Value-Added Services
A lifeline for Operators?

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Abstract

Every billing application provider, Comverse among them, argue that their products are critical to increasing value-added services (VAS) revenue when such revenues have become lifeline of service providers. This white paper provides empirical evidence and logical arguments to support this claim. It also discusses characteristics of VAS (such as VAS are, in general, on a long tail of revenue distribution graph) which may require unconventional functionality in billing platforms.

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1. Introduction

The traditional mobile revenue model is evolving significantly as a new giant, VAS, begins to make its presence felt in the mobile telco world. A number of enabling factors have finally, after many false dawns, awoken this monster and are feeding its appetite.

Three key factors have combined to affect this change. First of all, the advancement and growth in distribution of mobile device capability, predominantly in the form of the smartphone. Secondly, the speed of interaction capability due to the deployment of broadband infrastructure. Thirdly, the ease of application development, opening the door to thousands of new applications and rich content services. In addition, pricing, revenue models and advertising opportunities are shaping these converging forces to develop this new dawn of service consumption.

The VAS engine is powered by mass behaviour. The viewpoint presented in "I am the Media", by Alain Thys, 2006, outlines in dramatic fashion how individuals themselves are fuelling the new age of media communications. He stresses the importance of word of mouth and how, instinctively, people must and will share stories, experiences and opinions. Advancement in technical capability is enabling each individual to become a reporter, a story teller, a critique, an advisor, a friend, a confident, a supporter, an advocate, a debater, a promoter as part of this self-fuelled network of opinions. People are drawn to share emotions, let off steam or demonstrate solidarity and this is the force behind online communities and social networks. According to Alain Thys, "you don't even have to be creative". Robert Murdock, stated in Wired, July 2006, "To find something comparable, you have to go back 500 years to the printing press, the birth of mass media… Technology is shifting power away from the editors, the publishers, the establishment, the media elite. Now it's the people who are taking control".
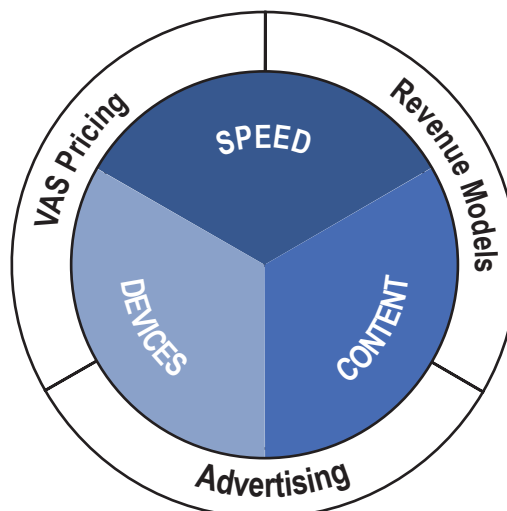

Figure 1: Value Added Services

In the case of mobile communications the 'long tail' phenomena is taking form in the large spread and divergence of tastes consumers are exhibiting for content. According to Mark Earls, author of *Herd: How to Change Mass Behaviour by Harnessing Our True Nature (2007)* "Things change because of people interacting with other people, rather than technology or design really doing things to people." Arguably, however it is the deployment of 3G infrastructure and the growing proliferation of available and VAS-able handsets that is provoking dramatic growth of VAS services in certain regions. Regardless whether the technology or actual behaviour is primarily stirring this monster, the figures present a clear view that VAS is on the increase worldwide and so too the stakes for the key players involved – the operators, the content providers, the device/ equipment manufacturers and the end users.

This article will present empirical evidence outlining how VAS growth is here to stay. It will explore the influence of handsets, speed, content and pricing on this growth and will present trends in evolving business models and VAS offerings for the consumer.

2. VAS Growth Figures

Clear evidence exists to confirm that data service consumption is growing steadily. During 2008, revenues from data services increased 17% from Dec 2007 and now account for >20% of the global service revenues (IBM Research, July 2009). For some leading operators, namely ATT and Verizon Wireless in the US, data is now contributing close to 40% of the overall revenues (Chetan Sharma Consulting, 2009).
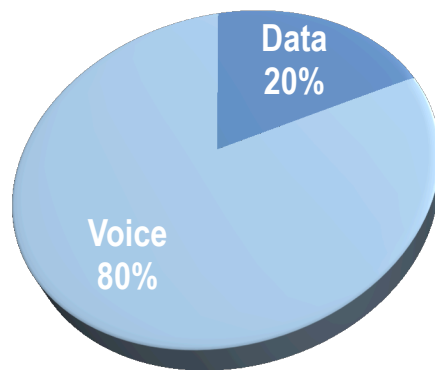

Figure 2: Global Revenue Distribution 2008

The top three data markets, China, Japan and the US, show steady mobile data revenue growth over the past three consecutive years and this trend is expected to continue. During 2008, the US registered the highest growth amongst the top 3, with over 40% increase from EOY 2007 levels, followed by Japan at 25% and China at 21% (Chetan Sharma Consulting, 2009).
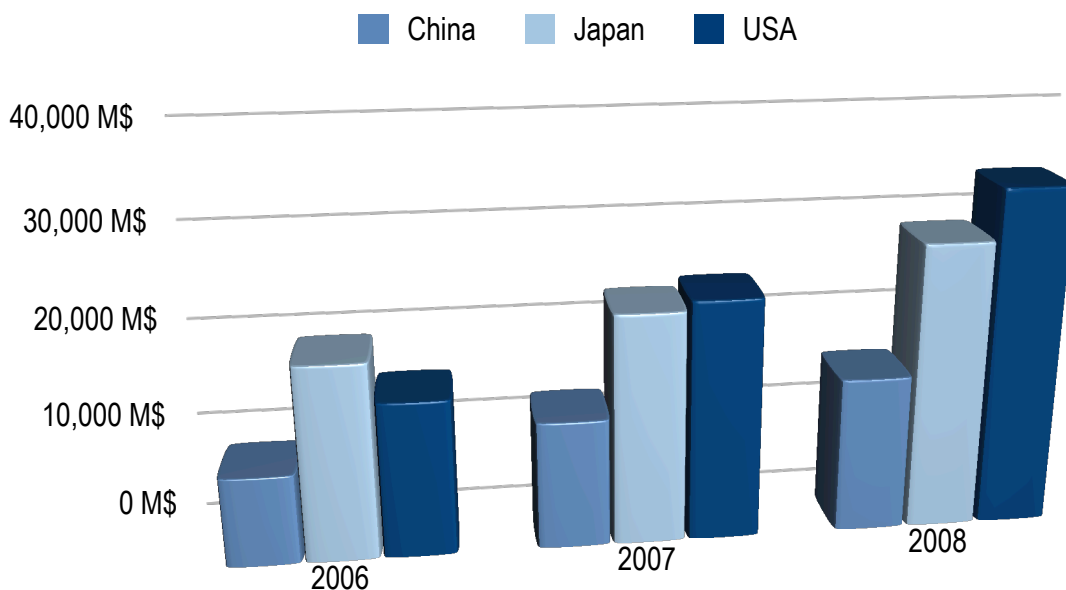

Figure 3: Mobile Data Service Revenues in Top 3 Data Market

Furthermore, revenue from mobile data services from top 10 carriers in 2008, increased 27% from December 2007 and now account for almost 48% of the global mobile data revenues though their subscriber base is around 30%.
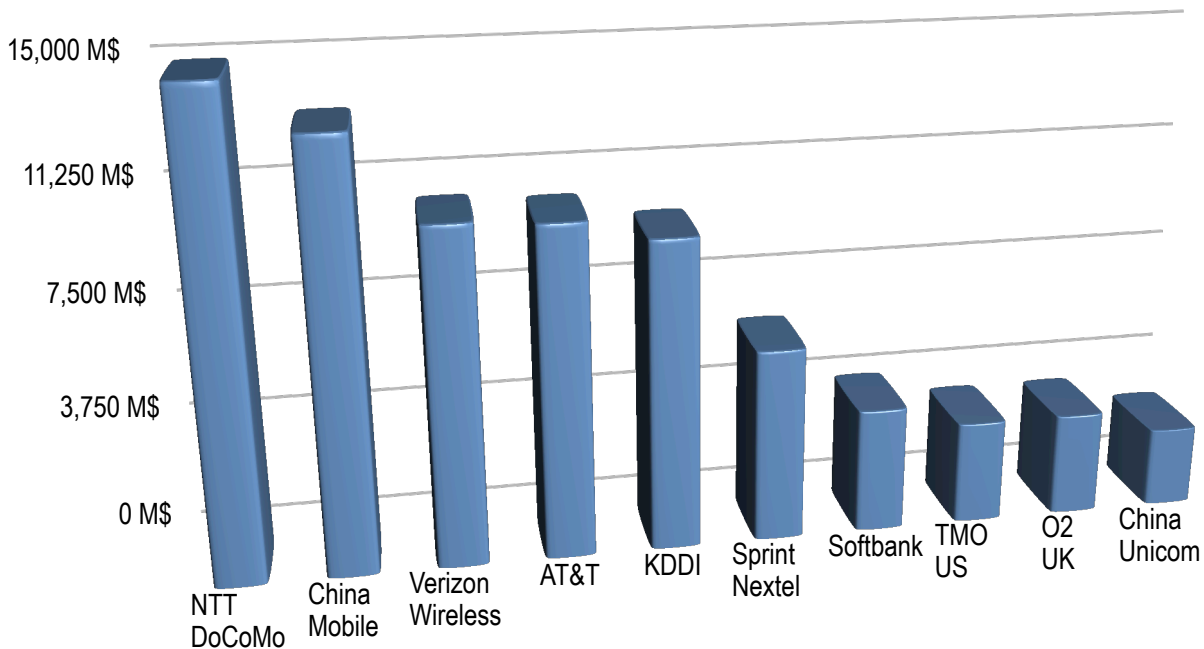

Figure 4: Global Data Revenue for Top 10 Carriers in 2008 (Source: Chetan Sharma Consulting)

NTT DoCoMo continues to dominate the wireless data revenues rankings with over $4B in data services revenue in Q408 and almost $15B for the year. Almost 42% of its overall revenue now comes from data services (Chetan Sharma Consulting, 2009). Also it is worth noting that DoCoMo crossed the 90% 3G deployment mark this year. NTT DoCoMo has been at the cutting edge of the mobile data evolution by creating new markets and exploring new technologies and social experiments ahead of most other operators During the last 9 years, DoCoMo's overall ARPU has declined 33% though data ARPU increased over 1800% and now accounts for almost 40% of DoCoMo's service revenues. Their voice ARPU has declined almost 60% (Chetan Sharma Consulting, 2009).

Table 1: Source: Chetan Sharma Consulting, April 2009

Rank	By Subscribers	By Data Revenue	By Service Revenue
1	China	US	US
2	India	Japan	China
3	US	China	Japan
4	Russia	UK	UK
5	Brazil	Italy	France
6	Indonesia	Germany	Italy
7	Japan	France	India
8	Germany	Spain	Germany
9	Italy	Australia	Spain
10	Pakistan	Korea	Russia

Increase in data ARPU, however, is not completely compensating for voice ARPU decline for most operators. Furthermore, there are very few operators who have experienced increase in overall ARPU. Comparing the ARPU for last 2 years, amongst the top operators, only Singtel, Rogers, T-Mobile UK, O2 Germany, O2 UK, Verizon Wireless and ATT experienced increase in both overall and data ARPU.

Indeed, the Merrill Lynch April 09 report signals the global data ARPU growth trend remains broad but uneven. According to Merrill Lynch's assessment, the growth is most pronounced in developed Asia and North America. However, in Q1 2009, 28 of the 43 countries tracked by Merrill Lynch had year on year declines, particularly Korea, Indonesia and Malaysia. According to it's April 09 report, data revenue, as a percentage of overall ARPU, averaged at 26% across all the countries it monitors.

Text messaging, however, still accounts for the lion-share of data service revenues. To really understand the growth of VAS, and in particular, new social networking trends, we need to explore the forces at play in this space.
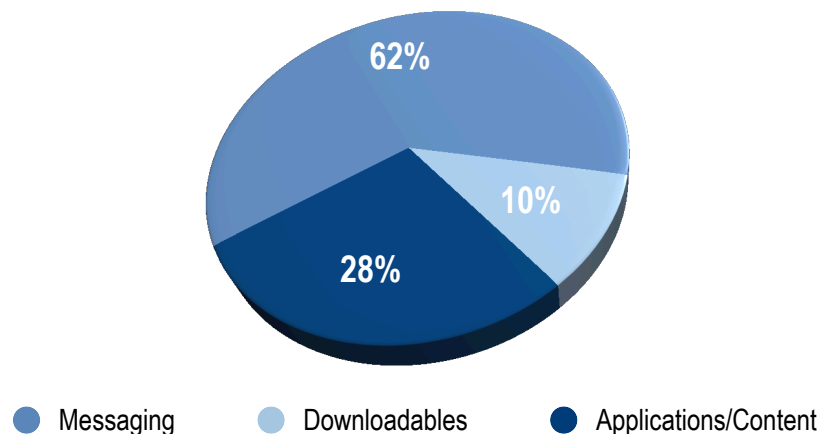

Figure 5: Global Mobile Revenue Distribution 2008 (Source: Chetan Sharma Consulting, 2009)

3. Device and Speed: a Combustible VAS Combination

The explosion in usage of social networking sites is well understood, but what is remarkable from a telecom perspective is how much this trend is driving use of the mobile internet, remark Merrill Lynch in their April 09 report. In the US, a January 2009 comScore survey calculated, in one year, a 71% increase in mobile internet subscription for news and information. Furthermore, the number of people logging on daily increased even faster – from 10.8M to 22.4M people (+107%). This survey highlighted that the number of users, accessing social networking sites, had increased dramatically, from 1.8M to 9.3M (+417%). This incredible growth, now with 42% of daily internet users accessing social networking sites, (up 25% from the previous year) highlights quite starkly that powerful network effects are at work here (Merrill Lynch 09).

So what has caused this explosion? The smartphone. Apple's i-phone alone has led to a frenzy on the Application stores, with 1 billion downloads in 9 months across 37 million devices (Chetan Sharma, 2009). Consultancy Frost & Sullivan recently estimated that Latin America's overall smartphone sales were up 12.7% year-on-year in the first quarter, and Pyramid Research projects that smartphones will grow to represent 5.4% of Latin American handset sales this year, up from 3% in 2008.

But it is not just the iPhone that has built the market for mobile Internet, according to the article *"Cellcos are finally getting payback from 3G as non-SMS data revenues soar"* ,Telecom.com (2009). The usability of all midrange and high-end handsets has improved significantly, and the operators themselves are positively

encouraging their customers to navigate off-portal rather than keeping them inside the walled gardens. This article explains that in the case of mobile broadband, all services are off-portal, and customers use dongles simply as a way to connect to the full Internet.

According to recently published IBM research, *M VAS Emerging Trends (July 2009)*, 140 million mobile social networking users are expected by 2013, generating subscription revenues in excess of $410 million. Social networks are rapidly becoming one of the primary drivers of mobile data traffic (Analysys Mason, April 09). Mobile users of social networks are likely to consume two or three times as much digital mobile content (pictures, music, videos and games) than their "asocial" peers. (ABI Report Forecast, September 08).

Data speeds have increased dramatically, and can now deliver a user experience that customers value and are prepared to pay for (Coleago Consulting, June 08).
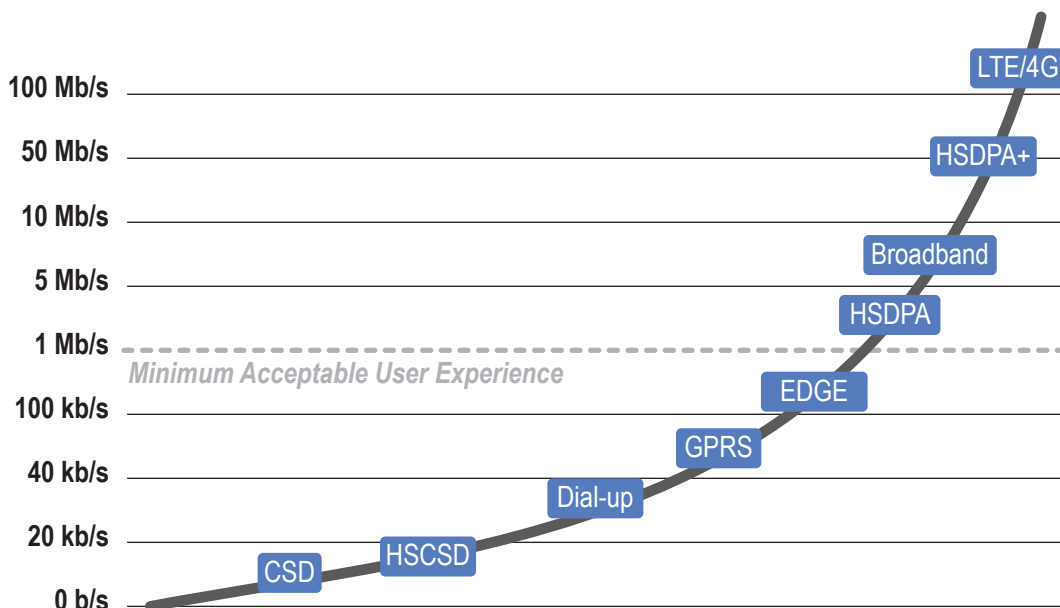

Figure 6: Data bitrate per Service (Source: Coleago Consulting, June 08)

In Japan and Korea almost 100% of mobile customers are now 3G enabled. Operators who had not launched HSDPA (High Speed Downlink Packet Access) by the end of 2007 generated much less revenue from data services in 2008, according to Coleago's analysis. For mobile operator, StarHub, in Singapore, data traffic increased dramatically (by 25%) within three quarters of their launch of HSDPA. US operators who have launched 3G services experienced significant growth in data also. For those operators who have brought to market a good data offering, data is now the main determinant of revenue growth in the US and will become even more important in future, state Coleago Consulting (2008) Verizon Wireless and AT&T Wireless, as previously discussed, have enjoyed significant data service growth in 2008.

4. The Long Tail Keeps Growing

In the Mobile Services Survey '08 (by IBM Institute for Business Value), 78% of the respondents favoured a wide range of service offerings, rather than a specialized set of offerings. The survey, conducted across US. Japan. India, China and Germany, shows a broad spread of interest across the utility and entertainment categories (IBM research, July 09).
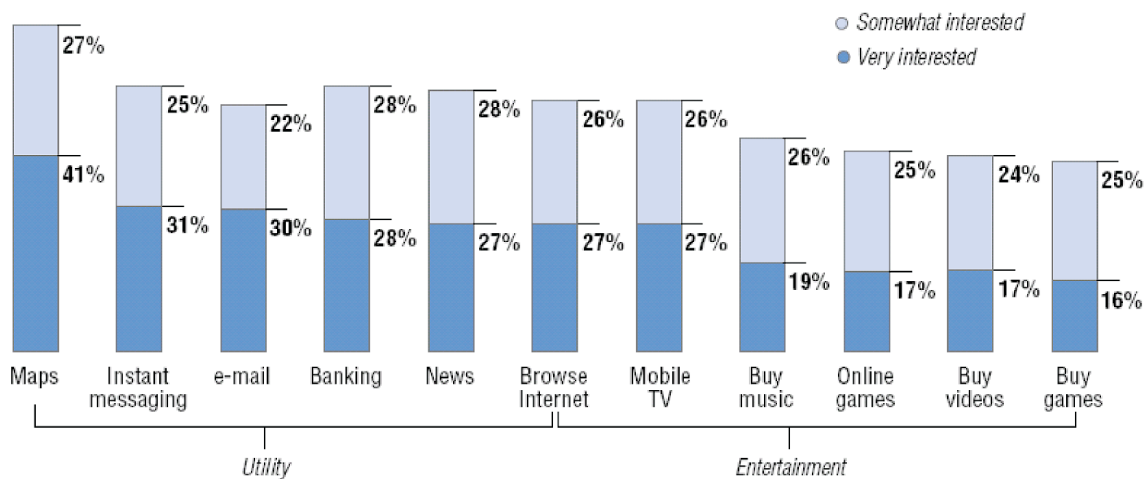
Figure 7: Source: IBM Research Presentation, July 09

This survey also serves to highlight an emerging dilemma for operators: how to tailor VAS offerings for consumers and how to control revenue. A recent Analysis Mason report, 2009 (*Emerging technologies, non-telco content strategies and online video top the list*) states that telcos have recognised that adoption of an effective content strategy represents an opportunity to increase revenue and achieve competitive differentiation, even in difficult economic conditions. Most Operators however, are now trying to identify VAS services which have appeal across segments –to create volumes that can offset low yield per customer (IBM Research, July 2009). According to this analysis, the challenge for operators is to identify, develop and market the right mix of VAS for its consumer base.

Operator legacy systems, developed to deliver mass market services, such as voice and SMS, are unable to support the enormous dispersion of customer preferences, powered by personalization of content applications. As new applications emerge daily, operators need to be able to respond to surges in tastes quickly. Customer appeal of certain applications may enjoy a brief lifespan and operators need to be able to react continuously with new offerings in order to regain their customer base. This mode of operation is completely different to traditional new service introduction. Traditionally a new service application was introduced after months of code development and system integration before it reached launch state in the live environment. Every new service required months of effort with new functionality upgrades, billing development and testing to enable the application to be billed appropriately. In this smartphone age, operators are reliant on the sophistication of their billing and campaign management systems to exploit the revenue potential from the long tail of content customization. According to IBM research, App Store stats alone as of May 2009, report 1 billion application downloads, more than 36k App available with 1000 new applications developed per week.   To derive full potential from this budding market, operators must have

I.   the agility to react to the latest application trend. Operators need to reduce market reaction time from months to days to hours. Ability to integrate and support the flood of applications on existing infrastructure is a key factor in time to market.
II.   the ability to cater for thousands of niche applications in real time, with flexible charging and rating capability, automated provisioning, bi-directional mediation and third party revenue model support.
III. the insight to identify which applications are successful and those that are not. The business intelligence to enable almost realtime service portfolio management in accordance with customer's preference.

These capabilities will provide the operator with the competitive thrust to hit on a successful service permutation for each customer, strengthening customer loyalty and promoting service usage.

5. SMS is here to stay

Operators are now separating data service revenues into SMS and non-SMS revenue streams. Despite the growth in non-SMS data, SMS still makes a substantial contribution to mobile operator data revenue (Coleago Consulting, 2009) This is evident from micro-blogging social network service Twitter, which celebrated its third birthday in March 2009. In his article *How will Twitter make money?* Neil Kennedy (January 2009) explains how Twitter currently pays vanity short code fees and SMS fees for mobile-terminated and mobile-originated messages.

SMS fees typically reverse at volume, with carriers paying application providers for SMS revenue generation, Neil Kennedy explains. A carrier such as AT&T might charge 5 cents per SMS and pass a fraction of a cent per message to large applications such as Yahoo! or Google. Twitter could be approaching an SMS volume that provides bargaining power with carriers for mobile-terminated and mobile-originated message revenue domestically and mobile-originated message revenue internationally.

Further evidence that SMS is here to stay can be observed from the developing VAS services in India. Reasons for enterprises to use SMS include its instantaneous delivery, ease of use and adoption, its reliable means of getting time-sensitive messages to recipients, including automated delivery acknowledgement and its compatibility across all users and handsets (BDA, 2007).

SMS still generates the majority of mobile data revenue, but there are some signs that this may be changing as the pressure is mounting for operators to grow non-SMS revenue. In Sweden, non-SMS data services contributed 48 percent of total mobile data revenue, up from 34 percent in 2006 (Ofcom report, November 2008). This trend is visible globally. Up until 2008, for a typical European operator, SMS accounted for up to 80% of non-voice revenues in previous years, but this figure has started to fall sharply. Operators such as Vodafone are seeing non-SMS services generating up to half of non-voice revenues. Investment in 3G – or 3.5G – is now generating payback, according to Anne Morris in her Total Telecom article, *Mobile data: Piling it high,(September 2008).*

The key question is not will there be mass-market take-up of non-SMS data services rather what role operators will play in providing these services and the service portfolio break-down between value-added ones and those based on Internet access (Telecom.com 09). Furthermore, operators' key focus is to generate substantial revenues through non-SMS data, according to Joss Gillet, at Wireless Intelligence. However, it is clear, that mobile operators increasingly will need to offer new and innovative data pricing packages and services in order to drive up non-SMS data revenues (Total Telecom, Sept 08).

Operators are carving out a strong revenue stream in providing Internet access – via both smartphones and dongles – but are eager to add some value, either for their own users or for the Internet-service companies themselves (Telecom.com 09). Correspondingly, new revenue share models are emerging.

6. Is Revenue Share Fair?

The shift of services beyond SMS messaging for operators has resulted in a gradual breakdown of the walled garden and operators are exploring new partnership arrangements to replicate the online experience on mobile for consumers. Vodafone in India was the first operator to experience significant benefits with 60% of it data traffic generated from its open interface strategy. Furthermore over 60% of Vodafone India's VAS revenues are from non-SMS based services. (BDA, Dec 07)
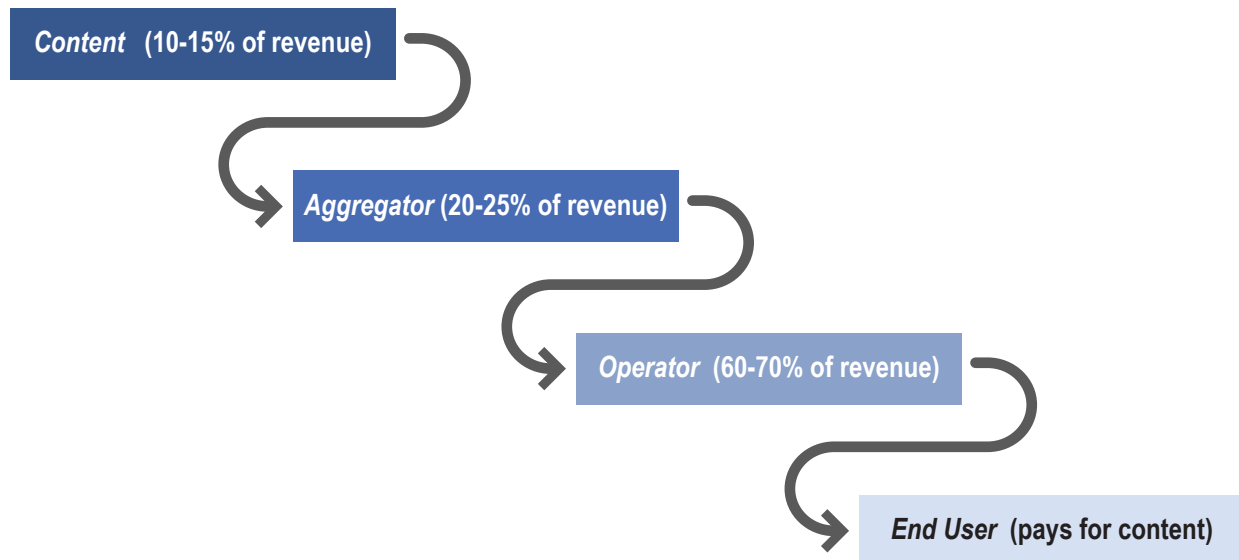
Figure 8: The VAS Revenue Share Model (Source BDA, 2007)

New revenue share models are developing with entrants, like Hungama in India, aggregating content and applications from owners of niche content providers (games, wallpapers, ringtones, news, entertainment, etc), for distribution based on customer specific needs. In some cases, these content aggregators also manage IVR, quality control, billing and accounting of the content and applications (BDA, 2007). The VAS value chain in India report how operators enjoy 60-80% of the revenues generated by third party content provider. Many believe that currently the revenue share model is skewed with many of the operators claiming up to 70% of the total revenue pie, according to the BDA, 2007 publication *Future of Mobile VAS in India*. The skewed revenue distribution in India has resulted in lower variety of content and levels of innovation due to almost every player stating that meeting ROI expectations becomes a challenge. Most content offerings therefore are based on movies, music and cricket. This has led to lower volume consumption and little differentiation. Operators justify claiming lion's share for VAS due to cost associated with network, billing, marketing and subscriber acquisition (BDA, 2007). In developed mobile markets of Europe and even China, there is a much more encouraging ratio for content providers. In Japan and Sough Korea the margin is somewhat lower at 20-30% of the data services revenue (Mint article, July 2009).

In India, the operators argue that most of the VAS is provided over SMS and WAP and these services are mostly operator controlled. Hence VAS players have no option but to give lion's share to operators. Operators have vast experience in prepaid and postpaid billing, and knowledge about essential issues, such as economic reconciliation for roaming customers. Furthermore, there are currently no offdeck payment services available in substantial scale (BDA, 2007).

The influence of the iPhone is forcing operators to adopt new business approaches. When Apple first attempted to negotiate distribution agreements for the iPhone, it came up against resistance from operators reluctant to put their backing behind a handset offering services – such as music, Internet browsing and applications – in which they had no role and which, furthermore, competed with their own offerings (Telecom.com 09). The take-up of the iPhone and its ARPU figure – more than US$90 a month – are so impressive that operators have been forced to change their tune, according to this article. However, Analysys Mason suggest in the article *The iPhone and the SDP* (CEO August Digest report, 2009) that mobile operators such as O2 and AT&T have been short-sighted in their strategy to partner with Apple, as by doing so they have reduced their position to that of "dumb pipe" and have surrendered application control and revenue to Apple, in an attempt to retain their customer base.

Content application providers such as AirMe have enjoyed great success with their mobile application that allows users to instantly upload their pictures on social networking sites such as Flickr.com, Facebook.com, Photobucket.com, Picasa.google.com and Twitter.com. According to Mint's July 2009 article, it is traffic such as this that device manufacturers hope will help break the stranglehold of telecom companies on the VAS market.

But operators will continue to seek ways to profit from the services adopted by their customers, even when they are offered by third parties. 2009 will see operators investing more in their API strategies, developing communities of application developers who they hope will pay to access back-office functions in their network. And even if such revenues are relatively small, there might be a way for operators to generate advertising revenues or for these new applications to drive usage of core services, such as voice or SMS (Telecom.com, 09)

A recently published article in Medianama, India, July 2009 stated due to the current structure of the revenue share models, the development growth of innovative products is slow. In this article, Onmobile, commenting on its 5 year partnership deal with Telefonica announced "there's no performance clause. But because it is on a revenue share model, there is perfect alignment. The better it does, the more the operator invests in it. It becomes self reinforcing cycle."

Another revenue model emerging has been powered by user demand for mobile applications. Handset vendors and OS platform owners have been leading the development of application stores, or 'app stores', during the past few months because their close relationships with the developer community, which tends to target particular OSs or application platforms, enable them to launch stores relatively quickly. Mobile Operators are at increasing risk of being disintermediated from the content value chain. Operators have responded with new partnerships to address this threat. As reported by Analysys Mason (June 2009), Vodafone unveiled its global initiative in May 2009, when it promised to offer its application developers a single point of access to its 289 million users worldwide, Analysys Mason, (June 2009).

Table 2: Major vendor-led mobile app stores [Source: Analysys Mason, 2009]

Vendor-led app store	Launch date	Payment methods	Vendor revenue share with application developers
Apple's App Store	Jul 1, 2008	Credit card	30%
Samsung's app store	Jan 1, 2009	Credit card	20%
Google Android Marketplace	Feb 2009 (started to accept paid-for applications)	Google Checkout	70% to developers, 30% to operators (Google claims it does not retain revenue)
BlackBerry App World	Apr 1, 2009	Credit card and PayPal	20%
Nokia Ovi Store	May 1, 2009	Credit card and operator on-phone billing (only in selected markets)	30% (credit card); 50% (operator billing)

Operators are well-placed to enhance some aspects of the user experience by utilising their core network assets, primarily their billing capability to support an intuitive payment experience report Analysys Mason (June 2009). Several major vendors' app stores offer credit card and PayPal payment methods, but these tend to be cumbersome in comparison with operators' on-phone billing mechanisms, and therefore operators billing platforms could well serve as a key competitive advantage in this increasingly crowded market space.

Operators, Analysys Mason advise, should work to incorporate app stores into their service portfolios in order to capitalise on the growing consumer demand for mobile applications, retain control of the end-user relationship and therefore maintain their relevance to the content value chain.

7. Mobile Advertising

Social networks provide a unique forum in which to market virtual goods and services not only by linking users to digital content, but also by allowing users to share their preferences with their friends or even to promote new services. In the article "*Mobile social networking: can it be monetised?*", Analysys Mason, (April 09) explain that the spontaneous nature of communications within social networks makes it a challenge to find the right context for paid-for and advertising-funded content and services. For this reason, Analysys Mason believe it will be difficult to leverage the viral qualities of social networks without seeming intrusive, although social networks that have evolved around a common interest will find it easier to integrate paid-for and ad-funded content.

Advertisement is seen as a new revenue avenue for VAS players compensating for low revenue share from operators (BDA, 2007) and thus reducing the barrier of entry for new entrants.

Analysys Mason, (February 2009) forecasts that, by 2012, mobile advertising will account for over 4% of total advertising spend in European countries that have relatively high mobile penetration and 3G network coverage, and for as much as 2% of advertising spend in emerging Central and Eastern European economies

8. Has it All Gone Flat?

Charging for data services is following a similar trend almost everywhere. The move towards flat-rate charging – providing data at a fixed rate per month, with some limits depending on the level of service – is now ubiquitous (Informa, 2008). Flat rate billing seems to have also played its role in data service consumption growth. According to Telecom.com, the introduction of flat-rate mobile data price plans – a concept that fits better in a postpaid market than a prepaid one – has driven the non-SMS data market globally. 2008 saw a switch to flat-rate and mobile Internet models. This article forecasts that 2009 will see this trend continue and will see the arrival of more-affordable mobile Internet devices. Perhaps the bigger uncertainty is whether mobile operators will accept a role as dumb pipes rather than continuing to invest in their own services and smart-pipe strategies (Telecom.com 09).

Barriers to VAS growth in India according to the BDA research (2007) may be due to lack of pricing clarity from operators. VAS uptake is stifled by confusion on premium SMS rates and the varying charges for pre-paid and post-paid SMS and lack of transparency on local and international roaming SMS rates. According to this report, operators usually quote rates for the content being downloaded, however, do not indicate the cost involved with exchanging SMS involved in downloading this content. Furthermore, there is no transparency on non SMS data usage. GPRS tariffs vary across operators with some charging a fixed rental and pay for usage, some only pay for usage, and some for on/off WAP portal usage. Users have no clarity on the charges being levied on them for downloading the content. Pushing all types of VAS promotions not in sync with users preferences, has led to consumers treating content as spam without discovering the benefits. Content providers feel helpless as most of the VAS offerings are operator controlled. Furthermore, homegrown legacy billing systems, which are not adept for itemized VAS billing, have limited service offerings to customers (BDA, 2007).

User experience is also limited by high VAS tariffs. Therefore, to generate more interest in VASs, operators have started to launch unlimited data plans and bundled offers. In Europe, operators are revisiting the pricing of their services and have started to offer unlimited data plans in most markets with high WCDMA and

broadband penetration to encourage the mass adoption of high-speed services and the migration from prepay to contract. (Joss Gillet, 07)

9. Recommendation to Operators

For operators, the path is clear. They must open up their networks to third party content, innovative applications and advertising. The sophisticated real time rating and charging capability of their billing systems enables operators to play an important role in this value chain, elevating their status from mere 'bit pipe'. The operator's billing system is key to the adoption of the new VAS business models emerging, having both the realtime rating functionality and the policy management capability to support accounting of revenue flow from the customer to the third party. The advanced policy management capabilities enable itemized billing of VAS services, however with the success of flat rate billing, subscriber preference for pricing simplicity over transparency needs to be further explored.

Operators ultimately *own* their hard earned subscriber base and with it, the valuable customer behaviour intelligence. Operators must ensure that they have the capability to exploit this valuable asset, using advanced analytics to identify and predict new business opportunities. In addition, customer profile analysis is vital for operators to manage their service portfolio, to understand the customer life cycle value and to retain market share, through early detection of trends and targeted campaign management. In the current economic climate, rigorous analysis and clear insight into individual service ROI is necessary to remain competitive. As the number of players involved in the value chain increase, so too the need for sophisticated analytics and the ability of the operator to dynamically refresh its portfolio of services.

Transformation of legacy billing systems to advanced real time converged solutions enable the operator to support bi-directional transactions between third parties and the end user. This is necessary for users who want instant confirmation and immediate acknowledgement from application hosts and real time interaction.

By breaking down the walled garden to innovative content, operators need to carefully consider the potential impact to customer experience. Factors to consider include, quality of content and applications, quality of service provided, risk of fraud attacks and possible exposure to scams. Policy management parameters enable operators to provide service assurance in the form of managed bandwidth consumption, authenticated access and firewall security, credit limit definition and parental control assignment. However, there is an emerging debate regarding the custodial obligation of the operator to its customers. Once it opens up the network, is the operator's control restricted to only bandwidth distribution and cost? Do operators have the power to refuse its customer's access to certain applications? In the US, AT&T have denied any involvement in Apple's decision not to accept the Google Voice application in the Apple App Store. Obviously Google Voice, would pose a direct threat to AT&T's core business, if on AT&Ts unlimited flat rate data offering, users were able to use Google Voice as an alternative to AT&T's voice service. This hot debate, highlights the emerging issues surrounding content application and the policing of same. According to the Engadget. Com (August 2009) report, the telecommunication regulator must play a role in policing the emerging business models and forces at play. This debate will continue to evolve as the mobile internet takes a step closer to replicating the world wide internet operating model.   Policy management is emerging as a key issue for operators as emphasized by a recently published article, *iPhone Overload* (September 2009). The pressure currently experienced by AT&T's network, as a result of mobile internet traffic, will soon be felt by most operators supporting data services. According to Cisco Systems, by 2010, global mobile data traffic is expected to exceed 200 terabytes per month - 6 times last years levels. It is a welcome problem for operators, but for the foreseeable future they are cautioned to "fasten your seat belts, its going to be a bumpy ride".

10. Summary

In summary,

– VAS and data services, SMS and non-SMS, are growing and will help to off-set declining voice ARPU as operators open up their networks to content applications.

– A barrier to entry for VAS application developers is the uneven distribution of the revenue share. This revenue model between operators, application developers and distributors is continuing to evolve as new players enter the market.

– Advertising will provide a revenue stream for VAS developers

– Flat rate pricing, the smartphone, broadband speed and application content have all played a significant role in driving VAS growth.

– Operators may be able to stay in the game, by virtue of their billing capability, however they will no longer control content to end users.

– Customer analytics will become a valuable asset for operators.

– A policy management system will be the necessary component to enable operators to support and compete with mobile internet.

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