Scaling Mobile for Development
A developing world opportunity

GSMA Mobile for Development Intelligence
With support from the Rockefeller Foundation

Interim report
April 2013
Overview

The mobile phone holds the power of ubiquity. Across the developing world, around 40% of people now actively subscribe to mobile services. Including those with access to a mobile despite not owning one would push the connected population to well over 50%. However, while access to core services such as banking, electricity and sanitation is near universal in developed regions such as Europe and the United States, it is enjoyed by below 50% in several developing regions.

This confluence underlines the opportunity held by Mobile for Development, which seeks to draw investment and partnership to scale mobile-enabled services that can help to facilitate service delivery in the absence of traditional modes of infrastructure that would otherwise do this. Indeed, Mobile for Development is a growing sector, with well over 1,000 live services now tracked by the GSMA across the developing world in verticals such as money, health, education and entrepreneurship. The problem is that while the sector has enjoyed continued growth in the number of services over the last 5-7 years, scale and sustainability have generally not been achieved.

This work is designed to inform and add insight to help address this challenge. It has been developed by Mobile for Development Intelligence with support from the Rockefeller Foundation. Our collaboration involves a research process and production of an interim and final report in April and May 2013 respectively, with a series of stakeholder workshops also held to drive thought leadership in this area. This being the interim report, we overview and provide analysis on the barriers to scalability, while at the final report stage we will provide further analysis and communicate recommendations to stakeholders on how these can be overcome.
About us

Mobile for Development Intelligence is a freely available, online platform of mobile market and impact data, analysis and access to an active community of practice in Mobile for Development. We believe that open access to high quality data will improve business decision making, increase total investment from both the commercial mobile industry and the development sector and accelerate economic, environmental and social impact from mobile solutions.

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## What you need to know

### Key findings

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<th>Developing world is becoming connected at a rapid pace:</th>
<th>Harness the scale:</th>
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<tr>
<td>Nearly 40% of people in the developing world now subscribe to mobile services, with subscribers having grown at over 10% a year since 2007. Taking into account people who have access to a mobile, despite not owning one, would push the connected population to well over 50%</td>
<td>While growth in the number of people using a mobile will moderate over the next 5 years, we still expect 130 million new mobile services subscribers every year to 2017. This means an increasing total addressable mobile for development market, uniquely positioned to use the mobile as an alternative to traditional modes of service delivery</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Network coverage is key:</th>
<th>Bridging the coverage gap is multi pronged:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Despite the rise in penetration, there is still a wide gap in coverage between urban and rural areas, with mobile penetration in urban areas up to double that of the rural population</td>
<td>To bridge the gap will require both further network roll-out and alternative solutions, such as by using green power for rural base stations. There is also a role for GSMA in lobbying for benign regulatory environments, and community power, which can be used both to aid mobile connectivity and access to utilities such as water and electricity</td>
</tr>
</tbody>
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<tr>
<th>Smartphones have grown, but are not the engines of growth:</th>
<th>Featurephones and smartphones blur:</th>
</tr>
</thead>
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<tr>
<td>Smartphones have grown to the point where we estimate just under 10% of people own one in the developing world, compared to virtually no take-up in 2007. This is dominated by low cost Android devices, which have steadily declined in price to below $100. We expect growth to continue over the next 5 years, but mainly for mid and higher income segments</td>
<td>It is increasingly important to consider the convergence in price and functionality between higher end featurephones and lower end smartphones. M4D service providers should be aware that as smartphone penetration rises, while this opens a more personalised experience, it carries trade-offs, such as lower build quality and battery life</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Democratising data:</th>
<th>Mobile data is the common denominator:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile operators and internet players are developing more innovative ways to get data into the hands of lower income segments, such as through hybrid data plans or even zero-cost mobile internet browsing</td>
<td>More people, including those at the low income end, will gain access to mobile data, either on featurephones or smartphones. M4D services can tap into a range of handsets and through a range of mediums (e.g. pre-installed apps on a featurephone, browsing on a smartphone)</td>
</tr>
</tbody>
</table>
Mobile: the closest to ubiquity

- On an ownership basis, the mobile phone is the most widely owned communication device in the developing world
- The PC is owned by a much smaller share of people, with tablets smaller still
- Access to a PC will be greater than ownership given device sharing, but the same is true of mobile, so the gap is unlikely to change

Penetration of population (developing world)

- Mobile: the closest to ubiquity
- On an ownership basis, the mobile phone is the most widely owned communication device in the developing world
- The PC is owned by a much smaller share of people, with tablets smaller still
- Access to a PC will be greater than ownership given device sharing, but the same is true of mobile, so the gap is unlikely to change

Note: mobile is proportion of people that subscribe to mobile services
Source: GSMA-MDI estimates based on GSMA Wireless Intelligence, Strategy Analytics, Telegeography
Access to services

- While access to basic services such as electricity and sanitation is near universal in most developed markets, it remains a minority in developing regions.
- Mobile access – either through direct ownership or having access to a mobile in the household – is more widespread, positioning it as a unique catalyst helping to increase access to these services.

*Mobile and financial services includes select countries

Source: GSMA Wireless Intelligence, GSMA Mobile Money program, IEA, World Bank, GSMA-MDI Analysis
High growth economies, even higher in mobile

- There are now around 6 billion people living in the developing world, six times that of the developed
- Incomes remain much lower, but have grown at 5% a year over the last 4 years
- Mobile adoption has grown even faster, but still over half the developing world population is yet to own a mobile, leaving a large opportunity for the mobile industry, and in turn presenting social and economic opportunities in connecting low income segments (e.g. Mobile for Development sector)

*Compound Annual Growth Rate. Population and GDP/capita are for 2011
Source: GSMA Wireless Intelligence, IMF, GSMA-MDI Analysis
Growth will come from the developing world

- Growth in active mobile subscribers in the developing world has been very strong the last 5 years at over 10%

- Even though we expect growth to slow to 2017, this still translates into around 130 million new people subscribing to mobile services every year in the developing world

- By contrast, most mature markets have reached saturation (something which will happen in developing regions, but not for several years)

Source: GSMA Wireless Intelligence, GSMA-MDI Analysis
Penetration

- We draw an important distinction between total penetration and active subscriber penetration

- **Total penetration** reflects all SIM cards (for mobiles, tablets etc), but also counts multi-SIM owners (common in the developing world to save money on calls) and some people who are registered but are only very infrequent users of their phone

- **Active subscriber penetration** reflects our estimate for the number of people who actively subscribe to mobile services

- This is a more representative measure in market sizing Mobile for Development
  - Reflects potential human user base of a service
  - Overlay population with access to a mobile (relevant for some sectors such as mobile learning)

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**Source:** GSMA Wireless Intelligence, GSMA-MDI Analysis
Regional view: soaring growth in India, Africa

- There is considerable variation in mobile penetration within the developing world, although penetration has risen fairly evenly over the last 5 years.

- Central/Eastern Europe is nearing maturity in penetration terms, while most other regions still have significant headroom.

- South Asia (e.g. India, Bangladesh, Sri Lanka) and Africa are the highest growth regions at close to 20% over the last 5 years, and we expect these regions to continue as growth leaders over the next 5 years, albeit at a slower pace.

Note: developing world only
Source: GSMA Wireless Intelligence, GSMA-MDI Analysis
Rise in the developing world

Mobile penetration

2007

2012

2017

Note: penetration is of active mobile subscribers (e.g. those who subscribe to mobile services)
Source: GSMA Wireless Intelligence, GSMA-MDI Analysis, Google Fusion
Urban/rural divide

- **Large coverage gap**
  - Cost of network roll out
  - Return on investment to mobile operator

- **Shared access brings several implications**
  - Augments the M4D reachable audience
  - Latent demand for mobile ownership
  - Virtual SIM technology (e.g. Movirtu)
    - Multiple log ins on one phone, each with a separate tariff (e.g. for women who could not otherwise own a phone)
    - Mobile as a utility (for now)
  - Design of M4D services (personalised nature)
  - This form of access likely to continue in rural markets in particular

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**Active subscriber penetration**

- **South Africa**
  - Urban: 62%
  - Rural: 40%

- **Ghana**
  - Urban: 63%
  - Rural: 30%

- **India**
  - Urban: 32%
  - Rural: 20%

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**Active subscriber penetration, South Africa**

- Urban:
  - No access to phone: 14%
  - Access to shared phone in household: 25%
  - Own basic or feature phone: 50%
  - Own smartphone: 12%

- Rural:
  - No access to phone: 22%
  - Access to shared phone in household: 39%
  - Own basic or feature phone: 38%
  - Own smartphone: 1%

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*Source: GSMA Wireless Intelligence, AMPS, Ghana Statistical Service, GSMA-MDI Analysis*
Income divide

- We show here one estimate based on data from South Africa.

- If these figures are accurate and indicative of other countries, there are interesting implications that arise.

- Little difference in penetration between incomes of below $850/year up to $11,000/year ($2-$30/day).

- Implies mobile seen more as utility than luxury, even for those with little disposable income.

![Active subscriber penetration, South Africa](chart)

Source: AMPS, GSMA-MDI Analysis.
User behaviours – what do people do on their phone?

- In Africa, call minutes are generally higher than texts (e.g. around 3-4 minutes per day vs. 1-2 SMS)

- There is also the use of other functions using a mobile
  - P2P money transfers
  - Cash ins and outs using a mobile account

- Text-based communication should be seen beyond just SMS
  - Social networking – e.g. 5% of African population uses Facebook, but this goes up to 30% among those who use the internet
  - As people get even low end phones with basic data access, social networks likely to become more popular mode of communication on mobile

Note: SMS data for India, Thailand, Malaysia not available for this report
Source: GSMA Wireless Intelligence, GSMA Mobile Money for the Unbanked 2011 Global Mobile Money Adoption Survey, Internet World Stats
# Prepaid and contract plans

<table>
<thead>
<tr>
<th></th>
<th>Prepaid</th>
<th>Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Term</strong></td>
<td>None</td>
<td>Commit to minimum (e.g. 18, 24 months)</td>
</tr>
<tr>
<td><strong>Customer spend</strong></td>
<td>Limited by size of top up (often $5 or under)</td>
<td>Minimum = contracted months x monthly tariff</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum = minimum + overage + other (e.g. roaming)</td>
</tr>
</tbody>
</table>
| **Barriers to acquisition** | Logistical (e.g. proximity to an airtime vendor) SIM registration provides identity barrier | Low income  
Lack of identity documents  
Poor credit history  
Lack of credit history |
| **Mobile operator view** | Lower customer lifetime value on airtime fees; less willing to subsidise handsets  
Limited ownership of customer  
Lower data/VAS uptake | Higher customer lifetime value on airtime fees; more willing to subsidise handsets  
Better knowledge/relationship of end users |
| **Is the dominant structure in** | **Africa, Middle East, Latam, parts of Asia (e.g. China, India)** | **North America, Western Europe, parts of Asia (e.g. South Korea, Taiwan)** |

Source: GSMA-MDI Analysis
How do the mobile operators think about different markets?

Digital pioneers and connected players

- E. Asia, N. America, Nordics, Australasia, W. Europe
- Monetising network investment
- Data explosion and network capacity
- Stagnation of traditional revenue

Fast growers

- Middle East, Latam, SE Asia, E. Europe, Russia, China, S. Africa
- Growth of users generally
- Data take-up from low ARPU
- Low post-paid penetration

Discoverers

- Africa, S. Asia
- Network deployment and coverage
- Profitability with very low ARPU customers

Challenges

- Service innovation
- Revenue diversification

Strategic focus

- Intelligent networks
- 4G roll out
- 3G network roll outs
- Low cost internet ecosystems
- Strengthening customer engagement
- Cost effective network coverage
- Service innovation addressing local needs

Note: sphere size based on population

Source: GSMA, MDI Analysis
High growth, low spend

- Growth of the mobile sector in many developing countries is higher than in mature markets given their high economic growth and continued rise in mobile penetration.

- However, people spend much less on mobile in developing markets, as the vast majority of users are prepay, making airtime costs a higher share of income (e.g. 2-3% on average, more for markets such as Kenya, compared to around 1% in developed markets).

- This ratio would be even higher among the base of pyramid users.

Note: Figures are for 2011. ARPU is per month in US $.
Source: GSMA Wireless Intelligence, IMF
Healthier competition helps prices

- There is a higher concentration of market share in developing relative to developed markets.
- However, this has mitigated in many developing markets over the last few years (the opposite has occurred in some notable developed markets such as the US and UK).
- Lower concentration generally translates into a more competitive marketplace, particularly by reducing prices.
- In combination with several other factors (e.g. increased network coverage, lower handset prices), this has helped drive an increase in mobile penetration in the developing world.
- Key for governments to understand this virtuous circle to promote healthy competition.

**Mobile operator competition (HHI)**

<table>
<thead>
<tr>
<th>Country</th>
<th>2007</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rwanda</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>8,000</td>
<td>6,000</td>
</tr>
<tr>
<td>China</td>
<td>6,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Kenya</td>
<td>4,000</td>
<td>2,000</td>
</tr>
<tr>
<td>South Africa</td>
<td>2,000</td>
<td></td>
</tr>
<tr>
<td>Ghana</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>UK</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Germany</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Brazil</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>US</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>India</td>
<td>1,000</td>
<td>1,000</td>
</tr>
</tbody>
</table>

*Source: GSMA Wireless Intelligence, GSMA-MDI Analysis*

**Note:**
- HHI = sum of squared subscriber market share.
- The greater the value, the greater the concentration of market share (generally less competitive).
Smartphones and featurephones

- We estimate still less than 10% of people have a smartphone in the developing world (nearing 50% in US/Europe)

- Smartphone penetration will rise, but less for low income segments

- Regional variation, especially for smartphones
  - Higher in Latam
  - Lower in Africa (where the smartphone may serve more of a community role (e.g. community health worker, agricultural co-op’s) for the time being

- By sheer size, East Asia (dominated by China), Africa and South Asian regions have the most mobile subscribers

Note: figures are estimated for 2012
Source: GSMA-MDI estimates based on GSMA Wireless Intelligence, Strategy Analytics
Outlook

Mobile in the developing world

- In 2007, mobile penetration was 24% with 1.3 billion active subscribers.
- By 2012, penetration increased to 39% with 2.3 billion active subscribers.
- In 2017, penetration reached 47% with 3.0 billion active subscribers.

Key influencing factors

1. Networks and coverage
   - Investment
   - Coverage expansion (urban to rural)
   - Mobile penetration will continue to inexorably rise, but...

2. Handset utility and access to data
   - Handset range
   - Handset price
   - Innovation in access to data
   - Subsidies
   - The shape and dynamics are more fluid, particularly in terms of the impact on lives of the base of pyramid versus the mass market

3. Income growth
   - GDP growth
   - Growth in GDP per capita

Source: GSMA-MDI Analysis
Networks and coverage: roll out so far

- 2G coverage is generally much more widespread than 3G in developing markets (average 2G coverage is around 95% of population, with 3G often below 70%)
- 3G coverage is growing, but there remains a sizeable urban-rural coverage gap due to roll out costs

Source: Safaricom, GSMA Wireless Intelligence, GSMA-MDI analysis
Networks and coverage: roll out to come

- Coverage will continue to increase, especially for 3G

- But what does this really mean?

- Handsets can access data on 2G networks (via GPRS), but the capacity (e.g. number of people using data) is less than 3G

- For the Base of Pyramid and other lower income segments, 2G coverage is sufficient to enable further rises in mobile penetration and even data use

- 3G coverage is a leading factor for higher intensity smartphone penetration (e.g. watching video) – in other words, what people do on a phone, not supporting whether they can own a phone

Source: Ericsson, GSMA-MDI Analysis
Networks and coverage: challenging economics in the pipeline?

- Mobile networks transfer data over radio spectrum, while fixed broadband networks transfer data via copper or fibre optic.
- This means the data economics are more challenging using mobile.
- Currently, this is not a problem because most people in developing markets use featurephones, which use less data than smartphones, and much less than a home broadband connection.
- However, as more people use data that networks have to absorb, the cost of data to consumers may rise, with more stringent usage caps also a possibility.
- Usage caps are more likely to impact mid and high end users, with price rises impacting mid and lower income segments.

Source: Enders Analysis, GSMA-MDI analysis
Networks and coverage: Green Power and alternatives

- Lack of reliable coverage in rural areas is partly because many network sites are off the electricity grid.

- For these areas, mobile operators can either power sites using a diesel generator or alternative means.

  - **Green Power** increasingly used in sub-Saharan Africa (e.g. Kenya)
    - Requires capex commitment from the MNO, but is a cheaper power source than diesel in the long run (ROI 2-3 years).
    - Number of green sites steadily increasing.
    - Infill solution to increase rural coverage.

- Smaller, but more limited, infill possibilities include IP-based connections (e.g. Range Networks).

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**Network sites on the electricity grid**

- Kenya: 10% Off grid, 90% On grid
- Tanzania: 31% Off grid, 69% On grid
- Uganda: 41% Off grid, 59% On grid

**Power solution for off grid sites**

- Kenya: 12% 24x7 DG, 28% DG-battery hybrid, 60% Green Power
- Tanzania: 4% 24x7 DG, 31% DG-battery hybrid, 65% Green Power
- Uganda: 3% 24x7 DG, 40% DG-battery hybrid, 58% Green Power

Note: DG = diesel generator. Data as of September 2012.
Source: GSMA Green Power for Mobile, Range Networks, GSMA-MDI Analysis.
Networks and coverage: utility access through mobile

Potential impact on mobile ARPU for off-grid customers is 14%+

1. Power from BTS infrastructure
   - (i) Outsource power solution to ESCo who sells community energy services or
   - (ii) Sell power from over-capacity of BTS power equipment

2. CPM from retail distribution network
   - Leveraging extensive rural sales dealer/retail network for distribution or sale of charging/lighting devices through commercial partnerships
   - Examples: Fenix International and MTN Uganda, Nokero, Azuri Technologies

3. Power with payment technology
   - Opportunity for micro e-payments: high volumes of small payments for off-grid domestic and small business energy
   - Examples: m-Kopa, Mobisol

Source: Digicell, GSMA Mobile Enabled Community Services
Handsets and data: featurephones and Android

- Smartphones are still less than a third of handset sales in most emerging markets, with featurephones (e.g. Nokia, Samsung models) dominant.

- Android is by far the largest smartphone platform; it now takes a quarter of all handset sales in Latin America and nearly 15% in the Middle East and Africa.

- Android has particular advantages for developers compared to other platforms:
  - Lower cost devices in the ecosystem
  - Larger audience
  - Open source (more flexible)

- Convergence: Android with featurephones

Note: ASP (Average Selling Price) and sales share for Q3 2012
Source: Strategy Analytics, company websites, GSMA-MDI Analysis
Handsets and data: smartphones blurring with featurephones

- There is now a convergence between smartphones at the low end and featurephones at the high end on price and functionality.

- Important implications:
  - As prices fall, smartphones open to wider audience, with potential for richer experience.
  - However, cheaper smartphones may compromise on quality (e.g. build, battery power – problematic for rural areas).
  - In time, smartphone adoption will rise even among lower income segments.
  - Over short to medium term, featurephones likely to remain the dominant handset type in most developing countries.
    - Reliable phones for voice calls and SMS.
    - Potential for enhanced experience using data.

<table>
<thead>
<tr>
<th></th>
<th>iPhone 4S (smartphone)</th>
<th>X100 (China) (smartphone)</th>
<th>Nokia Asha 305 (featurephone)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>iOS 5</td>
<td>Android 2.3</td>
<td>Series 40</td>
</tr>
<tr>
<td>Screen</td>
<td>Touch</td>
<td>Touch</td>
<td>Touch</td>
</tr>
<tr>
<td>Price ($, wholesale)</td>
<td>&gt;$500</td>
<td>$99</td>
<td>$60-90</td>
</tr>
<tr>
<td>Camera (MP)</td>
<td>8</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Processing power (MHz)</td>
<td>1,000</td>
<td>650</td>
<td>1,000</td>
</tr>
</tbody>
</table>

Note: prices indicative, as of January 2013
Source: Strategy Analytics, company websites, GSMA-MDI Analysis
Handsets and data: the subsidy divide

- The developing world accounts for a majority of handset sales but a minority of subsidy (portion of handset cost paid for by mobile operator)

- This is because most people using a mobile phone in the developing world do so on a prepaid plan (which operators generally do not subsidise)

- The economics governing customer lifetime value mean that this is unlikely to change over the next 2-3 years

- This means that the mobile community (operators and others) are looking at new ways of enhancing the experience of lower income users, such as through innovative access to data

![Global share of handset subsidies](Note: data is for 2011
Source: Strategy Analytics, GSMA-MDI Analysis)
Handsets and data: democratising data

Internet (OTT) players

- Google
- Opera Mini
- Mozilla

**Google Free Zone**
- Free internet access for Google search, Gmail, Google+.
  Further browsing is charged
- **Trials in Philippines, South Africa, Indonesia from November 2012**, full roll-out pending success of trials

**Facebook Zero, Wikipedia Zero**
- Free access to these sites on mobile internet

**Key implications:**
- Designed for basic and featurephones (e.g. majority of mobile users in emerging markets)
- Data into the hands of lower income groups
- Content creation (see slide 31, ‘Implications for user engagement’)

Mobile operators

- Hybrid data plans
  - Prepay element: customer caps spend on data each month
  - Contract element: commitment term
  - Avoids barriers to contract (e.g. proof of identity)
  - Operators more willing to subsidise handsets (featurephones or smartphones)

Source: Google, Opera Software, Facebook, Wikipedia, mobile operator websites, GSMA-MDI Analysis
Income growth

- The last 5 years have brought about significant growth in the income per capita in many emerging markets, while this has broadly stagnated in developed countries.
- We must caution the likely skew from higher income groups.

- The proportion of the population in the BoP has been falling (and will likely have continued falling since 2008), although there is significant regional variation.
- To the extent this decline continues, combined with declines in the cost of mobile ownership, this will be an additional driver for mobile penetration and, in middle income groups, upgrades to smartphones.

Source: IMF (income per capita), World Bank (Base of Pyramid), GSMA-MDI Analysis
Implications for user engagement

- As mobile penetration rises, we expect growth in user generated content to follow
  - This is already being seen with mobile activity on Wikipedia...
    - Orange Kenya: 87% growth in mobile Wikipedia page views in 4 months to October 2012, following launch of Wikipedia Zero (growth for rest of Kenya of -7%)
    - Orange Niger: 77% growth on the same basis (6% growth for the rest of Niger)

- ...and Twitter
  - 57% of tweets from Africa come from a mobile
  - Local content is key: 68% of twitter users get news through the platform, 22% search for jobs

- ...and high growth in use of the mobile version of the Opera Mini browser in Africa (mainly featurephones)

Note: Opera Mini figures are for the 12 months to March 2012
Source: Opera Software, Wikimedia, Portland Communications, GSMA-MDI Analysis
1. Market landscape: current and outlook
2. Impact of mobile on development sectors
3. Platforms, multiplicity, scalability and re-use
4. User-centric innovation
5. Appendix
## What you need to know

### Key findings

**M4D is growing:** there are now over 800 live mobile-enabled products and services in the developing world, with growth having accelerated over the last 3 years. There are also interesting geographic distributions: mobile money in Africa, learning/education in Asia, with health and agriculture more balanced.

**Emergence of new business models:** as new sectors in the M4D space have emerged since 2009, so too have new business models. Donor funding remains the most common model in mHealth, but others drawing revenue from consumers or business (e.g. using B2C, B2B and B2B2C) are used in the money, learning and entrepreneurship sectors in particular.

**SMS remains dominant, but new technologies are emerging:** 67% of M4D services use SMS as an access medium, its popularity having *increased* since 2009. USSD also remains popular, with the use of the mobile web and apps on the rise.

### Key implications

**The need for scale:** while the number of M4D services continues to rise, there remains a general lack of scale achieved (with some exceptions, such as in the mobile money sector). The drive for impact must be balanced by the need for scale.

**Diversification likely to continue:** while some sectors have established clearly defined business models that are unlikely to change (e.g. mobile money, where mobile operators make money on transaction volume), others are still evolving (e.g. an increasing focus on B2B in the mobile entrepreneurship sector).

**Balance basic functionality with growing data adoption:** SMS likely to remain a ubiquitous delivery medium given its ease of use, but M4D services designed to run via the mobile internet, through apps, or be hosted in the cloud are likely to increase, particularly in sectors focused on interactive content and P2P (e.g. mLearning and entrepreneurship).
Evolution

- Strong growth in the number of M4D services launched over the last 3 years

- Crucial to consider scale of each sector, not just the number of services or projects

Timeline of launches

Note: figures based only on mobile-enabled products and services in developing world tracked by GSMA (including those merged/closed)

Excludes services in pipeline with an impending launch

Source: GSMA-MDI Analysis
Mobile for Development landscape

• We show below the geographical distribution of live M4D services in the developing world tracked by the GSMA

• Mobile money has a concentration in Africa, learning and education in Asia, while health and agriculture are more evenly split between these two regions

Live deployments

Note: figures based only on mobile-enabled products and services in developing world tracked by GSMA
As of September 2012; excludes services in pipeline with an impending launch
Source: GSMA-MDI Analysis
Definitions for analysis and methodology

Our work so far...

Current GSMA resources

Further research & definitions

Analysis & initial findings

Over 800 M4D services tracked

Augmenting research

Analysis

Findings

Business model
• Where will the service generate revenue from?
  • Consumer
  • Donor
  • Business
  • Open Source
  • Government
  • Advertising

Device
• What type of device is the service aimed at?
  • Basic phone (e.g., Feature phone (e.g., Smart phone (e.g., PC/ laptop Tablet Other

Delivery technology
• What mobile delivery technology will the service utilise?
  • Native Voice
  • IVR
  • SMS
  • USSD
  • Text-to-Audio
  • Web
  • Apps
  • WAP

Enablers
• What kind of products and services are being offered?
  • Interactive content
  • Push content
  • Payments
  • Peer to Peer
  • Data Collection
  • Call Centre
  • Inventory management

Source: GSMA-MDI Analysis
# Business model

<table>
<thead>
<tr>
<th>Business model</th>
<th>Product/service type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consumer (MNO led)</strong></td>
<td></td>
</tr>
</tbody>
</table>
- Rolled out as a value added service (VAS) by an MNO  
- While it may not earn revenue from customer directly, VAS designed to drive new customer uptake/ reduce customer churn. |
| **Consumer (non MNO led)** |  
- Revenue generated directly by end user  
- e.g. subscription, one off mobile money payment |
| **Business** |  
- Businesses targeted by service to generate revenue  
- Generally supports internal business processes (e.g. Inventory management), or core business services (e.g., recruitment) |
| **Advertising** |  
- Revenue generated from advertising delivered through service itself |
| **Government** |  
- Primary funding comes from government |
| **Open Source** |  
- Service based around open source software/framework  
- Value derived from external parties adopting service |
| **Donor** |  
- Primary funding comes from donor organisations, usually in a lump sum grant |
| **Call Centre** |  
- Simple voice call to a trained human content provider |
| **Interactive content** |  
- Content based services that users can access by querying a central database  
- May be delivered via IVR, SMS, USSD, app, WAP, etc. |
| **Peer to peer content** |  
- Social networks and posting systems, users create and access content  
- Wide range of delivery mechanisms, even including voice |
| **Push content** |  
- Content pushed out (one way) via voice message or SMS  
- May be “broadcast” or “narrowcast” (customised by location/user profile) |
| **Data collection** |  
- Create customised surveys and send them to fieldworkers’ mobiles |
| **Inventory management** |  
- Supply chain management and stock ordering tools  
- Product security / validation tools |
| **Payments** |  
- Mobile wallets, payment gateways and a wide range of payment based services |

Source: GSMA-MDI Analysis
## Spotlight: use cases of mobile by sector

### Financial inclusion
- Money transfer
- Airtime and prepaid services
- Bill payment
- Bank account management
- Micro-credit
- Micro-savings
- Micro-insurance
- Corporate payments
- Mobile commerce
- Social payments

### Health
- Health education and promotion
- Reminders for patients to take medicines
- Remote patient monitoring and diagnosis
- Healthcare micro-payments
- Data collection tools for health workers
- Health worker training and capacity building
- Medical supply chain optimisation
- Drug verification
- Specialised medical devices

### Agriculture
- Helplines for advice and trading assistance
- Broadcast and narrowcast advice and weather updates
- Crop insurance and agricultural financial services
- Fair trade compliance tools
- Weather monitoring on base stations
- Agricultural supply chain management tools

### Learning
- Literacy and numeracy
- Financial literacy
- Technology literacy
- Language learning
- Workforce training
- Entrepreneurial skills and career development
- Job advice and connection
- Teacher training and support
- Classroom tools and resources

### Entrepreneurship
- Business advice helplines
- Job posting and trading platforms
- Training and skills development
- Store / SME management tools
- Inventory ordering and management tools

### Corporate & NGO use
- Prepaid airtime vending systems
- Surveying tools
- Fieldworker communications tools
- Crisis monitoring tools
- Supply chain management tools
- ICT training resources for small organisations

Source: GSMA-MDI Analysis
## Device

<table>
<thead>
<tr>
<th>Device</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic phone</td>
<td>Offers basic voice services (telephony/voice mail), SMS and USSD based services.</td>
</tr>
</tbody>
</table>
| Feature phone | Basic phone features plus...  
Internet enabled, supports transmission of picture messages downloading music, built-in camera |
| Smart phone   | Feature phone features plus...  
graphical interfaces and touchscreen capability, built-in Wi-Fi, and GPS (global positioning system) |
| PC/laptop     | Personal desktop computer, or laptop. Typically running Windows, or maybe Linux OS. |
| Tablet        | Smart phone features plus...  
Larger screen, increased computing power, front and rear facing cameras, extra ports (e.g., USB) |
| Other         | A “catch all” for devices not included in the above  
E.g., modems, Personal digital assistance (PDA), etc. |

## Delivery technology

<table>
<thead>
<tr>
<th>Technology</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voice</td>
<td>Basic telephony services, with voice delivered over a mobile network</td>
</tr>
<tr>
<td>IVR</td>
<td>Interactive voice response, allows a computer to interact with humans through &amp; voice recognition navigation and DTMF tones via keypad</td>
</tr>
<tr>
<td>SMS</td>
<td>Short Messaging Service, allows exchange of short text messages between mobile phone devices</td>
</tr>
<tr>
<td>USSD</td>
<td>Unstructured Supplementary Service Data. A synchronous message service creating a real-time M2P connection allowing a two-way exchange of data, mostly through menu structures</td>
</tr>
<tr>
<td>Text-to-Speech</td>
<td>Computer or handset based service that generates speech using text input</td>
</tr>
<tr>
<td>Web</td>
<td>A system of interlinked hypertext documents accessed via the Internet; also accessible via enabled mobile devices</td>
</tr>
<tr>
<td>Apps</td>
<td>a software application designed to run on mobile devices. (typically smartphones, and tablet computers)</td>
</tr>
<tr>
<td>WAP</td>
<td>Wireless Application Protocol for accessing information over mobile network. WAP browsers typically found on older feature phones.</td>
</tr>
</tbody>
</table>

Source: GSMA-MDI Analysis
Spotlight: device and delivery technology

Phone type

Basic Feature Smart

Popular access technologies

<table>
<thead>
<tr>
<th>Voice</th>
<th>Interactive Voice Response (IVR)</th>
<th>BBC WST Janala (Bangladesh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messaging</td>
<td>SMS</td>
<td>Manobi Agriculture (Senegal)</td>
</tr>
<tr>
<td></td>
<td>USSD</td>
<td>HIV-911 (South Africa)</td>
</tr>
<tr>
<td></td>
<td>MMS</td>
<td>Tata Telecom m-Krishi (India)</td>
</tr>
<tr>
<td>Browsing</td>
<td>WAP</td>
<td>mDhil (India)</td>
</tr>
<tr>
<td></td>
<td>Web</td>
<td>Kantoo English (Chile)</td>
</tr>
<tr>
<td>Apps</td>
<td>Embedded</td>
<td>Nokia Life Tools (India, Indonesia)</td>
</tr>
<tr>
<td></td>
<td>Java (J2ME)</td>
<td>Esoko (Africa)</td>
</tr>
<tr>
<td></td>
<td>Android</td>
<td>InfoNet Biovision (Kenya)</td>
</tr>
</tbody>
</table>

Source: GSMA-MDI Analysis
Business model: shifting to consumer revenue

- Just under half of m-services across all sectors sell a product or service to consumers.
- Donor-based funding accounts for a similar share, but this is heavily skewed by the mHealth sector.
- This has changed over the last 3 years, with newer projects less reliant on donor funding and more on a consumer-based business model.

Note: services often use more than one funding model, so percentages will add up to more than 100%

Source: GSMA-MDI Analysis
# Business model heatmap

Heatmaps are used to compare sectors on a given factor (here, business model) or to look at change in a sector over time. The shading is based on the frequency of a given category.

<table>
<thead>
<tr>
<th></th>
<th>Money</th>
<th>Health</th>
<th>Agriculture</th>
<th>Learning</th>
<th>E&amp;E</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consumer (non MNO)</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>Donor</strong></td>
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</tr>
<tr>
<td><strong>Consumer (MNO)</strong></td>
<td></td>
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<tr>
<td><strong>Business</strong></td>
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<tr>
<td><strong>Open source</strong></td>
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<tr>
<td><strong>Government</strong></td>
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<tr>
<td><strong>Advertising</strong></td>
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</tr>
</tbody>
</table>

Mobile **money** services are most likely to be funded at least partly through consumer revenue.

Emerging **entrepreneurship** services have a B2B focus, with applications in e-commerce, logistics and inventory management.

**Advertising** is not yet widely used:
- Developing market MNOs and VAS suppliers do no yet have advertising capability built in to their networks
- Not yet defined end user market

Source: GSMA-MDI Analysis
Business model evolution

- Here we look at the popularity of different business models for M4D services that launched before 2009 vs. after 2009

- There has been a shift to use different business models in the M4D sector over the last 3 years (evident in the health sector)
  - Increase in end-user pay
  - Increase in m-services offered as part of a wider suite of services from a mobile operator
  - On average, less reliance on donor funding

- On the other hand, m-services focused on entrepreneurship have consolidated around a B2B model (e.g. job advertising platforms, e-commerce)

### Pre 2009

<table>
<thead>
<tr>
<th></th>
<th>Health</th>
<th>E&amp;E</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer (non MNO)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Donor</td>
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<td></td>
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<tr>
<td>Consumer (MNO)</td>
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<tr>
<td>Business</td>
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<tr>
<td>Open source</td>
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<td>Government</td>
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<tr>
<td>Advertising</td>
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</tbody>
</table>

### 2009-12

<table>
<thead>
<tr>
<th></th>
<th>Health</th>
<th>E&amp;E</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Consumer (non MNO)</td>
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<tr>
<td>Donor</td>
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<tr>
<td>Consumer (MNO)</td>
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<td>Business</td>
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<td>Government</td>
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<tr>
<td>Advertising</td>
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</tbody>
</table>

Source: GSMA-MDI Analysis
Technology

- Basic and featurephones remain by far the most common devices for m-services use.
- Smartphones are targeted by a third of m-services – most popular in mLearning and mEntrepreneurship.

- SMS and its text-based cousin, USSD, are the most popular delivery modes.
- This owes to their nature of being ubiquitous technologies in the mobile world (making them cheap to deploy and available on any handset) and ease of use.

Note: services can be designed for multiple devices or technologies, so percentages will add up to more than 100%.

Source: GSMA-MDI Analysis
### Technology heatmap

<table>
<thead>
<tr>
<th></th>
<th>Money</th>
<th>Health</th>
<th>Agriculture</th>
<th>Learning</th>
<th>E&amp;E</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Native Voice</td>
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<tr>
<td>IVR</td>
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<tr>
<td>SMS</td>
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<tr>
<td>USSD</td>
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<td>WAP</td>
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<td>Web</td>
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<tr>
<td>Apps</td>
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</tr>
</tbody>
</table>

**Traditional voice** calls still used in mHealth (e.g. to seek medical advice), though not in other sectors

**SMS** is the most popular way to deliver an M4D service to the end user across all sectors

**USSD-based** services also widely used, but most concentrated for mobile money

Services using the mobile web popular in the entrepreneurship sector (e.g. location-based services)

Source: GSMA-MDI Analysis
The enduring power of SMS

- More m-services are now being designed for use on a smartphone (health, learning and entrepreneurship services in particular), although SMS remains the most commonly used mobile technology to deliver m-services despite this.
- On the other hand, fewer services are launching using traditional voice, although this is likely due to the complexity and cost of such services rather than its effectiveness.

![Bar chart showing m-services delivered via different methods](chart.png)

Source: GSMA-MDI Analysis
Product and service function (enabler)

- The product/service type (enabler) looks at the function the service is actually performing regardless of the vertical sector – in this way, it is a *horizontal* way of looking at M4D.
- The wide use of push content is mainly driven by SMS-based services in the health, agriculture and learning sectors.
- Other horizontals are more specific (e.g. data collection for mHealth services, payments in mobile money, inventory management in entrepreneurship services).

**M4D service function**

- Push content: 43%
- Data collection: 31%
- Interactive content: 29%
- Payments: 20%
- P2P content: 16%
- Call centre: 14%
- Inventory management: 3%

*Source: GSMA-MDI Analysis*
### Enabler heatmap

<table>
<thead>
<tr>
<th>Service</th>
<th>Money</th>
<th>Health</th>
<th>Agriculture</th>
<th>Learning</th>
<th>E&amp;E</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interactive content</td>
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<tr>
<td>Push content</td>
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<td></td>
<td></td>
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<tr>
<td>Payments</td>
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<tr>
<td>P2P</td>
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<tr>
<td>Data collection</td>
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<td>Call centre</td>
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<tr>
<td>Inventory management</td>
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</tr>
</tbody>
</table>

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**Interactive content** plays well into languages (often English) and other educational materials.

**Call centre** generally found in the health sector (as with traditional voice). Intuitively it would also suit mobile agriculture services, though cost and complexity may reduce its popularity in this vertical.

**Push and interactive content** (mainly through SMS, USSD) can be used to deliver weather alerts, soil agronomy information and crop prices.

Source: GSMA-MDI Analysis
Mobile money

- Most scaled of all mobile for development verticals
- Polarised: few big players, long tail
- Concentration of activity in East Africa
  - Even excluding industry champion m-Pesa, region accounts for around 50% of m-money transactions worldwide*
- Opportunity for increased scale
  - Emerging presence of large equipment vendors (Ericsson, Huawei)
  - 2.5bn unbanked, of which 1bn have mobile
- Potential for re-use
  - Payment as the common denominator
  - e.g. m-Kopa (solar lighting)

Mobile money – registered customers

As of June 2011...

- 60m registered customer accounts
- Around 20% of services with >1m registered customers

Challenges

- Operational hurdles
  - Distribution, including agent liquidity
  - Market segmentation
  - Customer activation
  - Fraud & risk management
- Regulatory barriers
  - Onerous customer registration / KYC
  - Licensing requirements
  - E-money
  - Agent regulation
- Inadequate investment
  - Margin pressures on core business
  - Lack of proof points
- Learning gaps
  - New products i.e. Savings
  - Greater efficiency to reduce cost

Note: registered customers exclude Safaricom (m-Pesa)
*June 2011, excludes Globe

Source: GSMA Mobile Money for the Unbanked, 2011 Global Mobile Money Adoption Survey
Mobile money: East Africa is the hub

<table>
<thead>
<tr>
<th></th>
<th>Global</th>
<th>East Africa</th>
<th>West Africa</th>
<th>Asia Pacific</th>
<th>Central Asia and the Middle East</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size (number of respondents)</td>
<td>52</td>
<td>11</td>
<td>13</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td><strong>Customer accounts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registered customer accounts, June 2011</td>
<td>60.4m</td>
<td>35.9m</td>
<td>6.4m</td>
<td>12.6m</td>
<td>1.9m</td>
</tr>
<tr>
<td>Annualised growth rate of registered customer accounts, December 2010 to June 2011</td>
<td>33%</td>
<td>29%</td>
<td>66%</td>
<td>43%</td>
<td>103%</td>
</tr>
<tr>
<td><strong>Functional transactions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P2P transfers per active customer, June 2011</td>
<td>0.69**</td>
<td>0.84**</td>
<td>0.15*</td>
<td>0.20**</td>
<td>0.07*</td>
</tr>
<tr>
<td>Bill payments per active customer, June 2011</td>
<td>0.29**</td>
<td>0.06**</td>
<td>0.03*</td>
<td>1.10**</td>
<td>0.09*</td>
</tr>
<tr>
<td>Bulk payments per active customer, June 2011</td>
<td>0.03**</td>
<td>0.02**</td>
<td>0.06*</td>
<td>0.19**</td>
<td>0.13*</td>
</tr>
<tr>
<td>Airtime topups per active customer, June 2011</td>
<td>2.07**</td>
<td>2.26**</td>
<td>2.68*</td>
<td>1.94**</td>
<td>0.44*</td>
</tr>
<tr>
<td><strong>Cash-conversion transactions</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Cash ins per active customer account, June 2011</td>
<td>1.85**</td>
<td>2.18**</td>
<td>1.03*</td>
<td>0.57**</td>
<td>0.27*</td>
</tr>
<tr>
<td>Cash outs per active customer account, June 2011</td>
<td>1.57**</td>
<td>1.98**</td>
<td>0.31*</td>
<td>0.06**</td>
<td>0.19*</td>
</tr>
</tbody>
</table>

Note: registered customers exclude Safaricom (m-Pesa)
Source: GSMA Mobile Money for the Unbanked, 2011 Global Mobile Money Adoption Survey
Mobile money: illustrative examples

**bKash Limited**

- Canonical mobile money payment system: send, receive, pay
- Largely rural Bangladeshi market presents opportunity: 15% formal banking penetration, over 50% mobile penetration
- Service seeing high growth
- Available through over 28,000 agents

Launched: **2011**

Backed by: **BRAC Bank**

Target markets: **Bangladesh**

**M-KOPA**

- Provides Pay-as-you-go solar solution, allowing users to pay KES40 per day via their m-Pesa account to use system for lighting and mobile charging.
- Partnered with Safaricom, leveraging its 45,000 agent network in Kenya
- Available at more than 80 locations in Kenya.

Launched: **2011**

Backed by: **Various donors and investors**

Target markets: **Kenya**

Source: bKash, m-Kopa, GSMA-MDI Analysis
Mobile health

- Largest development vertical by number of organisations
- High multiplicity and lack of scale identified as key challenges
  - Surplus of pilots (‘pilotitis’) and local impact
  - Lack of exit strategy for donors
  - MNO’s not used effectively
- Opportunities
  - Move to a linear value chain
  - Demonstrable value drivers for MNOs (e.g. ROI, churn reduction) and health industry
  - Advocate policy and legislative support (e.g. ITU/WHO Oct 2012 – build on current projects, form public/private/NGO partnerships)
  - Facilitate/broker public private partnerships and secure long term investment
  - Drive down cost through tax and other incentives for MNOs

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Fragmentation</th>
<th>Scale</th>
<th>Replication</th>
<th>No linear value chain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reduces sustainability (recent GSMA study of almost 700 services showed multiple overlap of services in countries and regions)</td>
<td>Not achieved in &gt;95% of solutions – limited reach of services</td>
<td>Without adequate proof points/data, replication is not happening</td>
<td>No “shared value proposition” being demonstrated by either mobile or health sector with clear understanding of each-other’s value drivers (impact indicators)</td>
</tr>
</tbody>
</table>

Source: GSMA mHealth program, GSMA-MDI Analysis
Mobile health: illustrative examples

**Motech**

- Open source mHealth software project
- Provides underlying application framework for a diverse range of mHealth solutions
- Enables solutions to be developed more quickly and cost-effectively with fewer technical resources
- Allows data sharing across different deployments of the software

**Etisalat Mobile Baby**

- Uses mobile to monitor pregnancy using ultrasound, identify danger signs, pay for emergency transportation, and communicate with the referral facility
- Brings together healthcare professionals, NGOs, pharmaceutical/insurance companies, state government
- Over 500 birth attendants trained, over 20,000 pregnant women registered

**Launched:** 2010
**Backed by:** Grameen Foundation
**Target markets:** Health initiatives anywhere in developing word (e.g., Africa, India)

**Launched:** 2011
**Backed by:** Etisalat, Qualcomm, D-Tree International and Great Connection Inc
**Target markets:** Africa

Source: Motech, Etisalat, GSMA-MDI Analysis
Mobile for Development Intelligence

Mobile agriculture

- Polarised sector – few services with large base (>1m users), long tail
- Opportunities for scale
  - Penetrate untapped rural market and ‘unconnected’ rural customers
  - Identifiable business case for mobile operators: MNOs are keen to launch services for rural sector to increase customers and brand loyalty while reducing churn
  - Strong focus from international community to invest in agriculture via ICT: food security, climate change, large addressable market
- Strong potential for overlap with other sectors
  - Financial services for rural sector (loans, insurance and savings)
  - Learning – training, advisory
  - Health – delivery of content via mobile
  - Utilities & M2M (e.g. irrigation pumps controlled by mobile tech)

Mobile agriculture opportunity

- Business model
  - Price sensitive customers (majority smallholder farmers)
  - Proof points
  - Many services, few with scale
- Mobile operators
  - Few MNO-led mAgri services
- Content
  - Lack of content providers
  - Illiteracy, technical illiteracy
  - Consumer education

Source: CIA World Factbook, World Bank, GSMA mAgriculture program, GSMA-MDI Analysis
Mobile agriculture: illustrative examples

**Farmforce**
- Penetrates untapped rural markets by integrating thousands of smallholder farmers with exporters in larger markets
- Focuses on international regulatory environment by aiding farmers compliance with food standards, traceability of goods, etc.
- Uses sophisticated ‘virtual farm’ concept, linking farmers to exporters via database.

Launched: **2012**
Backed by: **Syngenta Foundation**
Target markets: **Africa, Asia, Latam**

**Nong Xin Tong**
- Agricultural web and mobile based service for market prices, advisory, jobs, and more
- Agriculture ministry uses service for policy announcements
- Long term investment for China Mobile: focus on financial viability for farmers, not pure profit for MNO (service only USD 6 a year for farmers)
- Over 40 million users

Launched: **2010**
Backed by: **China Mobile**
Target markets: **China**

Source: Farmforce, China Mobile, GSMA-MDI Analysis
Mobile learning

- Interactive content is primary form of product/service for this vertical
- Business models hard to prove and make sustainable
- Needs more government regulatory support

- Opportunities for scale
  - Highly desirable service in emerging markets, which currently consumes around ¼ of family income in many low income households
  - Strong focus from international community to invest in education access (e.g., MDG2)

- Strong potential for overlap with other sectors
  - In terms of strategic knowledge partnerships, disseminating knowledge from other sectors
  - Content management systems and other interactive content services in other verticals

Believe mobile technology important to learning and education

<table>
<thead>
<tr>
<th>Country</th>
<th>Indonesia</th>
<th>S. Africa</th>
<th>China</th>
<th>Brazil</th>
<th>India</th>
<th>Korea</th>
<th>USA</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>92%</td>
<td>91%</td>
<td>90%</td>
<td>90%</td>
<td>87%</td>
<td>82%</td>
<td>73%</td>
<td>69%</td>
</tr>
</tbody>
</table>

Challenges

Regulatory
- Education and ICT policies to distinguish educational content from other VAS
- Policies required to accelerate ICT enhanced learning/training

Mobile operators
- Proving/pitching business case of educational content to MNOs
- Appropriate revenue share agreements with MNOs

Content and training
- Generating content to suit diversity of end-users (language diversity, literacy levels, etc)
- Human resource capacity
- Appropriate training lacking

Source: TIME Mobility Poll – Qualcomm – 2012, GSMA mLearning program, GSMA-MDI Analysis
## Mobile learning: illustrative examples

### Nokia Life Tools
- Provides a range services covering Agriculture, Education and Entertainment targeted at both urban and rural consumers
- Established over 90 knowledge partnerships across the four active countries
- Offered in 12 of India’s official languages alone
- Over 90 million users

**Launched:** 2008

**Backed by:** Nokia

**Target markets:** India, Indonesia, China, Nigeria

### Yoza Cellphone Stories
- Short stories and classic literature are published on mobile phones (MXit and on a mobisite)
- Users can comment, enter writing competitions, review stories
- Stories found in English, Afrikaans and isiXhosa
- 470,000 complete reads of stories and poems; 47,000 comments

**Launched:** 2010

**Backed by:** Shuttleworth Foundation

**Target markets:** South Africa, Kenya

Source: Nokia, Yoza, GSMA-MDI Analysis
Mobile entrepreneurship

- An up-and-coming vertical, with many new services emerging
- Mobile money is a critical enabler to many services
- Services tracked by GSMA are more likely to be delivered using mobile web, and offer B2B services
- High impact potential; in places such as Nigeria, Egypt, and Indonesia, micro-entrepreneurs estimated to generate up to 38% of GDP*

- Opportunity for increased scale
  - Maturing mobile money markets
  - Strong focus from international community on job creation in emerging markets
  - Supporting businesses in multiple sectors (e.g. agriculture, education, health)
  - Well positioned to benefit from natural ‘willingness to pay’ from businesses

Believe mobile technology important to entrepreneurship

Indonesia: 98%
India: 96%
S. Africa: 96%
China: 94%
Brazil: 93%
Korea: 92%
UK: 88%
USA: 87%

Challenges

Operational
- Assistance with customer relationship management
- Marketing
- Market data
- Training and mentorship

Investment
- Access to credit & capital
- Low costs to afford loans and business services
- Information about investment opportunities

Regulatory barriers
- Barriers inherited from mobile money sector
- Little knowledge of regulatory framework
- Tax and investment policies that impede innovation
- Company registration expenses and licensing requirements

*Booz & Co., “Mobile Value Added Services” 2012
Source: TIME Mobility Poll – Qualcomm – 2012, GSMA-MDI Analysis
Mobile entrepreneurship: illustrative examples

**Souktel**

- Service connecting job-seekers with employers via mobile
- Over 20 leading aid agencies actively use AidLink services to get key information to and from communities in crisis
- In Palestine currently serves close to 10,000 job seekers in a given month

Launched: **2006**

Backed by: **The Synergos Institute, The King Abdullah II Fund for Development**

Target markets: **Africa, Asia, Latam, Caribbean**

**Tiendatek**

- A tablet and barcode scanner system for shopkeepers: can register transactions, get useful metrics, charge credit cards
- Data fuels Tiendatek Data: a marketing analytics tool used by companies like Unilever and Bimbo
- System integrates with payment providers, mobile operators, hardware providers, integrators, banks, consumer-goods companies and shopkeeper associations

Launched: **2008**

Backed by: **Frogtek**

Target markets: **Mexico, Colombia**

Source: Souktel, Frogtek, GSMA-MDI Analysis
1. Market landscape: current and outlook
2. Impact of mobile on development sectors
3. Platforms, multiplicity, scalability and re-use
4. User-centric innovation
5. Appendix
What you need to know

### Key findings

**Barriers to scale are multi faceted**: scale is driven by a number of factors related both to an organisation and the wider sector. Across the M4D sector, the most important are the presence of defined value chains, sustainable business models, and market visibility.

**An important distinction**: it is important to distinguish between a true platform, a framework and a bespoke service. Platforms (e.g. Linux, iOS, Android) are generic and can accommodate a range of applications or services. Frameworks (e.g. Fundamo, Frontline SMS) are less generic than platforms, but provide many re-usable tools for others to use in M4D services. Bespoke M4D services are the least generic and are generally designed for one sector in one country.

In the M4D sector, bespoke services are most common, followed by frameworks, with true platforms generally controlled by global TMT firms (with or without direct interests in M4D).

**Mobile money stands out**: the mobile money sector has the most defined value chain, including a layer for vendors (e.g. Fundamo, Comviva) providing the underlying frameworks the services are built on.

### Key implications

**It takes an industry**: there is growing recognition among service providers, donors and impact investors of these barriers and the need to collaborate as a sector to overcome them. Partnerships with mobile operators have and will continue to play a key role.

**Re-use of frameworks**: the potential to re-use a service or the infrastructure underpinning it is a trade-off between how generic it is, technical complexity and cost to intervene. In general, the more generic and less costly/complex, the greater the potential for re-use.

Platforms are most generic but they are also most expensive and complex. Bespoke services are more accessible but also less generic. Frameworks strike a balance, and it is here where we see examples both of services being directly re-used across sectors and countries (e.g. Ushahidi, Motech) and of services connecting to an existing framework originally designed for a different sector (e.g. m-Kopa) happening in the field today.

**Fewer players, larger scale**: most mobile money services sit on top of a framework developed and owned by one of a relatively small number of vendors (e.g. 5-10 worldwide). In general, services in other M4D sectors are bespoke, and often duplicate other services in the same country.
In theory, platforms exist on several levels

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Delivery</th>
<th>Product/service (what does it do?)</th>
<th>Functional nature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smartphone</td>
<td>Text-based</td>
<td>Application level</td>
<td>Temporal</td>
</tr>
<tr>
<td>– iOS</td>
<td>– SMS</td>
<td>– Call centre</td>
<td>– Communication type</td>
</tr>
<tr>
<td>– Android</td>
<td>– USSD</td>
<td>– Interactive content</td>
<td>– Transactional</td>
</tr>
<tr>
<td>– BlackBerry</td>
<td>– STK</td>
<td>– Peer-to-peer</td>
<td>– Public</td>
</tr>
<tr>
<td>– Windows</td>
<td>– Voice (e.g. IVR)</td>
<td>– Push content</td>
<td>– Community vs. individual</td>
</tr>
<tr>
<td>– Symbian</td>
<td>– Data</td>
<td>– Data collection</td>
<td>– Location-based</td>
</tr>
<tr>
<td>Featurephone</td>
<td>Combination of these modes</td>
<td>– Inventory management</td>
<td>– Identity-based</td>
</tr>
<tr>
<td>– Nokia Series 40</td>
<td></td>
<td>– Payments</td>
<td></td>
</tr>
<tr>
<td>– Samsung/LG proprietary</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic handsets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Many</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Proprietary OS</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: GSMA-MDI Analysis
The “platform” problem

• In the mobile space the term “platform” can currently be used to mean:
  • iOS, Android, Linux,…
  • pieces of open source software with public APIs…
  • or simply mobile services that scale to reach a large user base…

Problem
• This use of the term doesn’t sufficiently indicate what can be reused, and in what sorts of ways

Solution
• We propose to make the issue of reuse more transparent by drawing a clear distinction between platforms, frameworks, and M4D applications

• This distinction will better enable us to landscape existing M4D services with respect to their reuse potential

Source: GSMA-MDI Analysis
A more helpful view

Our classification...

Platform

Generic in nature, could be used in a multitude of different services. An operating system, cloud, etc.

Framework

A set of re-usable software tools and interfaces for developing applications

- Generic/novelty
- Longevity/evolutionary
- Enabler/developer focus

M4D application

Foundation

Application built on top of a vendor framework

Bespoke

“One off” application built from the “ground up”

- Development tools open/closed to external developers

iOS  |  Nokia Series40  |  Ushahidi  |  Fundamo  |  Orange Money  |  Kom Kom

Source: GSMA-MDI Analysis
Examples of this classification

iOS development framework
- Angry Birds
- Twitter iPhone app

Foundation application level
- Ushahidi
- Kanco
- Urbanmirror

Ushahidi
- Mapping
- UI tools
- Time-line

Framework level

Platform level
- iOS

Bespoke application level
- Kom Kom

Source: GSMA-MDI Analysis
The cost of development

Low cost

Medium cost

High cost

Foundation app

Foundation app

Bespoke app

Framework

Tool

Tool

Tool

Platform

Source: GSMA-MDI Analysis
Why is achieving impact *with scale* important?

With increasing scale, there is increasing...

- Audience reach
- Ability to leverage size (e.g. to form partnerships, economies of scale and scope)
- Sustainability
- Impact

Impact in M4D can and has been achieved by small (e.g. local) and large (e.g. regional) scale organisations

*However, relatively few have achieved sustainable impact*

“We think [our impact is] probably around a $100 a farmer a year, which is maybe 10-20% of their annual revenue. However, the fact that impact equals scale doesn’t necessarily follow”

Mark Davies, CEO, Esoko

Source: GSMA-MDI Analysis
Achieving scale is multi-faceted

**Defined value chain**

- Fully formed: Collection of participants, but lack of defined value proposition
- Partially formed: Full ecosystem with defined value proposition at each level
- Unformed: Clusters and pilots, local impact, lack sustainable revenue

**Visibility**

- Poor: Defined customer base, streamlined operations, defined cost structure, revenue linked to investment
- Modest: Mobile health
- Good: Mobile money

Taking a user-centric approach to organisational culture and product design also plays a key role (see section 4)

Source: GSMA-MDI Analysis
Barriers to scale in M4D

- We show below key barriers to scale in M4D
- These will be felt more by some sectors than others

The need for...

Defined value chains with scalable infrastructure

Proven value proposition for participants at each stage of the value chain (e.g. M4D service provider, vendors, mobile operators)

Sustainable business models

Services with potential to become self sufficient or to have funding underpinned on long term basis

Visibility across markets and sectors

Knowledge of adjacent participants in the sector and ability to partner in areas that expand reach or value of the service

Current barriers

Lack, as opposed to multiplicity, of frameworks underpinning M4D services

Impact without scale

Funding models (silos, pilotitis)

Inability to harness scale of mobile operators

Partnerships

Source: GSMA-MDI Analysis
Defined value chains: the framework landscape

- The mobile money sector has the most defined value chain in M4D, helped by the presence of vendors whose business is to design and deploy frameworks (e.g. Fundamo, Comviva, Utiba)
- The majority of mobile money services sit on a framework owned by one of a few providers (who have relatively large scale)
- In contrast, the majority of M4D services in other sectors are bespoke, which reduces the potential for re-use

Does the mobile service use a framework?

Source: GSMA-MDI Analysis
Sustainable business models: the investors view

- Criteria for impact investors moving to focus more on ensuring scalability, sustainability and innovation as opposed to solely impact
- Willingness to accept risk provided an identifiable problem can be solved by the proposed solution, and that potential for long term scale exists (e.g. hundreds of thousands or millions of users)
- “We don’t mind if the investment opportunity has a 90% risk of failing, if the 10% chance of success has a disruptive impact capable of changing the market” – investor in M4D (anonymised)
Sustainable business models: funding silos and pilotitis

- Funding silos can result in duplication of services in different markets.
- This is exacerbated with small pilot projects that prioritise impact in the local area over the short to medium term.
- The result is a lack of sustainable business models with visibility to be used across markets or sectors, limiting scale.
- Most common in mobile health sector, but also seen in others (e.g. agriculture).

Source: mHealthAfrica.com
Sustainable business models: overlap of services

• As an example, the GSMA has tracked the number of mHealth services by type (e.g. wellness, prevention etc)
  – Africa alone has around 130 services, of which 66 are centered around prevention; we believe there are around 30 countries in the region with at least one mHealth service, equating to over 4 per country
  – Multiplicity of services is even higher in specific segments of the health market in some countries
    • For example, the GSMA tracks 18 mHealth services focused on HIV/AIDS in South Africa run by 14 separate organisations; 8 health prevention services in Uganda run by 6 separate organisations

• In some sense, this can be related to objectives – the WHO defines mHealth as the “use of mobile and wireless technologies to support the achievement of health objectives”

mHealth services by region

<table>
<thead>
<tr>
<th>Region</th>
<th>Wellness</th>
<th>Prevention</th>
<th>Diagnosis</th>
<th>Treatment</th>
<th>Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>3</td>
<td>66</td>
<td>13</td>
<td>16</td>
<td>31</td>
</tr>
<tr>
<td>Americas</td>
<td>6</td>
<td>13</td>
<td>20</td>
<td>/</td>
<td>11</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>29</td>
<td>46</td>
<td>36</td>
<td>/</td>
<td>28</td>
</tr>
<tr>
<td>Europe: East</td>
<td>6</td>
<td>7</td>
<td>4</td>
<td>/</td>
<td>4</td>
</tr>
</tbody>
</table>

Source: GSMA mHealth program, GSMA-MDI Analysis
Visibility: matching vendors with mobile operators

- Use of different vendors may increase cost for mobile operator, limiting roll out and slowing down service deployment (ultimately limiting scale)
- Other difficulties can arise if...
  - Need Value Added Service (VAS) provider with equipment embedded within network of the local MNO (this holds even if the MNO is a multi-national, as often need to hold separate negotiations with country op-co’s to launch a service in local markets)
  - Use multiple VAS providers (e.g. IVR VAS and a content VAS)
  - Negotiating with MNO on a business model
    - If M4D service provider wants revenue share or to charge a subscription for service, must have relationship with local MNO

Source: GSMA-MDI Analysis
Visibility: geographic fragmentation

### Smartphone OS providers

<table>
<thead>
<tr>
<th>Number</th>
<th>Few (5 majors)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td>International</td>
</tr>
<tr>
<td>Ecosystem</td>
<td>Integrated</td>
</tr>
</tbody>
</table>

Microsoft (Redmond, WA)
Apple (Cupertino, CA)
Google (Mountainview, CA)
BlackBerry (Waterloo, Canada)
Nokia/Symbian (Espoo, Finland)

### M4D deployments (e.g. m-health services led by MNO)

<table>
<thead>
<tr>
<th>Number</th>
<th>Many (hundreds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td>Local or national</td>
</tr>
<tr>
<td>Ecosystem</td>
<td>Fragmented</td>
</tr>
</tbody>
</table>

(Also hit by funding silos)

Source: GSMA-MDI Analysis
Visibility: forming partnerships

- Important for M4D organisations to form range of partnerships (e.g. MNO, vendor, content)

- Mobile operators are key partners both for connectivity and reach to the end user

- MNO-led M4D services appear most common in sectors with more of a proven value proposition

- There is an opportunity in other sectors to develop this

- Discussions with stakeholders suggest it is key to understand motivations – e.g. balancing the need for a return with the goal of social impact

“It’s not a sector [mAgriculture] that’s represented real value to them [MNOs] in the past. You need to approach them in such a way as meets their business objectives”

– Mark Davies, CEO, Esoko

“Very quickly we realised that positioning the product straight up as a business benefit made better sense. Until now we haven’t been proven wrong on this”

– Bhanu Potta, Nokia Life Tools

Source: GSMA-MDI Analysis
Re-use: a continuum of opportunity

Scope for re-use (sector or geography)

- **Low**
  - **Many**
  - **Bespoke applications** (e.g. KomKom, Cell Life)

- **High**
  - **Few**
  - **Frameworks** (e.g. Ushahidi, Motech, Fundamo)
  - **Platforms** (e.g. iOS, Android, Linux)
  - **Specific**
  - **Generic**

- • Designed for specific purpose (few generic elements)
- • Built with many generic elements that could be re-used (e.g. database, location engine, language)
- • Limited by need for customisability (e.g. identity, payment platforms)
- • Generic (e.g. built so that many services/applications can plug into)

Source: GSMA-MDI Analysis
To understand re-use, we must understand technology

- High level view of key components in a phone, network and server (e.g. where an M4D service is hosted)
- The area we are interested most in is the application layers which give a functional view of the services being represented

Source: GSMA-MDI Analysis
Under the hood: handsets and networks

**Handset application layer**

- The terminal represents the mobile device – e.g. phone, tablet, etc
- Hosts the applications principally used by the user
  - Built in apps (e.g. SMS inbox, browser)
    - mAgri service sending push SMS to the phone
  - Applications downloaded by someone after they buy a phone (e.g. BlackBerry apps)
    - Diagnostic app for child illnesses used by frontline health workers

**Network application layer**

- The network represents the mobile network – e.g. base stations, communications
- The application layer in the network hosts services used by the handsets
- These applications include messaging, voice, identity and location

Source: GSMA-MDI Analysis
Under the hood: server

- Application layer
  - Backend infrastructure that defines and realises the mobile service
  - Two parts: application and framework
  - Application
    - single self-contained application (bespoke - e.g. Z on right), OR
    - As an application built upon shared resources collected in a framework (e.g. A/B/C on right)
  - Framework
    - collection of resources and repositories that can be used by multiple applications in order function as a coherent service
- Communications
- Platform
  - Underpins the entire mobile service
- Caveats
  - Generic system shown, not specific to any one M4D service
  - Most frameworks themed to match a particular need (e.g. transactional in mobile money, identity in mobile health)
Service overlap

- This diagram shows the touch points in the architecture of two example mobile services.

Key:
- Items used by an agricultural SMS tip service (A)
- Items used by a diagnosis app for Health Workers (B)
- Items used by both

**Scenario A - agricultural SMS tip service**
- This is a service where a farmer would subscribe to receiving a periodic agricultural tip over SMS which is relevant to the crops they grow and the location their farm is located, according to the crop calendar/cycle

**Scenario B – diagnosis app for health workers**
- This is a service where frontline health workers are issued with mobile phones capable of running a downloaded diagnosis app on the phone. This works with a back end server to allow the health worker to step through a basic diagnosis tree for infant health and recommend relevant courses of action

Source: GSMA-MDI Analysis
Re-use in practice

- Genuine re-use
  - Open frameworks (e.g. Ushahidi, Motech)
    - Less resource (e.g. coding, money) to deploy an application based on an existing framework than to create an application from scratch (e.g. weeks instead of months)
    - APIs open to developers. Cost to use framework often low or zero, but may have licensing restrictions for commercial use

- Integration
  - Use of other frameworks (e.g. m-Pesa)
    - Connect M4D service to a payment solution (the need to transact is a ‘common denominator’ that can be integrated with other services)
      - Utility access for rural or remote communities (see spotlight overleaf)

Source: Ushahidi, GSMA-MDI Analysis
Spotlight: enhanced utility solutions

- Leveraging connectivity and mobile money to support Community Services
- GSM connectivity integrated to micro-utility systems can increase their resilience
  - Remote monitoring of units (e.g. photovoltaic energy production, battery voltage) and early detection of failure
  - User’s consumption patterns
- Micropayments can support energy access initiatives:
  - The “Pay As You Go” model allows for flexibility of payments and remote transaction
  - Provides consumer financing, eliminating the prohibitively high upfront costs needed to acquire equipment
  - Allows to send remittances wirelessly to the mobile money account of the individuals using the micro-utility system

m-Kopa provides Pay-as-you-go solar solution, allowing users to pay KES40 per day (USD0.47) via their m-Pesa account to use system for lighting and mobile charging. They have a distribution partnership with Safaricom, leveraging its 45.000 agent network in Kenya.

Grundfos Lifelink provides Pay-as-you-go purified water services in rural Kenya. The revenue management system allows water service providers to collect revenue via m-Pesa and monitor daily water consumption and revenue (close to 40 sites to date).

Source: m-Kopa, Grundfos, GSMA-MDI Analysis
Mobile operator opportunity: early view

- Few operators have publicly disclosed results or guidance on mobile services beyond connectivity
- Estimates largely confined to mobile money
- Clear upside potential, even beyond the proven businesses
  - Safaricom’s m-Pesa already 16% of group revenue (compared to 9% in 2010), and is a major driver of growth for the overall business
  - Telenor’s mobile money business <1% of group revenue, but it expects this to grow to around 5% by 2016
- Direct benefits are obvious (e.g. transaction fees); less obvious (and more interesting) are indirect benefits, such as those arising from ARPU uplift and churn reduction

Source: Safaricom, Telenor, GSMA-MDI Analysis
1. Market landscape: current and outlook
2. Impact of mobile on development sectors
3. Platforms, multiplicity, scalability and re-use
4. User-centric innovation
5. Appendix
## What you need to know

### Key findings

**Organisations, not departments:** developing user-centric innovation means the end user must be at the heart of all parts of an organisation, including management culture, product and service design, and marketing.

**Segmentation and personas are key:** M4D service providers must define target end user segments and develop personas that clearly define the gaps and opportunities that could be met by a given service.

**Cost and communication are key barriers:** high up-front costs and the fact many M4D organisations have partnerships where each party has a different background and set of objectives create barriers to effective implementation of user-centric innovation.

### Key implications

**From theory to practice:** user-centric innovation needs to be seen not as a theoretical concept, but a real modus operandi that permeates all parts of an organisation and is fundamental in the long term sustainability of an M4D service.

**Act early:** these should be defined as part of the service planning, which means an upfront cost and time resource. While there are encouraging examples of organisations redefining a service and its marketing message after launch (e.g. Tigo Money in Paraguay), this can be even more costly and time consuming.

**These are surmountable:** clear communication between stakeholders of a given service and a demonstrable link between investment in key tools (e.g. user research, segmentation and personas, and user feedback) and scale will drive acceptance and wider implementation of the user-centric concept.
What does it mean to be user-centric?

<table>
<thead>
<tr>
<th>User-centric</th>
<th>Functional-centric</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All parts of the organisation oriented towards the user and their needs</td>
<td>• Vision and strategy not oriented around customer needs</td>
</tr>
<tr>
<td>– Vision and strategy</td>
<td>• Users not often voiced in management discussions</td>
</tr>
<tr>
<td>– Management approach</td>
<td>• User focus not a shared organisational norm</td>
</tr>
<tr>
<td>– Organisational culture and rewards</td>
<td>• No clearly defined target segments or positioning</td>
</tr>
<tr>
<td>– User segmentation, targeting and positioning</td>
<td>• ‘One-size-fits-all’ products/services</td>
</tr>
<tr>
<td>– Products/services developed</td>
<td>• Inadequate marketing competencies and resources</td>
</tr>
<tr>
<td>– Marketing competencies and resources</td>
<td>• Processes not customer driven</td>
</tr>
<tr>
<td>– Operational processes</td>
<td></td>
</tr>
</tbody>
</table>

Source: GSMA-MDI Analysis
Why be user centric focused?

Health

In one project, an organisation tried to send personal HIV/AIDS test results to people over their mobile phones; they were surprised by the low pick-up rate until they realized that many people in the community share their mobiles with family and friends. A text message isn’t personal when multiple people share one phone.

Lesson

need to understand user and community habits before designing services

Note: examples adapted from: http://www.mobileactive.org/how-fail-mobileactives-definitive-guide-failure
Source: Mobileactive.org, GSMA-MDI Analysis
MNO perspective: the customer journey (mobile money)

- The process of converting a customer who had never heard of mobile money to one that habitually uses the service

- In theory this is the way it works, but where can practical barriers spring up?

Note: adapted from “Marketing Mobile Money: Top 3 Challenges” - Yasmina McCarty, June 2012
Source: GSMA Mobile Money program, GSMA-MDI Analysis
Lack of user centricity as a barrier in the journey

- **Unaware**
  - Customer has never heard of mobile money

- **Awareness**
  - Customer has heard of mobile money and knows what it does

- **Understanding**
  - Customer understands how mobile money could be useful to them

- **Knowledge**
  - Customer knows the steps necessary to transact

- **Trial**
  - Customer tries the service

- **Regular Use**
  - Customer habitually uses the mobile money service

"I do not trust it because I do not know how the money will reach the other person." – Non user

"Here in the deep village not many people know much about it, so they should sensitize us more on how it works." – Non user

**Vernacular of Mobile Money**

- "send money" means to Ugandans to post it, literally putting it in an envelope. When it comes to cell phone management of money, they would use the term "put".

Source: GSMA Mobile Money program, GSMA-MDI Analysis
Organisations and user centricity

User centricity impacts organisations at **all** these levels

Source: GSMA-MDI Analysis
Organisations and user centricity

Source: GSMA-MDI Analysis
Best practice for user-centric business – key questions

**Organisation**
- Are we integrated across functions and divisions (or even across organisations) to meet customer needs? Or do different business units serve the same customer segments independently?
- Are employees at every level rewarded based on customer metrics?
- Are frontline employees empowered to resolve user problems?
- Are systems in place to feedback user problems throughout the organisation?

**Strategy**
- Do we have clearly defined target market segments? For each of these, do we have a clear differentiation versus existing products / services?

**Culture**
- Is our mission / vision customer focused?
- Is the customer’s voice adequately represented in strategy conversations?
- Do top managers demonstrate a behavioural commitment to customers?
- Do our most powerful symbols or rituals reinforce the importance of customers?
- Is customer obsession a shared norm?

Source: GSMA-MDI Analysis
Organisations and user centricity

- Do we continually invest in better understanding our users’ needs?
- Have we benchmarked our marketing processes?
- Does our customer database actually help us to serve customers better?
- Are marketing metrics clearly defined and well understood? Can we show the link to ROI?
- Is our marketing mix based on robust customer research?

Source: GSMA-MDI Analysis
The ‘user focused’ marketing process

Source: GSMA-MDI Analysis
The ‘user focused’ marketing process

User Research
- User research e.g.
  - Focus groups
  - Interviews
- Immersion
- Observation
- Experiments
- Surveys
- Conjoint analysis
- Perceptual maps

Segmentation
- Geographic
- Demographic
- Behavioural
- Needs-based
  Chosen methodology a trade off: predictive accuracy vs. ease of implementation

Targeting
- Choose target segments based on the needs of different user groups, organisational competencies to meet them and the competitive landscape

Positioning
- Product
- Pricing
- Place (distribution)
- Promotion
  All designed to provide a compelling offering to the targeted user segments

Products and Services
- Product
- Pricing
- Place (distribution)
- Promotion
  All designed to provide a compelling offering to the targeted user segments

Personas
- Put a human face on abstract segment data (but still need to carefully link back to real user research, not just conjecture)
- Orient product design and messaging

Source: GSMA-MDI Analysis
Examining the process in more detail...

Source: GSMA-MDI Analysis
The process in action: CGAP

Quantitative survey covering 2,634 Ugandan households

Question topics covered: Demographics; Financial Service Behaviours; Mobile Usage

A process of prioritisation according to: Market opportunity; Customer accessibility; Willingness to try new financial service products

Deeper dive analysis

Source: CGAP, GSMA-MDI Analysis
Coming full circle: Tigo mobile money (Paraguay)

**Pre segmentation**
- Multiple service offerings
- Marketed all services to all customer segments
- Failed to differentiate on key consumer purchasing criteria
- Low take-up and traction

**Post segmentation**
- Consolidated service offerings
- Re-focused marketing with unified message around single, core consumer segment
- Improved uptake and volume
- Increased scale to other Tigo markets (Guatemala, Honduras)

**Segmentation lines**
- Route of remittance flow
- Amount and frequency of money transfers
- Customer behaviours

**Purchase criteria**
- Cost (most important)
- Speed (least important)

<table>
<thead>
<tr>
<th></th>
<th>Tigo Cash</th>
<th>Giros Tigo</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Services</strong></td>
<td>e-Wallet, merchant payments, domestic remittances via P2P transfer, top ups</td>
<td>e-Wallet, merchant payments, domestic remittances via OTC withdrawal, top ups</td>
</tr>
<tr>
<td><strong>Marketing focus</strong></td>
<td>All services</td>
<td>Domestic remittances</td>
</tr>
<tr>
<td><strong>Registration</strong></td>
<td>Application and validation at agent point</td>
<td>USSD (approximately 45 seconds)</td>
</tr>
</tbody>
</table>

Source: Tigo, GSMA Mobile Money program, GSMA-MDI Analysis
Creating Personas: further into the persona design process

Source: GSMA-MDI Analysis
Practical steps: creating a persona

Then, a persona should:

- Be a representation of the goals and behaviour of a fictional individual
- Epitomise the (prioritised) market segment
- Follow the rough outline of the template opposite

**Persona template elements**

- **Name**: respectful fictitious label
- **Role**: within a given user group, e.g., family
- **Demographics**: Age, income and personal details
- **Knowledge, skills and abilities**: real but generalised capabilities of persona
- **Goals, motives, and concerns**: describe the real needs of the user
- **Usage Patterns**: how frequently do they use mobile, and in what way
- **Action statement**: opportunity to provide a specific product/service that meets user gaps and needs

Source: GSMA-MDI Analysis
Example of Persona: CGAP

Matovu Simon

VILLAGE ENTREPRENEUR
Credit hungry, non-saver

Simon is a bike repairman in Fort Portal, Uganda. He needs small amounts of capital to invest in new parts that he can use in his bike repair business.

Currently he goes to friends, families, and sometimes SACCOs for small loans to invest in his business. The returns are good — over six months he makes a 100% ROI on any funds he puts into his business.

Simon doesn’t feel a need to save; he covers his family’s daily living costs with earnings from his business, and if he needs money for an emergency, he borrows more. He wishes he had access to more credit, however — he thinks he could grow his business with larger loans.

“I prefer getting money in one lump sum upfront and then paying down over time. If I can earn when I put money in my business, why save and not make anything?”

Name: Matovu Simon
Place: Fort Portal, Uganda
Primary occupation: Bike repair, farming
Marital status: Married with children
Monthly income: 80,000UGX

Insights & Observations
Money makes money when moving, makes nothing when stationary.
Some people have much higher appetites for risk.

Ideas
Idea #1: Additional lines of credit via mobile phone
Idea #2: Credit scoring for atypical borrowers

Source: CGAP, GSMA-MDI Analysis
Best practice persona design and use

**Personas of proposed m-service**

1. **Intuitively sound?**
   - The persona should make you believe this based on a real person
   - Use a “real” fictitious name, ideally first and surnames. Make sure the back story contains relevant information (even when not directly attributable to the service) e.g. educational background, aspirations, emotional disposition (optimistic, pessimistic, etc.)

2. **Elements there?**
   - The persona should feature all elements of the persona template
   - Refer back to primary research to find relevant details, do not be tempted to create the relevant parts without reference to primary data. Usage patterns should be based on pre-defined patterns constructed from the primary research.

3. **Based on fieldwork?**
   - The personas should be based upon bespoke fieldwork
   - Ideally data should be from a combination of quantitative and qualitative survey data, along with user interviews, relevant macro level reports (e.g. regional teledensity, etc.) and user concept testing. At a very minimum there should be user interviews and concept testing.

4. **Visible to wider organisation?**
   - The personas should be used by all relevant members of the organisation
   - Re-create new personas based on the baseline data involving all the relevant people/teams in the process. So they can understand the thinking behind the persona.

5. **Developed user stories?**
   - The personas should be used to develop user stories
   - If they have developed user stories prior to the persona’s they should have a persona for each user derived from the methods above and from the user stories, plus they should reconcile the personas to the user stories and primary research. If they have their personas but not yet created the user stories then they should hold an ideation workshop to compile the relevant user stories based on the provided personas with a wide a base of stakeholders as possible.

6. **Proposed user research in future?**
   - The development process should be such that user research is used in future.
   - Assuming an Agile approach to development, they should be planning to implement further user testing at key iterations of the development cycle as well as planning for user testing to be an intrinsic part of the final UAT.

Source: GSMA-MDI Analysis
Organisations and user centricity

Source: GSMA-MDI Analysis
Product and service lifecycle

Idea generation

Requirements gathering and analysis

Design & content development

Service model generation

Feedback and evaluation

Deployment

User

- Primary research, Persona development
- User stories creation, user testing
- User test - UX, UI and visual designs; Content development
- User testing - affordability, teledensity, access, etc.
- Showcase iterations and user test
- UAT - user test and correction

Source: GSMA-MDI Analysis
Barriers to implementing user-centric design in emerging markets

Access to users
- Geographical
- Cultural
- Identification of users

Cost of initial research and on going user testing
- Quantitative and qualitative surveys, prep, execution and analysis
- User interviews
- User testing on an iterative basis

Time and process costs
- Up front research and analysis
- Iterative testing and feedback loops

Cross partner communication
- Multi-partner projects need co-ordination across different teams e.g. organisations focused on social impact partnering with organisations specialising in tech development

Understanding of UX v's UI
- Tech development organisations are prone to doing user interfaces without much thought to user experience and user interaction
- Cross-team involvement in the process

Source: GSMA-MDI Analysis
## Calls to action

### Common Pitfalls

<table>
<thead>
<tr>
<th>Donors</th>
<th>Managers</th>
<th>Designers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Focused on big picture, less on whether service meets user needs</td>
<td>• Mismatch in MNO incentives and long term nature of BoP solutions</td>
<td>• Use ‘one size fits all’ template over primary user research</td>
</tr>
<tr>
<td>• Funding structures that don’t allow for user research, testing, etc</td>
<td>• Vendor/NGO managers minimise user testing due to upfront costs; rely instead on 3rd party reports</td>
<td>• Too much focus on visual design rather than whole experience</td>
</tr>
<tr>
<td>• Waste money on projects not targeting a real user segment</td>
<td>• Marketing neglected</td>
<td>• Pick up problems after service designed (expensive to change)</td>
</tr>
</tbody>
</table>

### Call to Action

<table>
<thead>
<tr>
<th>Donors</th>
<th>Managers</th>
<th>Designers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Understand the value of user centric design, and develop tools to test for it</td>
<td>• Organise business practices around user centric principles</td>
<td>• Integrate with end users as part of design process</td>
</tr>
</tbody>
</table>

Source: GSMA-MDI Analysis
1. Market landscape: current and outlook
2. Impact of mobile on development sectors
3. Platforms, multiplicity, scalability and re-use
4. User-centric innovation
5. Appendix
<table>
<thead>
<tr>
<th><strong>Glossary</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2G</strong></td>
<td>The second generation of digital mobile phone technologies including GSM, CDMA IS-95 and D-AMPS IS-136</td>
</tr>
<tr>
<td><strong>3G</strong></td>
<td>The third generation of mobile phone technologies covered by the ITU IMT-2000 family</td>
</tr>
<tr>
<td><strong>Active Mobile Connections</strong></td>
<td>Active unique SIM cards (or phone numbers, where SIM cards are not used), excluding M2M, that have been used for voice, messaging or data activity on the mobile network over the operator’s activity period, which can range from one to 13 months.</td>
</tr>
<tr>
<td><strong>Advertising</strong></td>
<td>Revenue generated from advertising delivered through service itself</td>
</tr>
<tr>
<td><strong>API</strong></td>
<td>An application programming interface is a protocol intended to be used as an interface by software components to communicate with each other.</td>
</tr>
<tr>
<td><strong>Framework</strong></td>
<td>A set of re-usable software tools and interfaces for developing applications</td>
</tr>
<tr>
<td><strong>Apps</strong></td>
<td>A software application designed to run on mobile devices. (typically smartphones, and tablet computers)</td>
</tr>
<tr>
<td><strong>ARPU</strong></td>
<td>Average Revenue Per User</td>
</tr>
<tr>
<td><strong>Basic phone</strong></td>
<td>Offers basic voice services (telephony/voice mail), SMS and USSD based services.</td>
</tr>
<tr>
<td><strong>Business</strong></td>
<td>Businesses targeted by service to generate revenue. Generally supports internal business processes (e.g. Inventory management), or core business services (e.g., recruitment)</td>
</tr>
<tr>
<td><strong>Call Centre</strong></td>
<td>Simple voice call to a trained human content provider</td>
</tr>
<tr>
<td><strong>Consumer (MNO led)</strong></td>
<td>Rolled out as a value added service (VAS) by an MNO. While it may not earn revenue from customer directly, VAS designed to drive new customer uptake/reduce customer churn.</td>
</tr>
<tr>
<td><strong>Consumer (non MNO led)</strong></td>
<td>Revenue generated directly by end user. e.g. subscription, one off mobile money payment</td>
</tr>
<tr>
<td><strong>Data collection</strong></td>
<td>Create customised surveys and send them to fieldworkers’ mobiles</td>
</tr>
<tr>
<td><strong>Donor</strong></td>
<td>Primary funding comes from donor organisations, usually in a lump sum grant</td>
</tr>
<tr>
<td><strong>Feature phone</strong></td>
<td>Basic phone features plus... Internet enabled, supports transmission of picture messages downloading music, built-in camera</td>
</tr>
<tr>
<td><strong>Foundation M4D application</strong></td>
<td>Application that is designed to sit on top of a framework owned by another vendor</td>
</tr>
<tr>
<td><strong>Government</strong></td>
<td>Primary funding comes from government</td>
</tr>
<tr>
<td><strong>GSM</strong></td>
<td>Global System for Mobile communications, the second generation digital technology originally developed for Europe but which now has in excess of 71 per cent of the world market. Initially developed for operation in the 900MHz band and subsequently modified for the 850, 1800 and 1900MHz bands. GSM originally stood for Groupe Speciale Mobile, the CEPT committee which began the GSM standardisation process</td>
</tr>
<tr>
<td><strong>HHI</strong></td>
<td>Herfindahl-Hirschman Index, A commonly accepted measure of market concentration. It is calculated by squaring the market share of each firm competing in a market, and then summing the resulting numbers</td>
</tr>
<tr>
<td><strong>Interactive content</strong></td>
<td>Content based services that users can access by querying a central database. May be delivered via IVR, SMS, USSD, app, WAP, etc.</td>
</tr>
<tr>
<td><strong>Internet</strong></td>
<td>A loose confederation of autonomous databases and networks. Originally developed for academic use the Internet is now a global structure of millions of sites accessible by anyone</td>
</tr>
<tr>
<td><strong>Inventory management</strong></td>
<td>Supply chain management and stock ordering tools. Product security / validation tools</td>
</tr>
<tr>
<td><strong>IP</strong></td>
<td>Internet Protocol</td>
</tr>
<tr>
<td><strong>IVR</strong></td>
<td>Interactive voice response, allows a computer to interact with humans through &amp; voice recognition navigation and DTMF tones via keypad</td>
</tr>
<tr>
<td><strong>Java</strong></td>
<td>A programming language developed by Sun Microsystems Java is characterised by the fact that programs written in Java do not rely on an operating system</td>
</tr>
<tr>
<td><strong>M2M</strong></td>
<td>Machine-to-machine is a broad label that can be used to describe any technology that enables automated wired or wireless communication between mechanical or electronic device</td>
</tr>
</tbody>
</table>
### Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNO</td>
<td>Mobile Network Operator</td>
</tr>
<tr>
<td>Active mobile subscriber penetration</td>
<td>Unless otherwise specified, this is the total active subscribers in the market divided by the total population, expressed as a percentage. (It is not the more often cited penetration of total mobile connections, which will always be higher)</td>
</tr>
<tr>
<td>Bespoke M4D application</td>
<td>A “one off” application built from the “ground up”</td>
</tr>
<tr>
<td>Open Source</td>
<td>Service based around open source software/framework. Value derived from external parties adopting service</td>
</tr>
<tr>
<td>Other</td>
<td>A “catch all” for devices not included in the above. E.g., modems, Personal digital assistance (PDA), etc.</td>
</tr>
<tr>
<td>OTT</td>
<td>Over the Top refers to video, television and other services provided over the internet rather than via a service provider’s own dedicated, managed IPTV network</td>
</tr>
<tr>
<td>Payments</td>
<td>Mobile wallets, payment gateways and a wide range of payment based services</td>
</tr>
<tr>
<td>PC/laptop</td>
<td>Personal desktop computer, or laptop. Typically running Windows, or maybe Linux OS.</td>
</tr>
<tr>
<td>Peer to peer content</td>
<td>Social networks and posting systems, users create and access content. Wide range of delivery mechanisms, even including voice</td>
</tr>
<tr>
<td>Platform</td>
<td>Generic in nature, could be used in a multitude of different services. An operating system, cloud, etc.</td>
</tr>
<tr>
<td>Push content</td>
<td>Content pushed out (one way) via voice message or SMS. May be “broadcast” or “narrowcast” (customised by location / user profile)</td>
</tr>
<tr>
<td>SIM</td>
<td>Subscriber Identity Module; A smart card containing the telephone number of the subscriber, encoded network identification details, the PIN and other user data such as the phone book. A user’s SIM card can be moved from phone to phone as it contains all the key information required to activate the phone</td>
</tr>
<tr>
<td>Smart phone</td>
<td>Feature phone features plus... graphical interfaces and touchscreen capability, built-in Wi-Fi, and GPS (global positioning system)</td>
</tr>
<tr>
<td>SMS</td>
<td>Short Messaging Service, allows exchange of short text messages between mobile phone devices</td>
</tr>
<tr>
<td>STK</td>
<td>SIM ToolKit: specified within the GSM standard, this allows operators to add additional functions to the phone menu in order to provide new services such as mobile banking or email</td>
</tr>
<tr>
<td>Tablet</td>
<td>Smart phone features plus... Larger screen, increased computing power, front and rear facing cameras, extra ports (e.g., USB)</td>
</tr>
<tr>
<td>TCO</td>
<td>Total cost of ownership</td>
</tr>
<tr>
<td>Text-to-Speech</td>
<td>Computer or handset based service that generates speech using text input</td>
</tr>
<tr>
<td>Total Mobile Connections</td>
<td>Total unique SIM cards (or phone numbers, where SIM cards are not used) that have been registered on the mobile network at the end of the period. Connections differ from subscribers such that a unique subscriber can have multiple connections.</td>
</tr>
<tr>
<td>USSD</td>
<td>Unstructured Supplementary Service Data. A synchronous message service creating a real-time M2P connection allowing a two-way exchange of data, mostly through menu structures</td>
</tr>
<tr>
<td>Voice</td>
<td>Basic telephony services, with voice delivered over a mobile network</td>
</tr>
<tr>
<td>WAP</td>
<td>Wireless Application Protocol for accessing information over mobile network. WAP browsers typically found on older feature phones.</td>
</tr>
<tr>
<td>Web</td>
<td>A system of interlinked hypertext documents accessed via the Internet; also accessible via enabled mobile devices</td>
</tr>
</tbody>
</table>
CEOs and high level executives from organisations the GSMA regards as leading in their sector were interviewed.

- Interviews were 1-to-1 and lasted around an hour
- We asked questions specifically tailored to issues of scalability and user centric attitudes

Interviews revealed that for these leading organisations:

- Success depended upon building to scale from the outset
- Reaching out to users on a regular basis to test products was essential
- There was a strong desire to clarify social impact of work
- Sustainable business models were essential, but tough to prove
- Partnerships were essential
- MNO partnerships were fruitful but hard to set up