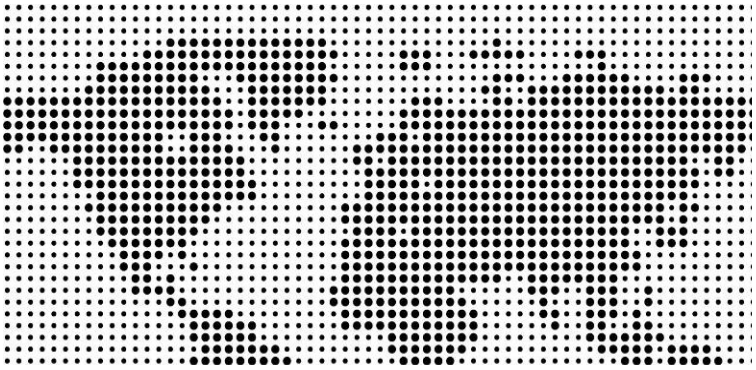
3G Applications and Services in Emerging Markets



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[1] Executive Summary

Emerging markets are of great interest to the entire wireless ecosystem. They provide tremendous opportunities for product and service growth while substantially improving the quality of life for residents. At the same time, they pose significant business model and technology challenges. This paper discusses how operators utilize innovative business models and 3G technologies to deliver popular and profitable data services in emerging markets countries.

Emerging Markets Regions

[2] Emerging Markets and their Significance

Emerging markets comprise about 20% of world's economies and 85% of the world's population[1]. They include most countries in Latin America, Africa, the Middle East, Central & Eastern Europe and many parts of Asia Pacific with notable exceptions[2]. They are attractive markets for wireless operators for multiple reasons including that they are expected to provide 87% of net adds worldwide between 2007 and 2010, and expected to provide 5 to 6 times greater GDP growth than developed countries in a similar period[3]. Moreover, providing wireless communications to these otherwise largely unconnected populations enables them to dramatically improve their quality of life. Such services facilitate employment growth and help improve education, medical care, and social services.

[3] Opportunities in Emerging Markets

Emerging markets have distinct socio-economic characteristics which offer many opportunities for businesses. From a device perspective, emerging markets often have low PC and LAN penetrations thus positioning handsets to offer data as well as for voice services.

From a communications services standpoint, voice use is typically under-saturated (e.g. penetrations < 50%), while data use is much less developed (e.g. < 5% have Internet access). As a result, there is usually considered to be great pent-up demand for both services. Wireless data services must themselves be tailored to run on low cost devices with little memory, low-end processors, and plenty of battery life. Such services must also be extremely easy to use.

[4] Need for Creative Business Models

Wireless operators in emerging markets have developed a variety of creative and effective business models. There are essentially three main formats that have proven successful in this regard. The first one involves using advertising to either subsidize or entirely pay for services. This approach has been successful in a broad range of wireless application scenarios such as music and game distribution, Internet browsing, social networking, and many others. The second model involves creating a variety of tariff structures that have low costs of entry. One version of this model involves amortizing the cost of a service over many users, such as sharing a broadband Internet connection in an Internet café. Another version involves offering services that have no fixed costs, but only small

[1] World Bank fact book, 2008
[2] Emerging markets countries notably exclude: Australia, Hong Kong, Japan, NZ, Singapore, S. Korea, Taiwan, Israel per Pyramid Research, 2008
[3] IMF, Jan 2009 & ECLAC, 2008

variable costs, such as paying for money transfers on a transaction basis, or listening to streaming music on a time charged basis. The last version of this model involves selling subscribers an essential service at an affordable price (e.g. Internet access on a pay as you go basis), and then cross-selling or up-selling optional services (e.g. music, video, or game contents). The third and final business model involves partnering with government and/or non-profit organizations to improve the health, education or welfare of a community. By doing so, operators can take advantage of subsidies, credit terms, and/or favorable tax policies. In the remainder of this paper, we will explore commercially successful 3G data applications and services which utilize each of these business models and leverage the many opportunities in emerging markets.

[5] Wide Range of Successful Data Services in Emerging Markets

A. Mobile Internet

Handheld mobile Internet access is very popular in emerging markets because handsets are much more prevalent than PCs. It is enjoying rapid uptake due to multiple factors, such as: (1) fast 3G connections – statistics show twice the uptake of browsing services with 3G versus prior technologies, (2) reasonably priced access plans, (3) the arrival of easy to use, fast-loading micro-browsers that run on little memory, and (4) widgets and quick launch icons. One example, Safaricom Kenya's Instant Internet service is focused on prosumers, small & medium sized businesses (SMB), and enterprise users. It offers push-email and organizer apps in addition to browsing. It also offers easy to use icons for launching popular applications like email, Facebook, etc, and is available on both basic handsets and smartphones. Instant Internet is charged on a usage basis at $0.10/MB on average, with only the phone cost as entrance fee. It has acquired an impressive 1.1M subscribers in 2008. Another example, Tata India's Mobile Internet is targeted to mass consumers. It takes advantage of small footprint browsers (100-160KB) from Opera & Novarra optimized for use on low end phones. At the same time, they offer full HTML capability in addition to WAP, and support text, image, and video with fast loading. Tata used a hybrid advertising plus subscription ($2/mo) model to achieve strong uptake of 1.3M users in less than 18 months. Mobile Internet browsing is enjoying fast uptake in emerging markets worldwide.

Safaricom, Kenya
"Instant Internet" service

Mobile Internet

- Open Internet access
- Basic handsets & Blackberries
- $0.10/MB on average
- 1.1 M subs in 1 yr Q1'09

B. Mobile Music

Music is a highly desired service in every culture, and with the advent of technology and business model refinements, a broad range of mobile music services have enjoyed success in emerging markets. Some of the technology advances include cost reductions of audio enabled devices, the introduction of higher speed 3G networks capable of downloading and streaming rich media to many users at once economically, and UI improvements that ease music discovery and purchase. Some business model advances include the reduction of music royalties and DRM protect-ions, the introduction of Ad subsidies and low flat rate pricing models, and the freedom to download music to any platform. One popular service embodying many of these advances is China Unicom's AnyMusic. It lets users download free music related contents like full-track songs, ringtones & wallpaper in exchange for viewing Ads embedded in the contents. This service has a simplified UI and is designed to work on low-end phones with small amounts of memory. It provides a good experience at CDMA2000 1X speeds and an excellent one at EV-DO or HSPA speeds. With

Airtel, India

"Live Music" service

On Demand Streaming Music

- 1.25 millions songs
- Multiple languages
- Create own playlist
- $0.60 for 30 minutes

CDMA2000 1X, China Unicom was able to acquire 1.7M subs in 14 months. Similar services were deployed by Iusacell, Mexico, Hutchison CAT, Thailand, and Tata, India with strong uptake.
Another prototypical example is Airtel India's Live Music. It is an on-demand streaming music service offering selection amongst 1.25 million songs from diverse categories and languages. It costs only $0.60 for 30 minutes with no setup fee. This and similar services are enjoying strong uptake in emerging markets given the popularity of FM radio (most handsets have FM receiver built in), the ability to use the service on low advantages over radio. Some of these advantages include the ability to choose one's own music and play any portion of it on demand. Other similar services let one create personalized play lists, identify songs and artist information as they play, and purchase/download music related contents instantly. Clearly there is a wide range of compelling music services and business models that are taking root in emerging markets.

C. Wireless Broadband

Wireless Broadband is one of the most fundamental services and core revenue drivers in many countries. It has been highly successful as a Fixed Broadband alternative given the lack of such infrastructure in many places and the high cost of laying new copper. After attaining a foothold in fixed broadband, 3G services are often extended to mobile use where they usually enjoy equal or better uptake.

One such example is Starcomms of Nigeria. Starcomms first addressed the fixed Broadband market with great success and then extended to mobility services as soon as licenses were available. They led the market with coverage, deploying EVDO Rel 0 in all Nigerian states rapidly, and adding Rev A in hotspots. Focused especially on the SMB, corporate and prosumer markets, Starcomms offered VPN & intranet services in addition to standard browsing/email. They offered pricing lower than existing DSL and cyber cafes (at $0.27 to $0.40/hour, and were able to achieve about 200K EVDO subs in first 2 years, with a target for 500K in the next 1-1/2 years.

Maxis, Malaysia

"Maxis Broadband" service

Wireless Broadband

- 2.2M 3G Subs in Nov '08
- 600K HSDPA subs, Jun '08
- HSDPA +16%
  ADSL - 20%

Another typical deployment is the fixed Broadband access service of Maxis, Malaysia. Maxis positioned their 3.6 Mbps HSDPA services squarely against ADSL, billing it as a high speed, portable solution for SMB and the home that is economically priced both against data only services and data/voice bundles. Their data only services were charged at flat rate of $18, $21, or $26/mo for 384Kbps, 640Kbps and up to 360 Kbps respectively. They also offered data/voice bundles that were aggressively priced versus landline telco bundles. Maxis offered multiple devices, including data cards, USB dongles, PDAs, and a special low cost, compact HSDPA/voice modem. Maxis acquired about 600K HSDPA subscribers in the two years ending June, 2008.

Both Starcomms and Maxis demonstrated many of the best practices for wireless broadband deployments. These include such elements as focusing on particular customer segments (typically including SMB), being early to market, gaining good coverage, offering compelling 3G data speeds, providing economical and easy to use devices (especially USB dongles), and offering affordable, value priced services.

China Unicom

"QQ" service

Social Networking

- China's #1 blogging, chat, gaming site
- *200M bloggers, Jan '09, doubled in 10 mos.*
- *$40M/yr Ad revenue, mid '07*
- *65% revenue from Virtual Goods, mid '07*

Buzz City

Off portal, Social Networking

Paid Ad Banners Per Quarter[1]:

- *Indonesia: 1.8 billion (up 47%)*
- *Libya: 103million (up 1640%)*
- *India: 660 million (down 1%)*
- *Tanzania: 114 million (up 30%)*
- *S. Africa: 540 million (down 7%)*
- *Romania: 103 million (up 43%)*
- *Kenya: 299 million (up 91%)*
- *Bangladesh: 134 million (up 71%)*
- *Egypt: 98 million (up 76%);*

1: Martin Garner, 10/08

D. Social Networking

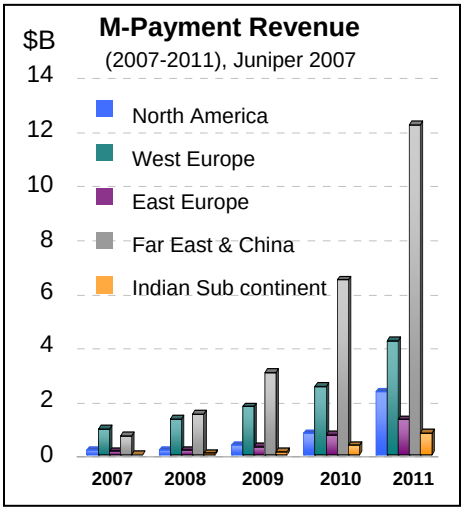
Social Networking services are highly successful in all markets, emerging and developed. In 2008, Intel estimated that 25% of all Internet traffic was Social networking related. Also, four of Vodafone's top ten visited Internet sites in 2008 were social networking sites. Such services typically include creating mobile Internet portals where members can find and connect with past colleagues or new acquaintances based on common interests. They usually interact by blogging text, photos and videos to a personal site, and then communicating via email, IM, SMS, etc. Despite appearing as luxury services, they have proven to be fundamental communication vehicles that even people with very little disposable income are willing to pay for. One of the biggest successes is Facebook Mobile with 30M members as of April 2009 and growing at 200% annually. Facebook Mobile has extended its dominant wireline Internet services to the mobile. It is being deployed by over 150 operators worldwide, including many in emerging markets, and many of the largest in the world: e.g. Telefonica, Vodafone, AT&T, etc. Facebook's service is the typical blog and chat format with instant alerts so members will know there are blog updates or messages. Facebook operators usually offer the service through their own portal, but may use a variety of monetization methods, including advertising or bundling with Internet access packages, whether usage based or flat rate.

There are many other successful mobile social networking sites, both on-portal and off-portal. These sites typically follow a similar blog & chat format, while periodically offering additional services, like multiplayer gaming communities (China's QQ), expert discussion groups (Brazil's Orkut), and virtual worlds where people can interact (Telkomsel's My Pulau). In addition to advertising, many of these sites obtain revenue from selling virtual goods (like website decorations), electronic goods (like ringtones, music and videos), and physical goods. Success of social networking in emerging markets has been linked to a variety of factors such as: (i) extending proven wireline sites to the mobile Internet, (2) providing tools that allow one to easily build mobile websites, and (3) ensuring that the sites are readable on many devices. The ability to easily find members with similar interests/affiliations is also essential as is providing a full set of collaborative communication tools. High speed uplinks like those provided by EV-DO Rev A and HSPA are also providing much improved user experiences and thus stimulating demand. Lastly, affordable pricing has been a key catalyst, as many successful services are either Ad funded or have low subscription rates. Fortunately, operators have made substantial revenue given the high volume of Ad exposures, the ability to sell more broadband access subscriptions, and the ability to supplement revenues with the sale of virtual and physical goods.

E. Mobile Advertising

Mobile Advertising has proven effective in many markets, emerging and developed. With its exceptional reach, immediacy and relevancy, mobile advertising enjoys higher response rates than most other advertising media (e.g. 3-5% click through rates are common) , and consequently higher Ad rates (e.g. CPM up to $50).

Mobile Advertising exists in a variety of forms, such as messaging (e.g. sending coupons by email or SMS), ad banners on the mobile web, ads returned with search results, and ads embedded in contents like music, videos & games. One example of successful banner advertising is the off-



Smart, Indonesia

"Smart dompet" service

Mobile Wallet

- Payments to Smart Wallet subs & participating merchants
- Recharge mobile account & send credits to other subs
- Add credit at bank or at Smart authorized agents
- $0.05 to$0.50 transaction charges

portal social networking site, Buzz City. Of the same blog & chat format as Facebook, this site focuses on cultivating communities of interest for what it considers 'the emerging middle class' in many developing markets. It has been so successful in growing these communities that it serves hundreds of millions of paid Ad banners in each of over a dozen emerging markets countries (e.g. India, Tanzania, Libya, Indonesia, etc).
Other examples of successful mobile advertising include Ad subsidized music such as the China Unicom and Iusacell examples previously mentioned, and the Ad subsidized handset browsing service of Tata. Each of these services acquired millions of users in one to two years.

F. Mobile Commerce

Mobile commerce and banking also pose large opportunities for operators in emerging markets. Juniper research forecasts there will be $12B in M-payment revenue annually in Far East & China and $1B to $1.5B in the Indian sub continent and Eastern Europe by 2011. To date hundreds of operators are engaged in a broad range of mobile commerce activities, including mobile banking, P2P payments, M-Ticketing, POS payment, M-wallet, etc. These services not only provide new revenue streams but are also known to reduce churn by increasing switching costs.

One extremely successful M-banking category to date has been P2P payments. A prototypical example is Safaricom Kenya's MPESA service, which enables individuals to send between $1.5 and $500 to any individual registered with the service at low transaction fees ranging from $0.40 to $5.00. In a manner similar to Western Union, subscribers deposit money with MPESA authorized agents who then credit their phone with funds that can be sent to other users. Launched in March 2007, MPESA acquired over 5.5M users in less than 2 years and more than doubled its subscriber base in the last 6 months. MPESA, like other banking services in emerging markets countries, has enjoyed great success for a variety of reasons. These include the fact that a large fraction of its population is without bank accounts, yet needs to send money to friends, relatives and business associates, often at substantial distance. Further, MPESA works on almost any handset, is priced very affordably, and is simple enough to understand, especially with help from its network of agents that are trained and incentivized to educate prospective users.

While MPESA in its current form does not require broadband wireless technology, Safaricom is planning next generation, browser based services with broader payment and banking capabilities which will leverage the higher speeds and lower latencies of its 3G network. Moreover, operators who are trialing mobile couponing and Ad embedded content (like music & gaming) aim to gain from 3G's lower cost of delivery and higher speeds.
Examples of other prominent M-commerce services include Smart Indonesia's Smart Dompet merchant payment service, and Tata India's 'Tata Zone' M-ticketing services for transportation and entertainment venues.

Iusacell, Mexico
"IusaTV" service

Mobile Video

- TV over EV-DO Rev A
- 12 Basic channels free w/paid Internet access ($12+/mo)
- Premium channels: $4.50/mo

G. Video related services

With the introduction of EV-DO Rev A and HSPA to emerging markets, operators now have sufficient capacity and low latency to implement video services and are actively deploying them. Of greatest interest to most are streaming services given their ability to work on devices with little memory and thus enable more users. Services like Iusacell's 'IusaTV' leverage some lessons learned from developed markets such as requirements to (i) provide an ample set of branded content in mainstream categories like: Children's, News, Entertainment and Sports, (ii) offer basic services at either a low flat rate, Ad subsidized, or bundled with other services like Wireless Broadband, (iii) provide ease of content discovery and use, (iv) deliver the services over 3G networks (research shows 3X greater uptake than over 2.5G), and (v) provide an ample variety of economical handsets. Other emerging markets operators have acknowledged the requirement to offer such services at very low cost since they are closer to luxury items than necessities. MTN SA, for example offers a basic set of streaming TV channels for just $1 U.S./month when added to a broadband service package. Tata Indicom charges $0.30 for 5 minutes of streaming video. Centennial, Puerto Rico takes another approach: they use mobile video as a value added component to boost the ASPs of voice & data services within bundled packages. As one of the most popular add-on options, Centennial was able to boost bundle ASPs into the $49 to $89 range. By mid 2008, Centennial was able to grow its data ARPU 31% year over year, helped substantially by such bundles. Many other operators are leveraging video in a similar fashion to enhance ASPs of voice and data service bundles.

MTN, South Africa
"Yellow Zone" service

Wireless Internet/ Phone Kiosk

- Low cost Internet cafes
- Make data/voice/fax affordable to rural populations
- Create jobs

H. Social improvement services

Social improvement services involve those that are intended to improve the health, education or welfare of a population, and because of this are often subsidized by government agencies or non profit organizations. They are important for operators because they represent ways to do good for the community as well as to build goodwill with government and regulators, and to gain financial support. Such initiatives also let operators economically explore new business models with reduced risk. One such example is MTN South Africa's Wireless Community Kiosk concept. With the goal of making broadband accessible to rural populations that lack wireline infrastructure and where the residents were generally too poor to afford such services individually, MTN created a business model that focused on lowering the cost of delivery to consumers and small businesses. By amortizing HSDPA capacity over many users concentrated in rural Kiosks, and charging more for business services than consumer ones, Kiosk owners could make the services affordable to both constituents and obtain enough volume to make a good living. Further, by offering a full complement of data, voice and fax services, Kiosk owners became a 'one stop shop' for users and were able to vitally supplement their ARPUs. Altogether, MTN proved through this initiative that it was able to construct and bring to life compelling business models that leverage 3G assets to achieve economic viability, even in highly cost constrained settings. In the process, it was able to create much needed jobs for remote communities and connect them to the rest of the world.

[6] Conclusion

Emerging markets are highly attractive and rewarding to wireless operators. Although dominated by low income subscribers, operators have crafted diverse business models that enable profitable operation, including ones with low entrance tariffs, Ad subsidies and government/non-profit support. Using such models and exploiting the cost and performance gains of 3G networks, operators have deployed a broad range of data services that vitally improve ARPU and profit. Such services already include mobile Internet, mobile music, wireless broadband, social networking, mobile advertising, mobile commerce, video related services and social improvement services. Many others have been deployed and warrant separate and detailed discussions. Through these innovative 3G data services and business models, operators continue to improve the quality of life for citizens of emerging markets.