Mobile at the Base of the Pyramid: Zambia
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### List of Acronyms

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<th>Definition</th>
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<tr>
<td>API</td>
<td>Application programming interface</td>
</tr>
<tr>
<td>App</td>
<td>Mobile application</td>
</tr>
<tr>
<td>BoP</td>
<td>Base of the pyramid</td>
</tr>
<tr>
<td>CPC</td>
<td>Cost per click</td>
</tr>
<tr>
<td>CPM</td>
<td>Cost per thousand impressions</td>
</tr>
<tr>
<td>DCB</td>
<td>Direct carrier billing</td>
</tr>
<tr>
<td>ICT</td>
<td>Information communication technologies</td>
</tr>
<tr>
<td>IFC</td>
<td>International Finance Corporation</td>
</tr>
<tr>
<td>IP</td>
<td>Internet protocol</td>
</tr>
<tr>
<td>MEST</td>
<td>Meltwater Entrepreneurial School of Technology</td>
</tr>
<tr>
<td>MNO</td>
<td>Mobile network operator</td>
</tr>
<tr>
<td>OS</td>
<td>Operating system</td>
</tr>
<tr>
<td>RIA</td>
<td>Research ICT Africa</td>
</tr>
<tr>
<td>RoP</td>
<td>Rest of the pyramid</td>
</tr>
<tr>
<td>SMS</td>
<td>Short message service</td>
</tr>
<tr>
<td>USSD</td>
<td>Unstructured supplementary service data</td>
</tr>
<tr>
<td>VAS</td>
<td>Value-added services</td>
</tr>
<tr>
<td>VAT</td>
<td>Value-added tax</td>
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</table>

*All dollar amounts are U.S. dollars unless otherwise indicated.*
Mobile applications (apps) in Zambia are in the formative stage—there are very few revenue-generating apps and even fewer that target the base of the pyramid (BoP).

Apps can be used as standalone applications or to support or complement products or services. Another use is for content delivery. Products and services offered via mobile phones are further differentiated as mobile services, mobile applications, and the mobile web.

- Mobile services include premium SMS, USSD, and voice services, which can be offered to any mobile user including basic phone users. These services are in the scope of this study as they cater to 80 percent of base of the pyramid (BoP) users, who mostly use basic phones. These services can be integrated with mobile apps and mobile web services.

- Mobile web services are services provided through mini browsers such as Opera Mini.

- Mobile applications are software packages that run on feature and/or smartphones with different operating systems (Symbian OS, Android, iOS, etc.).

All three services—mobile services, mobile web and mobile applications—can be combined in a set of products. For instance, customers can send requests via premium SMS to have analytics delivered to their businesses via a mobile application or mobile web. Mobile web, as such, is outside the scope of this study, but it is included where it is used in the context of mobile apps or services. Most websites have a mobile web view, but including mobile web in this mobile app study would mean including most e-commerce sites.
BoP in Zambia

This section draws on an ICT survey conducted by Intelecon and Research ICT Africa in 2010. The results of the survey are nationally representative. However, due to the sampling methodology, the results could not be disaggregated into the bottom of the pyramid (BoP) and the rest of the pyramid (RoP), as in the other country case studies. Also, the results are from 2010 and somewhat dated. Mobile penetration, for example, is considerably higher, even taking into account the high levels of SIM duplication (duplicate SIMs are estimated at around 26 percent in Zambia). ZICTA estimates mobile penetration at over 10 million, but it is more likely to be around 7 million unique users.

Formal banking penetration is low in Zambia and only 27.8 percent of adults had bank accounts with formal financial institutions in 2010. While Zambia is a good target for mobile money due to the lack of formal banking, it has not yet seen widespread adoption. One of the main problems is the lack of liquidity among agents, particularly those of the

<table>
<thead>
<tr>
<th>TABLE 1: Survey Results for Zambia 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Percentage of Population</strong></td>
</tr>
<tr>
<td>---------------------------------</td>
</tr>
<tr>
<td>Do you have a bank account (bank or post office)?</td>
</tr>
<tr>
<td>Do you have a mobile phone? (figures in brackets are estimates based on subscriber numbers reported by operators)</td>
</tr>
<tr>
<td>Do you use mobile money?</td>
</tr>
<tr>
<td>Among 15+ mobile phone users</td>
</tr>
<tr>
<td>Facebook, Twitter, MXit or other social networking</td>
</tr>
<tr>
<td>Browsing the Internet</td>
</tr>
<tr>
<td>Access farm prices and information</td>
</tr>
<tr>
<td>Do you ever use the Internet? (Gmail, Google, Facebook, MXit, email)</td>
</tr>
<tr>
<td>Among 15+ Internet users</td>
</tr>
<tr>
<td>First used the Internet on a mobile phone</td>
</tr>
<tr>
<td>First used the Internet on a computer or laptop</td>
</tr>
<tr>
<td>Signed up for any online social network (Facebook, etc.)?</td>
</tr>
</tbody>
</table>

Source: Intelecon & RIA

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2 Zambian Information Communication Technology Authority, 2013. Available at http://www.zicta.zm
3 The low banking penetration has been verified by other sources, such as the World Bank Global Financial Development Database, which has estimated formal banking penetration at 21.36 percent. Data available at http://tinyurl.com/oagwqnmz
4 According to latest data there are approximately 417,251 mobile money users, but it is unclear how many are active users.
dominant mobile money network, Airtel Money. A tie-up between Zoona and Airtel Money, in which Zoona will run the Airtel Money agent network and provide liquidity, may overcome this obstacle in the future.

In this scenario, what are the implications for mobile application development?

- 3 percent of Zambian mobile users browsed the Internet in 2010. This figure will have increased since as smartphone and feature phone prices have dropped considerably. For example, an entry level Android smartphone now costs $70.5


- Over 72 percent of Zambians do not own bank accounts. According to rough estimates, there are about 417,000 active mobile money users. This means that mobile money is has limited use as a means of collecting revenues and that mobile money growth has been meager since 2010. At this time, SMS or airtime-based payments offer the only feasible ways for Zambians to pay for apps or services. Another alternative is to use multi-sided platforms where the consumer does not pay but money is collected through conventional means like checks or bank transfers from companies and public institutions through subscription or advertisement models.
Evolution of App Adoption

Generally, app adoption takes place over three stages for BoP individuals.

- **Stage 1—Basic phone**: Here, services can only be provided via SMS or USSD. The 2010 survey of mobile use found that only 3 percent of Zambians had phones capable of browsing the Internet. This is likely to grow with the increasing penetration of 3G and adoption of feature phones and smartphones. According to rough estimates, about 90 percent of Zambians using phones use basic phones.

- **Stage 2—Feature phone**: Prices of feature and smartphones are declining and their penetration into the BoP segment is increasing. Feature phones open up another potential revenue source: web-based services made available through mini browsers such as Opera Mini. Stage 2’s advantage is that developers have more control over distribution and, therefore, revenue flows. However, control over revenue flows depends on the availability of other payment mechanisms such as mobile money.

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**FIGURE 1: Evolution of Mobile Adoption In Zambia**

<table>
<thead>
<tr>
<th>Stages</th>
<th>Stage 1: Mobile voice &amp; SMS</th>
<th>Stage 2: Mobile voice &amp; data</th>
<th>Stage 3: Mobile computing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue sources: Mobile operators</td>
<td>Airtime Share of premium SMS Share of mobile money fees</td>
<td>Airtime Share of premium SMS Share of mobile money fees</td>
<td>Airtime Share of premium SMS Share of mobile money fees</td>
</tr>
<tr>
<td>Revenue sources: Developer</td>
<td>Share of premium SMS</td>
<td>Web Share of premium SMS Share of mobile money fees</td>
<td>Share of app sales Mobile money revenue Web Share of premium SMS</td>
</tr>
<tr>
<td>Revenue sources: Third Party</td>
<td>Share of premium SMS Share of mobile money fees</td>
<td>Share of premium SMS Share of mobile money fees</td>
<td>Share of app sales Share of premium SMS Share of mobile money fees</td>
</tr>
<tr>
<td>Distribution channel</td>
<td>Mobile operators</td>
<td>Mobile operators Web</td>
<td>Mobile operators Web App stores</td>
</tr>
<tr>
<td>Technology</td>
<td>Basic mobile</td>
<td>Feature phone</td>
<td>Smart phone</td>
</tr>
</tbody>
</table>

The distribution of services and the collection of revenues are entirely controlled by the mobile network operators (MNOs), who charge between 60 to 70 percent of premium SMS revenues, after taxes and sales commissions. Revenue shares can be negotiated. Some operators prefer that app developers go through SMS aggregators, which further lowers the margins that developers receive from premium SMS. Typically, developer can expect around 15 percent of nominal value of premium SMS.

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6 USSD stands for Unstructured Supplementary Service Data. USSD is a protocol used by GSM cellular networks to communicate with the MNO servers. The most common usage of USSD is for mobile money services. Unlike SMSs, USSD messages create a real-time connection to the server during a session that remains open, allowing a two-way exchange of a sequence of data.
money, where developers no longer have to pay the high rates that MNOs charge for airtime payments. Mobile web typically uses PayPal or credit cards for payments. Advertisement revenues on the mobile web are limited by small screen sizes. Different screen sizes also make it difficult for developers to program apps for feature phones.

- **Stage 3—Mobile computing:** Smartphones open up a third revenue stream for developers: app sales, in-app sales or in-app advertisements. Zambia does not have MNO app stores; OS-based stores such as Google Play, iTunes, and BlackBerry stores are most popular. App developers can upload their apps to Google Play to be downloaded free by users. Paid downloads or in-app purchases are not possible as Google Play does not have commercial partners in Africa. A way around this is to partner with developers in other continents. App stores usually take a 30 percent share, leaving developers with 70%. This is a major improvement over premium SMS. Smartphones provide developers the widest choices for revenue collection and control over distribution. Smartphone penetration among BoP mobile phone users in Zambia is still very low, considerably below 5 percent. But this is expected to increase with cheaper Android-based smartphones coming into the market.

The ecosystem in stage 3 has widened to include additional players such as Google, Apple, Blackberry, Facebook, and Nokia. However, app developers targeting the BoP segment need to consider that 87 percent of the population is still in stage 1. This is changing rapidly, but transition to stage 2 and 3 will take time.

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7 The 2010 survey conducted by Intelecon and RIA found that 59,257 or 0.8 percent of the population had downloaded applications to their phone. Downloading applications requires a feature or smartphone.
A business must realize four goals: solve a problem, make a profit, obtain customers, and keep them.

Applied to app development, a developer has to choose a problem to solve and think about how to make money from solving it. Revenues need to exceed costs. The first important consideration is revenue sources. Obtaining customers is about choosing the right distribution channels and using suitable payment channels. Keeping customers is about continuously delivering value.

Decisions on distribution channels, revenue sources, and payments are intertwined. Most developers choose several combinations, either sequentially or simultaneously.

- Revenue sources: Fees and subscriptions, in-app advertisements, pay-per-download of content or apps, in-app purchases, and upgrade of free apps to paid feature-rich apps.
- Distribution channels: Via an app stores or directly to MNO subscribers as value-added services (VAS).
- Payment options: Premium SMS, mobile money, airtime, credit or debit card, and cash or checks.

The combinations of these determine the business models available to app developers. Broadly, there are three categories of business models in order of complexity: basic, freemium, and multi-sided platforms. The basic business model includes three versions: app store, VAS provider and content provider. The key feature of the freemium business model is that it is a blended model: free services are offered alongside premium paid services. The key feature of a multi-sided platform is that it facilitates transactions between two [or more] distinct yet interdependent customers.

**Basic Business Models**

The three basic business models are displayed in Figure 3.

**App Store**

The key feature of the app store model is that content or services are sold by app stores such as Google Play or Nokia’s Ovi Store. The developer gets a share of the value of the app. For example, in the Google Play store, a developer receives 70 percent and Google Play 30 percent. This applies to in-app purchases too.8

In this business model, these are the key questions that developers should ask:

- How does the developer gain visibility in the app store?
- What is the payment mechanism? Google Play does not allow a business in any African country to register as a merchant, so developers would have to go to other countries that act as intermediaries with Google.

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• What is the revenue share with the app store? The MTN App Store in Nigeria has a revenue share of 40/60, with 40 percent going to developers. In comparison, the revenue share for Google Play is 70/30, with 70 percent to developers.

• Are there any particular benefits of each app store choice and/or conditions of exclusivity? For example, local app stores may promote apps but require exclusivity in return. An example of the app store business model is the Zambian Draft Constitution app from Bongohive. The app’s purpose is to give Zambians a working knowledge of the constitution’s first draft. As the Zambian Draft Constitution is available for free on Google Play, this is not an ideal example, but if the app was charged for, the revenue share would be 70/30, with 70 percent going to the developer.

**VAS Provider**

The key feature of the VAS provider model is that content and/or services are distributed by bulk SMS, which is paid for by businesses or institutions. In this model, the distribution channel is not an app store, but the mobile network operator (MNO) network. These are the key questions that a developer should ask:

• Does the client provide the subscriber database or is it from a third party?

• How do developers market their services to businesses? Where do they find businesses that are interested in sending bulk SMSs to the developer’s customer base?

An example of the VAS provider business model is the Mukumiki product from SMSiZe. Mukumiki provides bulk SMS services to businesses,
institutions, individuals, and clubs. Clients send bulk SMSs through the Mukumiki webpage. Mukumiki a web-based app accessed through a desktop, not a mobile application, but the business model is the same.

Another example of the VAS provider business model is the Farm Prices app. Farm Prices is a mobile application managed by the Zambia National Farmers’ Union. It has two features: it provides market prices for commodities on a weekly basis; and it provides sellers with contact details of buyers. Both services are provided through premium SMS with its own short code. The livestock commodities included are cattle, goats, pigs, and sheep. The crop commodities offered are: beans, cassava, ground nuts, honey, maize, rice, sorghum, soybeans, sunflower, and wheat. Farmers pay the cost of a premium SMS for the service, which is Zambian kwacha 0.75 ($0.15).

Content Provider
The key feature of the content provider model is that customers pay for content and/or services through premium SMS or interactive voice response (IVR). Premium SMSs are distributed via the MNO network. The content provider receives a small revenue share of the premium SMS value, but the main portion goes to the MNO. These are key questions that developers should ask:

- What is the revenue share between MNO and developers?
- Is marketing done by the MNO? If not, how will developers ensure that customers are aware of their content or services?

Freemium Business Models
A layer of complexity is added in freemium business models. They are often used in conjunction with other business models, such as content provider models. This is a blended model: free services are provided along with paid premium services. Generally, there is a large user base for the free app, which is cross-subsidized by a smaller user base for the paid version. Paid users often comprise 10 percent.9 Paid subscribers access both free and premium services, hence the name freemium. Here are the key questions that developers should ask:

- What is the cost of providing content or services to free users?
- Do fees charged to paying customers cover free content and cost of operation?
- How many paid subscribers does the application need to break even?
- How quickly or often do free subscribers convert to paid subscribers?

There are no examples of the freemium business model in Zambia.

Multi-Sided Platform Business Models

Multi-sided platform business models contain complex combinations of all three dimensions: distribution channels, payment facilities, and revenue sources. Newspapers are a simple example of a multi-sided platform. Newspapers can be sold below cost to attract more readers, but can charge more for advertisement space, effectively cross-subsidizing the newspaper for its readers. The key features of a multi-sided platform business model are:

- **Network effect**—the platform’s value is dependent on the number of users on each side. The larger the number of users on one side, more the value for users on the other side.
- **Facilitator**—a multi-sided platform facilitates transactions between different customer bases.
- **Distinct customers**—the business model can differentiate between different customer segments, charging distinct prices within each segment.
- **Interdependent prices**—prices are interdependent, lowering the price on one side allows an increase in price on the other side.
- **Prices are independent of cost**—allowing free downloads of apps is less than the cost of developing apps. Revenues to cover costs are generated from the other side.
- **There are two variations in the multi-sided platform business model.** In the first version, customer segment A gets services for free (or heavily subsidized) while customer segment B pays for the services. In the second version, customer segment A pays to advertise to customers of segment B (usually consumers), thereby allowing the platform to subsidize content to consumers.

Here are key questions that developers should ask:

- How can developers attract sufficient A and B customers?
- Which side (or segment) is more price sensitive?
- What is the optimal pricing for interdependent markets? Free or low payment for one side and higher charges for the other, or more balanced payments?

Zaplaces and Zhappening in Zambia are examples of how advertising revenues can be obtained on a multi-sided platform. The advertising revenue model generally requires an intermediary to match advertisers with app developers or publishers.
The attractiveness of a publisher to an advertiser depends on the size of its subscriber base. Businesses are charged a subscription fee to advertise within the Zaplaces or Zhappening apps.

**Conclusions**

App developers must choose the best combination of distribution channels, payment facilities, and revenue sources to succeed. The bulk of potential customers still use basic phones. Feature phones and smartphones make up only 10 to 15 percent of the mobile subscriber base. Apps programmed for smartphones need to generate enough revenues from smaller numbers of subscribers to sustain app development, in contrast to apps developed for feature phones. Designing products and services such as multi-sided platforms are the most effective way to achieve scalability. Multi-sided platforms offer the most promising business model for apps, particularly because existing payment facilities are uneconomical. However, this business model is sparingly used.
Very few revenue-generating applications in Zambia include BoP users in their target markets. Three are listed in the table below, along with their distribution channels, payment facilities, platforms, and revenue models.

While the various OS App Stores are the major distribution platform in Zambia, two of the three apps highlighted below bypass formal app stores and are distributed independently. Two of the three use formal banking facilities and payment does not occur in-app but separately.

iSchool Zambia

iSchool Zambia is considering a unique blend of business models. It now operates a standard content provider model in which educational content is provided to schools and students. However, it is also looking at launching a multi-sided business model where customized Android software provides a platform for socially beneficial apps in sectors such as eHealth and eGovernment.

In its basic form, iSchool Zambia is a bundled eLearning solution that covers the Zambian primary school curriculum. It provides over 6,000 detailed lesson plans for teachers. For students, it provides thousands of colorful, interactive multi-media lessons in English and eight local languages. It also has a one-year professional development course for teachers, which guides them towards a new style of teaching and learning.

iSchool provides the hardware and the software for eLearning. The ZEduPad is a low-cost, low-power tablet, imported from China. It comes pre-loaded with all learning content, and can be charged with solar power. There are home, school, and teacher versions. The home version includes eHealth applications, a scaled-down version of Wikipedia, word processing, spreadsheet, and presentation applications. The school version has only the primary school curriculum. The teacher version includes lesson plans and a professional development course. All versions use a customized Android operating system.

iSchool Zambia revenues come from two sources: schools purchase the tablets, storage cabinets, solar power panels, and battery-powered projectors, at around $6,000 for the basic package. There are no subscription costs and all updates are free. The ZEduPad has a landed cost of $100; iSchool Zambia has opened a retail store where the home version is sold at $200.

A key challenge is to finance schools so they can purchase the iSchool Zambia package. The $6,000 price tag is very high for schools.

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TABLE 2: App Summary

<table>
<thead>
<tr>
<th>Distribution Channel</th>
<th>Payment Facilities</th>
<th>Platform</th>
<th>Revenue Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>iSchool Zambia</td>
<td>Independent</td>
<td>Formal banking facilities</td>
<td>Android</td>
</tr>
<tr>
<td>Farm Prices</td>
<td>Independent</td>
<td>Premium SMS</td>
<td>SMS/ USSD</td>
</tr>
<tr>
<td>Zhappening &amp; Zaplaces</td>
<td>Google Play &amp; iTunes</td>
<td>Formal banking facilities</td>
<td>Android &amp; iOS</td>
</tr>
</tbody>
</table>
The iSchool Zambia's customized Android software provides a platform for other products and services, currently not available in Zambia. iSchool Zambia plans to open an app store where users can download the iSchool syllabus to their Android smartphones. Other applications in the eHealth and eGovernment sectors will also be available.

Apps That Are Not Revenue-Generating

**National Agricultural Information Service (NAIS)**

The National Agricultural Information Service (NAIS) operates a SMS-based service to answer agriculture-related queries from farmers. SMSs are charged at standard rates (that is, not at premium SMS rates). NAIS is investigating providing voice services as well. The service is available in two provinces, Lusaka and Kasama. The target market is around 20,000 farmers and penetration is currently around 4000 farmers or 20 percent of target. The NAIS service does not generate revenues.

**Bantu Babel**

Bantu Babel is a translation app for all major Zambian languages. It includes translations of useful survival phrases in all major languages. The application works off-net. Currently, Bantu Babel has around 1,000 downloads. There are no revenue streams but the publisher is investigating advertising as a means to earn revenues.
Generation of revenues is at the heart of any business model. App developers have to make a choice about how they will make money from their products and services: fees and subscriptions, in-app advertisements, pay-per-download of content or app, in-app purchases, or the upgrade of a free app to a feature-rich paid app.

Globally, advertising and app purchases are the dominant mechanism for revenue generation (see figure 11). The trend in 2013 also shows a shift towards advertisements, in-app purchases, and freemium models.

Developers in Zambia have, in principle, the same choices as developers anywhere else, but are constrained by the following market factors:

- Smartphone penetration is still quite low in Zambia.
- MNOs own the distribution channels—via their SIM cards—to subscribers and take revenue shares of between 60 to 70 percent for content delivery.
- There are no local app stores.

The various revenue sources available for app developers in Zambia are discussed in the sections following.

**USSD/SMS-Based Content or Services**

Value-added services such as ringtones, wallpapers, and daily horoscopes have been offered for many years. Any developer considering providing services or content via this channel needs to be aware that subscribers, networks, and payment facilities are all in the hands of MNOs. The revenue share for developers is relatively small. At the same time, this is the most effective channel to reach large numbers of BoP customers. Apps using this channel should try to ensure that premium SMS is not the only revenue source and that it is complemented by others. An example of an SMS-based content service is Farm Prices, operated by the Zambia National Farmers’ Union, which provides agricultural price information to farmers.

<table>
<thead>
<tr>
<th>TABLE 3: Revenue Sources</th>
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</thead>
<tbody>
<tr>
<td>In-app advertisements</td>
</tr>
<tr>
<td>Pay-per-download</td>
</tr>
<tr>
<td>In-app purchases</td>
</tr>
<tr>
<td>Freemium</td>
</tr>
<tr>
<td>Subscriptions</td>
</tr>
</tbody>
</table>
App Purchase, App Upgrade and In-App Purchases

The mechanics are the same when launching products through Google Play, Facebook, iTunes, etc., independent of the developer’s location. However, in practice, there are limitations. By far the most attractive platform for African app developers is the Google Play store because of its revenue split of 70/30 in favor of developers and relatively straightforward and transparent procedures for registering apps. 10 Though the Google Play store is popular, the list of countries in which developers may register as merchants does not include a single African country.11 This means that developers are either restricted to free apps on Google Play or have to work through partners registered as merchants on other continents. Another option is to sell through an operator app store, but none are operational in Zambia. Multinational operators may have an agreement with Google to act as merchants in all countries in which they operate. Payment is then made from the user to the operator and from the operator to the developer. The revenue share is thus likely to be lower compared to directly selling through the Google Play store.

In addition to selling applications, revenues can be generated by selling upgrades with more features or allowing in-app purchases. In Zambia, there are no examples of apps that use these revenue sources and include BoP users in their target markets.

In-App Advertisement

In-app advertisements represent a promising source of revenue for app developers in Africa. The advertising model generally requires an

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10 Visionmobile, 2013
intermediary to match advertisers with app developers or publishers. The attractiveness of a publisher to an advertiser depends on the size of its subscriber base. This is the key characteristic of a multi-sided platform. There are no mobile advertising platforms in Zambia. Individual apps like Zhappening and Zaplaces from the publisher Venivi Limited are attempting to create their own multi-sided platforms by acting as intermediaries between businesses and consumers. The distinguishing characteristic of a multi-sided platform is that prices for one group are independent of prices for the other group. Businesses are charged subscription fees to advertise within the Zaplaces or Zhappening apps. However, Zaplaces and Zhappening are targeted at wealthy urban consumers and do not include the BoP as part of their target markets.

Other Revenue Sources
Revenues can be generated by several other means. Apps can be commissioned by public institutions such as schools, clinics, or companies. These kinds of contracts can subsidize the development of other applications.

iSchool Zambia, an educational software and hardware company, falls under this model. It opened its first retail store in November 2013, in Manda Hill in Lusaka. ZEduPad, an Android-based learning application, is sold there. It plans to launch an app store in the near future.

Apps can be designed to support business processes, manage information, and/or receive and make payments. Revenues are thus generated by the supported business processes and not by the app.

Conclusions
Unlike Nigeria and Ghana, advertising revenue is not a viable revenue source for apps targeting the BoP. The market is not yet developed and there are no app advertising platforms. Subscription and freemium models are viable. However, outside of standard business models, particularly in the VAS space, few Zambian apps successfully charge customers. iSchool Zambia has adopted an innovative model that could have a significant impact in Zambia if the soon-to-be-launched app store is a success.

The path to monetization in Zambia is extremely challenging. Several app developers have to supplement incomes through contract work to cross-subsidize app development. Although there are several possible revenue sources, few are practically available because of the lack of payment facilities. The challenge is to match revenue sources with available payment facilities.

Freemium
The freemium model provides a basic service for free and then encourages consumers to purchase additional features at a price. The freemium business model reduces risk by allowing consumers to test out the product or service and then decide whether they want to purchase more features. This is a good model for the BoP market because it provides risk-free trials and the low-income consumers can clearly understand the benefits of the additional services that paid product upgrades would provide.

Subscription
Monthly subscriptions are an attractive revenue source because of the stable cash flow they provide. Companies pay for a range of services, such as delivering bulk SMSs to their customers, allowing customers to request information, and informing farmers about market prices. While there are several companies offering bulk SMS services, none could be identified as app-based.
Payment Facilities

There are four main payment options for app developers to collect revenues: operator-based, mobile money, bank-based, and others. Operator-based payment facilities include premium SMS and airtime transfer. Mobile money can be operator-based or bank-based, depending on regulatory frameworks. Bank-based payments are electronic transfers, checks, or debit and credit cards. A fourth category, that is not bank or operator-based, comprises scratch cards and vouchers. The cost of collecting revenues and degree of availability varies, depending on the facility.

The upper limit (in terms of the number of potential customers) that an app developer can target is around seven million, which is the estimated number of Zambians that owned mobile phones in 2013. Only 2.3 million Zambians have some banking facilities (including post office bank

12 Estimated unique users taking into account duplicate SIM cards

FIGURE 13: Payments Facilities Zambia
accounts), so this reduces the customer base sharply. The number of Zambians with credit or debit cards could not be reliably established but it is significantly lower than those with formal bank accounts. Vouchers and scratch cards potentially target the entire mobile user base, but distribution channels would need to be built up from scratch and the actual target market would be local, unless app developers distribute vouchers along operator airtime channels. This would entail a significantly lower revenue share.

**Premium SMS**

Premium SMSs are similar to ordinary SMSs. However, instead of content they contain a payment instruction. When a subscriber sends a premium SMS, her/his airtime is reduced by a specified value, usually higher than the cost of a standard SMS. Because these messages involve a premium fee, they incorporate a special number (known as a ‘short code,’ consisting of 4 to 8 digits).

Premium SMS is the most attractive payment facility because of a target market that consists of around 7 million mobile users. The economics of premium SMS will make it very difficult for new entrants into the app economy to make money unless the app attracts significant volume. In Zambia, the average cost of a premium SMS is Zambian kwacha 2 ($0.35). The dominant SMS aggregator is AfriConnect. Mobile operators typically take between 60 and 70 percent of after-tax revenues. If the volume is below 25,000 SMSs, the remaining 30 to 40 percent is shared equally between AfriConnect and the developer (or publisher). If the volume is greater than 25,000, AfriConnect receives a lower share, down to 30 percent (after operator revenue share and taxes), depending on the volume of SMSs. Table 4 compares the two scenarios: sending premium SMS directly with an MNO. Tax, (both VAT and regulatory tax), is deducted from the nominal premium SMS value, leaving the after-tax revenue to be shared between MNO, SMS aggregator, and developer. Finally, the table estimates number of premium SMSs required for the developer to earn $5,000 per month.

App developers can bypass SMS aggregators such as AfriConnect and get much higher percentage of revenues. There are indirect costs, though, to this approach because developers have to negotiate with each MNO on revenue shares, and payment terms can be disadvantageous. AfriConnect operates its own premium SMS gateway, so payments are received directly and not through MNOs, leading to quicker payments to developers.

Depending on whether the app developers use SMS aggregators or negotiate directly with MNOs, volumes have to be significant to achieve sales of $5,000. Going via SMS aggregators and charging Zambian kwacha 2 for each premium SMS means the app developer must sell at least 74,236 SMSs to make $5,000. The volume required to make $5,000 is less at 51,965 if app developers bypass SMS aggregators (though there are additional indirect costs).

In addition to VAT and regulatory taxes on premium SMSs, the regulatory authority, the Zambian Information Communication Technology Authority (ZICTA), requires all commercial users to pay a premium SMS license fee per short code. The charge is $3,000 for a new short code and $2,000 for annual renewal. SMS aggregators such as AfriConnect can reduce this cost by providing short codes on pro rata basis (for as long as a promotion lasts) but this is generally used for competitions that last a short period of time.

ZICTA does not charge a licensing fee if the premium SMS is for non-profit, NGO, or government use. For new app developers,

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14 Operators can take up to 6 months to pay.
providing a non-profit service to test premium SMS models may be an alternative approach. If the market is viable, developers could transition towards a commercial model.

The high upfront costs—specifically the regulatory license fee of $3,000—explains why premium SMS generally remains the preserve of mobile operators, with few app developers using premium SMS as a payment facility. However, there is room for experimentation because ZICTA does not charge fees for non-commercial premium SMSs.

**Airtime**

Airtime is, theoretically, an alternative to premium SMS as a payment facility. It has the same attractive features: a potential subscriber base of around 7 million and a payment method with which all subscribers are familiar. However, there are two challenges: first, it cannot be easily integrated into an app but requires a separate transaction where the buyer has to send airtime to the seller and assume that the seller will honor the transaction. Second, mobile operators oppose the use of airtime as a payment mechanism and developers have not integrated airtime as a payment facility in Zambia. Also, airtime as a payment facility involves the challenge of cashing out: the accumulated airtime has to be resold for cash.

**Direct Carrier Billing**

Direct carrier billing (DCB) is the direct deduction of mobile airtime when a consumer buys an app. When compared to premium SMS, DCB offers greater flexibility—payment can be deducted in-app rather than by sending or receiving an SMS. Also, DCB is integrated directly into the MNO’s billing platform.

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### TABLE 4: Premium SMS

<table>
<thead>
<tr>
<th></th>
<th>Via AfriConnect</th>
<th>No SMS Aggregator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premium SMS value</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>VAT (16%) in Zambian kwacha</td>
<td>0.16</td>
<td>0.16</td>
</tr>
<tr>
<td>Regulatory tax (10%) in Zambian kwacha</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>After tax revenue in Zambian kwacha</td>
<td>0.76</td>
<td>0.76</td>
</tr>
<tr>
<td>Operator share (65%) in Zambian kwacha</td>
<td>0.49</td>
<td>0.49</td>
</tr>
<tr>
<td>Revenue remaining after tax and operator share in Zambian kwacha</td>
<td>0.26</td>
<td>0.26</td>
</tr>
<tr>
<td>SMS aggregator share in Zambian kwacha</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>Developer share in Zambian kwacha</td>
<td>0.19</td>
<td>0.19</td>
</tr>
<tr>
<td>Developer share of nominal premium SMS value (%)</td>
<td>19%</td>
<td>19%</td>
</tr>
<tr>
<td>Premium SMS received to raise 27,500 Kwacha ($5,000)</td>
<td>148,472</td>
<td>29,694</td>
</tr>
</tbody>
</table>

Source: Author interviews & calculations

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15 One of the reasons mobile operators oppose using airtime as a payment method is that Central Banks tend to discourage it because it can potentially become an alternative currency and it can hide money laundering.

16 In Nigeria, Greenspek, developer of apps such as Exam Success Points, My Abuja, and First Aid, initially used airtime as a payment facility, but reported that users were reluctant to pay because they were concerned that their airtime payment would disappear and the app download would not take place.
In terms of revenue share, DCB is far more attractive than premium SMS as operators typically receive between 10 percent and 20 percent of revenues rather than the 60 percent to 70 percent, which is typical of premium SMS. DCB is not available in Zambia.

Mobile Money

Mobile money has the potential to be a major payment facility for mobile applications. Its main limitation is its lack of penetration, particularly outside urban areas. Superficially, mobile money in Zambia is very attractive: Airtel Money alone reports more than 1.2 million users. But these high numbers disguise the fact that very few subscribers are active users. Airtel Money is a default option for new Airtel subscribers but few go on to use the service. Airtel Money agents have struggled with liquidity and potential customers have been turned away. Active users are less than 10 percent of the 1.2 million subscribers. Similarly, MTN Mobile Money has around 700,000 subscribers but active users constitute 7 percent of the total (49,000 subscribers).17

Zoona

Distinct from the MNOs, Zoona is an independent mobile money operator. While Zoona provides traditional mobile money services, it is also trying to grow the small business ecosystem by offering working capital financing packages linked to customer use and growth of Zoona mobile money. In other words, the higher the Zoona mobile money used by a small business, the more working capital that business can access. At this stage, Zoona is focused on expanding its mobile money transactions and integrating Airtel Money’s operations. Zoona is taking over Airtel Money operations including its agent network and addressing the lack of liquidity experienced at Airtel Money agent locations.

None of the mobile applications identified have integrated with Zoona, but discussions are going on with Bongohive. Zoona has raised $4 million from Omidyar Network and Accion Frontier Investments, $800,000 converted debt from Sarona Asset Management, as well as founders’ money. Zoona has 180 agents spread around the country and has 347,584 senders and 446,510 receivers of mobile money transfers. It is currently growing at 20 percent a month. The minimum transfer amount is Zambian kwacha 5 and the maximum is 5,000. Average transfer value is Zambian kwacha 300.

Because of Airtel Money’s liquidity problem, consumers pay an additional fee to guarantee the option of cashing out at a Zoona agent. While the Zoona guarantee is relatively small, it means Zoona is not a viable micro-payment processor. The transaction fee for transferring Zambian kwacha 25 is 20 percent of the value of the transaction or Zambian kwacha 5. As liquidity problems within the mobile money ecosystem are addressed, the additional Zoona fee may not be necessary.

Another major obstacle is the high cost of a cash-to-cash transaction. A minimum of 3 percent

<table>
<thead>
<tr>
<th>Transfer amount</th>
<th>25</th>
<th>100</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>750</th>
<th>1500</th>
<th>2500</th>
<th>3500</th>
<th>4500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash in</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>Transfer fee</td>
<td>0.5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Cash out at Airtel Money</td>
<td>2.5</td>
<td>2.5</td>
<td>5</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Cash out at Zoona agent</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>Total cost cash-to-cash</td>
<td>5</td>
<td>5.5</td>
<td>10</td>
<td>19</td>
<td>21</td>
<td>41</td>
<td>72</td>
<td>93</td>
<td>113</td>
<td>133</td>
</tr>
<tr>
<td>Total cost cash-to-cash in %</td>
<td>20</td>
<td>5.5</td>
<td>5</td>
<td>6.3</td>
<td>5.3</td>
<td>5.5</td>
<td>4.8</td>
<td>3.7</td>
<td>3.2</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Zoona website, interview & author calculations
for Zambian kwacha 4500 is high compared to international standards. It means Zambians will prefer to deal in cash where possible.

Vouchers and Scratch Cards

Vouchers and scratch cards are ideal for local prepaid services. No app in Zambia uses vouchers. While not necessarily suitable for app stores, vouchers can be used to activate subscriptions for mobile services that target mobile users in particular locations, such as farmers requiring market prices. In Zambia, Zoona uses scratch cards to distribute specific benefits to consumers on behalf of clients. For example, the World Food Program uses vouchers to ensure that the correct beneficiaries receive food parcels. Other clients have been agricultural suppliers, The Ministry of Community Development and Social Services, food suppliers, and aid agencies.

Conclusions

Premium SMS is the most viable payment facility in Zambia due to the large numbers of subscribers still using basic and feature phones. Revenue shares are negotiable with MNOs, though dependent on subscriber volumes. The lack of viable alternative payment facilities (including mobile money) make premium SMS as a workable option. The possibility of bypassing premium SMS license fees if the app is non-commercial allows for greater experimentation among app developers.

Scratch cards could also be a viable option, especially since a vendor (Zoona) is successfully operating in Zambia. This is an untested model, but worth considering.
Distribution Channels

The availability of mobile applications depends on distribution networks. Distribution can take place through app stores, mobile operators (through USSD services, for example), or through local distribution networks.

Using USSD or SMS-based services to deliver content has the advantage of having the distribution channel already in place through mobile networks. This is the main justification given by operators for their high revenue shares. In addition, operators actively market VAS content on their platforms. App developers also have the choice of operator app stores, operating system (OS) app stores, independent app stores, or local app stores. There are several options for global stores. The basic features of each global OS store are summarized in the table below.

Distribution is driven by the size of the consumer market and estimates of its potential growth. For example, BlackBerry is still a viable platform in Africa because of the large number of consumers that have BlackBerry phones, while in North America and Europe, developers are moving away from BlackBerry.

Android and iOS dominate with nearly two-thirds market share. Mobile web (especially HTML5) has a significant market share of around 17 percent.

Blackberry App World and Google Play are currently the best options to distribute apps in Zambia. Samsung, Airtel, and MTN are reportedly launching app stores, but no timelines have been given.

<p>| TABLE 6: OS App Store Features |</p>
<table>
<thead>
<tr>
<th>Name</th>
<th>Established</th>
<th>Revenue Share</th>
<th>Total Number of Apps (approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple App Store</td>
<td>2008</td>
<td>70/30</td>
<td>→1 million</td>
</tr>
<tr>
<td>BlackBerry World</td>
<td>2009</td>
<td>70/30</td>
<td>235,000</td>
</tr>
<tr>
<td>GetJar</td>
<td>2004</td>
<td>Free</td>
<td>750,000</td>
</tr>
<tr>
<td>Nokia Ovi Store</td>
<td>2009</td>
<td>70/30</td>
<td>120,000</td>
</tr>
<tr>
<td>Samsung App Store</td>
<td>2009</td>
<td>70/30</td>
<td>Unknown</td>
</tr>
<tr>
<td>Windows Phone Store</td>
<td>2010</td>
<td>70/30</td>
<td>125,000</td>
</tr>
</tbody>
</table>

Source: App store websites
TABLE 7: Primary Platforms Used by Mobile Developers

<table>
<thead>
<tr>
<th>Platform</th>
<th>Percentage of Developers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Android</td>
<td>34.4</td>
</tr>
<tr>
<td>iOS</td>
<td>32.7</td>
</tr>
<tr>
<td>HTML5 mobile</td>
<td>17.3</td>
</tr>
<tr>
<td>Windows Phone</td>
<td>4.5</td>
</tr>
<tr>
<td>BlackBerry</td>
<td>4.2</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: Visionmobile, 2013

TABLE 8: Distribution Channels Available in Zambia

<table>
<thead>
<tr>
<th>Operator app stores</th>
<th>MNOS have not launched app stores.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS app stores</td>
<td>International stores such as Google Play and BlackBerry World are the primary distribution platform for the smartphone market. Uploading on Google Play is free and revenues are split 70/30. There is no payment facility available in the African continent for Google Play, so apps targeting Zambians are free.</td>
</tr>
<tr>
<td>Handset app stores</td>
<td>BlackBerry World is the app store for Blackberry devices. BlackBerry World has 120,000 apps and payment can be made by credit card and PayPal (some countries can pay by carrier billing but this is not available in Zambia). BlackBerry World is the third largest app platform in the world, after iOS and Google Play. Due to its efficient compression technology—resulting in lower bandwidth usage—Blackberry is one of the most popular smartphones in Africa and is still seen as a viable development platform, despite its declining user base in Europe and North America. Handset app stores such as Samsung and Nokia have app stores, but do not have local branches in Zambia.</td>
</tr>
<tr>
<td>Third party app stores and websites</td>
<td>GetJar is a major third party OS store. GetJar is third party because it is independent of handset operators (such as the Nokia Ovi Store) and also OS stores (such as iTunes, Google Play, and BlackBerry World). Uploading apps onto GetJar is free and there is no revenue share requirement. This is an attractive app store from a revenue share perspective, but its awareness among BoP consumers, when compared to websites such as waptrick.com, is low.</td>
</tr>
</tbody>
</table>
Conclusions & Recommendations

The app environment in Zambia is relatively small and undeveloped. There are several constraints in the market:

- Revenue streams—with the exception of USSD and SMS, few models have been tested and awareness among consumers is low.
- Payment facilities—between a quarter and a third of Zambians have access to formal banking facilities, so there is a large unbanked population. Mobile money suffers from low active use. Premium SMS remains the most viable and attractive payment mechanism.
- Distribution models—local app stores do not exist. Global app stores such as BlackBerry App World and Google Play are available, but there is no local presence creating app awareness and visibility among consumers.

As a result, very few apps meet the criteria of generating revenues and including the BoP within their target markets.

The most innovative app in Zambia is iSchool Zambia. iSchool Zambia has an innovative distribution model: it is a bundled service that provides both hardware and software. The ZEduPad is distributed via schools or through its retail store in Lusaka. The ZEduPad includes a customized version of the Android operating system that provides a closed ecosystem that includes socially beneficial applications within a commercial operating model. The closed ecosystem represents an opportunity to launch an app store that targets socially beneficial apps, where content and quality can be ensured. This is an untested model in Zambia but represents an innovative alternative to the lack of local app stores and associated lack of visibility and awareness.

Few developers have resources to launch their own app stores. As such, here are several recommendations targeted at new and emerging app developers. The first set of recommendations is directed at industry and policy levels:

- One measure to improve the app ecosystem would be to push for direct carrier billing (DCB). DCB has a five times higher conversion rate than credit cards18 and offers more security and flexibility than premium SMS. DCB as a payment facility has seen 300 percent year-on-year growth rate on Google Play19 and has the potential to transform the app economy in Zambia.
- Apart from Bongohive, which is an app incubator and focused on developers, app stakeholders are not represented in the ecosystem. In Ghana, app developers are represented by the Wireless Application Services Providers Association of Ghana (WASPAG). Its purpose is, among others, to ensure that industry stakeholders earn a fair return on their investments. There is a similar need in Zambia, particularly to address issues such as consumer protection, direct carrier billing, payment facility transaction fees, and developer education and skills. A wireless industry association would be useful in advocating, for example, the removal of ZICTA’s premium SMS licensing fees.

Recommendations for app developers include:

- Premium SMS is the most viable payment facility available in Zambia and provides access to around seven million subscribers. Depending on volumes, operators are prepared to offer better terms than the common 70/30 share (MTN is already lower at 65 percent revenue share). Developers with significant

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19 Mobile Payments Today, 2013
subscriber numbers can negotiate for better revenue shares with SMS aggregators and MNOs. Recommendation: Negotiate with operators on premium SMS. There is also a role for aggregators to negotiate on behalf of developers with MNOs—by aggregating volumes, better revenue shares can be negotiated. Finally, industry advocacy groups can lobby with MNOs to offer better revenue shares to grow developer communities and encourage locally generated content.

- Multi-sided platforms are generally unexplored in Zambia when compared to Nigeria and Ghana. The proportion of BoP subscribers (as a percentage of the overall population) is similar. Apps such as Nandimobile from Ghana represent opportunities that could be explored in Zambia. Recommendation: Explore this opportunity. The benefit of the multi-sided platform model is that it bypasses payment facility bottlenecks for consumers. By providing the app and its content for free to consumers, the developer can build its subscriber base, becoming more attractive to businesses targeting these consumers. The key challenge is solving a problem for these two markets: businesses on the one hand and consumers on the other. Several examples can be found in the summary.

- Advertising is a potentially profitable avenue but revenues to date are insignificant. This is a model that depends on local information and is most likely to be one of several revenue streams. Once critical mass has been reached, businesses or third party advertisers can be approached for ad placements. As apps collect data about their subscribers and the retail sector continues to expand, there is a potential match between advertisers and app developers. Recommendation: Experiment with alternative revenue sources such as advertising. Zaplaces and Zhappening are innovative approaches in Zambia that are slowly building an advertising market. The Zambian app advertising market is still in its infancy but it will develop over time.
References


Mobile at the Base of the Pyramid: Zambia