IVR menu. Registration requires navigating two menu levels, first choosing a crop list, then a specific crop. Information on the sex and location of service users is collected on the fifth and sixth calls.	After registration, users dial 212/321-2 to access the IVR menu. Menu option 1 is their chosen crop; 2 provides access to information on all other commodities; 3 is market prices and 4 is options to change preferences or deregister. Users receive a crop-relevant SMS every Sunday. Information is available on 15 crop/livestock topics. Market prices (Q1 2016) and weekly weather forecasts (Q4 2016) are recent additions.	Users pay MWK 40 (0.06 USD) on their fourth call of the month for unlimited access for the rest of the month. They are reminded of the pricing model during the welcome message, which they hear each time they dial.
Customer journey	**72%** of target market **registered**	**75%** of registered users **accessed content**	**40%** of users accessing content were **repeat users**	**32%** of power users were **paying customers**[22]
Key findings	• **Radio campaigns brought on half of users; AEDOs have less reach, but generate high-quality users.** 44% of users brought on by radio advertsing had never accessed content on the service. Only 12% reported hearing about the service through AEDOs, but all of these users tried the service content; 67% had accessed multiple times.[21] • **Having AEDOs on board increases trust in the service.** UX research found that users prefer to be informed about the service by an authority figure. • **M'chikumbe helps AEDOs to do their job.** This, combined with the government buy-in on the project, meant Airtel could leverage their presence on the ground without the need to offer financial incentives. • **Airtel didn't track the source of acquisitions, making it difficult to judge which methods have been most effective.** Lower marketing budget in the future will need to be spent carefully. There was a missed opportunity to understand which marketing methods brought on the most users and how engaged those users were.	• **Registration became more complicated as more crops were added to the service.** When the service launched, only five crops were available and only one menu level was required. Structuring a broad content offering under multiple verticals in an IVR menu while maintaining a good user experience remains a challenge. • **Ease of registration is a key success factor.** UX research found that the target market has low technological literacy and anything beyond a one-step process would limit acquisitions. • **Users hear a two-minute message explaining the service before they register, and every time they call.** This user education methodology may lead to drop-off amongst this battery-conscious demographic. UX research suggests that users may spend more charging their phones than on airtime in rural Malawi. *"I have two phone batteries. I keep one charged while I use the other."* Service user, female, 42, Ordinary advanced farmer, Dowa district • **Service users may not understand they are registering for a service when they select a crop.** Their ability to access information outside their chosen crop might be compromised by this structure.	• **SMS is not the best way to reach this market.** Two in three Malawians do not enroll in secondary school — a significant proportion of the market is semi-literate or illiterate.[23] HNI will adapt their platform to allow OBD, a more relevant form of push messaging for the audience. • **Dynamic market price information has not had the predicted impact.** Market prices, added in Q1 2016, represent only 13% of annual traffic despite changing every week. Weekly weather forecasts were added in December 2016. Both forecasts and market prices require UX testing and marketing. • **Information is more important than story.** Early UX research suggested that dialogues are an engaging style for the target audience. However, early content was too story-focused: users found it hard to extract the key messages. HNI have evolved relevant content on 321 and 212 into a 'Q&A' structure where a farmer asks a question to an authority figure (e.g. an AEDO). • **Most users don't return to the service.** UX research suggests that the opening message on the service is too long (almost two minutes each time) and is delivered too quickly. Even tech-literate users are not always able to understand what to do next.	• **The pricing model is confusing and at odds with the larger service offering.** 321 offers eight free calls, with a charge of MWK 15 per call from the ninth call onwards. It is not clear that either pricing model is well understood. However, it is clear from service usage data that Airtel is currently generating negligible revenue from this service. Airtel Malawi's CEO, Charles Kamoto, sees the service as beneficial for customer loyalty. • **Users who understand the charging model may 'play it safe'.** UX-led research found that some users thought of the charge on the fourth call as a fine rather than a charge. They stop calling after the third call of the month. • **Most service users (79%) live below the poverty line.**[24] Many M'chikumbe users regularly hold an airtime balance below MWK 40,[25] which means they would not be able to make a fourth call to the service. • **Repeat users value the service and report willingness to pay.** Most repeat users interviewed in the field (81%) said they would continue to use the service: *"The messages are a lot more beneficial and useful as compared to the cost."* Service user, female, 42, Ordinary advanced farmer, Dowa district

21. 'Rapid Feedback' phone survey, September 2016 (N=758)

22. Average over September 2015 to September 2016, range 21—62%, based on 212 pricing model.
23. World Bank Databank, UNESCO Institute for Statistics, 2010.
24. 'Outcomes' phone survey of ~500 users, April 2016
25. Airtel Malawi reported data

Future roadmap

It is important for Airtel to carefully consider how to keep the agricultural content on the service up to date. Driving traffic to dynamic content such as weather and market prices, which change every week, will encourage return users. Emergency information on the location of pest and disease outbreaks and advice on how to deal with them is also likely to be added in the future.

The novelty value of an agricultural information service in Malawi is high and the opportunity to reach users with life-changing information is considerable. As they reach greater scale, Airtel must ensure the technology vendor, HNI, has the capacity to support a large number of concurrent calls to the IVR system. HNI also intends to add OBD capacity to their platform to make push messages more engaging and understandable. IVR menus could be stripped down with messages optimised to individual users (e.g. reminders about pricing only on the call before charging, removing the long welcome message if the user has heard it before).

To make M'chikumbe sustainable, Airtel will need to reduce costs and, ideally, increase revenues. By outsourcing day-to-day management of the service to HNI, Airtel Malawi will minimise their operational costs, keeping acquisition and running costs per user low. Early research identified a possible link between M'chikumbe and Airtel Money (such as built-in vouchers claimable against farming inputs) which was never fully explored, but may improve the M'chikumbe value proposition internally. Entering into business-to-business (B2B) arrangements with agribusinesses by offering, for example, targeted advertising of their products, could potentially lead to new revenue opportunities, as well as new sources of content.

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