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insights

Capgemini's telecom, media & entertainment journal

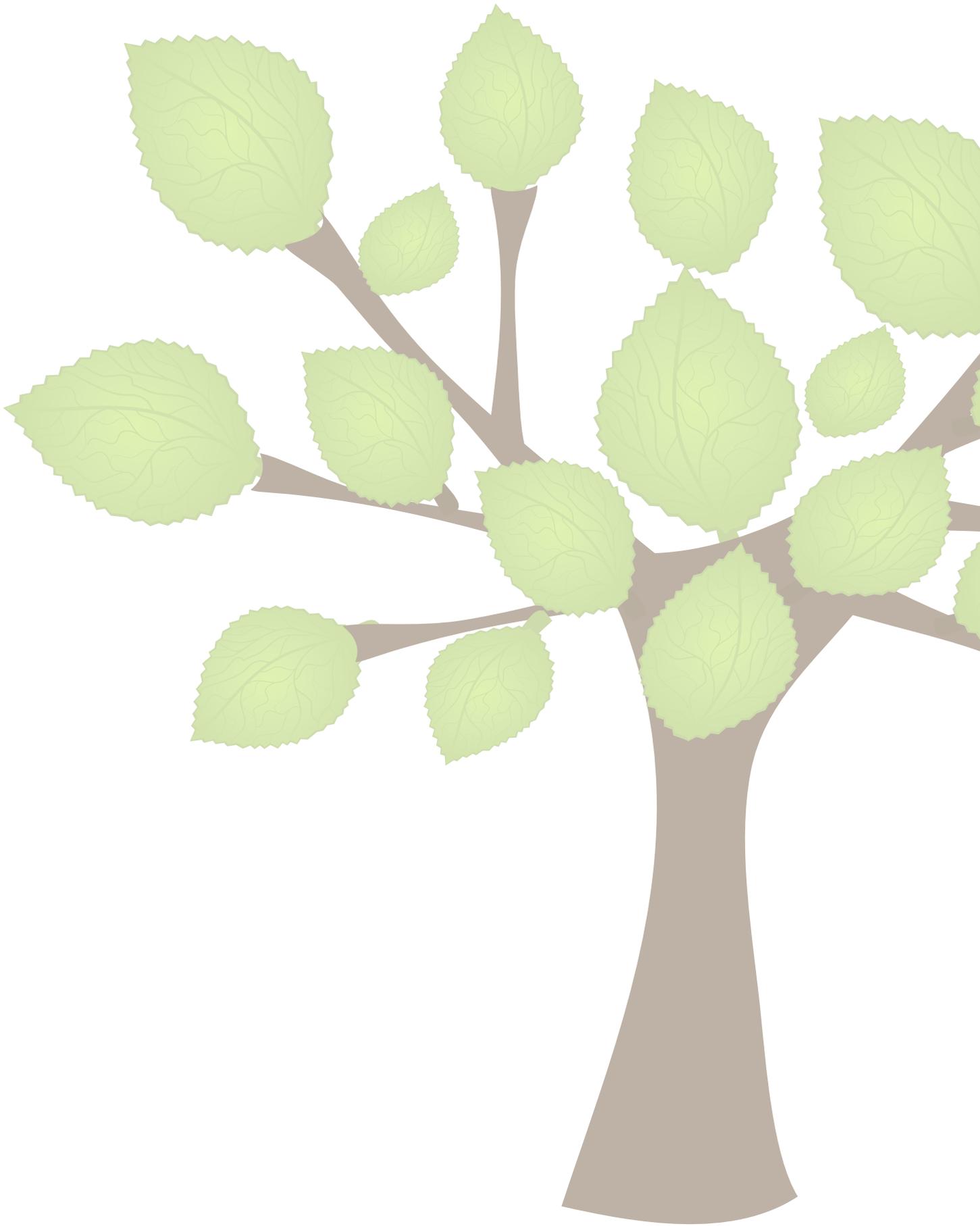
Social Networking
Application Stores

First Person Interview:
Jan Wäreby, Ericsson

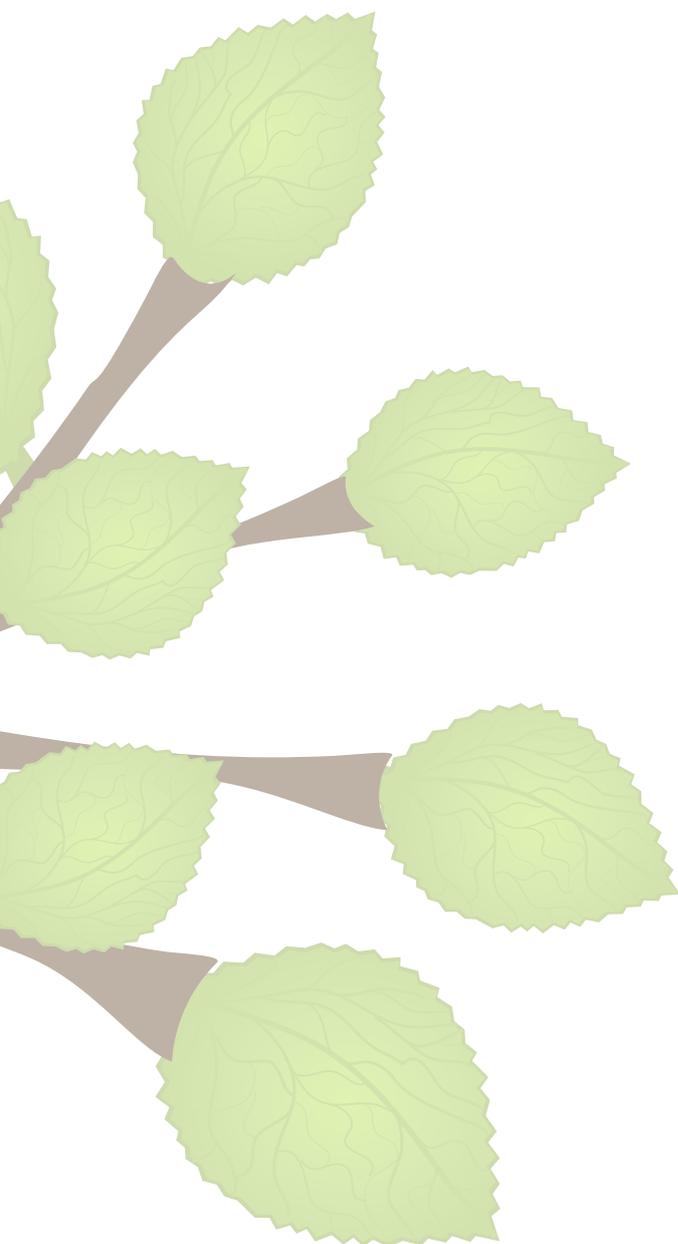
Spectrum Valuation

Sustaining Agility

Next Generation Customer Services



CONTENTS



first person

- 4 An Interview with Jan Wäreby, Senior Vice President and Head of Business Unit Multimedia, Ericsson

industry insights

- 10 Social Networking for Telcos
- 18 Mobile Application Stores: Assessing Opportunities for Telecom Operators
- 28 Web 3.0: Expected Evolution of the World Wide Web
- 36 Spectrum Valuation: A Holistic Approach
- 44 The Onset of Connected Devices: Opportunities and Challenges

management insights

- 52 TechnoVision™ 2012 in the TME Industry
- 58 Next Generation Customer Service Strategies: Harnessing the Power of the Internet and Web 2.0 for Delivering Customer Care
- 66 Sustaining Agility and Growth: Why it is Important for Companies to Periodically Implement Significant Organizational Changes

lite bytes

- 72 Mobile and Internet Vignettes and Trends



editorial

Welcome to the latest edition of our Insights journal.

As the TME industry emerges out of a tumultuous period, players across the value chain are faced with a number of challenges in returning back to growth. The shifting consumer preferences, ever increasing demand for ubiquitous connectivity, and evolving business models are offering a number of new growth avenues. Indeed, we see that various players are already pursuing a number of these opportunities pointing towards an early revival of the TME industry.

For our *First Person* interview, we had a chance to speak with Mr. Jan Wäreby, Senior Vice President and Head of Business Unit Multimedia at Ericsson. Mr. Wäreby is a seasoned marketer and has held various senior positions within Ericsson's sales organization including head of the company's mobile phone business. We discussed with him various growth opportunities for the TME industry and how it is expected to evolve over the next few years.

In our *Industry Insights* section we first examine the implications of the growing popularity of **social networking sites on telcos**, and the potential strategies for operators to best address this opportunity. We then assess the attractiveness of launching a **mobile applications store for telecom players**, in which we discuss the key benefits for operators to get into this space and also how they can compete effectively against device and operator system vendor stores. The third article talks about evolution of the Web, **the onset of Web 3.0** and how it is expected to impact the digital content value chain. In the following article we evaluate the various methodologies for **spectrum valuation** and suggest a five step approach to arrive at an accurate value of the spectrum. We wrap up this section discussing the key opportunities and challenges presented by the **connected devices** market for mobile operators and the different business models that players can adopt to tap into this market.

In the next section, *Management Insights*, we discuss some of the broader technological and organizational issues that TME players need to consider while formulating their future strategies. In the first article we present Capgemini's proprietary **TechnoVision™ framework for TME players** aimed at helping organizations to align their businesses with key technology trends. In the next article we discuss the importance of **next generation customer services** and the growing role of social media in providing superior and cost-effective customer care services. We conclude with an article on **sustaining agility and growth by London Business School Professor Freek Vermeulen**, in which we highlight the risks for TME companies that resist structural changes for too long and the need to periodically implement organizational changes.

I hope you find this edition of Insights thought-provoking and enriching. If you would like to discuss any of the issues raised, then please get in touch with me.



Rob Staples
Global Head of Telecom, Media & Entertainment,
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industry INSIGHTS

Social Networking for Telcos

10

Mobile Application Stores:
Assessing Opportunities for Telecom Operators

18

Web 3.0: Expected Evolution of the World Wide Web

28

Spectrum Valuation:
A Holistic Approach

36

The Onset of Connected Devices:
Opportunities and Challenges

44

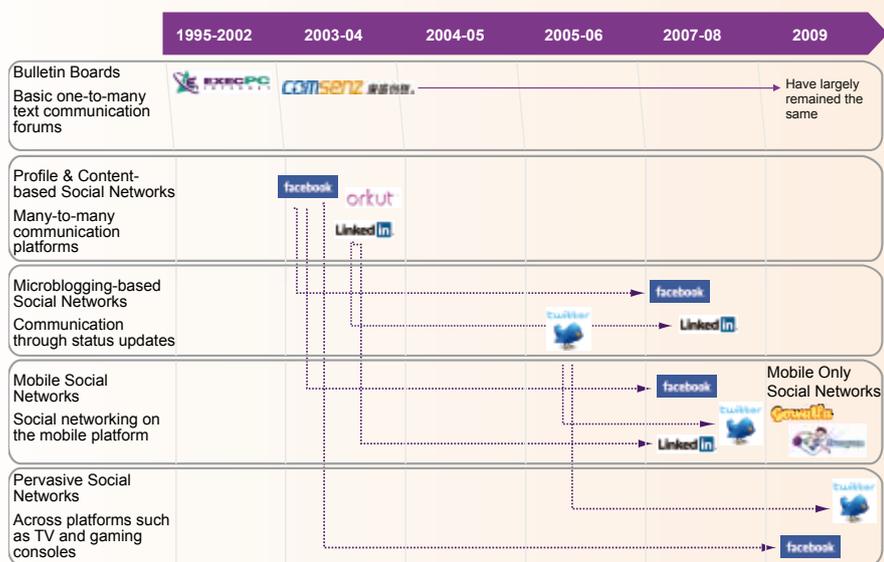
Social Networking for Telcos:

Assessing the Telco Opportunity in Social Networking

by Jerome Buvat, Subrahmanyam KVJ, and Priyank Nandan

Abstract: In recent years there has been a sharp rise in consumer interest and time spent on social networks, driven by increasing consumer desire for multi-way communication and collaboration. Several telcos have ventured into social networking, however, their activity so far has been largely limited to partnerships with established online players in order to offer customized mobile versions. Operator challenges around venturing into social networking include competition from established social networks and coping with volatile consumer behavior. On the other hand, benefits such as new revenue streams, increased data traffic, and low capital investments make a foray into social networking a worthwhile proposition. Our analysis indicates that online social networking is not attractive, given the large network-agnostic subscriber base and global reach of market leaders. The real opportunity for telcos is presented by the nascent mobile social networking space where operators can leverage their existing strengths such as address book information, location capabilities, and brand recall. We recommend that telcos do not delay their entry into mobile social networking and quickly launch aggregation services. This should be followed by incrementally adding capabilities such as enhanced address book applications, geo-location based services, and a gradual shift towards pervasive social applications. Telcos should decide on the ideal combination of revenue models—such as local advertising, micropayments, advertisements, and subscription—based on the type of social network they decide to launch.

Figure 1: Evolution of Social Network Service Offerings



Source: Capgemini TME Strategy Lab analysis; Tech Radar, *So where's China in the world of social networking Sites – Facebook, MySpace*, January 2008. Note: Mobile social network has been considered when a network has launched a dedicated mobile application; Comsenz is an enabler of bulletin board (BB) services in China, where there are over three billion registered BB users

Social Networking Overview

Social networking is one of the most rapidly evolving services on the Web. Online bulletin boards of the mid 1990s have given way to interactive platform agnostic social services (see Figure 1). Over the last five years, social networking has witnessed several innovations with most services regularly updating their core offerings through new features and functionality.

Social networking is emerging as an important cross-platform service across the PC, mobile, and TV. As a result of increasing consumer desire to access their social networks on the go, their usage on the mobile platform has gone up significantly

(see Figure 2). Many social networks have also started offering their services on other emerging platforms. For instance, while Facebook offers integration with Microsoft's gaming console Xbox LIVE, a Twitter widget is available to subscribers on Verizon's FiOS TV.

Impact of Social Networking on the Web

Social networks are gradually transforming the Web landscape with more and more websites integrating social functionalities. The decline in time spent by users on other Internet activities can potentially be attributed to the sharp rise in user engagement on social networks (see Figure 3).

This increasing time spent on social networks is resulting in these portals emerging as gateways to other content on the Web. In December 2009, 15% of traffic to major Web portals like Yahoo, MSN and AOL came from Facebook and MySpace¹.

As social networks move towards becoming the most popular communication and content platforms on the web, both fixed and mobile, they hold the potential of disrupting

Figure 2: Increased Usage of Social Networking on the Mobile Platform

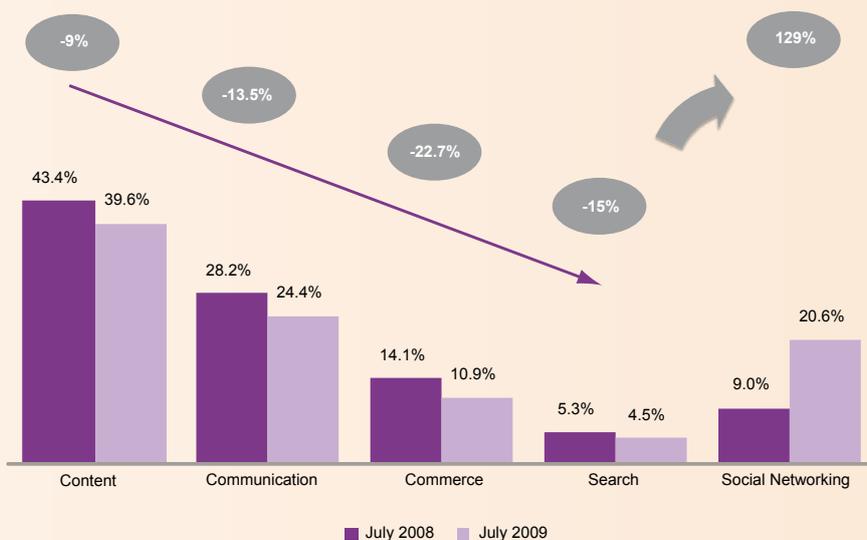


Source: Company websites; Comscore, *Social Networks on the Move*, September 2009; Morgan Stanley, *The Mobile Internet Report*, December 2009
 Note: 1) Percentage of total market refers to the number of mobile users using mobile Internet services during the three month periods ending May 2008 and May 2009. 2) Mixi is one of the most popular social networks in Japan, available on both the fixed and mobile platform

current communication and content providers. Telcos should thus firm up strategies on how to mitigate any likelihood of disruption to their core services. In this paper, we qualify the social networking opportunity for telcos and propose some recommendations around how telcos can tap this market.

“ The mobile social networking space offers telcos an ATTRACTIVE OPPORTUNITY ”

Figure 3: Share of Time Spent on Internet Activities, %, July 2008 - July 2009, US



Source: Capgemini TME Strategy Lab analysis; OPA Internet Activity Index

¹ San Francisco Chronicle, *Facebook directs more online users than Google*, February 15, 2010.

Current Telco Initiatives in Social Networking

The popularity of social networking has prompted telcos to foray into this space (see Figure 4). Telecom players have mainly entered this space through partnerships, although some have chosen to acquire or build their own social networks. This section presents an overview of key telco social networking initiatives.

Partnerships

Most telco activity has been limited to partnerships with established social networks to offer customized mobile versions of their services on the operator's network. Such a model provides operators an easy entry route and the potential to benefit from the popularity and user-base of existing networks through increased mobile Internet, SMS, and MMS usage. For instance, more than 200 operators in 60 countries have partnered with Facebook to promote mobile products².

Some operators have also partnered with device manufacturers to offer social networking focused handsets. For example, 3 has partnered with handset vendor INQ on a range of social phones available exclusively to its subscribers. Such partnerships are

aimed at differentiating the operator's offering and driving uptake of social networking on the mobile platform.

Aggregation

Many telcos have also launched aggregation services such as Orange Social Life, Virgin Mobile Connect, and Vodafone 360 that pull content from multiple social networks into one application. These services typically integrate address book, social networking, email, and instant messaging (IM) contacts of users into a single contact list and allow subscribers to manage multiple social profiles from one location. Such applications provide telcos with an easy opportunity to leverage the popularity of existing social networks by offering their subscribers an aggregated user experience.

In fact, after partnerships with existing social networks, the launch of aggregation services has been the next step adopted by most telcos in their foray into social networking.

Acquisitions

Some telcos have acquired social networking companies, either to leverage technology capabilities or to gain user-base. In 2007, South Korean operator SK Telecom acquired a leading regional social network, Cyworld, which had around three million subscribers at the time of acquisition, as part of its strategy to bolster its online portal Nate. Driven by the popularity of Cyworld, Nate overtook market leader Daum as South Korea's most visited Internet portal within a year of the acquisition³. Another example is Vodafone, which acquired Zyb in 2008 in order to gain the technical competency required to launch an enhanced address book service. Vodafone has since used Zyb's technology and redeployed it in the form of its mobile social networking offering, Vodafone 360⁴.

Figure 4: Summary of Telco Initiatives in Social Networking

	Partnership	Acquisition	In-House Development
2006-2007		<p>Acquisition of popular existing social network</p>	<p>Content-based social network for sharing pictures</p>
2008-2009	<p>Partnerships to drive data traffic</p>	<p>Acquisition for technology</p>	<p>General fixed + mobile social network</p> <p>Virgin Mobile Connect</p>

Source: Company websites and press releases

² Facebook Press Room Statistics.

³ Asia Pulse, *K COMM Overtakes Daum as Korea's Most-visited Internet Portal*, June 2004.

⁴ TechCrunch, *Danish Mobile Social Network ZYB Acquired by Vodafone for €315-million*, May 2008.

However, acquisitions have not been a very popular entry strategy for telcos so far mainly because of lack of attractive acquisition targets and fluctuating valuations. For instance, Facebook's estimated valuations have varied from US\$750 million to US\$15 billion. Furthermore, most major social networks have not positioned themselves for sale and are either planning an Initial Public Offering (IPO) or are owned by large conglomerates which are reluctant to exit.

In-House Development

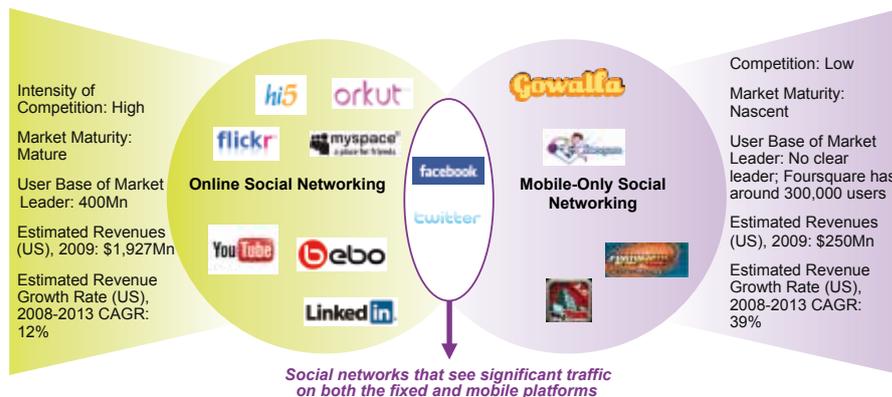
As exceptional cases, operators such as Orange and Telefónica have experimented with launching their own social networks, however, these initiatives continue to be in early stages of uptake. Orange Labs' initiative, Pikeo, a photo sharing service, which was launched in 2006, continues to be in public beta phase and has not been commercially launched in France Telecom's home market. Similarly, Telefónica's social networking offering, Keteke, which was launched both for PC and mobile platforms, is still in public beta since 2008.

The long gestation periods for operator-developed online social networks indicate that these initiatives have not taken off as expected in the face of high competition from established players.

Opportunity for Telcos in Social Networking

Telcos need to carefully evaluate the most attractive opportunities in social networking before making a leap. The PC-based online social networking space is dominated both by large global players—such as Facebook and MySpace—and regional giants like China's Qzone and South Korea's Cyworld. Telcos are likely to find it difficult to compete with these established social networks,

Figure 5: Social Networking Platforms Differentiated by their Opportunity for Telcos



Source: Company websites and press releases; Informa, *Mobile Social Networking Forecasts*, 2009; Piper Jaffray, *Pay to Play: Paid Internet Services*, July 2009

considering online players' large network-agnostic subscriber base and wide reach on the fixed platform.

The mobile platform, however, offers telcos an attractive opportunity to enter the social networking space considering the nascent state of mobile-only social networks, their rising attractiveness, and certain key telco assets which can be leveraged to make the foray successful (see Figure 5).

Most successful mobile-only social networks have been launched as recently as 2009 and this space is witnessing a lot of innovation and user traction. Foursquare, a mobile geo-location based social network, which was launched in March 2009, is currently seeing a check-in every second.⁵ We believe telcos should tap this opportunity by leveraging their assets such as billing systems, address book information, and location information. For instance, telcos can customize existing billing solutions to enable transactions on mobile social networking services. Similarly, address book information could be integrated with IM, email, and social profiles to offer enhanced address

book services. Location information of users can be used to develop geo-location services.

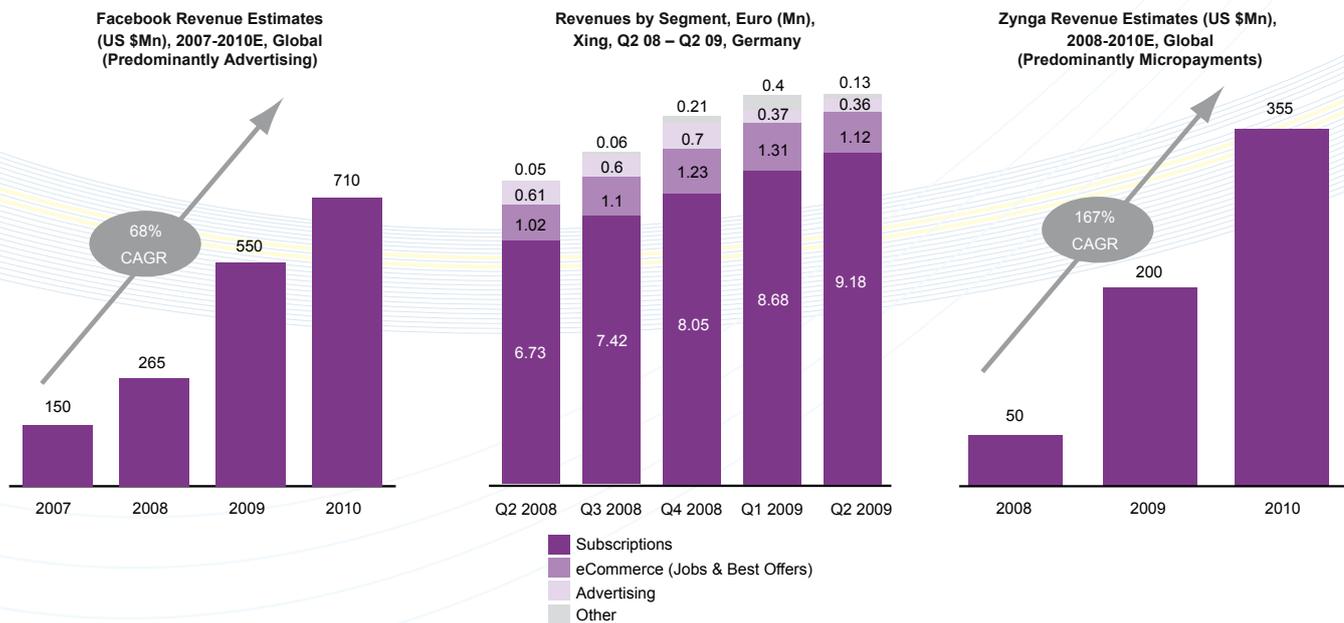
Telcos should thus launch mobile social networks and benefit from incremental revenue streams, increased data traffic, multiple monetization schemes, and low investment risks which make this proposition all the more attractive. We detail these benefits in the subsequent sub-sections.

Incremental Revenues Through Multiple Monetization Models

The rapidly evolving social networking space presents telcos with a real opportunity to boost revenues from non-core services. The success of advertising, which is the mainstay of revenues on most social networks, coupled with the emergence and early successes of new monetization models such as micropayments and subscriptions makes social networking all the more attractive for telcos (see Figure 6).

⁵ Tech Crunch, *Foursquare Who? Gowalla What? MyTown Has 500,000 Users And 31 Million Check-Ins*, January 2010.

Figure 6: Growth Indicators of Different Monetization Models in the Social Networking Space that Telcos Can Potentially Deploy



Source: Capgemini TME Strategy Lab analysis; company websites and annual reports; Piper Jaffray, *Pay to Play: Paid Internet Services*, July 2009; Inside Social Games, *The Latest Stats on Zynga: New Traffic, Revenue and a \$1 Billion Valuation?*, November 2009; Virtual Goods News, *\$50 Mil Revenue from Virtual Goods Sales for Zynga in 2008*, January 2009.
 Note: 1) Zynga is one of the leading social gaming companies, operating popular games including Farmville, Mafia Wars, on Facebook. 2) Xing is one of the popular business-user oriented social networks operating primarily in Germany

“Users on the mobile platform are 2.5 TIMES MORE LIKELY TO PAY FOR SERVICES than those on the fixed platform”

The willingness of users to spend money on social networks is another healthy sign which presents potential incremental revenue streams for telcos. In 2009, it was expected that 33% of the total social networking revenue in the US came from paid services such as membership fees, premium features, and virtual goods⁶. Most interestingly, research indicates that users on the mobile platform are 2.5 times more likely to pay for web-based services than those on the fixed platform⁷. Therefore, even from a monetization standpoint, venturing into the mobile social networking space is much more lucrative for telcos.

Low Investment Risks

The low level of investment required to launch a social network that can potentially yield telcos high benefits in terms of incremental revenues, increased stickiness, and high data

traffic make the proposition extremely attractive. In December 2009, a leading social network, Friendster, which had nearly 50 million users was sold for an estimated €29 million⁸. Launching mobile social networks typically costs even less. For instance, Gowalla, a leading mobile geo-location based social network, which had close to 100,000 users within three months of launch, required just US\$2 million for initial funding⁹. Such moderate levels of investments compared to capital-intensive telecom initiatives make social networking a low capital risk proposition for telcos.

Telcos' entry into social networking, though, will be accompanied with a set of challenges such as the dynamic nature of the space and volatile consumer behavior. Maintaining sustained market leadership will thus be difficult in the face of changing

6 eMarketer, *Worldwide Social Network Ad Spending*, March 2009; Piper Jaffray, *Pay to Play: Paid Internet Services*, July 2009.
 7 Morgan Stanley, *Mobile Internet Report*, December 2009.
 8 TechCrunch, *Friendster Valued At Just \$26.4 million In Sale*, December 2009.
 9 Venture Beat, *How Gowalla landed \$8.4 million for location-based game*, December 2009.

consumer preferences. Moreover, demographic variations and regional peculiarities will make target audience identification a significant challenge. For instance, there was a 1% fall between December 2007 and December 2008¹⁰ in unique audience composition of member community¹¹ sites amongst the 18-34 year olds. In contrast, UK social networking subscribers in the 15-24 year age segment grew at 14% between June 2008 and June 2009¹².

However, despite these challenges, social networks remain attractive and have garnered a substantial user-base with steady revenue growth. As the Web becomes more social, telcos are well positioned to lead this transition by virtue of their hold on client address books, a user's closest set of contacts. Most of all, the nascent state of mobile Web provides an opportunity for telcos to define new paradigms in consumer

behavior and monetization models and not be burdened by the history of the desktop Web. Considering these factors, a foray in mobile social networking seems an attractive opportunity for telcos.

Recommendations

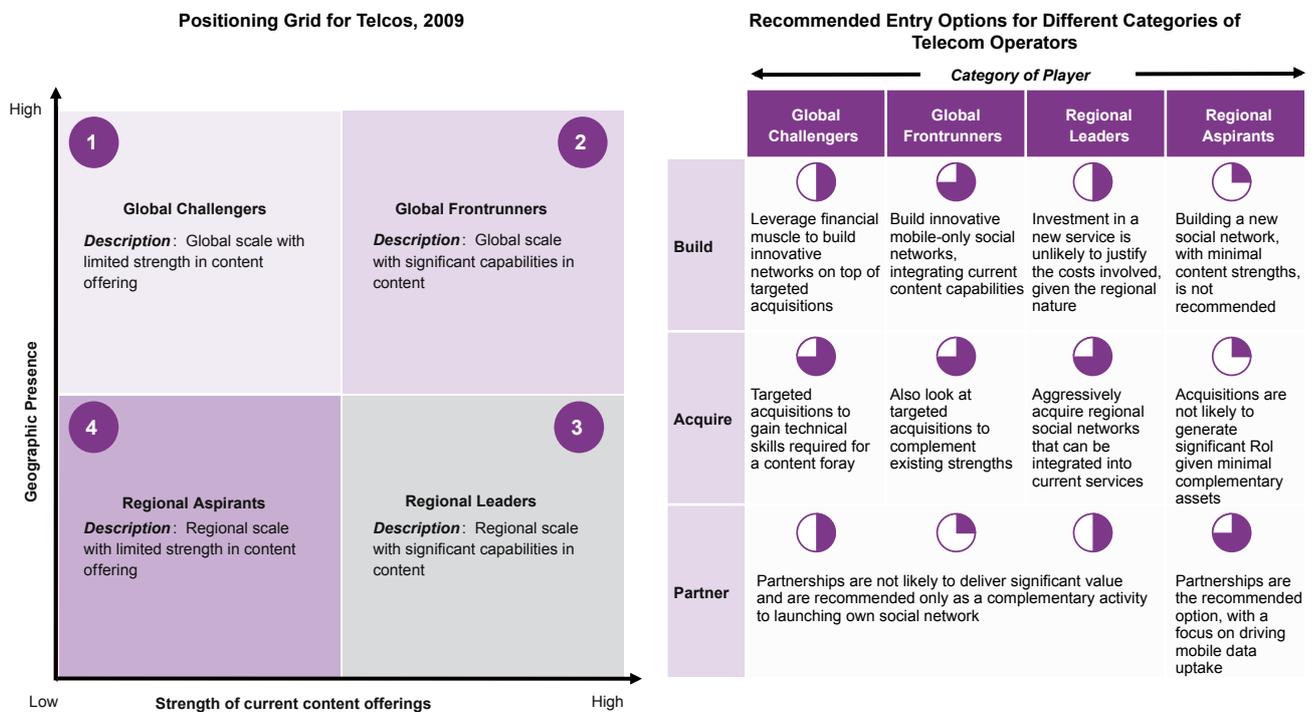
In this section, we propose some recommendations around how telcos can successfully launch, operate, and monetize their mobile social networking proposition.

How to Enter

A one-size-fits-all strategy will not work for a telco entry into social networking. Instead, an operator's entry into mobile social networks needs to be closely tied to their scale of operations and strength of existing content offerings. Scale of operations for an operator includes parameters such as subscriber base, geographic reach, brand strength, and financial resources, all of which

“ MAINTAINING SUSTAINED MARKET LEADERSHIP in social networking WILL BE DIFFICULT in the face of changing consumer preferences ”

Figure 7: Scale and Capabilities in Mobile Content Play a Significant Role in Determining Success of Operator Initiatives in Social Networking



Source: Capgemini TME Strategy Lab analysis

10 Nielsen, *Global Faces and Networked Places*, March 2009.

11 Note: Member Community implies Social Networking and Blogging websites.

12 Comscore, *15-24 Year Olds in the UK Encroach on their Elder's Social Networking Space*, August 2009.

“Operator entry into mobile social networks NEEDS TO BE CLOSELY TIED to their scale of operations AND STRENGTH OF existing content offerings”

will be critical in determining its social networking entry route. Similarly, an operator’s existing content capabilities which include mobile content experience, existing content partnerships, and application development skills, will help create a platform for successful offerings. For instance, micropayment-based transactions on social networks are inherently similar to content sales on operator mobile portals in terms of immediacy of transaction and small amounts involved. Similarly, existing partnerships with content companies will play a key role in building a mobile social network.

From a social network entry perspective, telcos can be positioned in four categories based on their scale and capabilities in mobile content: Global Challengers, Global Frontrunners, Regional Leaders, and Regional Aspirants (see Figure 7). Telcos should formulate their entry strategy in the mobile social networking space based on their grid position.

Global challengers and frontrunners should primarily enter through their own social networks. That said, while global challengers should leverage their financial strength to acquire social networking players

for technology, global frontrunners should build on their strong content capabilities to develop offerings in-house. Alternatively, regional leaders and aspirants should mainly consider partnerships and selective acquisitions to step in. Regional leaders should focus on acquiring regional networks, with considerable traction in local markets, and enhance them further by leveraging their content strength. Regional aspirants on the other hand should partner with existing social networks or application developers to create value-added offerings because they have minimal content strengths and scale to either build or acquire.

How to Launch and Drive Uptake

Telcos should adopt a chronological launch strategy to quickly make an entry into mobile social networking (see Figure 8). Operators should initially offer simple applications and incrementally add enhanced features. Since the space is nascent and telcos have limited prior experience, it is imperative that their first step is successful and helps generate brand awareness. Telcos should thus step in quickly by offering a simple and addictive mobile social networking experience to garner a large subscriber base and learn in the process. This should be followed by integrating additional functionalities such as enhanced address books, location-based social features, and cross-platform access. This approach will help telcos best leverage their strengths and establish a measured and steady footing in this space.

It is also important for telcos to adopt multiple promotion strategies such as partnerships, push marketing, and an open approach in order to drive uptake of their social networking proposition. Operators can partner with device vendors to offer pre-bundled applications thereby creating a wider ecosystem for their social network. Furthermore, partnerships with innovative developers such as gaming companies will encourage

Figure 8: Chronological Launch Approach for Telcos in the Mobile Social Networking Space

	1 Social Network Aggregation Services	2 Enhanced Address Book Applications	3 Geo-location Based Services	4 Pervasive Social Applications
Description	<ul style="list-style-type: none"> Services which enable users to access multiple social networks on mobile phones through single sign-on 	<ul style="list-style-type: none"> Applications that integrated social networking contacts, IM buddy lists and email addresses with a user’s contact list 	<ul style="list-style-type: none"> Services which leverage a user’s physical location to provide enhanced context aware services and experiences 	<ul style="list-style-type: none"> Applications which extend the reach of social networks across platforms such as TV, gaming consoles, etc.
Rationale of Positioning	<ul style="list-style-type: none"> Easy to develop, hence the quickest entry route Strong acceptance in market as they offer users ubiquitous access to their online social profiles on the go 	<ul style="list-style-type: none"> Integration of social information with the address book is the next logical enhancement Offers significant value-add to subscribers by making contacts as the center of communication 	<ul style="list-style-type: none"> Once capabilities are developed, the next step involves adding location and context to applications Telcos are best equipped to offer such services as they can bypass GPS 	<ul style="list-style-type: none"> Future of mobile social networking lies in cross platform ubiquitous access of social information Telcos will need to extend their social offerings across devices
Indicative Examples	<ul style="list-style-type: none"> Social Life (Orange) Connect (Virgin Mobile) SocialNet 	<ul style="list-style-type: none"> Vodafone 360 MyCommunity (T-Mobile) 	<ul style="list-style-type: none"> Foursquare Gowalla Loopt 	<ul style="list-style-type: none"> Facebook on Xbox LIVE Twitter widgets on Verizon FiOS

Source: Capgemini TME Strategy Lab analysis

users to sign up through viral applications built on top of the operator's social network. Pushing their service to subscribers by integrating it into various traditional telco mediums such as MMS, SMS, and mobile portals, is another marketing strategy which can yield operators rich dividends. This approach will help transfer the operators' existing subscriber base onto their social network. Most importantly, in order to attract users from competing networks and to foster community effects, telcos should not limit their service to users of their own network.

How to Monetize

A successful monetization strategy for their mobile social networking offering will be of foremost concern to telcos delving into this space. Operators will need to select the right monetization scheme based on the kind of social network they decide to launch (see Figure 9). So while local advertising will work best for telcos launching geo-location based mobile social networks, subscriptions will be the way to go for niche networks targeted at specific user groups. Though the primary business model of a telco should depend on the type of social network, ideally, a combination of multiple business models will engender greater gains.

Pricing is another area where telcos can bring in innovation. Data plans from most operators are still expensive and not very attractive for accessing social networks on the mobile platform. Introduction of attractive flat-rate plans and targeted

Figure 9: Different Monetization Models which Telcos can Adopt for their Mobile Social Networks

		Monetization Models			
		Local Advertising	Micropayments	Display and Search Advertising	Subscription
Works Best For?		• Telcos launching location-based social networks	• Telcos launching social gaming applications	• Telcos launching general purpose social networks	• Telcos launching niche social networks targeted at specific users
Why?		<ul style="list-style-type: none"> • Most features revolve around a user's location and context • Collaboration with local vendors for promotions offers significant revenue upside 	<ul style="list-style-type: none"> • Compelling social games stimulate users to spend on virtual goods • Asian geographies stand testimony to the success of micropayment model 	<ul style="list-style-type: none"> • Telcos have large existing subscriber base, which if translated into users of their social networking proposition hold potential for generating revenues from display and search adverts 	<ul style="list-style-type: none"> • Users with specific interests are more willing to pay • In the online world too, most niche networks have successfully adopted the subscription model

Source: Capgemini TME Strategy Lab analysis

pricing can be a key differentiator for operators.

In conclusion, mobile social networking presents telcos with a real opportunity to tap into their latent assets and establish a firm footing in this nascent yet highly attractive space. It is imperative for telcos to leverage the early mover advantage and quickly enter mobile social networking by offering simple yet compelling applications. Operators can then incrementally enhance their applications to offer greater value add to their subscribers. In order to drive growth and generate significant user traction, telcos would need to adopt an open approach and not tie in subscribers to their own networks. Finally, to gain maximum revenue, operators would need to adopt a combination of monetization schemes based on the type of mobile social network they decide to launch.

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Priyank Nandan is a consultant in the TME Strategy Lab. His recent work includes market assessment for new service launch for a global media conglomerate and identification of acquisition targets within the digital content space. Prior to joining the Lab, Priyank has worked for a major IT product company. He is based in Mumbai. ■

Mobile Application Stores: Assessing Opportunities for Telecom Operators

By Jerome Buvat, Sayak Basu, and Prenul Sogani

Abstract: Mobile application stores have generated considerable interest and discussion in the recent past. Particularly, the success of Apple's application store for the iPhone has established online storefronts as an important distribution channel for mobile content and applications. This has led device players, Operating System (OS) vendors, and many mobile operators to launch their own application stores. We expect the mobile application market to be worth almost US\$ 9 billion globally by 2013¹. For operators, application stores can be an important lever to grow data revenues—our estimates indicate that operators can improve their non-SMS data revenues by 10 to 11% over a five year period by leveraging direct revenue streams through application downloads, mobile traffic as well as indirect revenues such as advertising, and provision of billing services. However, telcos will need to compete with device and OS vendor stores to attract consumers and developers to their storefronts, which could prove to be a daunting task. Operators will also need to develop sustainable revenue streams from application stores, in light of falling ASPs² and proliferation of free applications. We recommend global players with a large captive customer base to build end-to-end capabilities, while smaller regional telcos should undertake only select activities in-house, relying extensively on third-parties for the technology platform. Operators should launch platform-agnostic application stores, support non-device specific platforms in order to target a wider subscriber base, and expand the market for mobile applications. In order to maximize revenue potential from storefronts, operators should also experiment with innovative pricing models that are linked to the usage, popularity, and stickiness of the application. Moreover, operators can grow new revenue streams through the provision of white-label services such as billing support, customer management, and payments to other storefronts.

Application stores have gained considerable attention in the recent past and are emerging as an important channel for the distribution of mobile content. An application store is an online aggregation and distribution platform for downloadable applications for smartphones and high-end feature phones. For developers, these stores act as a channel to reach out to a large number of consumers, while providing necessary functionalities such as billing, payment gateway, and customer management. For

consumers, storefronts provide a single destination for accessing reliable mobile applications across a variety of genres, with trusted and secure mechanisms for managing the interactions.

In this paper, Capgemini's TME Strategy Lab qualifies the application store opportunity for mobile operators and proposes some key recommendations on how telcos can successfully launch and operate mobile application stores.

¹ Capgemini TME Strategy Lab analysis.
² Average Selling Price.

Key Developments in the Mobile Application Store Market

Application stores have been in existence for almost a decade. For instance, Handmark and Getjar, both independent stores, have been operational since 2000 and 2004 respectively. However, the multiplicity and proprietary nature of device platforms and consequent high entry barriers for independent developers have restricted these stores from garnering a wide developer and end-user community. By 2008, around eight years since its inception, Getjar had around 50,000 applications available on its store³. This number was surpassed by Apple's App Store in less than a year of launch⁴.

The success of Apple's App StoreTM has resulted in a paradigm shift in how mobile applications are created and distributed (see Figure 1). Apple managed to build a strong developer community by allowing developers to retain 70% of the revenues generated from an application. Moreover, Apple provided a captive customer base of over 36 million⁵ iPhone users who have cumulatively downloaded more than three billion applications by the end of December 2009⁶.

The success of Apple's App Store was followed by a number of announcements from various players around their decisions of entering the space. Device vendors such as Nokia and Research in Motion (RIM, maker of the Blackberry smartphones); OS vendors Microsoft and Google; and telecom operators have all entered the applications store market (see Figure 2).

Figure 1: Major Changes Introduced by Apple App StoreTM

		Pre App Store Launch	Post App Store
Application Development	Application Creation	Professional Companies/Self	Professional Companies/Self + Retail
	Application Ownership	Primarily Carrier	Developers
	Application Accessibility	On deck – One among many services	On deck – Dedicated store for apps
	Time to Market	2-3 months	~2 weeks
Degree of Openness	Platform Openness	Closed, permission-based	Open subject to sign up
	Supporting Devices	Spectrum of devices – low-and-high-end	Some high end devices
	Content Restrictions	Many non-competition restrictions	Fewer restrictions
Costs for Developers	Porting Cost	High porting costs to support wide range of devices	Limited device support
	Entry Route & Membership Fees	Complicated, differing pricing amongst operators, aggregators	Streamlined processes, fees in-line with market
	Revenue Split	20/80 or 30/70	70/30 or 80/20

Source: Capgemini TME Strategy Lab analysis; *Mobile app store overview*, Distimo, November 2009; *Mobile app store overview, 2005 Mobile Games White Paper*, IGDA

Figure 2: Application Store Launches by Various Types of Players

OS Vendors	Handset Vendors	Telcos
Open, non-restrictive support for app development	Hardware targeted stores launched for higher device uptake	Customer oriented stores launched for better customer experience
 <p>Oct '08 Oct '09 Announced</p>	 <p>Jul '08 Apr '09 May '09 Oct '09 Sep '09 Jul '09 Aug '08 Announced</p>	 <p>Dec '09 Q4 '09 Nov '08 Aug '09 Sep '02 Q1 '10 Q4 '08 Nov '08 Q3 '08</p>
Independent App Stores		
Support for applications spanning different platforms and devices		
 <p>Dec '00 Dec '04 Dec '04 May '06</p>		

Source: Company Websites and News Releases

3 JetViewVietnam.com, *GetJar exceeds half a billion application downloads*, December 2008.

4 TechCrunch, *State of The iPhone Ecosystem: 40 Million Devices and 50,000 Apps*, January 2009.

5 Apple Insider, *Apple's iPhone was No. 3 worldwide smartphone in 2009*, February 2010.

6 Apple Insider, *Apple announces App Store downloads top 3 billion*, January 2010.

“ Typical telco entry strategies into application stores INCLUDE CREATING PROPRIETARY SOLUTIONS, deploying white-label stores and aggregating third-party stores ”

Figure 3: Application Store Launches by Telecom Operators

Proprietary Stores		White-label Stores		Aggregate Third-party Stores	
Greenfield Stores	Existing Mobile Portal Upgrades	Off-the-Shelf App Store Solutions	Hosted App Store	Application Store Aggregator	Open Source Based App Stores
<ul style="list-style-type: none"> Operators with large customer base have developed own application stores It involves provisioning of an extensive application store solution 	<ul style="list-style-type: none"> Some operator portals already have necessary elements in place for a successful store These include third-party management, revenue assurance, customer profile management and service catalogs 	<ul style="list-style-type: none"> Some operators buy platforms directly from companies such as Amdocs Operators can acquire companies providing application store platform solutions 	<ul style="list-style-type: none"> These are similar to off-the-shelf stores but managed by third parties such as Ericsson Independent app stores such as GetJar and Handmark provide white-label stores that are then managed by them 	<ul style="list-style-type: none"> These stores have multiple third party stores accessible through a single platform Smaller operators with a restricted customer base can act as aggregators 	<ul style="list-style-type: none"> App stores have also been created around open source platforms such as Android or LiMO This allows sharing the entire revenue with the developers, rather than mobile OS vendors
Examples					

Source: Capgemini TME Strategy Lab Analysis. Company websites and news releases

Telco Activity in the Application Stores Space

Most leading mobile operators have either launched their application stores or have announced their intent to launch one in the near future. The launch strategies range from creating proprietary solutions to embracing third-party hosted application stores (see Figure 3).

The trend of launching these stores is not limited to developed markets, with multiple players from the emerging economies including Bharti Airtel (India), China Mobile, and TIM Brazil also announcing their entry into this space.

Operators have forged strong alliances as a part of their strategy for competing in this space. These alliances tend to be for accessing technology, content, or other ancillary services necessary to provide application store offerings. Sprint partnered with Getjar to make almost 60,000 applications available to its customers through a link on its portal, in an effort to increase the variety of content available. Aircel

in India has engaged IT solutions provider Infosys to implement an application store, based on Infosys’ application store platform called “FLIP”. Similarly, operators are also tying up extensively with credit card companies and online payment merchants for a more convenient application store experience for their customers.

Telecom players are also collaborating to develop standards. The most significant announcement has come from a consortium of 24 operators who have come together to form the Wholesale Applications Community (WAC)⁷, which aims to create an open platform for developers to reach the customers of its member networks. Other initiatives include BOND⁸ which is attempting to build a new platform for secure mobile application development and Joint Innovations Lab (JIL)⁹, that is creating a widget ecosystem that provides developers with access to various operator assets.

While application stores are an important growth area within the mobile data market, telcos are faced

7 The Wholesale Applications Community is a global alliance of leading telecommunications operators and device manufacturers that establishes routes to market for developers.
 8 The BOND⁸ initiative is backed by operators including 3 Group, AT&T, T-Mobile, Telenor, Telefónica, Telecom Italia and Vodafone.
 9 Joint Innovations Lab (JIL) is a joint venture between Vodafone, Verizon Wireless, China Mobile and Softbank Mobile.



with the question of whether they should launch application stores at all, and if yes, how should they position themselves in a space dominated by device players. In the subsequent sections, we assess the need for operators to launch application stores in more detail.

Rationale for Telcos to Launch Application Stores

We believe operators should launch application stores to retain their prominent position in mobile content distribution as well as to benefit from new revenue streams through the sale of applications, provision of access services, and rendering of additional services such as integrated billing and access to network Application Platform Interfaces (APIs).

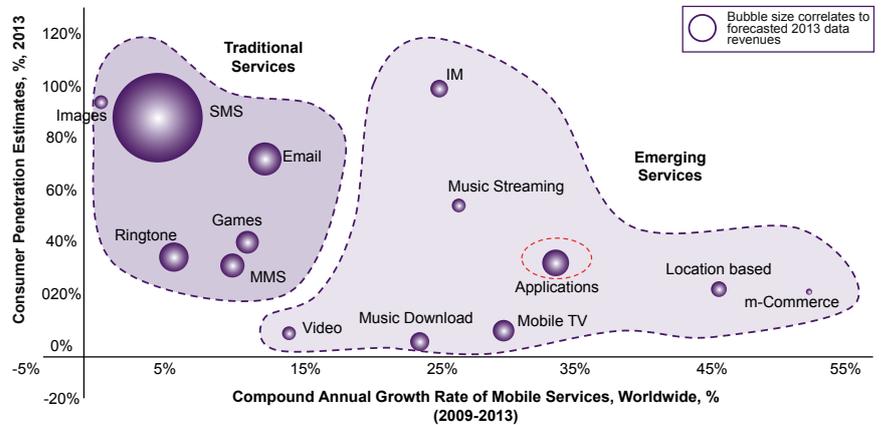
Revenues from Application Downloads are Set to Grow Exponentially

Application stores are emerging as a key distribution channel for mobile content. An increasing number of users are consuming popular mobile content such as music or games through downloadable mobile applications. According to a survey, 70% of mobile users download mobile applications, the highest amongst all mobile content categories¹⁰.

We estimate the total revenue from paid mobile application downloads in 2009 at around US\$ 3.8 billion¹¹. However, indications are that this is only a fraction of the total market opportunity. Changes taking place across the ecosystem are likely to result in both demand side pull as well as supply side push, ultimately resulting in growth of the segment.

A major thrust from the demand side will be a result of the extension of the customer base for the service. With greater awareness about application stores, uptake is

Figure 4: CAGR, Revenue and Consumer Penetration of Various Mobile Data Services, Worldwide, 2009-2013

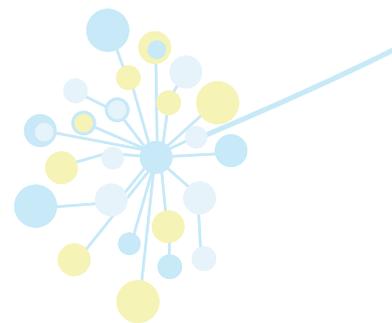


Source: Capgemini TME Strategy Lab Analysis; Informa, *Global Mobile Network Traffic 2007-2012*; Informa, *Global Messaging End User Forecasts*, November 2008; Morgan Stanley, *Mobile Internet*, December 2009; Nielsen, *Mobile Media Europe: State of the EU5 Union*, March 2009; ComScore, *The Next Big Things: Mobile Internet & Applications - Gaining Momentum*, 2009

expected to grow beyond the early adopters. The trend is expected to be further strengthened by increasing penetration of smartphones. Adoption trends of mobile data services indicate that 73% of smartphone users have downloaded at least one application¹².

Similarly, on the supply side, improved device capabilities such as bigger screens, position sensors, and better user interfaces are expected to enable a number of innovative applications with compelling use cases for consumers. Easier application discovery and simpler billing will enhance monetization opportunities for developers, thereby broadening the developer base and ultimately improving the adoption of services.

These factors are expected to give a strong boost to the adoption of mobile application services. We expect the market for mobile applications to reach US\$ 8.6 billion by 2013, growing at a CAGR of around 30% between 2010 and 2013 (see Figure 4).



¹⁰ Xiam, *Mobile content discovery*, August 2009.

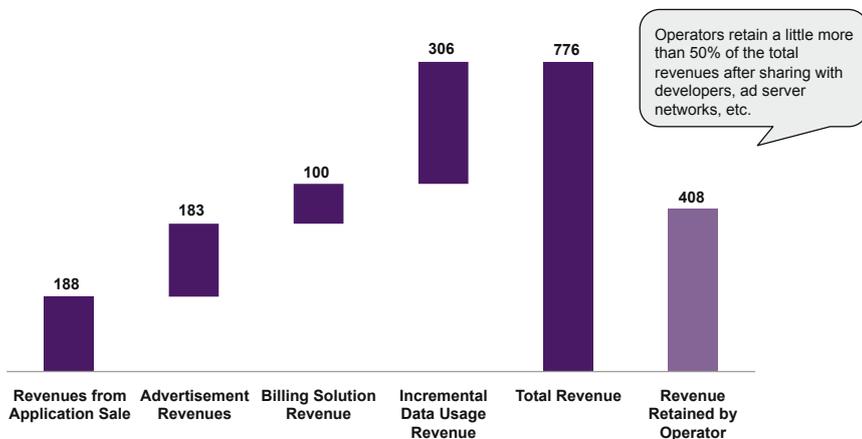
¹¹ Capgemini TME Strategy Lab analysis.

¹² Brookings, *What Consumers Want From Mobile Communications in the United States, United Kingdom, Spain, and Japan*, September 2009.





Figure 5: Revenue Uplift from Operator-Owned Application Stores



Source: Capgemini TME Strategy Lab analysis

“*Mobile applications have emerged as a HIGH-GROWTH AND SUSTAINABLE AVENUE of revenue generation*”

The Potential for Uplift in Data Access Revenues is Attractive

Launching an application store will provide operators with an opportunity to augment their existing data services revenue. There are going to be primarily four revenue streams for operators, namely revenue share from sale of applications, mobile advertising revenue, data usage revenue, and payment gateway revenue. Relying on the aforementioned revenue streams, we believe that a typical operator¹³ can expect a non-SMS data revenue uplift of up to 11% by 2013¹⁴.

Beyond the revenue potential that accrues from the various streams depicted in Figure 5, operators will also be in a position to drive the kind of applications that are provided on their stores. By encouraging developers to write applications that rely on data in the cloud, operators can drive adoption of applications that require a higher data usage. Our analysis suggests that such an approach holds the potential to drive up overall revenues from the application store by as much as 17%

with over a third of this incremental revenue coming from increased data usage. A key driver for this uplift will likely come from consumers upgrading their data plans.

The revenue upside appears specially attractive since the investments required for setting up an application store would not be significant when compared to typical telco initiatives. While the capital costs associated with launching the initiative would be fairly small in the telecom operator context, the main component of the operating cost would be around marketing of the storefront.

Storefronts Help Attract and Retain High-Value Subscribers

In addition to augmenting current data revenues, application storefronts can also be instrumental in attracting and retaining subscribers with high-spend on mobile data services. High-value customers exhibit a greater tendency to download and use mobile applications. For example, in the US, while only 11% of subscribers with annual income lower than US\$ 25,000 download mobile applications, the figure shoots up to 34.3% of the consumers for the category comprising income levels greater than US\$ 100,000 every year¹⁵. To retain these potentially high-value customers on the network, it would be important for operators to provide a compelling application store offering.

Application stores would also be important for operators to build and create a robust content ecosystem. Operator content strategies have only been moderately successful until now. For example, between 2007 and 2008, the share of mobile web traffic for operator portals fell from 57% to 22%¹⁶. To re-establish their position in the content value chain, operators would need to create a strong ecosystem.

¹³ We have considered a hypothetical Western European operator with a subscriber base of 50 million and data ARPU of US\$12.

¹⁴ Capgemini TME Strategy Lab analysis.

¹⁵ Brookings Governance Studies, *What Consumers Want From Mobile Communications in the United States, United Kingdom, Spain, and Japan*, September 2009.

¹⁶ Nokia Siemens Networks, *Nokia UK Smartphone Study*.





A successful application store offering could help operators take the preliminary steps in this direction. The storefronts allow operators to forge relations with content owners and creators, which can be leveraged while sourcing content for other initiatives. More importantly, application stores can be a lever to create a user-base comfortable with purchasing and using operator-provided content and services. A large base of content users will also have a knock-on effect on content providers, who would be more willing to provide their services through mobile operators.

“Do-Nothing” is not an Option
 Operators are threatened by the prospect of being rendered mere “bit-carriers” due to the expansion of online and device players across the value chain. The emergence of application stores as primary channels for mobile content distribution can further impact operators’ positioning in the value chain. With popular services such as web browsing, games, and social networks being increasingly consumed over the mobile platform, application store expertise is increasingly becoming critical in disseminating these services to consumers. Consequently, inaction in this space would undermine not only the competitive positioning of operators vis-à-vis other players who actively launch application stores but also the ability to drive data consumption amongst existing consumers.

However, a well-planned application store offering can present an opportunity to operators to retain a share of mobile content revenues, retain control over the end-consumer, and be in a position to define the overall data consumption experience.

Key Challenges for Telcos

While application stores present an attractive opportunity for telcos, success in this market is likely to be faced with many challenges, as operators will need to compete with well-established device and OS vendors for subscribers as well as developers, while focusing on growing data revenues. This section details some key constraints telcos are likely to face in launching and operating an application store.

Device Vendor-owned Application Stores Likely to Dominate

The growing opportunity in the applications store space is likely to result in intense competition among players to try and grab a dominant position in the market. Among the device manufacturers, Apple, with its existing dominant position in the market and access to the early adopters of technology with a propensity to spend on mobile services is likely to continue as the dominant application store. RIM, with access to a niche, enterprise audience is also likely to be a strong contender in this segment. Nokia can leverage its large base of existing users and its strength in the emerging markets.

Among the various platforms, Android is likely to gain traction in the market driven by its success in creating a good developer community. Bolstered by the growing optimism around the success of Android-based devices and relaxed policies around content restriction, the developer community for the Android Store has grown rapidly and had made available around 16,000 applications on the store by early December 2009¹⁷. However, the biggest possible game-changer in this space could be Microsoft’s launch of Windows Mobile 7 Series, whose launch was followed by rave reviews. Considering

“ A successful application store will be critical for operators to maintain **THE RIGHT SUBSCRIBER MIX BY RETAINING HIGH-VALUE CUSTOMERS** ”

17 Techcrunch, Google: *Actually, We Count Only 16,000 Apps in Android Market*, December 2009.





“Application stores can be AN IMPORTANT LEVER FOR TELCOS TO PREVENT DISINTERMEDIATION from the mobile content value chain”

the fact that Microsoft has extensive established developer relationships, a technologically superior offering from the organization along with suitable encouragement for developers will be able to enhance the possibility of success of the Windows Marketplace.

Given the inherent advantages enjoyed by the device vendors, it is likely that they will continue to be the dominant players in the applications store space in the years to come. Device vendors have the advantage of being able to position their stores on-deck for the large base of users that they have. Also, in addition to having strong brands, they will be the best positioned to offer applications which make optimum use of device functionalities. While operator stores would be able to leverage their existing customer experience management capabilities, they would have to create a strong proposition for users as well as developers to compete in the market. We expect that independent third-party stores will find it difficult to compete in this space, and will need to get into extensive partnering agreements to continue to be relevant.

Fragmentation of Developer Community

One of the consequences of the multiplicity of platforms, devices and application stores will be that developers will align themselves with particular storefronts. Since the success of a storefront is intricately linked to the quality of applications available on it, the competition for retaining the best developers on the major stores is going to be intense. The ability to attract developers to create applications exclusively for particular storefronts will depend on a number of factors such as revenue share offered, developer support for testing and marketing of applications, extent of content restrictions, captive customer base, and ease of application creation.

Declining Average Selling Price of Applications

Driven by the proliferation of free and mass market applications, the average selling price of applications is likely to drop – analyst estimates indicate a value of US\$ 1.72 by 2014, as compared to a value of US\$ 3.83 in 2009¹⁸. The positioning of a storefront in the market has a huge bearing on the ASPs, as indicated by differential pricing of certain applications on various stores. For example, the popular gaming application Tetris is priced at US\$ 4.99 on the Apple App Store, while it is priced at US\$ 6.99 on the Windows Marketplace¹⁹. Consequently, storefronts will need to closely examine their positioning in the market and formulate strategies accordingly for maintaining profitability of the application store operations.

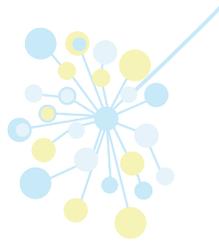
In summary, application stores can be an important lever for telcos to prevent disintermediation from the mobile content value chain and help retain as well as grow data revenues. However, operators will need to compete with device and OS vendor stores for developers as well as revenues, which could prove to be a daunting task. Operators will also need to develop sustainable revenue streams from application stores. In the next section, we elaborate on how telcos can overcome these challenges to successfully launch and monetize application stores.

Recommendations

With the entry of a number of new players in the application store space, competition is expected to be intense. Device vendors with their early entry into the space and capability of addressing customers across the globe are expected to continue performing strongly. However, operators can take a number of steps, some of which leverage their existing competencies, which will help them successfully launch an application store offering.

18 Ovum, *Telecoms 2020, 4Q09*.

19 Distimo, *Mobile Application Stores State of Play*, February 2010.



Choose the Right Positioning Based on Scale

Operators need to decide on the extent of activities that they would undertake in the application store segment. While global players with a large captive customer base might want to build end-to-end capabilities in the space, smaller players might decide to undertake only select activities in-house, relying extensively on third-parties for the technology platform (see Figure 6).

The rationale for larger operators to build extensive capabilities would be their existing capabilities around sourcing and distributing content, and hence the prior existence of a strong ecosystem. For smaller operators, the lack of negotiating leverage with scale players such as device vendors will be a key constraining factor in attempting end-to-end capabilities. The existence of a number of white-label solutions for various activities of an application store will make it easier for operators to enter the space by forging suitable alliances. For example, Ericsson's recently launched eStore solution allows operators to easily set-up their application stores, while simultaneously giving them access to a number of applications across platforms and devices. T-Mobile has taken a similar approach in creating its storefront "web2go", for which it has sourced the platform solution from mobile Internet platform provider SurfKitchen.

Support Device-Agnostic Platforms to Expand User Base

A critical component of operator strategy to compete in the space would be their support of device-agnostic platforms. This will allow operators to support a much wider device portfolio through their storefront, while simultaneously reducing porting efforts, and hence costs and time-to-market for developers. Additionally, platform-agnostic applications will allow

Figure 6: Positioning Strategy for Operators in the Application Store Space

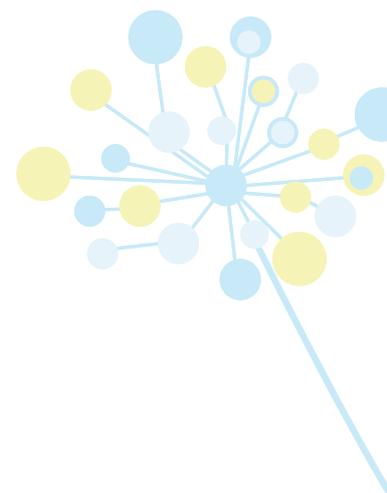
	Creation		Aggregation		Networks		Devices		Customer Management		Examples
	Teasing Support	Category Support	Partnership	Platform Support	Reach	Lease Out	Feature phone Support	Customization	Retail	Billing	
Integrated Stores	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	 
Truncated Stores	✓	✓		✓	✓				✓	✓	  
White-label Stores			✓		✓	✓	✓			✓	 

Source: Capgemini TME Strategy Lab analysis

a distinct positioning option for operators, thereby avoiding direct competition with vendor partners.

There are a number of commercial solutions already available in the market such as appMobi, Rhodes, and PhoneGap that allow developers to create applications across platforms. In addition, there are ongoing industry initiatives such as JIL and the Wholesale Application Community, which are trying to create a common platform for application development.

Another option available to operators to encourage device-agnostic application creation would be to actively promote web-based applications. The evolution of network speeds will enable more complex applications to be delivered over the web using software technologies such as HTML5, Flash, and JavaScript. Not only will this allow platform agnostic application creation, but it will also help operators to extend the user base to feature phone users. Appropriate pricing strategies will allow operators to garner greater data usage revenues from users accessing more services over the web.





“ *Aggressive revenue sharing with developers can* HELP OPERATORS PLAY THE ROLE OF A “DISRUPTOR” AND CORNER A HIGHER MARKET SHARE ”

Consider Aggressive Revenue Share with Developers

Since the quality and reliability of applications available on a storefront will be dependent on the strength of the developer community, it is imperative that operators provide the necessary incentives for the creation of exclusive applications for their storefronts. We believe that aggressive revenue share arrangements, wherein operators allow developers to retain a higher share of application revenues when compared to other storefronts, can help operators play the role of “disruptor” and corner a higher market share. While a revenue share of at least 75% for the developers will be necessary to remain competitive, analysis indicates that by increasing developer share to 80%, operators can get incremental revenue uplift of around 11% points, resulting primarily from a greater market share of application downloads (see Figure 7).

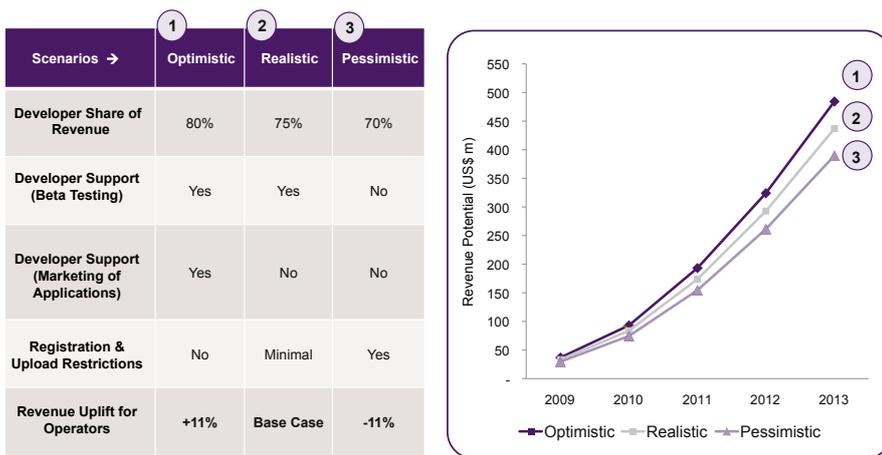
Additionally, operators could experiment with innovative revenue-sharing models to attract developers. For instance, popularity-based revenue share arrangement can provide the necessary incentive for developers to put their best work on the operator storefronts.

Enhance Revenues through Innovative Pricing

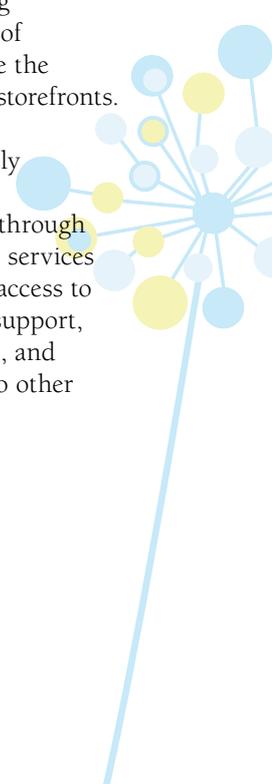
Operator storefronts also need to ensure that they formulate optimal monetization strategies. Operators should strive to develop pricing models that are optimized based on the nature of the application, with popularity, market potential, and stickiness of an application being the defining criteria. For instance, applications in categories such as medical and finance are highly customized, resulting in a limited number of such applications. However, because of the utilitarian nature of these applications, the consumer willingness to pay is fairly high. As a result, these applications are suitable for subscription pricing (see Figure 8). Similarly, application categories such as games and entertainment although popular, have low consumer willingness to pay for such services. Consequently, such applications are better suited for advertisement-based monetization models. Operators should play an active role in formulating the monetization strategies of applications, so as to ensure the greatest returns from their storefronts.

Operators should also closely examine the possibility of augmenting their revenues through the provision of white-label services such as APIs for providing access to network resources, billing support, contact centre management, and other existing telco assets to other storefronts.

Figure 7: Effect of Developer Support on Operator Revenue



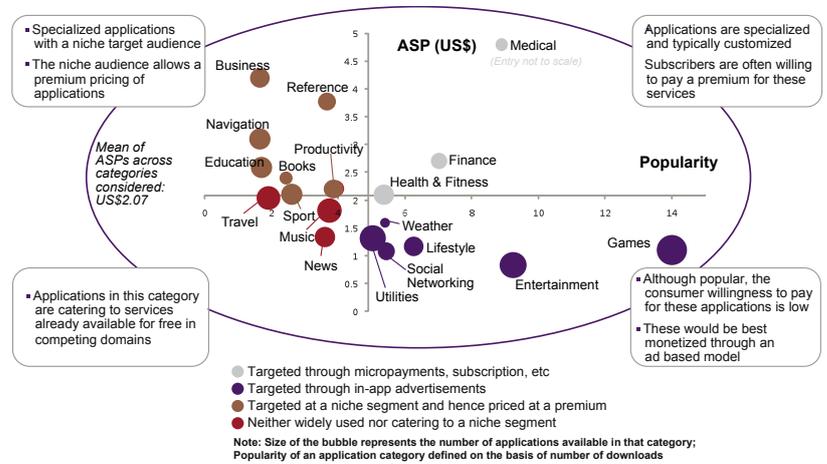
Source: Capgemini TME Strategy Lab analysis





In conclusion, while application stores provide operators with a great opportunity to re-establish their position in the mobile content value chain, the opportunity requires a strong operational strategy for success. Operators need to leverage existing capabilities so as to be able to create a robust offering for the consumers. The opportunity should be looked at from the perspective of a strategic imperative to reverse the present trend of disintermediation from the content ecosystem rather than from a pure revenue enhancement point of view. Over the next few years, as the popularity of application stores as a content distribution platform grows, operator initiatives will emerge as the cornerstone of their overall mobile data strategy.

Figure 8: Monetization Model for Various Application Categories

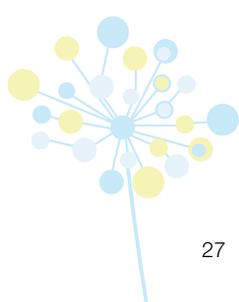


Source: Capgemini TME Strategy Lab analysis; Charles Teague blog, July 2009

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Web 3.0: Expected Evolution of the World Wide Web and Opportunities for TME Players

By Riku Rintanen and Gurdishpal Ahluwalia

Abstract: The World Wide Web (the Web) is evolving continuously. Web 1.0 entailed top-down distribution of content and information by website owners. Web 2.0 already enables users to create and share information/content with each other rather than just passively consume it. Over the next few years, the Web is expected to undergo significant changes across the digital content value chain. Key features of Web 3.0 include intelligent applications, cloud computing, open technologies, and advanced data mining. Intelligent applications entail programs that source data from all over the Internet; search tools that segregate results into relevant sub-categories; and mash-up programs that use data/functionality from multiple external sources. Cloud computing involves on-demand access to software applications and computing facilities over the Internet. Open source codes, Application Programming Interfaces (APIs) and platforms decentralize the application development process and encourage the development of the many types of applications around a central platform. Lastly, advanced data mining techniques profile consumers in real-time and help deliver relevant content/advertising. Web 3.0 presents significant opportunities to TME players. Original Equipment Manufacturers (OEMs) should lead the development of open technologies/platforms to gain a central role in the ecosystem. Operators should leverage their hardware assets and customer relationships to become significant players in the cloud computing market. They can also create open platforms for which applications can be developed by multiple independent players. Media players should leverage semantic technologies to better disseminate content over the Web and also use advanced data mining to segment customers and serve highly relevant contextual ads. Web 3.0 is in the early stages of growth. Uncertainty about the exact nature of expected features is perceived to be a challenge. However, TME players should ensure that they are not thwarted by the underlying uncertainty. In fact, they should aim to play a more active role in shaping the upcoming landscape of the next generation of the Web.

“ WEB 3.0 IS EXPECTED TO FOSTER
*not only the development of
new services but also* NEW WAYS
OF DELIVERING SERVICES TO END
CONSUMERS ”

The only thing that is constant is change. Nothing epitomizes this adage better than the Web.

Web 1.0 entailed top-down distribution of content. The Web was used primarily as a publishing platform. The sole source of data/information/content for various web pages and applications were website owners. Application development for Web 1.0 was complex and limited to a few developers because of the extensive use of closed APIs throughout the ecosystem.

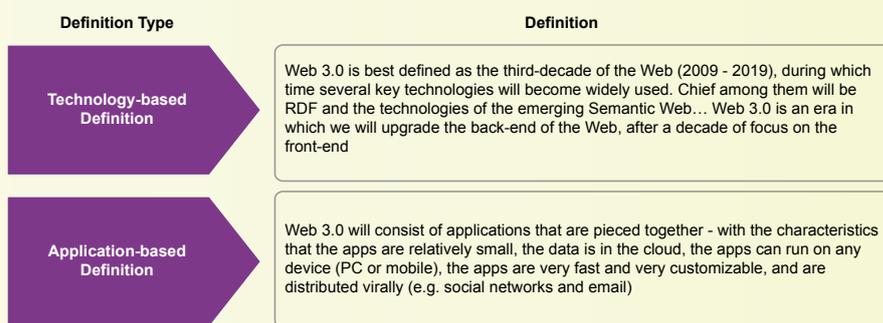
In the current stage of Web 2.0, distribution of content is no longer just a top-down process. Popular websites and applications—such as Flickr, Wikipedia, MySpace, and

YouTube—enable users to create and share information/content with each other rather than just passively consume it. Application development has been simplified significantly as compared with Web 1.0 due to the APIs provided by players such as Apple, Google, and Facebook.

Going forward, the Web is likely to undergo significant enhancements due to the continuing efforts of various ecosystem players such as Internet players, software products/ services vendors, device OEMs, and operators. Multiple developments are happening simultaneously in an interconnected manner and they promise to reshape the Web significantly. Although there is no unanimity as yet on the definition of the next stage Web 3.0, due to the relatively nascent nature of developments, a couple of definitions capture the essence of what Web 3.0 promises to deliver (see Figure 1).

Web 3.0 is expected to foster not only the development of new services but also new ways of delivering services to end consumers. This will greatly increase customer choice as well as convenience.

Figure 1: Selected Definitions of Web 3.0



Note: RDF: Resource Description Framework
 Source: Nova Spivack, *Web 3.0—The Best Official Definition Imaginable*, October 2007. Eric Schmidt, *Seoul Digital Forum*, August 2007

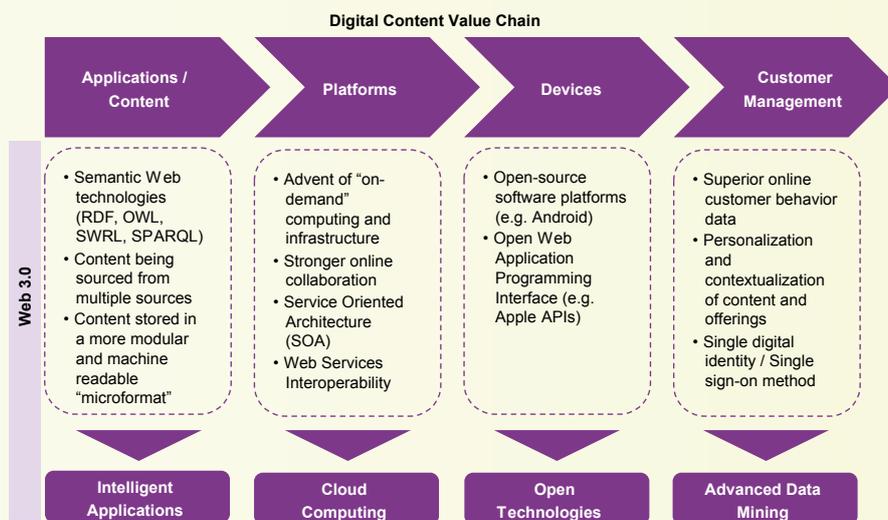
In this paper, Capgemini discusses the key expected features of Web 3.0 and offers a snapshot of the likely evolution of the Web over the next few years. Subsequently, we identify opportunities for TME players to leverage these developments and to benefit through improving reach as well as the monetization and offering of new products or services.

Key Features of Web 3.0

Key features of Web 3.0 span across the digital content value chain and include intelligent applications, cloud computing, open technologies, and advanced data mining (see Figure 2).

“ KEY FEATURES OF WEB 3.0 INCLUDE intelligent applications, cloud computing, open technologies, and advanced data mining ”

Figure 2: Key Features of Web 3.0 across the Digital Content Value Chain



Note: RDF: Resource Description Framework. OWL: Ontology Web Language. SWRL: Semantic Web Rule Language. SPARQL: SPARQL Protocol And RDF Query Language (recursive acronym)
 Source: Capgemini TME Strategy Lab analysis



Figure 3: Illustration of Categorized Results from Yahoo! Search



Source: Yahoo! Developer Network website

to quickly jump to relevant pages/ sections.

Microsoft acquired Powerset in 2008¹ to enhance its capabilities in semantic search technologies. Yahoo! currently uses RDF for its open search platform SearchMonkey. Through semantic technologies Yahoo! and Microsoft try to overlay content with contextual information to improve search results and provide more relevant data. Figure 3 demonstrates how SearchMonkey helps Yahoo! to display search results with information categorized as per potential user interest areas.



Web 3.0 will also facilitate the development of mash-ups, which are web pages or applications that use data/functionality from multiple external sources to offer enhanced services to consumers. LinkedIn allows users to incorporate data from multiple websites on their profiles. Similarly, TripIT mashes up data from different confirmation e-mails sent by various travel sites to create a master itinerary for the user. It then intelligently sources weather, local maps, and city guides from websites such as Google, Wikipedia, and Flickr to create a customized travel document with mashed-up data.

Intelligent Applications

Web 3.0 will see the emergence of applications that will be intelligent enough to source data from all over the Internet rather than just local databases. Intelligent applications will be enabled through semantic web technologies aimed at bringing structure to web content and enabling software agents to better interpret the context of various documents. This will permit browsers and other applications to find, share, and combine information more easily.

Search tools will also benefit through new semantic technologies that can process descriptions/annotations associated with web documents. This will help search programs to identify the context of the search and return more relevant query results based on the context rather than just the keywords. Moreover, search results can be segregated into relevant sub-categories, thereby helping consumers

Cloud Computing

Cloud computing², which is a key component of Web 3.0, entails readily available and scalable “on-demand” processing capabilities for web-based services and devices. Although data storage and retrieval services such as Flickr (cloud-based storage of photos) have been around for a while, Web 3.0 will push cloud computing further through offerings such as

¹ Microsoft Press Release, *Microsoft Live Search Acquires Powerset Search Company*, August 2008.

² Cloud computing refers to Internet-based computing wherein one or more of the key constituents of software—platform, application, hardware resources, and information—are made available over the Internet on an on-demand basis.



Software-as-a-Service (SaaS) and the cloud Infrastructure-as-a-Service (IaaS).

Software-as-a-Service (SaaS)

SaaS is a form of software deployment. An application is licensed for use as a service and provided to customers on demand over the Internet. SaaS has found applicability across multiple functions – Sales, Customer Relationship Management (CRM), Customer Service Management, and Business Applications such as Inventory Management and e-Commerce. Many players are already active in the SaaS space. Key vendors include Salesforce.com, NetSuite, Siebel, and SAP.

Cloud Infrastructure-as-a-Service

This entails Platform-as-a-Service (PaaS) and IaaS. PaaS delivers operating systems and associated services over the Internet without downloads or installations³. Salesforce.com, apart from offering SaaS, also offers platform services on which developers can build custom applications⁴.

The latter refers to an organization using computing resources—servers, storage, hardware, and networking components—on an “on-demand” basis. The service provider owns and maintains the resources and rents out capacity to multiple clients. Amazon EC2 (Elastic Cloud Computing) allows users to rent computing resources (effectively virtual computers) on which they can run their own applications⁵.

Internet players are particularly aggressive in offering cloud-based services by leveraging their extant

storage infrastructure. For instance, Google recently announced that it would allow users to upload, store, and organize any type of file in Google Docs⁶. Even traditionally “on-premise” software players such as Microsoft have started building hybrid models wherein on-premise applications are integrated with cloud-based services. Microsoft launched MS Office Live that allows documents to be stored and shared online through cloud-based services. It also launched Windows Azure Platform in 2009⁷ to allow developers to build cloud-based applications.

Open Technologies

Another key constituent of Web 3.0 will be the increased prevalence of open technologies. These refer to publicly available source codes, APIs, or platforms that enable individual developers and software development firms to extend the functionality of a core product/service offering.

Open Source and Open APIs on the Internet

Open technologies on the Internet entail open source codes and open APIs.

Open source code encourages developers to play a more active role in developing new consumer applications. Open APIs, along with semantic web technologies would help applications to use services and information from each other, thereby ushering in quick development of “mashed” applications that use functionality/data from other applications. The widespread adoption of open source code and open APIs is expected to significantly increase the choice and relevancy

³ www.platformasaservice.com.

⁴ Company website.

⁵ Company website.

⁶ The official Google Docs Blog, *Upload and store your files in the cloud with Google Docs*, January 2010.

⁷ *Microsoft Cloud Services Vision Becomes Reality with Launch of Windows Azure Platform*, Company Press Release, November 2009.

of applications and services made available to end users.

Google Maps API allows developers to assimilate interactive maps from Google into their own websites, thereby creating enhanced, mashed-up sites. Developers can thus more effectively convey location information to their consumers without developing mapping functionalities of their own.

Open Platforms for Mobile Devices

Open platforms for mobile devices are similar to their web-based counterparts. These entail open source operating systems, such as Android, for mobile devices and open APIs for storage, media, graphics, and hardware access similar to Apple's iPhone APIs.

The last few years have already witnessed a number of developments in open technologies for the mobile platform. While new entrants such as Google chose to enter the mobile platform space through their open source offering Android, existing players such as Nokia have also decided to open up access to the Symbian operating system⁸.

Opening mobile platforms to third-party application developers decentralizes the application development process and allows platform providers to focus on developing core components of their offering. Open platforms also leads to increased choice of applications/content to users and result in greater usage.



Advanced Data Mining

Data mining provides knowledge of user profile and needs, which can be leveraged for targeted marketing. Although data mining is already being used to some extent, Web 3.0 promises to leverage advanced data mining for tracking consumer behavior real-time and delivering relevant content/advertising. This would lead to increased relevancy of content/advertising and consequently, superior monetization prospects for value chain players.

Advanced data mining includes publisher-side data mining for contextual advertising⁹ and ISP¹⁰-side data mining for behavioral targeting¹¹.

Publisher-side Data Mining

This entails tracking and analyzing consumers' surfing activities as well as search patterns to classify them into relevant sub-segments and deliver relevant, contextual ads. This can be implemented by either individual publishers or advertising networks in collaboration with publishers.

In case of implementation by individual publishers, consumers are served ads based on their previous interactions with the publisher and current interests (identified through their recent browsing history). With advertising networks, data mining is applied to consumers' previous and current browsing history across multiple websites.

Semantic technologies, discussed earlier, will further help advertisers to understand the online behavior of customers and improve contextual

8 *Symbian Completes Biggest Open Source Migration Project Ever*, Company press release, February 2010.

9 In contextual targeting ads are served on web pages featuring relevant content—for instance, car ads on automotive websites.

10 Internet Service Provider.

11 Behavioral targeting uses data from an individual's Internet activity ('click-stream') to identify the relevant ads to deliver to that individual.

12 Company website.

advertising. Companies such as Kontera perform real-time semantic analysis of a web page, identify terms/words that could be of interest to the user, and deliver contextual ads¹². This enables advertisers to display highly relevant in-text ads based on the content that a user is reading.

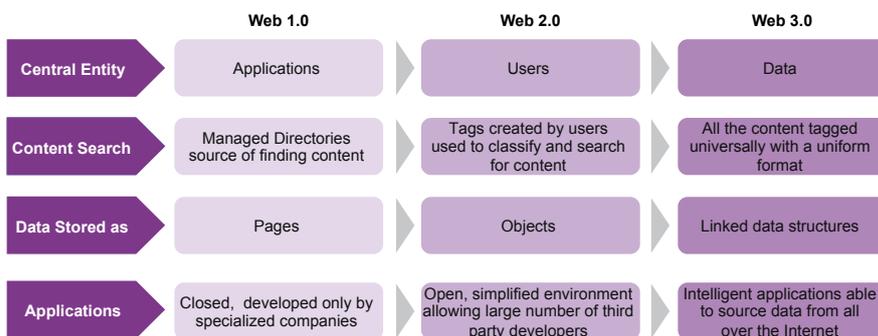
Another variant of publisher-side data mining uses consumer profiles from projects such as OpenID. Here, users are authenticated and identified across multiple sites through a common ID that is linked to a wide range of user demographic information such as name, date of birth, location, and sex. Coupled with behavioral data, this will help websites to segment and target their customers better. OpenID has already gained significant adoption with over one billion OpenID accounts and more than 50,000 websites accepting OpenIDs for login. Players such as Google, Facebook, Yahoo!, France Telecom, and Telecom Italia either issue or accept OpenIDs.¹³

ISP-side Data Mining

ISP-side data mining is similar to publisher-side data mining, except that the analysis is performed either by an ISP or through a network that includes multiple participating ISPs.

The key advantage offered by ISP-side data mining is that the analysis of user behavior is not restricted to a selected set of publishers. In fact, complete online interactions of participating users can be monitored and relevant ads can be delivered based on previous and current online behavior of consumers.

Figure 4: Expected Evolution of the Web



Source: Capgemini TME Strategy Lab analysis.

Behavioral advertising delivered through ISP-side data mining is expected to be more effective than contextual advertising delivered through publisher-side data mining as the former allows advertisers to gauge interests of target audience in a comprehensive manner.

To summarize, the progressive development of the Web 3.0 features discussed will have significant effect on the constitution of the Web. As highlighted in Figure 4, the next generation of the Web will be centered on data rather than applications or users. Content search will be more effective and context relevant. Applications, driven by semantic web and open technologies, would be intelligent enough to source their data from all across the Internet rather than be confined to locally sourced data. We will also see a greater adoption of services delivered over the cloud and advertisers will be able to leverage advanced data mining techniques.

¹³ OpenID Foundation website.

Recommendations for TME Players

Recommendations for OEMs

For OEMs, the major opportunity lies in the adoption of open technologies. OEMs should not only support but also lead the development of open technologies/platforms to gain a dominant position in the emerging landscape. OEMs should focus on aggregation rather than in-house development, foster the growth of developer communities, and encourage the development of myriad applications on the underlying platform.

A case in point is the early success Apple's App Store, which now offers around 150,000 applications¹⁴ and has witnessed more than three billion application downloads in less than two years¹⁵. The success of Apple's model has prompted other device vendors such as Samsung and Blackberry to launch their own open platforms and provide SDKs¹⁶ to third-party developers.

Moreover, OEMs should also encourage developers to use semantic technologies¹⁷ to enable applications to source data from all over the Internet. This will significantly improve the utility of applications and therefore, also improve the uptake of services.

Recommendations for Operators

Key opportunity for operators lies in the cloud computing market¹⁸, which is expected to grow from US\$46.4 billion in 2008 to around US\$150 billion by 2013¹⁹. This rapid growth provides a huge opportunity for

operators to leverage their existing assets and offer cloud-based services.

Operators already have strong customer relationships and the experience of managing large data centers. Moreover, with their control over last mile access, operators are better positioned to provide high quality cloud services as compared with online players such as Amazon and Google who currently do not have access to complete end-to-end networks.

Some telcos have already started leveraging existing assets to offer cloud-based services. For instance, Verizon has launched its cloud services called Computing-as-a-Service (CaaS) through which it offers a hybrid solution of virtual infrastructure and traditional physical infrastructure delivered over the cloud²⁰.

Through cloud services, operators can move beyond the role of connectivity providers and move up the value chain. Cloud services will not only lead to higher network utilization but also provide incremental revenue streams.

Another opportunity for operators can arise through the adoption of open technologies / platforms. Telcos can follow a model similar to that recommended for OEMs by offering third-party applications, centered on an open platform, to their subscribers. Orange has launched its App Shop targeted at its subscribers across multiple countries such as France, UK, Belgium, and Spain²¹.

Application stores would also enable operators to enrich their value add services portfolio.

Lastly, operators can also participate in ISP-based behavioral tracking. However, they need to be careful about consumer privacy issues and ensure that all stakeholders are notified about trials or deployments and also have an option to opt out.

Recommendations for Media Players

Media players should actively support semantic technologies such as RDF and SPARQL. These technologies enable websites to store contents such that they can be used by third-party websites and applications easily and more relevantly. With increasing adoption of these technologies by third-party websites, publishers can better disseminate their content over the Web and reach out to a much larger audience through syndications. In fact, publishers such as BBC and Reuters have already started using semantic technologies to make their data more searchable and capable of being used in mash-ups²².

Players should also leverage advanced data mining, especially publisher-side techniques, to segment customers and serve highly relevant contextual ads. However, only larger media players with multiple Web properties should look at independent development. Small- and medium-sized publishers should participate in consortiums or partner with an Internet player to deliver contextual ads.

14 159,433 applications on AppStore, 148apps.biz, February 24, 2010.

15 Apple's App Store Downloads Top Three Billion, Company press release, January 2010.

16 Software Development Kit.

17 Semantic technologies include RDF and SPARQL.

18 Includes the following services:

Business process services: e.g. payroll, printing, ecommerce delivered over the cloud

Application services: All paid applications delivered over the cloud

Application infrastructure services: Application platform-as-a-service

System infrastructure services: server/compute, server operating system (OS), client OS, storage, or networking on which the consumer can run a variety of applications

Management and security services: operational management of access, consumption, delivery and service-level agreements associated with cloud-based services

Forecast: *Sizing the Cloud; Understanding the Opportunities in Cloud Services*, Gartner, March 2009.

19 Forecast: *Sizing the Cloud; Understanding the Opportunities in Cloud Services*, Gartner, March 2009.

20 verizonbusiness.com.

21 Orange Newroom, *Orange launches Application Shop, giving customers click-and-go access to thousands of applications, services and games*, December 2009. Orange Partner website

(www.orangepartner.com).

22 W3.org, *Case Study: Use of Semantic Web Technologies on the BBC Web Sites*, January 2010 *Newsroom.net*, *More on Reuters Insider Launch*, May 2010. *Research-live.com*, *All in good time*, March 2010.



“ Operators are better positioned to provide HIGH-QUALITY CLOUD SERVICES as compared with ONLINE PLAYERS ”



In conclusion, TME players should leverage the expected enhancements to the World Wide Web to improve reach as well as monetization and also offer new products/services. Although there is still a great deal of uncertainty about the exact nature of developments as the new ecosystem is still being shaped by innovation efforts of larger and smaller players, TME players should not get bogged down by the challenge. In fact, they should aim to play a more active role in the emerging Web 3.0 ecosystem as maximum benefit will eventually accrue to dominant players.

TME players should be aware of the opportunities arising from Web 3.0, identify existing strengths/assets, and build a medium-term roadmap towards developing products and services that can benefit from the developments in Web 3.0. Moreover, they should assess their internal capabilities and identify the optimal mix of in-house and partner-driven product/service development. Change is inevitable. TME players should aim to be at the forefront and shape new developments rather than passively accept the new order.



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Spectrum Valuation: A Holistic Approach

By Philippe Blanc, Nathalie Bes, and Sayak Basu

Abstract: The mechanism for spectrum allocation¹ has evolved over the years from “beauty contests”, to lotteries, onto the present market driven auctioning process. In the coming years, we are going to witness a significant amount of spectrum being put up for auction. A variety of factors including technological advancements, increased efficiency of broadcasting technologies, and the tendering of remaining 3G frequencies to meet increasing data demand are combining to create a market for spectrum. The single biggest challenge for operators in constructing winning bids for the spectrum is to reconcile the gap between internal valuation and market perception of the price of the spectrum. Consequently, operators run the risk of either over-bidding or under-bidding for the assets and losing out in a competitive auction. It is also pertinent to note that peer market comparisons serve only a limited purpose while arriving at spectrum pricing. The wide variation in auction prices around the world makes sole reliance on any such benchmarking exercises fraught with risk. In this paper, Capgemini proposes a four-step approach for arriving at the right price for the spectrum. The first stage involves a comprehensive understanding of auction specificities and the key success factors for a winning bid. Subsequently, operators need to quantify the economic value of the license that they can realize. This is followed by the evaluation of the competitive context wherein they look at the competitor business case and financial strengths to gauge the expected market value of spectrum. Finally, the inputs from the earlier stages are aggregated to define the bid price for the spectrum which maximizes the chances of a successful bid while being aligned to the operator objectives.

“*The coming years are going TO WITNESS A SIGNIFICANT AMOUNT OF SPECTRUM being put up for auction*”

Evolution of Spectrum Auctions

Historically, spectrum allocation has evolved significantly in terms of the methodologies adopted by governments the world over. In the US, for instance, the evolution of the spectrum distribution has moved from a command-and-control structure towards a market-driven process. In the initial years, the US communications regulator, FCC², used comparative hearings to determine spectrum allocation. In this process, applicants set out their cases for being awarded a license and the licensing authority then determined the best applicant based on a combination of objective and subjective criteria. As an evolution from comparative hearings, the FCC tried lotteries in the mid-1980s.

The lottery system was designed to be fair and more transparent than comparative hearings. However, this system saw the FCC receive thousands of applications. Spectrum allocations finally moved to a market-driven process through auctions, which were inherently transparent and encouraged only the serious participants to take part.

For regulators, auctions offer a potent mechanism for ensuring that the owner of the spectrum—the government—receives a fair value. Moreover, since market forces are involved in discovering the price for the spectrum, the process is perceived to be fair.

¹ Spectrum allocation refers to the issuance process for usage rights of radio frequency bands of the electronic spectrum, by the government or the regulator. Currently, the process in most developed markets involves auctions to arrive at a market determined price for these assets.

² Federal Communications Commission.

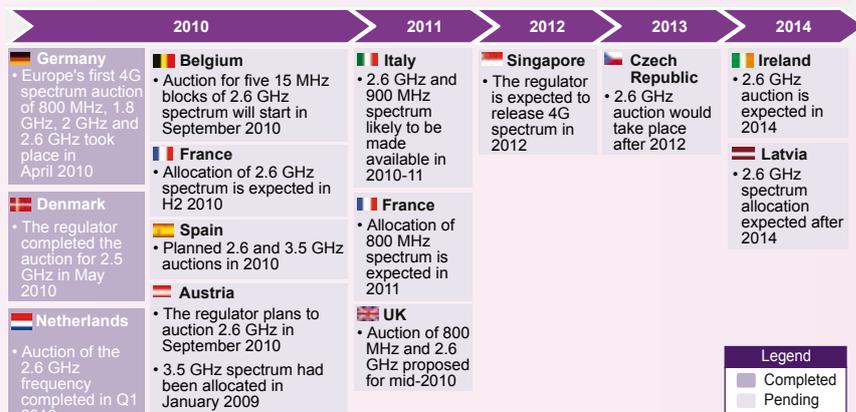
Current Market Opportunity

Across Europe and most of the developed world, regulators are looking at spectrum auctions driven by the explicit need to address distinct market opportunities for next generation services and to raise funds. A combination of factors is contributing to spectrum release, chief amongst which is the advent of new technologies and associated spectrum dynamics. Technological developments have given rise to the usage of the 2.6 GHz spectrum band for LTE³. Similarly, improvements in broadcasting technologies (such as the advent of DTT⁴) have led the industry towards a path of spectrum optimization thereby enabling usage of existing spectrum for other purposes. This spectrum is part of what has been considered the digital dividend for the telecom industry. In many European countries, regulators are eventually looking at tendering the remaining 3G frequencies as data demand continues to grow driven by the advent of high-powered smartphones such as the Apple iPhone. Spectrum release is also tied to local market consolidation. In markets that see mergers and acquisitions among operators, a portion of spectrum could also be potentially released back into the open market.

Keeping in mind these market opportunities, a number of European countries have initiated the process to auction spectrum for next-generation services over the coming years (see Figure 1).

In this paper, we look at key challenges associated with pricing spectrum for a bidder. We also present the case for a holistic approach that strives to work beyond the challenges and adopts a highly structured approach towards pricing spectrum.

Figure 1: Spectrum Auction Calendar



Source: Various regulator websites; Fitch Ratings, *European Telecoms—Spectrum Issues for the Fore*, November 2009
 Note: The auction dates for certain geographies are Capgemini estimations based on industry interactions

Challenges in Spectrum Pricing

Telcos need to arrive at an optimum price for spectrum based on a combination of the business-case driven value and the market-perceived value to a contender. Here, the key challenge is less about valuation and more about pricing. Examples from recent spectrum auctions are proof of this challenge. For instance, the recent auctions of remaining 3G blocks in Italy and France led to very different spectrum prices reflecting contrasting competitive bid situations rather than fundamentally different economic spectrum value for the bidders. In Italy, three out of the four Italian operators each bought a block of 5 MHz for €88.8-90.2 million (slightly above the reserve price of €88.7 million) whereas French auctions led to €582 million for two blocks (far above reserve price of €120 million per block).

While operators can have a better understanding of how they value spectrum based on their own projections (intrinsic value), the

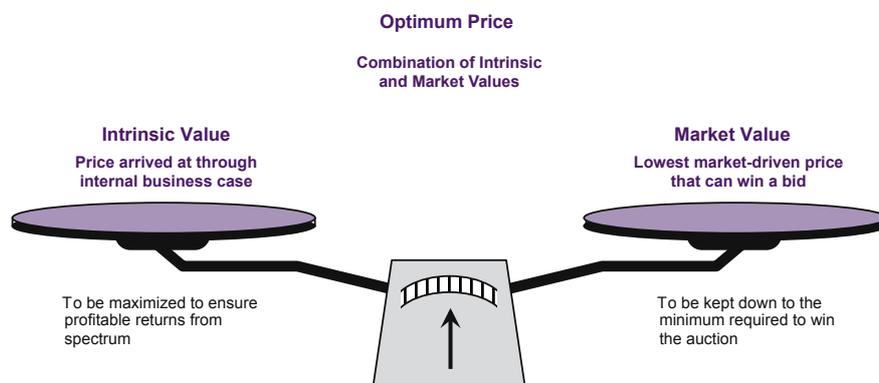
“ THE KEY CHALLENGE for spectrum acquisition is less about valuation and MORE ABOUT PRICING ”

3 Long Term Evolution.

4 Digital Terrestrial Television.



Figure 2: The Spectrum Pricing Challenge



Source: Capgemini TME Strategy Lab analysis

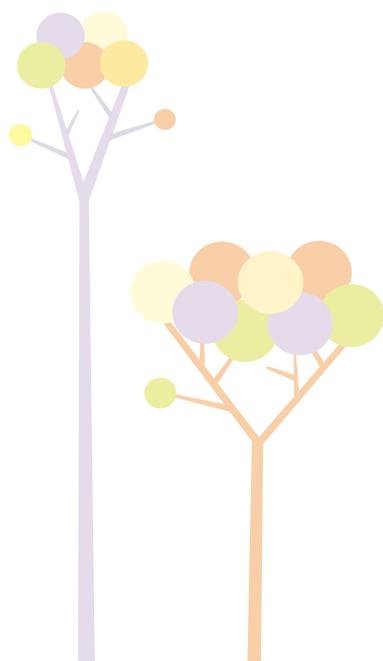
market perceptions strongly vary from market to market and with every round of the auction (market value). Consequently, telcos face significant challenges in arriving at an optimum price that will see them win a spectrum bid. The biggest challenge for telcos is to arrive at a price that will see them neither over-bid nor under-bid. The optimum price is usually a function of bidder's objectives including profitability, need-to-win, brand image, and other external factors including financing capacity, impact on share price consequent to winning or losing a bid, or other potential indirect impacts on future auctions (see Figure 2). Telcos should also exercise caution in using peer-market comparison techniques such as benchmarking in arriving at an optimal price.

Risk of Over-bidding

One of the biggest challenges facing mobile operators across the world is to accurately estimate the perceived importance of spectrum to competitors and the perceived attraction of newer services to consumers, along with their inclination to pay. The fluid nature of these assumptions almost always

results in mobile operators ending up bidding significantly higher than what can be called a fair market price, considering the incremental revenues which would accrue due to the spectrum assets. A classic example of such a situation was witnessed in the 3G spectrum auctions in the early part of this decade. While operators over-bid one another, the bigger challenge proved to be in coming up with applications at price points that would encourage mass uptake.

The intangible factors involved in valuing spectrum also sometimes play a much larger role than was intended. A case-in-point is that of Vodafone UK. In 2001, the operator believed that their market leadership would be under threat if they did not acquire 3G spectrum at the first auction. Consequently, the company took a strategic bet on the importance of the spectrum and raised their bid, factoring in a premium for this strategic potential. When the results were out, it was revealed that Vodafone paid UK£6 billion for spectrum for which the other operators O2, T-Mobile, and Orange paid UK£4 billion each. This over-bidding accompanied by a large debt hastened Vodafone's decline to a number two position in the market.



Risk of Under-bidding and Losing

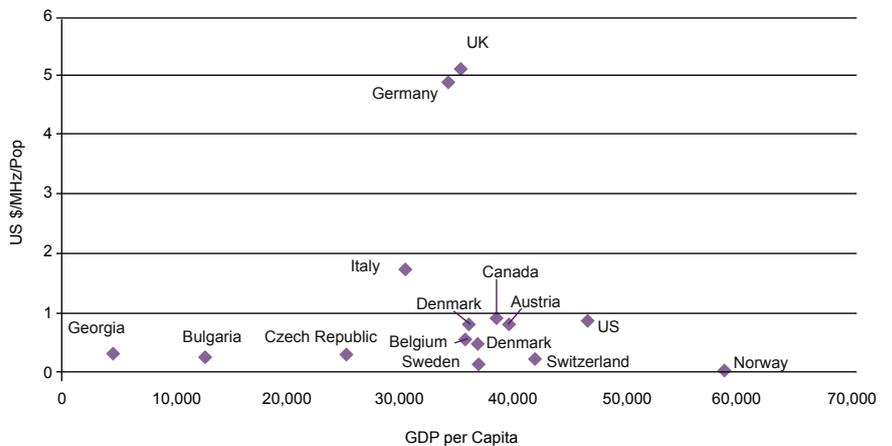
While operators face a significant risk of over-bidding in their enthusiasm to ensure that their bids are accepted, there also exists a real challenge of operators potentially under-bidding in comparison to their market peers, especially in single-round auctions. At its core, the key issue around under-bidding lies in estimating the extent to which competitors can and will stretch themselves in a bidding war.

Limitations of using Range-bound Assumptions

While the discovery process of optimal spectrum price from a combination of intrinsic and market price is a popular approach, many telcos also use peer-market comparison too as a guide for spectrum pricing.

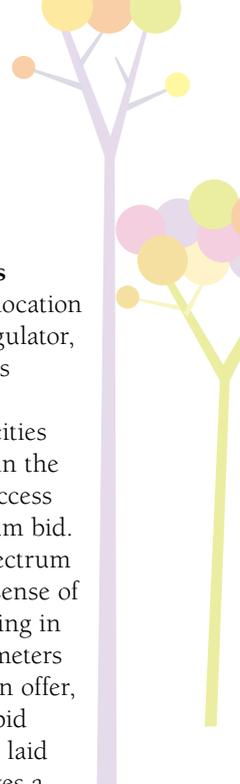
A key drawback of using comparisons from other geographies as a reliable approach towards valuing spectrum lies in the fact that the price paid for spectrum in each market is closely tied to a host of local factors, resulting in wide variations in these values between geographies (see Figure 3). While broader metrics around price of spectrum per capita can be derived from other markets and used as pointers, in reality, a combination of macro and micro factors impact spectrum valuation. An indicative set of such factors include the market saturation, threat of new entrants, number of licenses on offer, round of spectrum licensing, financial strength of incumbents, population density, and economic spending power of potential consumers in that region. Under these circumstances, it is prudent that operators use such benchmarking approaches as only one of the input methods towards spectrum valuation rather than as a full-fledged methodology that drives their auction strategy, given its simplistic approach to the complex issue.

Figure 3: Spectrum Price Paid in Select European 3G Auctions and Worldwide 4G Auctions in USD/MHz/Pop, in Relation with GDP per Capita



Source: Capgemini TME Strategy Lab analysis; Telecom ParisTech, *Spectrum Valuation—Principles and Methodology*, October 2008; Fitch Ratings, *European Telecoms—Spectrum Issues to the Fore*, November 2009. Note: 3G auction prices adjusted with 2007 exchange rates.

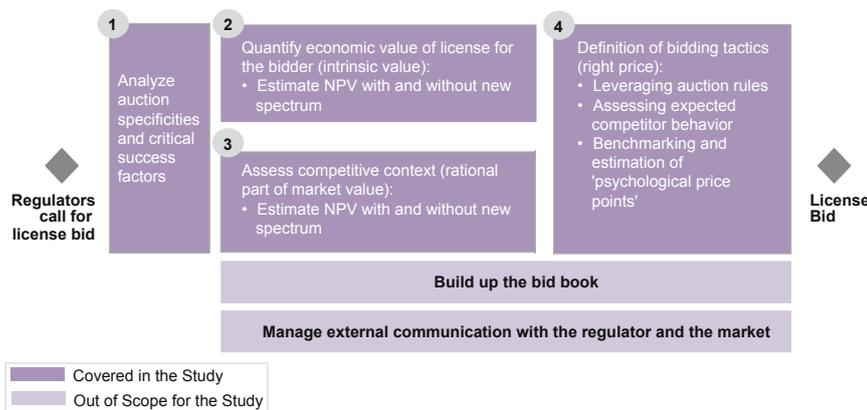
“Spectrum price is affected by A HOST OF LOCAL FACTORS, resulting in wide variations across geographies”



Holistic Approach for Spectrum Pricing

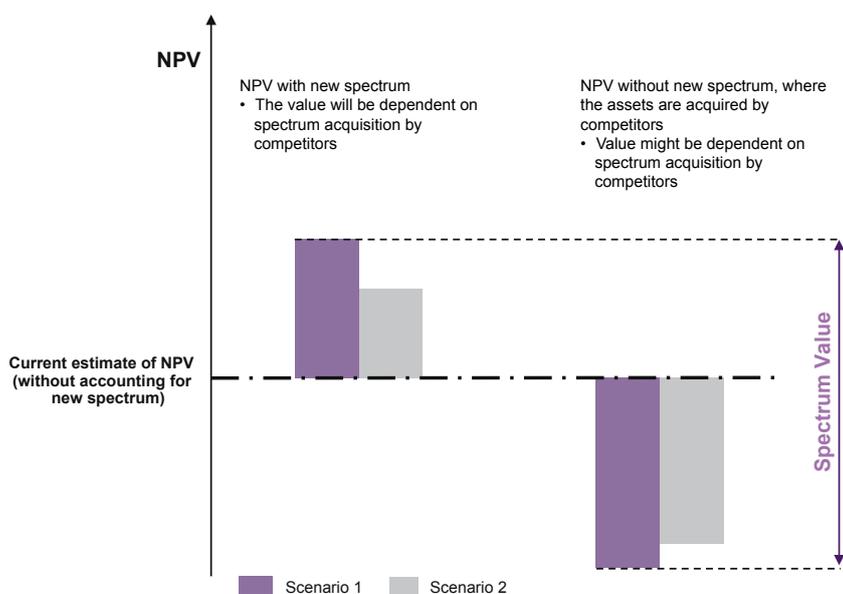
Based on projects conducted for operators in different geographical settings, Capgemini has built a robust methodology for a successful spectrum bid process, which captures the key lessons from various engagements (see Figure 4).

Figure 4: Capgemini Consulting Approach to Successful Bidding



Source: Capgemini TME Strategy Lab analysis

Figure 5: Estimation of Spectrum Value by Calculating the Deviation from Base Case NPV



Source: Capgemini TME Strategy Lab analysis

Analyze Auction Specificities

The details of the spectrum allocation directive, as defined by the regulator, should be analyzed in-depth as the first step of the spectrum valuation process. The specificities of the allocation process help in the identification of the critical success factors for a successful spectrum bid. The various clauses for the spectrum allocation process also give a sense of the attractiveness of participating in the process, by detailing parameters such as amount of spectrum on offer, coverage obligations, and the bid process. The eligibility criteria laid down by the regulator also gives a sense of the likely competitors during the spectrum auctioning process.

The details of the auction specifics help in establishing the various analyses that would need to be carried out. For example, if there are multiple blocks of spectrum available, a detailed analysis is required to understand whether all of them are identical in terms of the allocation process and fit with the bidder's requirements. This step is crucial in establishing the timelines for the various steps subsequent to this stage.

Estimate the Intrinsic Value of Spectrum for the Bidder

Successful acquisition of spectrum assets results in potential revenue uplift, through provisioning of new services, ability to accommodate a greater number of customers on the network, cost savings, and by preventing competitors from taking certain positioning in the market. The intrinsic value of spectrum captures this potential revenue uplift by assessing the difference between the operator net present value (NPV) with and without new spectrum (see Figure 5). However, the analysis of benefits accruing from new spectrum must also factor in the cost of licence and coverage obligations.

The NPV from the scenario where the operator is unable to secure new spectrum might be drastically



different from the base case NPV. Strategic plans rarely capture the base case scenario, which estimates the NPV in the absence of fresh spectrum allocation in the market. Alternative strategies to compensate for the absence of additional spectrum such as investments in other technologies and densification of existing network need to be captured in this analysis. The possibility of other players in the market establishing a strong competitive advantage through the acquisition of new spectrum and the resultant negative impact must also be factored into the business case.

The business case and hence the intrinsic value is specific for each operator. It is a function of its positioning in the market, its long term strategy for utilizing the spectrum, and its existing assets such as the network infrastructure. Consequently, the business case for the market leader will vary significantly from that of the third or fourth placed player in the market for the same spectrum asset.

The intrinsic value for markets with a scarcity of spectrum has an additional component to reflect the value of obtaining spectrum to prevent the

access to this asset for competitors. In these cases, pre-emption revenues need to be considered and the intrinsic value of spectrum should be adjusted accordingly to a higher figure (see Figure 6).

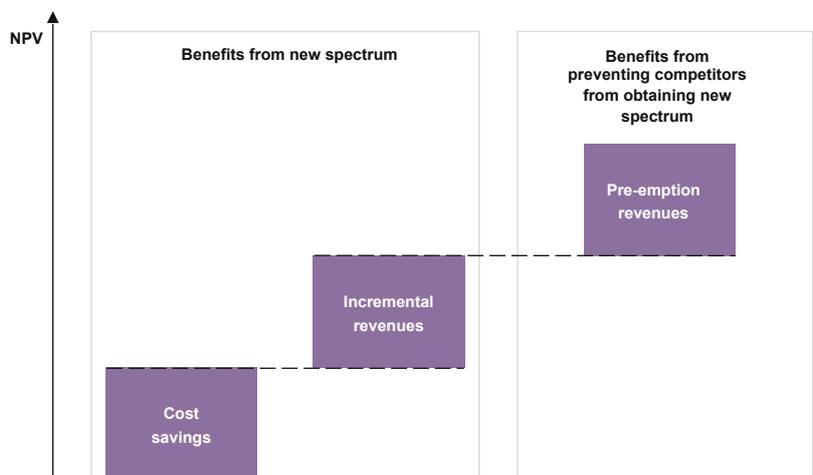
Assess Competitive Context

In order to arrive at a winning bid, telecom operators also need to consider the other crucial piece of the puzzle, the market price. The market price is the minimum amount an operator would need to pay to ensure a successful bid for spectrum. The market price is a function of the willingness of operators to pay for spectrum assets, which also reflects the spectrum scarcity in the geography in which it is being auctioned. If there is enough spectrum for each potentially interested player, asset value will come close to the reserve price defined by the regulator. On the contrary, if there is perceived scarcity, operators are likely to increase price to their limit (either maximum intrinsic value or perceived value for competitors).

For instance, European 2.6 GHz LTE auctions are currently characterised by availability of significant amount of

“OPTIMUM PRICE FOR SPECTRUM SHOULD CAPTURE *the business-case driven value and market-perceived worth to a contender*”

Figure 6: Intrinsic Value from Spectrum Acquisition Reflecting Pre-emption Revenues



Source: Capgemini TME Strategy Lab analysis





spectrum (2*70MHz) in comparison to the 800 MHz LTE spectrum. This led to very low price levels for the 2.6 GHz spectrum as compared to 800 MHz LTE auctions where spectrum is more constrained and characterised by better propagation features. In Germany where both spectrum blocks were allocated in the same process, price per MHz for 800 MHz band went 32 times higher the price for 2.6 GHz band.

The spectrum allocation process may also be designed to influence market prices, as regulators may try and meet their government's quest for new budget contributions. The tendering process may artificially boost spectrum value by granting asymmetrical features to the various auctioned spectrum blocks. Bidders might be tempted to bid higher for blocks that are offered without coverage, national roaming, or wholesale obligations. Similarly, some regulators tend to adapt the auctioning process to the level of expected competition. When the degree of competitiveness is unclear, regulators may favor low visibility auctions (sealed auctions) whereas clear demand for spectrum may lead to simultaneous multi-round auctions. The reserve price of the spectrum also plays a significant role in impacting the market value. If positioned too high, they will deter contenders from bidding or drive a "wait and see situation" as in Italy in 2009 when the 3G reserve price was set at close to €460 million. On the contrary, when positioned low in poor economic situation, they tend to polarize bids.

To estimate the "market value" of the spectrum, it is necessary for a bidder to assess the probable bid for each of its competitors. The assessment will have several elements such as quantifying the intrinsic value for each competitor through a business case, evaluating their ability to invest capital, stock exchange and shareholder sentiments, and assessing the character traits of

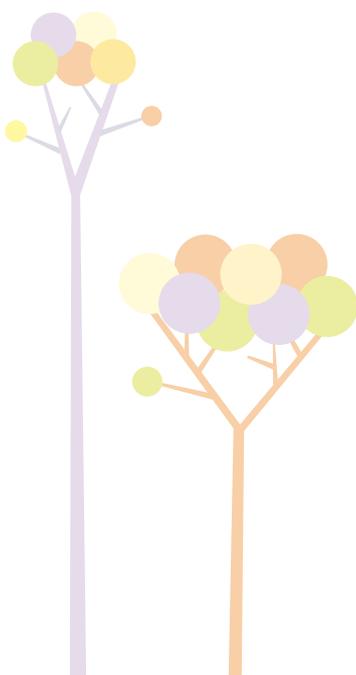
likely competitors to ascertain their desire to emerge as the winner of the auction.

Building the business case for competitors is a complex but insightful task which helps to establish the amount competitors are likely to bid if they behave rationally. The NPV analysis will be conducted similarly in many respects to the one for the bidder, although less detailed. It provides a fairly reliable indication of operator intent as most of these players are presently under fairly strict cost management scrutiny, therefore exhibiting less unpredictable behaviors. Specific customer dynamics profiles need to be built for each competitor within an overall consistent acquisition and churn market model. Similarly, specific network profiles have to be built for each provider.

Bidders will exhibit different bidding behaviors, based on the style of their management, their risk appetite, their willingness to get a good bargain, and their estimates of what a winning price would be. An aggressive bidder will use its maximum NPV (or the competitor's maximum NPV if required) whereas a cautious player will just try and position slightly above the "first loser", keeping room for maneuver within its own NPV range. Such behavioral patterns will help weigh the various NPV calculations made according to possible alternative market and technology scenarios. Hence, psychological levels should not be neglected when fine-tuning competitive price expectations.

Define the Right Price

In the end, defining the *right price* will be about designing bidding tactics and price levels that maximize winning chances vis-à-vis planned competitive bids, while being compliant with the bidder's objectives and external constraints. It is imperative that the right price captures the operators' motivations



for acquiring spectrum while in some cases profitability will be the operative criterion for the interest in spectrum and in other cases the bidder might want to win the auction at any price, because of other factors.

Complex auction processes, which combine various criteria create opportunities for several approaches that need to be considered both for the bidder and their competitors.

In order to assess the probability of winning for each potential bid, we identify competitors' possible behavioral response and probabilities for various scenarios in a bid. These behaviors depend on the competitors' business case but also on non-rational elements such as psychological price points. Potential psychological price-points can be gathered through benchmarking references from spectrum allocations in international markets as well as by studying the local context. For example, previous allocation process in the home country, prior announcements around spectrum value, and analyst projections all contribute to setting these check-points for the bidders.

In the case of the intrinsic value being far above the estimated competitor willingness to pay, the right price will be defined by market value. In the case that the intrinsic value is lower than market value two types of behaviors are possible. If there is strategic value in winning the spectrum (e.g. brand benefit, better alignment with strategic goals, improvement in customer experience) that is not reflected in NPV calculation, an operator can bid above intrinsic value to maximize its chances to win. In other cases, some operators adopt a rational behavior and bid around their most probable intrinsic value.

In conclusion, arriving at the right price for spectrum is a complicated exercise. It requires appraisal of both the bidder's business case as

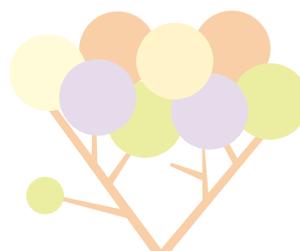
well as that of other competitors that are participating in the exercise. A holistic approach that factors in all the variables in the process is required to arrive at the right price. The bid price for spectrum should maximize the probability of winning the bid, while being compliant with the bidder's objectives and external considerations.

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“ A holistic approach is required TO ARRIVE AT THE RIGHT SPECTRUM PRICE ”



The Onset of Connected Devices: Opportunities and Challenges

by Olivier Gouteix and Subrahmanyam KVJ

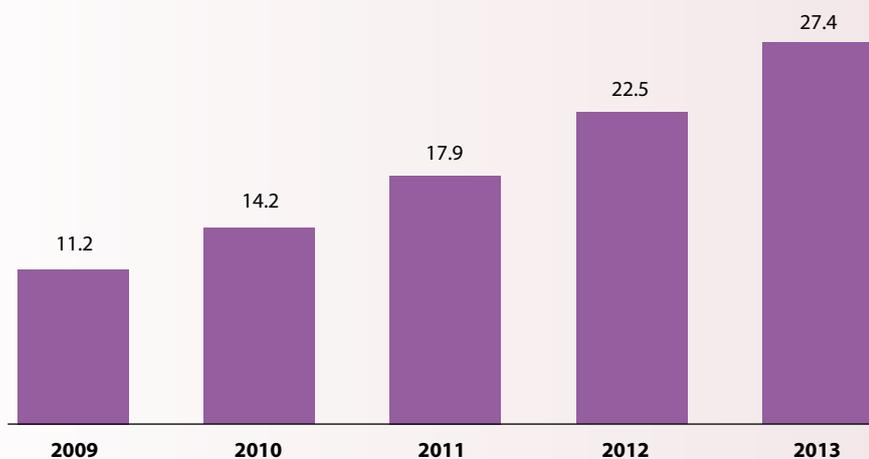
Abstract: The rapid evolution of consumer electronic devices and their ability to wirelessly communicate is leading to the formation of a new category of connected devices. For mobile operators who have thus so far limited themselves to enterprise M2M¹ services, the connected devices space offers the potential for creating new revenue streams. Devices such as e-book readers, digital photo frames, portable navigation devices, among others, are proof of this evolving device class. The pervasive availability of content, technological developments in portable devices, and the expansion of network capacity and speed are driving the uptake of connected devices. Indeed, it is estimated that by 2020, there will be over fifty billion connected devices². At the same time, this emerging segment faces key challenges around managing scale, adhering to regulatory requirements, costs of 3G modules, and the lack of industry standards. Mobile operators will also face a significant challenge around creating new and innovative business models. Mobile operators should consider taking a step-by-step approach involving wholesale deals, third-party retail, and direct retail based models for addressing the connected devices opportunity.

The advent of next-generation devices and digitization is driving significant changes in content consumption patterns. Consumers increasingly view connectivity as a pre-requisite for all digital devices and this is likely to bring the next big opportunity for telecom operators. Advancements in

device technologies and shifting focus to pervasive-content services have led to the emergence of “connected devices”—a range of devices that have always-on connectivity and access to remote services. The growth potential offered by this new generation of devices presents telcos in developed

markets with an opportunity for growth in an otherwise saturated market. In doing so, telcos are increasingly looking to expand their scope to offer B2B as well as B2C services around devices from sectors as diverse as consumer electronics, healthcare, and automotive.

Figure 1: World M2M Market, €Billion, 2009-2013



Source: IDATE, *Mobile 2010: Facts & Figures*, 2010

Operator involvement in data services for devices, traditionally offered as part of their M2M offerings, has been limited to specific services such as monitoring, security alarms, and point of sale (POS) terminals. Moreover, operator strategy to address the opportunities in this space was largely built around a third-party wholesale model. The high cost of provisioning and activation for thousands of SIM³ cards was one of the primary reasons why most telcos chose to address the enterprise M2M market through resellers and MVNOs⁴. Consequently, large operators have not formulated group-

1 Machine-to-Machine.

2 Ericsson estimate.

3 Subscriber Identity Modules.

4 Mobile Virtual Network Operators.

level strategies at addressing this opportunity.

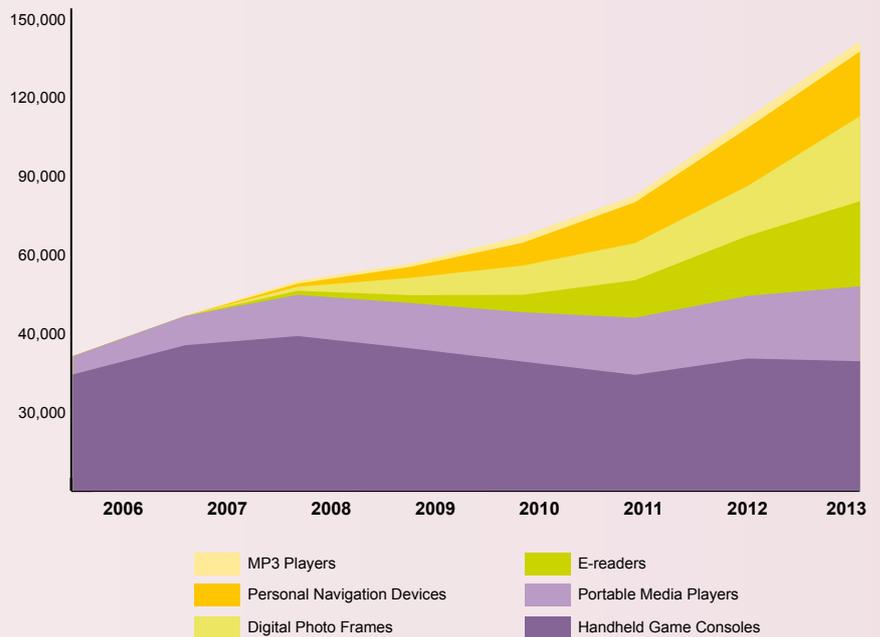
The arrival of devices where connectivity can add significant value to the core product, such as the Amazon Kindle and the Apple iPad, has encouraged operators to take a proactive stance towards the setting up of dedicated business units focused at these connected devices. For instance, AT&T has set up two divisions to target emerging devices focused on the consumer and enterprise M2M opportunity. Similarly, Deutsche Telekom is creating an international M2M competence center⁵. In December 2009, Telefónica created a global M2M unit while Vodafone signed a partnership with Verizon-Qualcomm's M2M joint venture nPhase⁶. In addition, O2 has partnered with Wylless group, a network enabler of M2M solutions, to extend its connectivity footprint. Operators are looking to address this expanded M2M market that is poised to grow significantly in the coming years (see Figure 1).

In this paper, we analyze the opportunity surrounding this emerging category of connected devices and the challenges that telecom operators will face in tapping into this new growth area. We also recommend some key next steps for telcos and the roles that they can potentially adopt in the connected devices ecosystem.

Market Overview

These are still early days for connected devices. However, the introduction and early success of devices such as the Amazon Kindle and the interest in the Apple iPad highlight the untapped potential in providing connectivity to a new category of consumer electronics

Figure 2: Analyst Estimates for Select Connected Device Worldwide Shipments, '000s, 2006-2013E



Source: In-Stat, *Mobile Graphics and Multimedia Review*, November 2009

devices. Industry players from multiple segments are increasingly realizing the value that wireless connectivity can add to their traditional devices.

Market Size

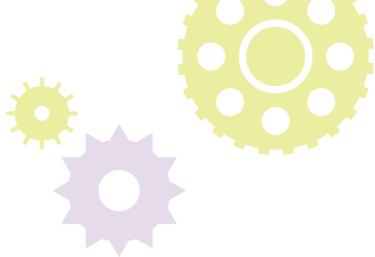
Early estimates indicate the strong growth potential of this market. Ericsson estimates that there will be over 50 billion connected devices, including traditional mobile handsets, dongles, netbooks, and a whole new category of emerging devices by 2020⁷. Figure 2 shows the growth forecasts for a subset of these devices. Telcos have a key role to play in this space, given their strengths in distribution and bundling devices with services. According to one estimate, over 60% of all Internet-connected mobile devices will be sold through telecom operator controlled distribution channels by 2013. For operators, the service is already

“ The connected devices market is AN OPPORTUNITY FOR TELCOS TO EXPAND share of consumer wallet ”

⁵ Company websites.

⁶ GSMA, *Embedded Mobile Newsletter*, March 2010.

⁷ Intel, *Network 2020 Vision: From Telco to QoE Service Provider*, May 2009.

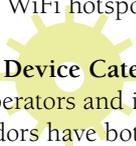


beginning to add significant value. It is estimated that while operators take a hit of US\$50-100 in subsidy for a netbook contract of two years, the total value generated over the duration of the contract is as high as US\$1,440 or more⁸. Early examples of such devices have also begun to appear in the marketplace. Vodafone has partnered with navigation equipment company TomTom for a portable navigation device to offer over-the-air connectivity in 33 countries⁹.



The telco opportunity in these devices is not limited only to mobile connectivity. Devices such as portable gaming consoles, and portable media players can also leverage fixed WiFi networks for connectivity. Consequently, operators could look at tapping this opportunity with triple-play packages, devices such as the MiFi¹⁰, and WiFi hotspot networks.

Upcoming Device Categories



Telecom operators and independent device vendors have both been experimenting in creating the next genre of connected devices.

E-Readers

Electronic readers have rapidly grown to become a category of their own, after the success that Amazon has seen with Kindle. Amazon claims that for every ten copies of a physical book, the company sells six Kindle copies¹¹. Such strong figures have encouraged many companies to enter the e-reader market with simple over-the-air download solutions powered by telecom operators. Barnes & Noble's Nook e-reader allows consumers to download books through AT&T's 3G network.

Digital Photo Frames

Digital photo frame vendors have come up with products that allow wireless reception of emailed

pictures directly onto their frames. By embedding 3G chipsets inside the frame, these vendors, in collaboration with telecom operators, are offering monthly subscription services where the frame gets its own unique email ID with the operator providing access. For instance, the Cameo digital frame that retails for US\$40 offers a monthly subscription plan of US\$2 for providing email connectivity. T-Mobile USA provides the access network for this device¹².

Tracking and Monitoring Devices

Vendors are increasingly coming up with devices that can be used for tracking, monitoring, and informing purposes. For instance, a product called "Smart Insoles", which is being tested by AT&T, can alert old-age users when they are about to fall down, through the intelligent use of accelerometers. The product can also detect falls and call for help automatically using the cellular network¹³. Such products can be combined with other tele-health devices such as a pill dispenser and bundled as part of a larger service package.

In-vehicle Computing Solutions

Telecom operators are also working with hardware and software vendors to provide connectivity to innovative in-vehicle solutions. Sprint offers connectivity services to an in-vehicle computer which is built into select Ford vehicles, called the Ford Work Solutions. The service is priced at a monthly subscription rate of US\$50¹⁴.

Portable Computing Devices

An area that is gaining rapid traction in current consumer markets is portable computing devices in a tablet form-factor. Apple's release of its tablet, the iPad, is generating significant interest in this segment. The fact that Apple has already sold over two million iPads in two months

and the strong potential for extensive data usage through this segment are driving telco interest in the category¹⁵. Other device vendors are also actively looking at introducing similar products to compete in this category. Similarly, device vendors are also introducing laptops with embedded 3G chipsets.

Emerging Pricing Models

The evolution of such innovative device categories will also require operators to adapt their current pricing models in order to drive uptake of these devices and services.

Subscription Pricing

This model is valid for services that are offered on a continuous usage basis. For instance, services that offer pervasive network access to portable devices come under this category. Apple's iPad is a ready example of this category of pricing model. Here, AT&T, the partner operator provides data packages on a tiered subscription package. Similarly, in-vehicle computing is also a potential device class for this pricing model. This model can also be deployed for device categories where the potential to consume significant data exists.

Pay-per-use Pricing

This pricing model is typically used for services where network connectivity adds value to the overall device, but is not inherently critical for regular usage. Digital cameras that allow for direct uploading/emailing of pictures constitute a potential candidate for this model.

Bundled Pricing

This pricing model can be adopted for devices where the device vendor already has a strong relationship with the customer and connectivity could significantly enhance the value of the device. For instance, such a model can be applied to device categories

8 In-Stat, *Mobile Graphics and Multimedia Review*, November 2009.

9 Mobile Entertainment, *TomTom partners Vodafone for GO LIVE 1000*, April 2010.

10 A MiFi device is a class of wireless router that utilizes cellular connectivity to create WiFi-based local networks.

11 Beta News, *Amazon CEO: We sell 6 Kindle books to every 10 books*, January 2010.

12 Washington Post, *T-Mobile Cameo Parrot Digital Frame*, June 2009.

13 BusinessWeek, *Could AT&T Prevent Falls among the Elderly*, May 2009.

14 Michigan Willz, *Ford Work Solutions Integrates Computer into Vehicle*, September 2009.

15 Apple, *Apple Sells Two Million iPads in less than 60 Days*, May 2010.

such as e-book readers. Amazon's Kindle reader is a real world example of this category of pricing. Amazon bundles the cost of the network access in the cost of the device and content, while the network partners Sprint and AT&T provide seamless network connectivity. Such pricing models can also be adopted for devices that are not likely to put a significant strain on the networks.

Figure 3 depicts the various categories of devices and the potential subscription models.

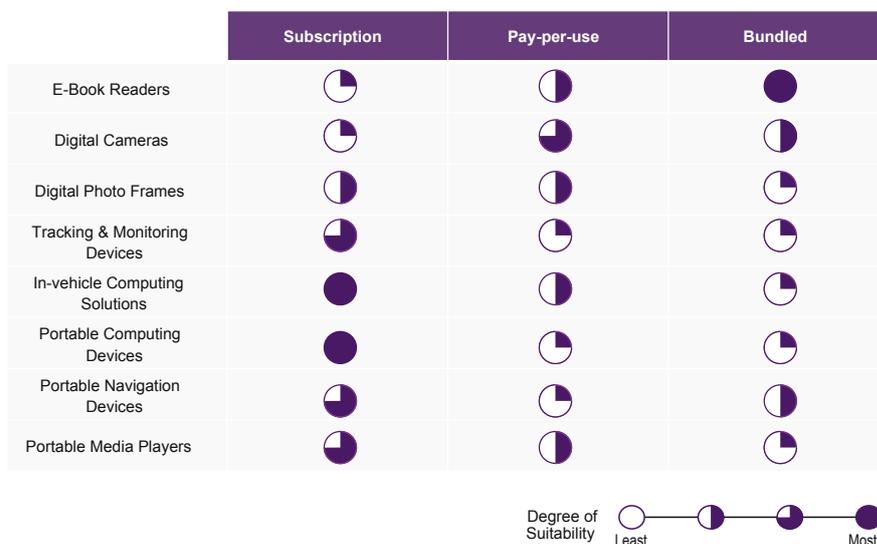
Key Challenges Facing Connected Devices

The connected devices space, while experiencing strong traction due to multiple growth drivers, is, however, not without its share of challenges.

Managing scale/volume

A key challenge with traditional M2M services involving asset tracking and monitoring has been the high maintenance costs that are associated with managing thousands of connections that make up a single M2M customer. Operators were reluctant to spend significant amounts of time in carrying out provisioning, billing, and customer service to enterprises that typically generated very low per-SIM ARPU. For instance, average monthly ARPU generated by an electricity or gas meter is as low as €1.5¹⁶. This was one of the primary reasons why most telcos chose to address the enterprise M2M market through resellers and MVNOs. With the rapid rise in connected devices, operators will continue to face this challenge from multiple fronts. They will now have to cope with devices that connect to their network using multiple technologies, including 2G/3G/WiFi; using multiple connection modes, including constant-on, passive, and burst, and using multiple billing

Figure 3: Overview of Emerging Connected Devices and Potential Pricing Models



Source: Capgemini TME Strategy Lab analysis

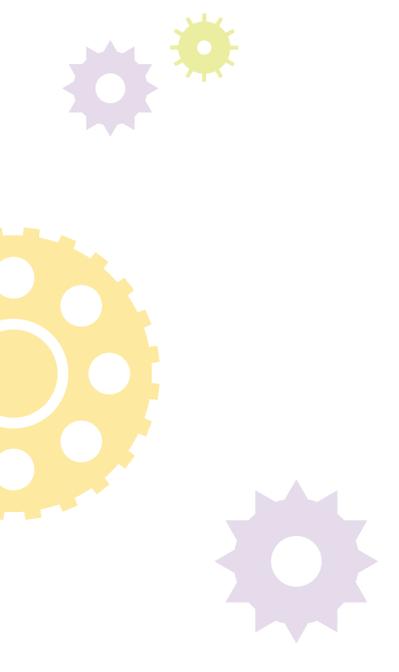
models including free, pay-per-use, and tiered pricing. Integrating these requirements with an existing billing relationship that the consumer has with the telco will likely prove a further challenge that operators face.

Navigating a fragmented value chain

At present a key challenge confronting the connected devices industry is the fragmented nature of the value chain. The inherent character of the industry, which requires provision of services across different industry verticals, is the major cause for the complexity and the resulting fragmentation of the value chain. This results in the creation of isolated pockets of expertise, and a proliferation of supplier/buyer interfaces, ultimately leading to a complicated product and service development process, longer time-to-market, and increased costs. Additionally, it raises the important question of who “owns” the customer—the device manufacturer or the telecom operator—in the case of embedded devices.

“ Mobile operators will need to adapt their CURRENT PRICING MODELS in order to drive uptake of connected devices ”

16 Jasper Wireless Mobile Messaging Analyst, *Service Providers are a New Market for M2M Network* Jasper, October 2008.



While in the past, the limited size of the opportunity caused the bigger players to address the market through intermediaries, it is expected that with the market reaching a critical mass, some of the larger players are going to play a more direct role in the space, leading to future consolidation.

Regulatory requirements

Device vendors and telcos alike face the challenge of standing up to the demanding regulatory requirements of the healthcare and automotive verticals. In the case of medical devices where patient monitoring data is transferred remotely to health workers, operators will need to ensure that they work with device vendors and healthcare service providers proactively in creating a high quality of service with minimal latency.

Lack of clear industry standards

A key challenge facing developers, telecom players, and device vendors is the lack of clear industry standards for the development of such devices. A major hurdle for device vendors, in particular, is in customizing their devices for multiple telecom networks that follow opposing standards, thereby limiting their ability to drive volumes. Currently, telcos have gained significant experience in certifying handsets for use on their networks; however, going forward, they will need to gain newer capabilities if they are to certify connected devices from various industries. This creates a greater need for the establishment of clear industry standards for both devices and the APIs¹⁷.

Cost of 3G modules

One of the biggest challenges faced by connected devices in their growth curve is the cost of the 3G module that is being embedded into these devices. While developers and content providers are coming up with compelling and innovative ideas for connected devices, the cost of



the 3G module in itself is becoming a significant stumbling factor. In the Kindle e-book reader, the cost of the mobile broadband module is estimated to make up for as much as 21% of the total cost of the device¹⁸.

To address this challenge, operators are attempting to limit the number of modules required for solution implementation. For example, concentrators are being used to enable the use of a single module for multiple smart meters. This has allowed Enel to have around 400,000 modules for 30 million smart meters in Italy, while EDF expects to deploy 700,000 modules to support almost 33 million meters in France¹⁹. Additionally, industry players are attempting to drive scale benefits by having a common set of guidelines for modules from different vendors. Towards this end, the GSM Association has formed an alliance with 25 major players from the industry to develop a set of guidelines for the design and implementation of embedded modules.

Challenges in bringing the service to market

With a proliferation of connected devices, operators will face the challenge of encouraging consumers to sign up for a variety of plans for their multiple devices. Moreover, a bigger challenge could revolve around the risk of cannibalization of more profitable service offerings.

Telcos will also face internal challenges over bringing such services to the market. For instance, they will need to clearly state the governance of such new services. Most of these services are typically consumer facing, handled by the retail (B2C) division, while these services still are technically M2M services that are handled by their enterprise (B2B) division. Operators will face the challenge of minimizing such channel conflicts.

¹⁷ Application Program Interface.

¹⁸ GSM Association, *Embedded Mobile—a new era of connected devices* Ana Tavares Lattibeaudiere, GSMA, February 2010.

¹⁹ GSM Association, *Embedded Mobile Newsletter—Issue 3*, October 2009.

“ Cost of 3G modules is becoming A MAJOR CHALLENGE in the growth path of connected devices ”

Next Steps for Telcos

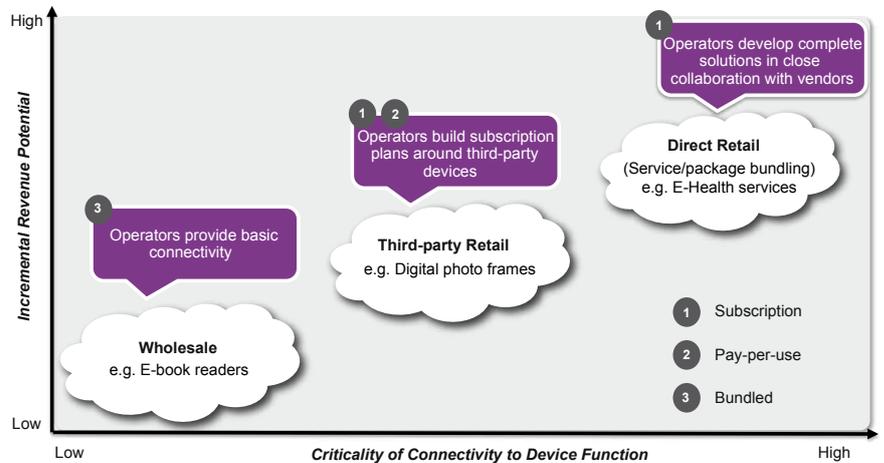
The connected devices ecosystem presents the right opportunity for telcos to utilize their existing assets while ensuring that they have a strong potential to create innovative and steady future revenue streams. Given the diversity of devices that make up the connected devices space, operators are faced with the option of choosing between multiple operating models. The choice of model is closely tied to the role of connectivity for the device and the potential revenue uplift that it can offer telcos (see Figure 4). Indeed, it remains imperative that telcos approach each connected device opportunity with a clean sheet of paper, rather than be constrained by historical approaches.

Wholesale

Wholesale option offers the most straightforward strategy for telcos in their approach to connected devices. Operators should focus their energies on ensuring that they provide a superior packaged wholesale solution to device vendors that want to embed connectivity into their devices. Telcos should strive to set up certification laboratories that will pre-test and pre-qualify multiple 3G data modules that independent device vendors can directly pick and choose for inclusion in their device. Such streamlined processes help vendors reduce their time-to-market, while helping telcos to rapidly enable connectivity over a wide range of devices.

Telcos should typically adopt the wholesale approach for devices where device-connectivity is a “nice-to-have feature”, rather than a “must-have” feature. A case in point is e-book readers where the content consumption happens over an extended period of time. For these devices, operators should strive to work with module vendors in driving down the costs of 3G modules, while encouraging device vendors to embed

Figure 4: Potential Operating Models for Telcos in Connected Devices



Source: Capgemini TME Strategy Lab analysis

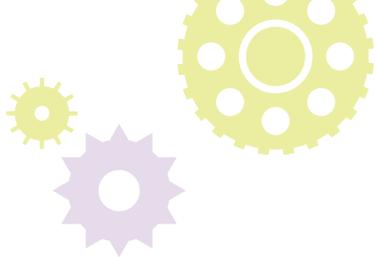
connectivity as a value-add to the product. Bundled pricing offers the most potential for this category, given that the primary focus remains on the device and not the value derived out of connectivity.

Third-party Retail

The third-party retail strategy allows operators to tie a data plan with emerging connected devices that will be sold at traditional retail stores. This allows device vendors to tap into the distribution strengths of traditional retailers, while allowing telcos to bring new customers into its fold. In this model, telcos typically pay a subscriber acquisition commission to the retailer, and monetize the customer through regular data subscription and pay-per-use plans.

This approach is suitable for traditional consumer electronic devices which when combined with wireless connectivity provide a much more compelling user experience. Digital photo frames, when embedded with mobile modules and the ability to remotely and wirelessly receive images, create a new product class

“ The wholesale model offers THE MOST STRAIGHT FORWARD ROUTE TOWARDS monetizing the connected devices opportunity ”



in themselves. Telcos can also adopt this approach when dealing with consumer devices such as the iPad that have a fixed-wireless WiFi radio and a wireless module as an optional attachment.

Direct Retail



The direct retail strategy is usually reserved for those products and services for which connectivity is critical to their core function, and for those products that offer the maximum potential for revenue uplift for telcos. These products usually are high-value consumer gadgets such as mobile Internet browsing devices, e-healthcare devices, and security solutions. For such products, telcos should put their entire marketing and distribution strengths behind the products and work closely with the device vendor to create a compelling user experience. Telcos can also look at potentially building service packages that combine these devices with other traditional telco services. Telcos could package wireless connectivity to mobile Internet devices for their fixed-line broadband customers or create a floater data usage policy for a household that could potentially include all of the connected devices within the household. A subscription pricing model is best suited for this category of devices.

Beyond gadgets that allow for content consumption in varied forms, telcos should focus on packaging solutions around specific customer needs, such as healthcare. In this context, telcos should focus on partnering with healthcare providers and device vendors and work with them early on at the design stage to create compelling remote healthcare services.

For long term success in this market, in addition to adopting appropriate operating models, telcos will also need to ensure that they develop or acquire the necessary technical expertise. Telcos would need capabilities which allow real-time processing of data gathered from a large number of devices, so as to be able to provide intelligence around the status of the connected devices. Additionally, because of the large number of devices that the new environment would need to support, operators would need to develop systems and processes for instant and automated provisioning of services, along with a scalable backend system to support continued operations. Telcos will need to work extensively with other members of the value chain to drive standardization of the technologies so as to ensure a more vibrant ecosystem, allowing scale benefits to kick in for the entire industry.

Conclusion



The connected devices space offers significant potential for mobile operators to drive new revenue streams and innovative business models. The range of potential devices opens up opportunities for players across the value chain, including application developers, device manufacturers, content players, and telecom operators. However, in order to reach their true potential, it is imperative that all players work collaboratively in collectively developing the market. For telecom operators, the nascent state of the market presents a significant opportunity to drive the space in terms of business models while continuously expanding their reach into consumers' homes and increasing their share of wallet.

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“ A DIRECT-TO-RETAIL STRATEGY WORKS BEST *for devices where connectivity is critical to the function* ”

management INSIGHTS

TechnoVision 2012™ in the TME Industry

52

Next Generation Customer Service Strategies:
Harnessing the Power of the Internet and Web 2.0 for
Delivering Customer Care

58

Sustaining Agility and Growth:
Why it is Important for Companies to Periodically Implement
Significant Organizational Changes

66

TechnoVision™ 2012 in the TME Industry

By Patrick Steemers and Priyank Nandan

Abstract: The Telecom, Media and Entertainment (TME) industries are highly technology-dependant and prone to rapid and disruptive changes due to the evolution of technology. Capgemini's TechnoVision™ framework is designed to enable organizations align technology trends with business objectives. The framework identifies twenty-two developing technologies that are mapped to six operational and one technology cluster. Developments in access technologies and devices are enabling highly personalized and rich multimedia services delivery, allowing TME players to create the "You Experience" for consumers. The changing nature of services is mandating that TME players look outside their organizations for sources of innovation. Telecom players are achieving this by leveraging the "We Collaborate" cluster – many are opening up their network and data assets in a controlled manner to the external development community through Open Application Programming Interfaces (APIs). The new environment also demands a high-level of agility from TME players, and requires organizations to adopt "Process-on-the-fly", which refers to modular, reusable process and IT solutions that allow companies to respond to change in real-time. TME players are increasingly "Thriving on Data", as new business models and services are expected to make extensive use of customer data analytics. An increasing number of telecom players now outsource network and IT management to managed service providers who offer "Sector-as-a-Service" solutions that allow telcos to focus on service creation and customer management, and thereby improve operational efficiency. IP-based next generation telecom networks constitute the "Invisible Infostructure" for the TME industry on which content and applications are delivered to end-users, agnostic of the underlying physical layer technologies. TechnoVision also provides the tools for telecom players to map these technology developments to the key business drivers for the industry – the need to generate new revenue streams, optimize cost structures, recreate barriers to entry and prepare for the new wave of convergence.

“Rapid pace
of technology
development
NECESSITATES
FREQUENT
STRATEGIC
REALIGNMENT
for TME
players”

The Telecom, Media and Entertainment (TME) industry is technology-intensive. Consequently, the rapid pace of technology development necessitates frequent strategic realignment for players across the value chain. The introduction of new technologies can lead to the emergence of new business models, can facilitate player movements across the value chain and can sometimes displace incumbents from leadership positions. Hence, it is imperative for players to keep a tab on emerging technology trends, anticipate the likely effect on their businesses and plan long-term strategic responses.

Capgemini's TechnoVision framework enables organizations to identify emerging technology trends and use this knowledge to achieve better alignment between technology and business objectives. This paper introduces the TechnoVision

Framework, and maps the clusters defined in the framework to key technology trends in the TME space. We then identify the key business drivers that lead to the adoption of each technology cluster by TME players.

TechnoVision

Capgemini has identified 21 key technology building blocks, structured into 6 broad operational clusters that help narrow down the emerging trends in technology and provide a detailed perspective on the impact of these trends on different businesses (see Figure 1).

The TechnoVision framework thus has six operational clusters, and one technology cluster "LiberArchitecture", which is not operational itself, but underpins all the others. We take a detailed look at each of these clusters, and how

“ **CAPGEMINI’S TECHNOVISION FRAMEWORK** *is designed to enable organizations align technology trends with business objectives* ”

they can be mapped on to the TME industry.

You Experience

The “You Experience” cluster constitutes a wide range of user interface technologies that delivers a highly customized experience to end users. “You Experience” envisages a shift away from the conventional approach of strait-jacketed and pre-packaged off-the-shelf solutions. Instead, it marks the advent of a new class of technology deployments tailored to meet the specific customer interface requirements that the service demands.

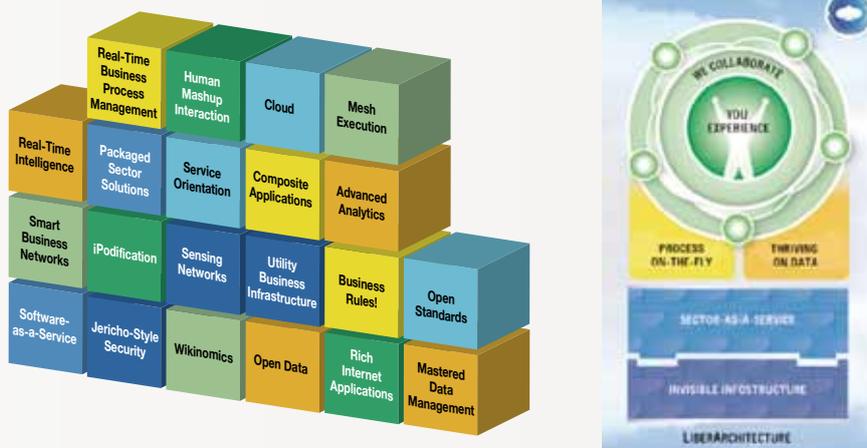
In the TME context, the online “You Experience” will constitute a range of improvements in mobile and fixed access technologies, as well as the development of device interface technologies that facilitate highly personalized services for end-users.

Telecom firms have continuously invested in upgrading end-user bandwidths across both fixed and wireless networks. Wireless operators are investing in 4G networks and multiple fixed-line operators are currently rolling out FTTx networks¹. These upgrades in access speeds allow consumers to involve themselves in a highly interactive and immersive user experience.

Moreover, the development of touch-screen display technology, increased processing power on handsets, and full-featured desktop-level operating systems on handhelds have brought about a significant improvement in the user experience on mobile devices. Indeed, key trends such as ipodification, application stores, full-fledged personalized Internet access and ubiquitous access to social media platforms have been made possible by the rapid and continuous expansion of Internet backhaul capacities and simple, yet highly advanced device interfaces.

An interesting example of the intersection of high-speed networks with innovative applications, and devices can be seen in the case of the Slingbox. The device allows for place-shifting, where it enables consumers to remotely view the content of their home’s cable, satellite or PVR² programming. Access networks laid out by fixed operators to the consumer’s home allow the content to be streamed to anywhere in the world. The mobile application of the Slingbox, Slingplayer, allows this content to be streamed through high-speed mobile networks onto the consumer’s mobile devices. Throughout this process, the focus is on the consumer experiencing a seamless service and accessing content in a manner that is most convenient to the consumer. Online media giants are taking interactivity to the next level. For instance, Yahoo! has recently launched widgets that are embedded on television sets. Consumers can customize these widgets based on their preference and pull email/social networking feeds/ documents on their TV sets³ whilst simultaneously viewing their desired programs.

Figure 1: Key IT Trends and TechnoVision Clusters



Source: Bernard Helders, Pierre Hessler, Ron Tolido, and Ard Jan Vethman, *Capgemini TechnoVision*, 2010

1 Fiber to the Node/House.
 2 Personal Video Recorder.
 3 Business Week, *Yahoo!’s Next Frontier: Internet TV*, January 2009.

“Development of device interface technologies facilitates a highly personalized “YOU EXPERIENCE” for end-users”

We Collaborate

The “We Collaborate” cluster describes capabilities that help organizations tap the power of internal and external collaboration. By connecting to the outside world, fixed, predefined business transactions become ongoing relationships with clients and partners, facilitating the collaboration, innovation and co-creation of concepts, ideas, knowledge and tangible products.

In the TME context, this cluster will constitute the gamut of technologies that allow telecom operators and media players to involve external developers, content partners and open communities to participate in service creation and innovation on traditional communication and media offerings.

Telcos are now encouraging developer communities to tap into core telco data assets such as user identity, billing, presence, location, messaging and call control functions through APIs and development tools, that facilitate open innovation on core telco products and services. The Orange Partner Program⁴ offers over 22 APIs⁵ to external developers to create applications for Orange mobile customers. On the fixed platform, BT’s 21CN SDK⁶ provides developers tools to create applications for its next generation IP-based fixed network. Vodafone’s Betavine, Telefónica’s OpenMovil APIs, and T-Mobile’s

developer portal are other notable initiatives.

Media publishers have embraced social network technologies, wikis and blogs to create highly interactive online publications that seek to capture consumer opinion and feedback, and in some cases even to create content. For instance, Sky News plans to install a Twitter client on its journalists’ computers to encourage use of social media into their news gathering efforts⁷. BBC Global News is encouraging news journalists and editorial staff to make use of social media and online tools to be more collaborative in producing news content⁸.

Process-on-the-fly

Frequently changing rules and regulations, risk management, mergers and acquisitions, collaborative product development and service management require telecom organizations to rapidly align processes and systems to change. “Process-on-the-fly” cluster includes capabilities that allow enterprises to respond to critical business events in real-time.

The TME industry throws up the challenge of managing large organizations that need to respond promptly to the changing consumer preferences, and evolving enterprise voice and data requirements. Rapid evolution of business process management tools has allowed

the TME industry to add dynamic capabilities to core processes such as customer acquisition, provisioning and fulfillment, retention and self-care, based on actual customer-dependant variables. Increasing adoption of such flexible on-the-fly business processes is enabling TME players to achieve cross-channel agility and cost efficiency. For instance, with rise in real-time charging capabilities, most operators are looking at targeting multimedia consumption in the prepaid segment. Similarly, multiple mobile operators around the world have introduced pay-as-you-use mobile Internet plans, on the back of such on-the-fly business processes. It is estimated that revenues from such customized services will deliver over \$2.9 billion revenue by 2012⁹.

Thriving on Data

Detailed insight into crucial data and events is a necessity for organizations that want to navigate a constantly changing, information-rich environment. Organizations that know how to connect the use of data to their strategic business objectives are “Thriving on Data”, constantly reading, analyzing and reacting to information inside and far outside the company boundaries. Information thus is becoming a corporate asset, which serves all strategic and operational parts of the business.

With the proliferation of services, and increasing touch-points in their interactions with consumers, TME players have access to a wealth of data around consumer interests and usage patterns. Garnering such data for precision marketing and advertising not only creates new revenue streams for players in the TME sector, but also improves the effectiveness of their marketing campaigns.

With their traditional businesses saturating, operators are increasing

4 Orange Partner Program website. Telecoms.com, *Orange sees API Uptake, but Operator Cooperation Needed*, 2009.

5 API: Application Programming Interfaces.

6 SDK: Software Development Kit.

7 EConsultancy.com, *Sky News wants its Staff to Embrace Social Media*, January 2010.

8 Guardian.co.uk, *BBC Journalists must keep up with Technological Change*, February 2010.

9 Mobile Marketer, *Carriers Prioritizing Personalized Services over Advertising*: ABI, April 2009.

focus on usage, location and customer data for revenue augmentation. For instance, when Vodafone offered premium turn-by-turn navigation services with the now defunct Wayfinder acquisition¹⁰. Combining customer intelligence and ad server technologies unlocks such innovative additional revenue streams.

Media companies are also increasingly profiling and delivering targeted advertising to their consumers, based on historical usage patterns, as well as peer behavior. In the UK, BT, in collaboration with the BBC and ITV, is planning to mine customer usage data for delivering targeted advertising as part of “Project Canvas”¹¹. Similarly, precise implementation of behavioral targeting will demand real-time integrated business intelligence solutions and a comprehensive data management capability for the enterprise of the future.

Sector-as-a-Service

Business solutions for horizontal services such as office automation, CRM, HRM and finance, are delivered as little-customized, package-based software. The scope of business solutions now extends beyond “support” functions, and is increasingly relevant to sector-specific services. Cost cutting, simplicity, efficiency, economy of scale and industrialization drive the need for organizations to adopt managed services.

Like in other industries, in the TME space, the adoption of managed services is not limited to IT management and non-core activities, but to functions that were considered core to the telco business viz. network management, billing, CRM and so on. As margins on core telco equipment shrink, equipment vendors have moved into the managed services space. Vendors such as Alcatel Lucent

and Ericsson now offer “Sector-as-a-Service” offerings viz. network design, maintenance and management, and now, even content delivery platforms, to telcos on a managed basis as relatively standardized services.

The TME sector has progressively advanced to a significant level of maturity over the years, and consequently, has been able to standardize a number of services, processes and software packages. Best of breed platforms and pre-integrated solutions are being used to simplify business processes and decrease the total cost of ownership. Services such as telco billing, provisioning and CRM solutions are increasingly made available through the Software-as-a-Service model or as part of an outsourcing solution, thereby reducing the time-to-market and cost of ownership. Telco-specific software packages and suites also support MVNOs¹², allowing these players to replicate the necessary functions of a typical operator without getting too involved in the nitty-gritty of the non-core aspects of the business.

Telcos can also act as a managed provider to other businesses by offering its assets to other companies and help drastically reducing time-to-market, as well as aid in adding significant value to enterprises. Amazon’s Kindle e-book reader depicts a good example of a telecom operator, Sprint, offering a Sector-

as-a-Service solution. By integrating its wireless data solution into the hardware, and offering seamless connectivity through its existing network, Sprint allowed Kindle to create a compelling user-experience.

Invisible Infostructure

IT infrastructure such as servers, storage, application platforms and networks gradually evolve into a utility-style “Invisible Infostructure”, supplying all the infrastructural services that an organization needs to responsibly and securely run its business on. Organizations are liberating themselves from the complex tasks of having to run these basic infrastructural services. These infrastructural services increasingly will be supplied from a cloud, which hides the details of suppliers, technologies and systems.

In the TME context, “Invisible Infostructure” refers to solutions that allow network-agnostic applications that can be modular, reusable and scalable. Telecom players are introducing infrastructural elements that allow innovative business models to be put into play on top of them. Telco building blocks such as Service Delivery Platform (SDP) and IP Multimedia Subsystem (IMS) provide the necessary technology infrastructure for a host of services. These technology platforms isolate the service creation process from the underlying network infrastructure.

“ *Organizations that know HOW TO CONNECT THE USE OF DATA to their strategic business objectives are “Thriving on Data”* ”

¹⁰ MocoNews, *Vodafone to use Wayfinder for Location Based Advertising*, May 2009.

¹¹ Telegraph, *BT Vision Vows to Tackle Slow Take-up*, January 2009.

¹² Mobile Virtual Network Operators.

IP technologies allow applications to leverage network assets without having to be rewritten for multiple access and core network technologies.

Additionally, ownership of network infrastructure enables telcos to be providers of “Invisible Infostructure” to other businesses. Telcos such as AT&T in the US have begun to offer what are the building blocks of such structures. AT&T offers cloud-based storage services, application hosting services, among other services to other enterprises. For instance AT&T’s Synaptic “Compute As a Service”, offers computing processing power that can be used for development of in-house apps or as a testing and development platform for external enterprises. The service is a pay-per-use cloud-based “virtual server” service for companies and developers. AT&T provides and manages the virtualization-based server infrastructure over a private or Internet-based cloud, and the customer manages the database and applications¹³.

LiberArchitecture

This seventh, non-operational cluster contains the enabling principles that underpin the other operational clusters. This cluster includes the technology architecture elements that enable organizations to collaborate and communicate effectively beyond their traditional boundaries by adopting uniform norms. Open standards and SOA (Service Oriented Architecture) are the key principles of systems based on the “LiberArchitecture”.

Open standards and technologies are today re-defining the traditional contours within which players in the value chain have operated. Increasing collaboration amongst TME players is leading to the development of a new open ecosystem where consumers, developers, and third-party businesses can participate equally. For instance, the rising popularity of open mobile platforms such as Android is

“ OPEN STANDARDS AND SOA (Service Oriented Architecture) are the key principles underlying the “LiberArchitecture” ”

beginning to result in a cascading effect in the mobile industry.

Service orientation is being adopted across sectors to provide the foundation for other processes and workflows. In the Media and Entertainment industry, SOA is being used for processes like rights management, production and content delivery. In the telecom industry, players are using SOA to interface across the large legacy systems, so as to be quicker and more flexible with the delivery of products to the markets.

For the TME sector, the impact of these clusters is very pronounced as the sector is not only subjected to the changes brought about by these trends, but also acts as an enabler to these platforms. Consequently, players in the TME space not only need to plan for the potential impact of these clusters, but also need to develop a deep understanding of the emerging trends so as to tailor their service offerings according to their requirements.

Putting TechnoVision to Practice in TME

A strong understanding of the link between the various TechnoVision clusters and the business drivers of the TME industry will help TME players steer in the right direction. Rapid evolution of technologies, as well as changing consumer behavior, is throwing up a set of unique challenges for the TME

industry. Disruptive technologies such as VoIP and Internet messaging are threatening core telco revenue streams, even as saturated and competitive markets exert considerable pressure on pricing. Telcos need to balance revenue enhancement through new services, whilst focusing on structural cost reduction. Investments in new technology to recreate entry barriers also stay in focus, even as telco-media convergence compels fundamental changes in business models and services.

The key business drivers for the TME industry can be directly mapped into one of the seven TechnoVision clusters, thereby offering companies a clear view of the emerging trends that are likely to impact their business in the coming years (see Figure 2).

New Revenue Streams

With their traditional businesses saturating, the TME industry is constantly looking to identify new revenue streams. Mobile firms are looking to “Thrive on Data” to deliver targeted mobile advertisements, and location-based services among others. Operator entry into areas such as cloud computing, and wholesale solutions for the M2M industry mark the beginning of the development of Sector-as-a-Service and Invisible Infostructure solutions, in the process, creating new growth areas for telcos. Additionally, the move to open standards and SOA will assist in launching innovative services and applications, often provided by third

13 AT&T’s Synaptic Compute as a Service Website. PC World, IBM and AT&T Unveil Cloud Computing Services, November 2009.

parties, to widen the base of revenue generating activities.

Transformation to Cut Costs

To tackle the business imperative of cost rationalization, telco players need to look internally to try and achieve maximum efficiency. Empowering the organization with flexible processes which allow easier launch of services, with minimum disruption to existing systems, will save precious resources for the organization. Similarly, use of “Process-on-the-fly” based managed services, and Invisible Infostructure, which allows outsourcing of non-core activities, further cut costs by ensuring that the organization is lean. The migration towards open standards and service orientation will allow players to engage with different vendors, thereby allowing them to choose the most cost effective options.

Recreate Barriers to Entry

With growth saturating in developed markets and competition rapidly on the rise in emerging markets, telcos are looking to recreate entry barriers across their service portfolio. They are achieving this by bringing in a unique, personalized experience to their consumers, thus limiting the risk of churn. Operators will also need to ensure that they forge close ties with their consumers after analyzing the usage patterns of their customers closely. Strong relationships with customers create a sense of loyalty acting as an entry barrier for competitors.

Convergence & the Digital Supply Chain

High-end devices such as the Apple iPhone herald the arrival of convergence as a long-term phenomenon that is here to stay. Such devices have spurred TME players to deliver a “You Experience” experience that allows high levels of differentiation. Consumers now look for a compelling user experience in services that they are already used to. Likewise, the advent of the third screen is forcing operators to identify and create touch-points through which they can reach out to consumers, and consequently monetize their interest.

The increasing digitization of media, along with corresponding rise in device capabilities and network speeds are ensuring that customers today have multiple touch-points with TME players. Media is now increasingly time-shifted and place-shifted and all of this is leading to increased interaction of TME players with consumers and amongst consumers themselves. Availability of affordable bandwidth is enabling media players and companies from outside the TME space to increasingly build services and solutions that utilize existing network infrastructure.

In conclusion, TechnoVision provides a structured approach for TME

players to identify the future trends in Information Technology and assess the potential impact on their business in the coming years. When assessed in conjunction with the business drivers in the industry, the TechnoVision framework articulates how TME players can successfully leverage these trends to not only survive but thrive in the changing business landscape.

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Figure 2: Relevant Drivers for TechnoVision Clusters

Business Drivers	Technology Clusters					
	You Experience	We Collaborate	Process-on-the-fly	Thriving on Data	Sector-as-a-Service	Invisible Infostructure
Seek new revenue streams		✓		✓	✓	✓
Transformation to cut costs			✓	✓		✓
Recreate barriers to entry	✓	✓		✓		
Convergence and digital supply chain	✓	✓			✓	

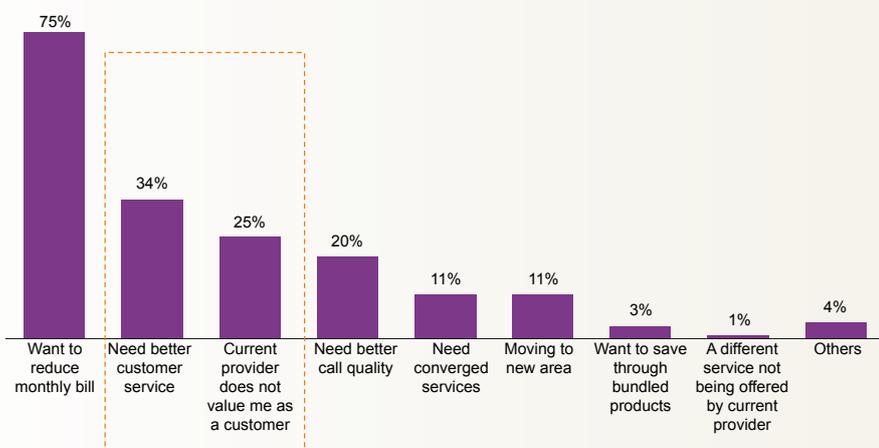
Source: Capgemini TME Lab analysis

Next Generation Customer Service Strategies: Harnessing the Power of the Internet and Web 2.0 for Delivering Customer Care

by Alain Gerset and Sameer Vaidya

Abstract: Customer service plays an important role in combating churn and operators should look at extending their portfolio of customer service channels by leveraging the Internet and Web 2.0. Developing web-based consumer care will enable operators to “be where the customer is” and consequently, also find user acceptance. Key next generation customer service strategies include the use of social media interactions, chat-bots¹, and multi-channel integration. The power of social media can be harnessed for delivering customer care through the proactive identification and dissemination of important information. Social networks can also be used for delivering consumer care. And existing customers can be encouraged to solve other users’ problems. Operators can make the customer service even more cost-effective and efficient by leveraging interactive chat-bots. These are computer programs designed to simulate the responses of real customer service agents. In addition, operators should offer integrated multi-channel service experience to customers. This entails consistent user experience across channels, persistence of context while switching from one channel to another, and the recommendation of optimal channels for problem follow-up and resolution. However, operators should be cognizant of the possible implementation challenges and proactively adopt appropriate mitigation measures. Some of the key challenges that operators need to anticipate include managing customer expectations from social media and chat-bot care, escalating problems from one channel to another seamlessly, handling complex queries through chat-bots, recording customer interaction history across channels, and integrating customer data scattered across multiple silos. Lastly, operators should quickly develop a presence in the new channels and aim to improve their services in a phased manner based on a defined, long-term roadmap and customer feedback. Once implemented, these next generation customer service strategies promise to provide a significant boost to the churn management initiatives of operators.

Figure 1: Selected Key Reasons for Churn among North American Voice Customers*, 2009



* Base of 106 US online consumers who were looking at switching home phone providers; multiple responses were allowed.
Source: Forrester Research, *The Science of Churn: When and Why Consumers Switch Service Providers*, January 2009

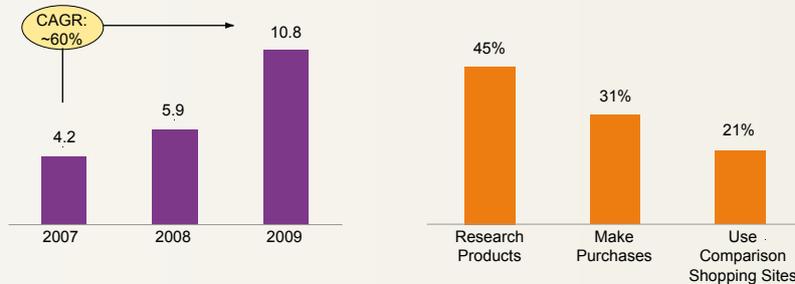
Fixed and mobile operators, who continue battling stagnation and high subscriber acquisition costs in developed markets, do not underestimate the importance of customer retention. High-quality customer service is a key element in the battle against customer churn. In fact, customer service is one of the most important factors affecting customer experience; poor delivery on this front is highly likely to lead to churn (see Figure 1).

¹ A chat-bot is a computer program designed to simulate the responses of a real support agent.

Figure 2: Average Daily Minutes Spent by a User on Social Networking Sites, Selected Developed & Emerging Markets*, 2007-2009 and % of Online Consumers regularly using the Internet for Researching / Purchasing Products, Europe, 2009**

Average daily minutes spent by a user on social networking sites, selected developed and emerging markets, 2007-2009

% of online customers regularly using the internet for researching/purchasing products, Europe, 2009



* Countries include US, UK, Australia, Brazil, Japan, Switzerland, Germany, France, Spain, and Italy
 ** Responses of European online consumers to the question "Which online activities do you do at least monthly?"; multiple responses were allowed
 Source: Capgemini TME Technology Services Lab analysis. Nielsenwire, *Led by Facebook, Twitter, Global Time Spent on Social Media Sites up 82% Year over Year*. Forrester, *A Deep Dive Into European Consumers' Online Behavior*, 2009, August 2009

“ HIGH-QUALITY CUSTOMER SERVICE is a key element in the battle against customer churn ”

Moreover, as communications products and applications are often critical from customers' point of view, they expect customer service to be readily and globally accessible. Therefore, operators are continuously trying to identify new customer service channels that can help to quickly solve problems in a cost-efficient manner.

Although operators have started complementing traditional customer service channels such as call-centres and IVR² with messaging (e.g. e-mail, SMS) and online self-service, there is an opportunity for operators to extend their portfolio of customer service channels further by leveraging the Internet and Web 2.0³. Customers are spending increasing amounts of time on social networking sites and are also using the Internet extensively for researching and buying new products (see Figure 2). Developing web-based consumer care channels will enable operators to “be where the customer is” and consequently, also find user acceptance.

In this paper, Capgemini identifies ways in which operators can leverage the Internet and Web 2.0 to develop next generation customer service strategies and deliver smarter, more efficient customer experience. We also highlight key challenges and mitigation measures that operators should focus on to ensure effective use of these new customer service channels.

“ Operators can EXTEND THEIR PORTFOLIO OF CUSTOMER SERVICE channels further by leveraging the Internet and Web 2.0 ”

² Interactive Voice Response.
³ Web 2.0 includes applications, services and sites such as social networking, video-sharing, blogs and wikis.

“ KEY NEXT GENERATION CUSTOMER SERVICE STRATEGIES

*include the use
of social media
interactions,
chat-bots, and
multi-channel
integration ”*

Key Next Generation Customer Service Strategies

The key next generation customer service strategies include the use of social media interactions, chat-bots, and multi-channel integration to offer quick and optimal response to customer queries or problems. We will now discuss these strategies in detail.

Social Media Interactions

The power of social media can be harnessed for delivering customer care in three ways—proactive identification and dissemination of important information, customer service through social networks, and encouragement of existing customers to solve problems of other users.

Proactive dissemination of important information

Operators can monitor consumer discussions of their products / services on social networks and other Web 2.0 sites such as blogs and discussion forums to proactively identify customer issues, pain-points, or information needs. Having identified these requirements, operators can proactively make available the desired information through their websites, e-mails, or other media. For instance, Comcast monitors Twitter for customer conversations and proactively contacts the customers to address their concerns and resolve issues⁴.

Additionally, operators should also leverage the interactivity and rich-media delivery capabilities of the Internet to convert their plain-text FAQ / self-help / product-overview sections into an audio-visual experience for the users. Device vendors such as Apple have started using this route to educate their customers about the finer aspects of their products⁵.

Customer service through Social Networks

As discussed earlier, to “be where the customer is” will be important for operators going forward. An effective way of accomplishing this is through fostering an active presence on popular social networking sites such as Facebook and Twitter. Dedicated agents can be used to monitor user activity / queries.

For instance, AT&T has a team of dedicated social media care agents. Each agent has a Twitter ID and handles approximately 1,000 tweets per day⁶. AT&T also has a Facebook page where users can post their queries on the wall or click on the links to other customer care channels⁷.

Similarly, Vodafone UK has a Facebook page where customers can post issues for discussion. Simple queries are resolved by the web relations team. For complex issues, users are directed to other care channels and are advised to provide a reference to Facebook conversations⁸.

“ Operators
should also
LEVERAGE THE
KNOWLEDGE
OF EXISTING
CUSTOMERS for
query or problem
resolution ”

4 Businessweek.com, *Comcast's Twitter Man*, January 2009.

5 Company website.

6 SocialMediaToday.com, *How 5 Top Companies Win with Twitter*, February 2010.

7 Facebook and AT&T websites.

8 Vodafone UK's Facebook page.



Encouragement of peer resolution

Operators should also leverage the knowledge of existing customers for query or problem resolution. This can be accomplished by encouraging customers, especially those who are technology- or product-savvy, to respond to problems that are posted on social media applications / platforms by other users.

One way to implement this is to create discussion boards that allow posting of customer issues and also encourage peer resolution. Another way is to use existing social networking sites such as Facebook and Twitter. For instance, Twitter pages of AT&T and Comcast allow peer resolution in addition to dedicated support provided by social media agents. Vodafone UK's Facebook discussion board also allows customers to respond to problems reported by other users⁹.

Chat-bots

Customer service can be made more cost-effective and efficient by leveraging interactive chat-bots. A chat-bot can participate in intelligent conversations wherein a customer

can ask a question or request a task and the chat-bot responds with appropriate answer or action. Chat-bots vary in maturity based on the degree of interaction and query resolution capabilities (see Figure 3).

Simple self-service assistants typically direct the user to appropriate web-pages based on selected keywords in the user's query. For instance, 'Ask Laura' from T-Mobile (UK) allows users to write a question and in response, directs them to the appropriate answer in the FAQ section¹⁰.

The next level of chat-bots entails simple interactive conversations through which customers are guided towards appropriate web-pages, offered advice on using the correct channels, and provided basic support or information.

For instance, O2 UK's 'Ask Lucy' service can remember user names across sessions, answer customers' queries, and offer support by suggesting solutions or providing directions to the appropriate knowledge source. BT's 'Ask Emma'

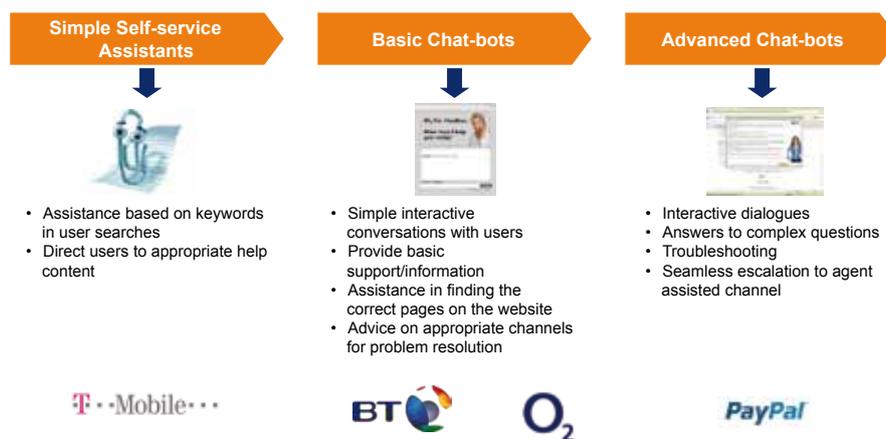
is a similar virtual agent service. 'Ask Verizon' also has a virtual agent called Frank who answers customers' support queries and points to other appropriate channels if he (it!) is unable to answer them¹¹.

Advanced chat-bots can perform a multitude of tasks and support extended natural language conversations with users. For instance, they can ask pointed questions to dig deeper into a problem or seamlessly escalate the issue to an agent-assisted channel. PayPal's 'Sarah' is a multi-lingual chat-bot capable of bringing up dynamic pages based on context and addressing complex issues, such as disputes and refunds¹².

Early results indicate that chat-bots will gain consumer appeal and acceptance. For instance, O2 UK's 'Ask Lucy' gets about 1,000 questions per day and BT's call center volumes were reduced by 700,000 annually after the launch of 'Ask Emma'¹³. Moreover, these chat-bots can also help position an operator as market-leading in deploying customer-friendly new services/technologies.



Figure 3: Key Types of Chat-bots



Source: Capgemini TME Technology Services Lab analysis. CreativeVirtual.com News. Virtuoz PayPal case study

9 Vodafone UK's Facebook page.
10 Company website.
11 Company websites and press releases. Creativevirtual.com news articles.
12 Company website. VirtuOz's (www.virtuoz.com) PayPal case study.
13 Chatbots.org and Creativevirtual.com news articles.



Verizon's website was regarded as the best support site for a US operator in a survey conducted by the Customer Respect Group with a special mention of Frank, the chat-bot featured in 'Ask Verizon'¹⁴.

Multi-channel Integration

Customers now have access to multiple customer care channels such as call centers, websites, SMS, emails, social media, and chat-bots. Faced with these choices, consumers can select any of the channels based on their convenience to initiate contact and follow-up on inquiries. At times, consumers may want to use different channels for initiation and follow-ups. For instance, a consumer may flag a problem first through a chat-bot, and follow it up with calls to a contact center in case the query has not been resolved.

In such cases, it would be user-friendly if the operators can remember the context of those calls. In that case, consumers would not have to explain the problem from scratch when they use a different channel for follow-up as compared with the channel used for initial contact.

Therefore, operators should look towards offering an integrated multi-channel service experience to consumers (see Figure 4).

An integrated multi-channel service experience entails multiple components. First, the user should get consistent experience across all channels in terms of services and resolutions offered. In other words, consumers should be sure that they will get the same response regardless of the chosen channel.

Next, the user should be able to seamlessly switch over from one channel to another for further discussion of a problem. An important aspect here is persistence of context; information about the customer, the current problem, and the solutions already tried out. For instance, a user should be able to switch from a chat-bot discussion session to live discussion with an agent without losing context of the situation.

Lastly, the integrated service should be able to recommend optimum call strategy, in terms of customer care channels used for problem follow-up and resolution, for a customer based

on her preferences and call history. This would also entail switching from one channel to another in case the initial contact is made through a less preferred channel. In turn, this would help operators to delight customers while reaching out to them proactively or while following up on calls.

The key benefits of next generation customer service strategies discussed above include enhanced consumer convenience, potential reduction of voice call traffic to contact centers through offloading of queries to web-pages or social networking sites, and resultant decline in customer care expenses.

However, implementations of these strategies bring forth a set of challenges as well. We now discuss the key challenges and their mitigation.

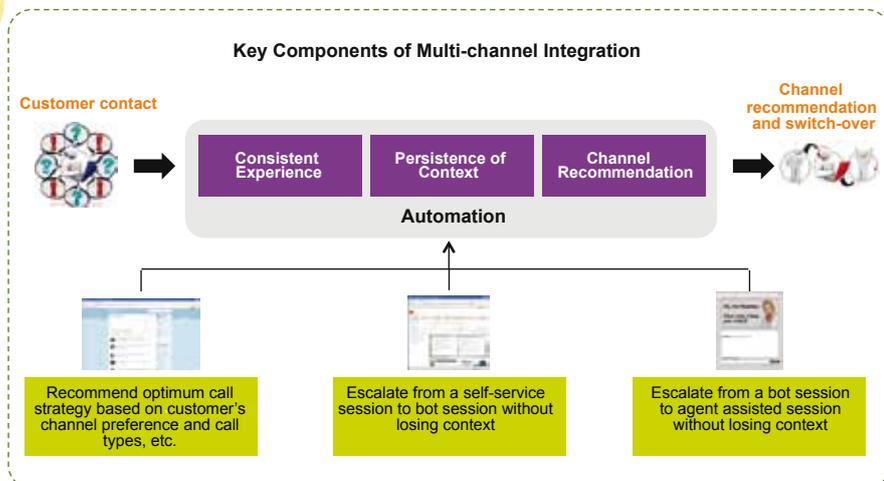
Key Challenges and Mitigation

Challenges with Customer Care Delivered through Social Media

The foremost challenge associated with using social media for customer care is managing consumer expectations. If the user is not clear about who is going to resolve issues—customer care agents or fellow customers—it can lead to confusion and dissatisfaction. Similarly, if a customer expects immediate problem resolution while using social media and if that expectation is not met, the customer will not only become frustrated but also become averse to using the platform again.

Therefore, operators should specify who is going to respond to their queries and also indicate approximate turnaround times to consumers using next generation customer care channels. Additionally, operators should moderate discussions on forums and blogs to ensure that correct advice is provided to a customer by fellow users.

Figure 4: Key Components of Multi-channel Integration



Source: Capgemini TME Technology Services Lab analysis

14 Creativevirtual.com news articles.

Customer identification through social network IDs is also an important issue. For problems such as billing disputes, operators would need to know details such as customer ID or phone number. Here, the customer can manually provide the details or the operator can use a mapping software to link social network IDs with customer billing, Customer Relationship Management (CRM), and other records. In either case, privacy issues become important, and operators should either seek explicit buy-in from customers or restrict the usage of social networking and Web2.0 sites to technical problem resolutions.

Another important challenge is the seamless escalation of a customer query or problem to other channels in case it cannot be solved through social media. Some operators have started using partially manual solutions to make social media interactions available to other

“ *The foremost challenge associated WITH USING SOCIAL MEDIA FOR CUSTOMER CARE is managing consumer expectations* ”

customer care channels. For instance, Comcast enables social media data integration with CRM data by manually entering social media and account data (phone number) into a system called Grand-Slam¹⁵. However, the need of the hour is to implement integrated multi-channel system architecture, discussed in detail later.

Challenges with Bot-care

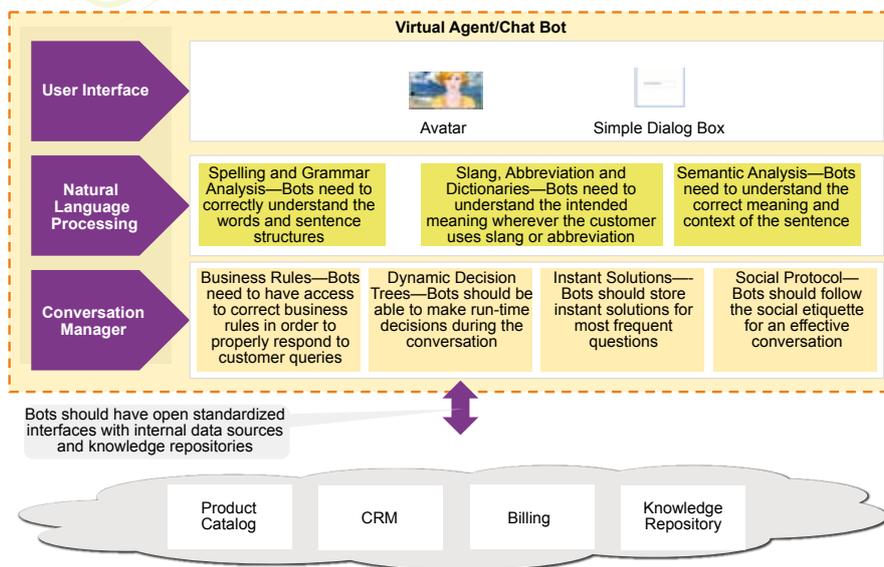
Operators need to be careful while deploying chat-bots for customer service as they might not be able to

handle complex queries or decipher the use of slang or abbreviations by customers. The key challenge here is to ensure that customers do not get frustrated while dealing with a chat-bot.

In order to mitigate this, operators should ensure that they set reasonable customer expectations in terms of the kind of problems that their chat-bots can solve and also provide chat-bot interaction guidelines.

Operators should also work towards deploying sophisticated chat-bots with advanced natural language processing and conversation capabilities. The key components of natural language processing include spelling and grammar analysis, slang / abbreviation and dictionary support, and semantic analysis. Enhanced conversation capabilities can be developed through well-defined business rules, dynamic decision support trees, instant solution support, and social protocol adherence. Lastly, chat-bots should have open standardized interfaces with internal data sources such as Product Catalog, CRM, Billing, and Knowledge Repository systems. Figure 5 highlights the conceptual structure of a sophisticated chat-bot.

Figure 5: Conceptual Structure of a Sophisticated Chat-bot



Source: Capgemini TME Technology Services Lab analysis

15 Techtargat.com, Social CRM Customer Data Management can be the Hard Part, February 2010.

Challenges with Multi-channel Integration

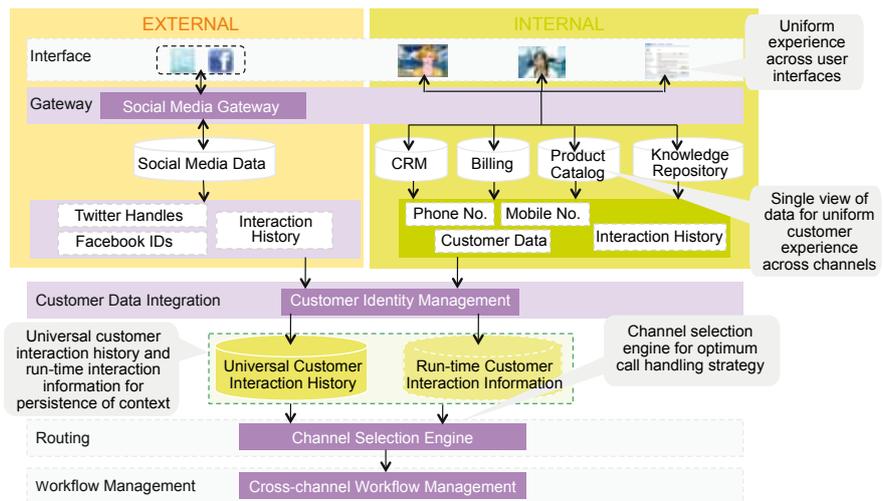
The lack of customer interaction history across multiple channels and customer data scattered across multiple silos are the key challenges faced by operators in their attempt to enable integrated multi-channel customer service.

To elaborate, existing systems would typically not include history of customer interactions over new media / applications such as social networks and chat-bots. Therefore, context and history information could be lost easily, leading to sub-optimal customer service.

Moreover, customer information has multiple aspects and different types of data are usually stored in different types of databases/systems such as CRM and Billing. However, with next generation customer care, the traditional integration of databases/systems is not enough. Information such as social networking IDs and interaction history need to be cataloged and stored as well.

Therefore, operators need to implement integrated multi-channel customer service architecture with new channels, shared customer history, and single view of data (see Figure 6).

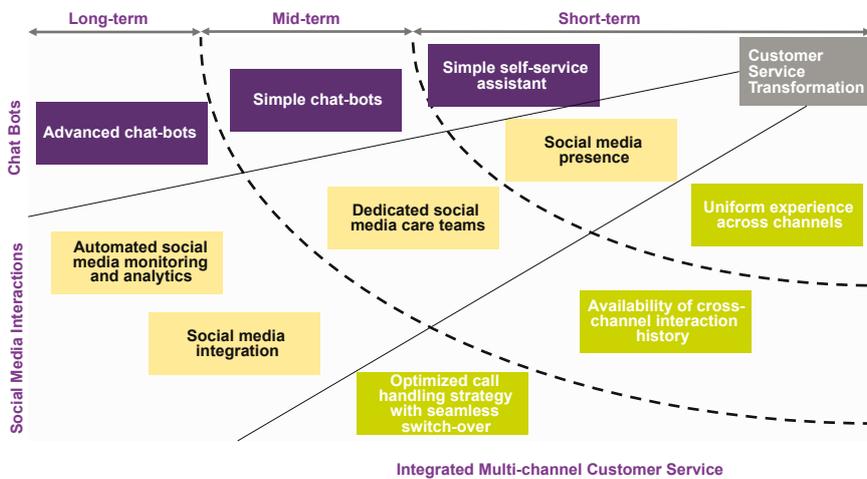
Figure 6: Schematic of Integrated Multi-channel Customer Service Architecture



Source: Capgemini TME Technology Services Lab analysis



Figure 7: Phased Approach for Launching Various Next Generation Customer Care Services



Source: Capgemini TME Technology Services Lab analysis

In conclusion, next generation customer care delivered through social media, chat-bots, and multiple integrated channels will enable operators to “be where the customer is” and help deliver superior customer service. Developing these channels should be seen as a continuous process by operators (see Figure 7).

Operators should quickly develop a presence in next generation customer care channels and aim to improve their services in a phased manner by not only using a roadmap but also incorporating customer feedback that will help them customize their services appropriately.

Once effectively implemented, these next generation customer service strategies promise to help operators to position themselves as leaders in customer care. Consequently, they would boost the arsenal of fixed and mobile operators in their continuing quest against churn. Not adopting next generation care is hardly an option for leading operators.

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“ Operators should QUICKLY DEVELOP A PRESENCE in next generation customer care channels and IMPROVE THEIR SERVICES in a phased manner ”



Sustaining Agility and Growth:

Why it is Important for Companies to Periodically Implement Significant Organizational Changes

By Freek Vermeulen

Abstract: Telecom, Media and Entertainment (TME) companies typically do not implement major organizational changes when things are seemingly under control. However, if a company persists with the status quo and avoids making significant organizational changes for too long, unhealthy structures and patterns start to develop. These insidious effects include the formation of rigid internal boundaries that stifle communication and cooperation; the adherence to narrowly defined routines that hamper agility; and the emergence of strong power centers that divert resources. If an organization has not been restructured for some time, silos tend to develop along business unit lines. The key problem here is that employee communication and cooperation primarily takes place only within the well defined boundaries of the business units or functions. This can lead to a company executing tasks inefficiently or becoming unresponsive to the needs of the market. Employees and departments who repeatedly perform the same task stifle imagination, innovation, and the search for new opportunities. This, in turn, leads to the stagnation of the entire organization. Lastly, if an organization resists change for too long, it faces the risk of power centers emerging. These entrenched interests will strengthen themselves further to the detriment of the future growth and profitability prospects of the entire company. Therefore, TME companies should conduct periodic check-ups of their internal health in order to take preventive measures, i.e. organizational changes, at the right time. These changes should be directed towards forming new employee networks, disrupting rigidity of thinking and routines, and shaking up the entrenched power centers.

“Unhealthy structures and patterns take root in a company IF CHANGES ARE NOT MADE REGULARLY”

If the financial top and bottom lines are robust, TME companies usually avoid making far reaching changes for fear of upsetting the balance within an organization. Moreover, many analysts and experts may also criticize sweeping changes made when a company appears outwardly healthy.

Although the business environment may seem calm and not outwardly demand immediate harsh changes, unhealthy structures and patterns might start to develop internally in an adverse manner. Therefore, postponing major changes until the health of the organization deteriorates significantly is not the optimal approach. In fact, it is extremely important for TME companies to periodically assess their internal health and recognize the need to

make organizational changes. In this paper, London Business School professor Freek Vermeulen¹ highlights the unhealthy structures and patterns that take root in a company if changes are not made regularly. They also emphasize the need for companies to periodically make significant organizational changes. Subsequently, we present frameworks that can help companies to assess their internal health; identify whether it is necessary to change; and also determine the type of change that is needed.

Development of Unhealthy Structures and Patterns within an Organization

If a TME company continues to maintain its existing set up and avoids making significant organizational changes for too long,

¹ This paper is based on joint work with Phanish Puranam, London Business School, and Ranjay Gulati, Harvard Business School. See also the article *Change for Change's Sake*, Harvard Business Review, June 2010.

unhealthy structures and patterns start developing internally. These destructive effects include the formation of rigid internal boundaries that stifle communication as well as cooperation; the adherence to narrowly-defined routines that hamper agility; and the emergence of strong power centers that divert resources (see Figure 1).

Rigid Internal Boundaries Stifle Communication and Cooperation

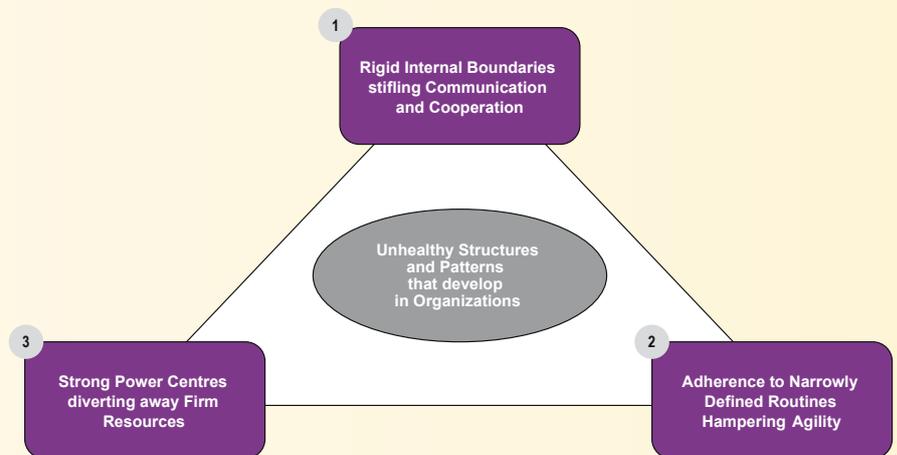
Typically, TME companies and business units have organizational structures that are centered on a particular criterion such as product, customer type, function, or geography. However, the key problem with such structures is that they give rise to rigid internal boundaries in which communication and cooperation primarily takes place within the well defined confines of the business units or functions. This can lead a company to execute tasks inefficiently or become unresponsive to the needs of the market.

For instance, a company organized as per customer type may carry redundant functional sub-units within each business unit and this could lead to the replication of resources and activities. Similarly, a company that is organized along functions is less likely to recognize shifts in the marketplace, new product opportunities, or changing customer behavior.

Although matrix structures have been deployed by many TME companies to force the interaction across two dimensions such as products and functions, they can result in unclear responsibility, ambiguous accountability, and slow decision making.

A potentially better solution is to periodically restructure the organization around a different criterion—say from function to

Figure 1: Unhealthy Structures and Patterns that develop in Organizations



Source: Freek Vermeulen, Phanish Puranam, and Ranjay Gulati

product, which helps to expand the network of the company's employees and to encourage communication and collaboration in a much wider fashion than before. This happens because when a reorganization takes place, employees not only create new networks within their new business units but also retain their previous networks and cultures, at least for a while². Therefore, after a reorganization, employees cooperate along both informal (previous) and formal (new) networks over the near-term and the firm benefits through increased cross-pollination of ideas.

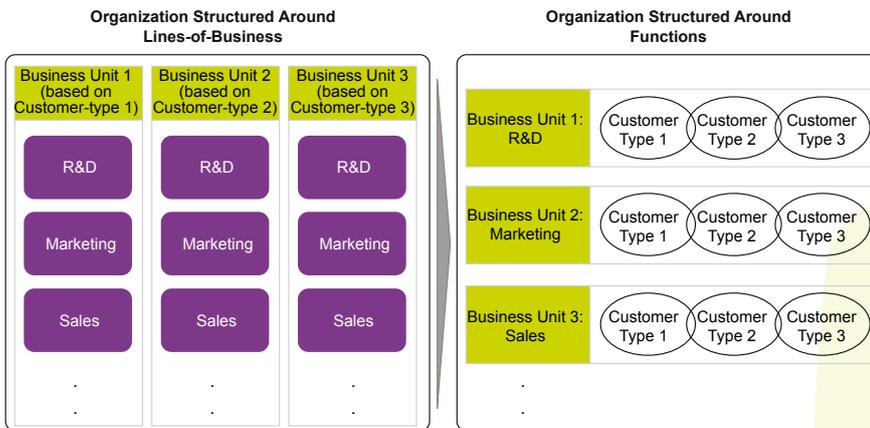
In 2001, Cisco reorganized its structure from line-of-business to function (see Figure 2). In the line-of-business organization structure, employee interaction and collaboration were restricted to the boundaries defined by the three business units.

The changes proved beneficial for Cisco. Its new centralized Research & Development (R&D) group encouraged engineers to exchange ideas and collaborate not only with each other but also with their peers across the company. The centralized

“Unhealthy structures include the formation of rigid internal boundaries; THE ADHERENCE TO NARROWLY DEFINED ROUTINES AND THE EMERGENCE OF STRONG POWER CENTERS THAT DIVERT RESOURCES”

² This was first observed by professors Jackson Nickerson and Todd Zenger from Washington University.

Figure 2: Schematic Representation of Cisco's Organization Structure Change



Source: Freek Vermeulen, Phanish Puranam, and Ranjay Gulati

R&D group did not lose the pulse of Cisco's customers, as feared by many, because employees did not hesitate to meet or phone their old colleagues to develop optimal, cross-technology solutions. A combination of new networks, old and informal networks, and Cisco's customer-oriented culture helped Cisco to innovate and streamline its product offerings³.

Eventually, however, employees lose contact with their previous colleagues, the informal network subsides, and the new formal network becomes well entrenched. Thus, once the beneficial near-term impact of a restructuring wears off, silos re-emerge as employees start limiting their communication and cooperation within their new teams. The solution, once again, is to change the organizational structure.

Coming back to the Cisco example, the organizational structure was changed once again in 2004 with the creation of three business councils representing a partial reversion to the previous grouping. These units spanned across functions as well as technologies and helped to better capture customers' feedback

on Cisco's strategy, products, and services⁴. This was necessary as the old, informal networks had decayed and stopped being effective in capturing the voice of the customer.

Adherence to Narrowly-defined Routines Hampers Agility

Routines can be good for improving efficiency; however if a routine goes on for too long, it becomes entrenched and can be difficult to break out of.

If an organizational structure is stable for too long, things continue to happen in a particular way within each department or sub-unit. Of course, employees and departments become more efficient in performing repeated activities as specified by the narrowly defined routines. However, the flip-side here is that when the external environment changes and market / competitive pressures rise, they find it extremely difficult to adapt and make the necessary transition.

Worse, employees and departments become complacent and stop seeking out new opportunities. As employees stop exploring new opportunities

and growth frontiers, they start losing their capability to look ahead, imagine, innovate, and discover game-changing opportunities. This, in turn, leads to the stagnation of the entire organization. Thus, adherence to narrowly-defined routines significantly hampers organizational agility.

One way to break routines is by opening up the inter-department boundaries as discussed earlier. However, relying on just one type of change for too long is counterproductive as the change itself can become routine! Many companies, such as Hewlett-Packard, have periodically vacillated between centralization of functions (such as sales, marketing, finance, product development) and decentralization into product groups every few years⁵. Such changes may yield benefits initially, but eventually they become a routine process and employees simply start alternating between the two—what they are doing presently and what they were doing a few years back.

Therefore, as indicated in Figure 3, during successive changes, companies should place different emphasis on different change areas (structures, rewards, and processes). Moreover, within each area, they should restructure the organization around different key aspects of the change area. Rewards could be based more on recent employee performance in one year and on medium to long-term capability development in the next.

Strong Power Centers Divert away Company Resources

If a TME company resists changing its organizational structure for too long, it faces the risk of power centers emerging within it. These power centers or entrenched interests will concentrate on strengthening themselves further and more importantly, on garnering the

³ Freek Vermeulen, Phanish Puranam, and Ranjay Gulati.

⁴ Ibid.

⁵ Ibid.

maximum share of its resources rather than passing them on to smaller, needier units with good growth potential.

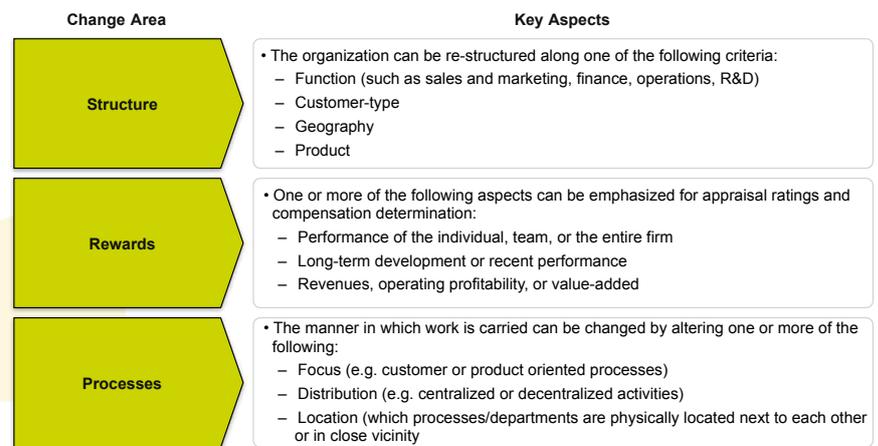
A company will initially allocate more resources to a large business unit and the more resources a department gains, the more its size will grow even if it is a relative under-performer. Thus, the allocation of funds in an organization is typically a self-propagating cycle that favors and strengthens larger business units.

To begin with, this is not a problem as the department may genuinely need resources to develop new products or markets to grow its market share. However, over the medium- to long-term, the resources and, therefore, the power allocated to the department may not be justified. The department could find itself selling products or services in a stagnating or declining market and may be unwilling or unable to identify adjacent rapid growth opportunities.

In such circumstances, the organization is better off allocating less funds to the powerful unit and more funds to smaller business units with good growth potential.

Many TME companies try to address the issue by establishing cross-unit teams, starting centralized corporate funds, or creating specific integrator functions. However, obtaining the requisite buy-in and support from senior members of powerful business units is an extremely challenging process due to the conflicts of interest involved. These senior executives are primarily judged based on the performance of their own business unit and are therefore, highly likely to be uncooperative exhibiting tardiness while attending meetings or providing only lip service while agreeing to provide information and other resources. Moreover, these

Figure 3: A Regime for Change: Avoiding Routines



Source: Freek Vermeulen, Phanish Puranam, and Ranjay Gulati

senior executives are unlikely to be challenged for not supporting up-and-coming units as long as they deliver their targets in their strong business units.

Such insufficient cooperation will lead to suboptimal resource allocation for the smaller units, thereby jeopardizing their growth prospects.

Frameworks for Assessing the Internal Health of an Organization and Identifying Remedial Measures

As discussed earlier, although there may not be any external symptoms of underlying problems—top line and bottom line growth could be in alignment with stakeholder expectations—TME companies should be aware that they might become victims of their own success. Unhealthy structures and patterns could be taking shape inside the organization and could jeopardize future success.

Therefore, it is very important for companies to periodically perform a health self-check and identify the appropriate time to change.

“ *Firms should CONDUCT PERIODIC CHECK-UPS OF THEIR INTERNAL HEALTH in order to take preventive remedies, i.e. organizational change at the right time* ”

“ *Each organizational change will need to place* **A DIFFERENT EMPHASIS ON DIFFERENT CHANGE AREAS, i.e. structures, rewards, and processes** ”

We now present a framework, in the form of a questionnaire⁶, which can help to identify whether the time has come to affect significant organizational changes. The framework (see Figure 4) tests whether communication and cooperation are being restricted by departmental boundaries; employees have started adhering rigidly to routines; or powerful business units and executives have started diverting resources away from future growth units into business units more relevant in the past than in the future.

The framework depicted in Figure 4 can help an organization to determine whether it is an appropriate time to redesign the company. It can also help them to decide the type of changes to be implemented.

In the framework, the “yes” responses carry one point each. If the overall score, after summing up the responses to the 12 questions, is less than three points, the firm is in good shape and does not need any changes at the moment. The advice in this case is to run the self-assessment after 6 to 12 months. If the score is 3 to 7, it is just the right time to change. If the score is more than 7 points, the need to change is urgent. In fact, it indicates that the company is already late to change and the scale of the required changes is large.

In order to determine the type of change required, it is necessary to examine the scores in each category.

If the highest score is in the “Quality of Communication and Cooperation” section, then managers should consider changing the criterion (product, customer-type, function, geography) around which the organization is structured. More specifically, a high score in this section indicates that the company is already suffering from a decrease in cooperation among its various business units.

Changing the structuring criterion and the organizational structure can help the company to grow informal networks that are not

constrained by the boundaries of formal structures. This leads to increased communication as well as collaboration between business units and benefits the organization due to the increased cross-pollination of ideas. The caveat here is that informal networks, which arise primarily from contacts with previous colleagues, decay with time and do not survive for too long. Therefore, firms should be prepared to repeat the process periodically to ensure that new informal networks keep developing.

If the maximum score is in the “Adaptability” section, it indicates that the firm is finding it difficult to innovate or identify/capitalize on new developments and opportunities in the marketplace. To mitigate this, companies should expose employees to new aspects of their tasks. However, to break routines, managers should ensure that the upcoming change is significantly different from the previous one. Moreover, to sustain an organization’s capacity to adapt, the firm should be ready to not rest on its past successes and accept a constant state of mild disruption. The existing way of working is challenged continuously.

Figure 4: Framework for Assessing the Health of an Organization

Category	Questions	Response (Yes / No)
Quality of Communication and Cooperation	1. Do employees primarily interact only with people from their own groups or departments?	1.X
	2. Are there strong subcultures within business groups or departments?	2.X
	3. Are there breakdowns in communication due to rigid inter-departmental boundaries?	3.X
	4. Has cooperation among groups decreased over the past five years?	4.X
Adaptability	1. Are many employees not comfortable with change?	1.X
	2. Do employees and groups/departments operate according to set routines?	2.X
	3. Has it been long since the organization developed a significant new source of revenue?	3.X
	4. Has the % revenue contribution from new streams declined over the past five years?	4.X
Power Balance among Departments	1. Do powerful groups/departments or individuals gamer most of the firm's resources?	1.X
	2. Is it difficult for employees/departments not in the dominant group to obtain resources?	2.X
	3. Do powerful groups/departments or individuals hamper decision making?	3.X
	4. Have the groups/departments or individuals that were influential five years back increased their power or influence?	4.X

Source: Freek Vermeulen, Phanish Puranam, and Ranjay Gulati

⁶ The questionnaire should be distributed to all managers of the firm from time to time. Their anonymity should be preserved to ensure that respondents answer honestly.

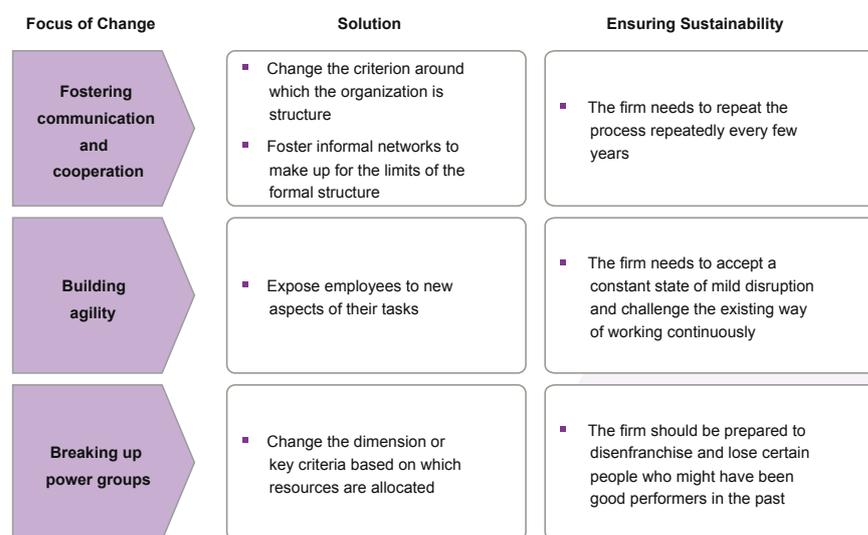
Lastly, if the highest score is in the “Power Balance among Departments” section, it indicates that there is a significant imbalance of power within the organization with resources being diverted away to a few powerful business units and tomorrow’s potential star units being made to starve for resources. In such cases, it is necessary to change the dimension or key criteria on the basis of which resources are allocated. The powerful vested interest groups are unlikely to allow such changes without a fight and therefore, TME companies may need to make multiple changes simultaneously to shake themselves up. This can entail disenfranchising and even losing some people who might have been good performers in the past.

Figure 5 summarizes the discussion on how to change.

In conclusion, even if a company does not have outward symptoms of ill-health, it might have developed internal unhealthy structures and patterns as a result of not effecting organizational changes for a long time. These ill-effects can adversely impact the nimbleness of the TME organization to grab emerging opportunities or respond quickly to the changes in the external environment, thereby threatening future growth and profitability. Therefore, companies must know when and how to change.

TME companies should conduct periodic check-ups of their internal health in order to take preventive remedies, i.e. organizational change, at the right time. These changes help form new employee networks, disrupt rigidity of thinking and routines, and shake up the stronghold of entrenched interests. Ignoring internal health and not taking pre-emptive measures can lead to massive

Figure 5: How to Change: A Framework



Source: Freek Vermeulen, Phanish Puranam, and Ranjay Gulati

reorganizations, restructurings, and retrenchments, a painful process for everybody involved. Worse, they might not be effective at all because the right time to change may have passed. In contrast, making the right changes at the right time will typically help firms to not only implement less radical changes but also stay relevant in the marketplace due to the timeliness of the change. Therefore, companies should make it a habit to administer internal health self-checks regularly.

Freek Vermeulen is an associate professor of Strategic & International Management at the London Business School. His work concerns the intersection of strategy, leadership, and execution. It has been published extensively in the most reputed academic journals, and in outlets such as the Financial Times, Harvard Business Review, Sloan Management Review, and the Wall Street Journal. His forthcoming book (Pearson, October 2010) is entitled “Business Exposed: The naked truth about what really goes on in the world of business”. He is based in London. ■

“REGULAR CHANGES HELP form new employee networks, disrupt rigidity of thinking and routines, and shake up the stronghold of entrenched interests”

lite BYTES

As the TME industry starts showing indications of revival we put forward some vignettes and trends depicting the lighter side of our Telecom, Media and Entertainment industry

Mobile:

- Did anybody ever complain about long girl-talks? The Pew Research Center reported 75% of teens between the ages of twelve and seventeen now own cell phones and of those who do, girls typically send or receive eighty text messages per day versus the boys', thirty per day.
Source: Reuters, *Third of U.S. teens with phones text 100 times a day*, April 2010
- Unsure about customs laws? There's an app for that. In an attempt to make going through customs easier, Dutch authorities have embraced smartphone technology, developing an application that tells travelers what they are not allowed to take with them.
Source: Reuters, *Unsure about customs laws? There's an app for that*, May 2010
- According to a UK survey, 54% of the women quizzed said they would prefer to date a man who owns an iPhone. 37% mentioned that owning an iPhone makes a man seem more reliable.
Source: TotalTele, *Unsure Ugly? iPhone is the app for that*, April 2010
- UK consumers' tendency to stash away the old phone after buying a new one is apparently locking away huge amounts of money. Research indicated that there is roughly £2.1 billion lying dormant in people's drawers in the form of old handsets.
Source: TotalTele, *Billion-pound handset horde*, May 2010
- According to a survey of UK commuters' worst bugbears, people who talk loudly over the phone are second only to smelly people. However in spite of that more than half admitted listening to other people's conversation and enjoying reading other's text messages.
Source: TotalTele, *Smelly people, phone users top worst commuter league*, May 2010

Internet:

- 20% of American divorce petitions in 2009 contained references to the Facebook website.
Source: *The Sun*, *Divorces blamed on Facebook*, May 2010
- According to research at the University of Leeds, people who spend long hours Internet browsing are more likely to show symptoms of depression. However, it is not clear what comes first—are depressed people drawn to the Internet or does the Internet cause depression?
Source: *University of Leeds*, *Excessive internet use is linked to depression*, February 2010
- Here is something for tweeters too eager to disclose their location. Website PleaseRobMe.com uses geo-locational networking tools like Foursquare to generate a list of empty homes whose occupants are away. The intention was to make people aware of the dangerous side-effects of location sharing.
Source: *The Consumerist*, *PleaseRobMe.com Lets The World Know No One's Home*, February, 2010
- Twitter users need to be more cautious with their tweets after a man was convicted in the UK for "joking" about blowing up an airport. This was apparently the first successful UK criminal prosecution for a tweet.
Source: *Financial Times*, *Fine over Twitter airport 'joke'*, May, 2010
- Lost your camera? Try "Facebooking" it. A tourist who picked up a lost camera found its owner by setting up a dedicated Facebook group for it. What started as an experiment in "six degrees of separation"—hoping to find the user in six links—ended up with the group membership exceeding 250,000.
Source: TotalTele, *Lost and Facebooked*, November 2009

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*“By 2020, there will be
50 billion connected devices”*

*—Jan Wäreby, Senior Vice President and
Head of Business Unit Multimedia, Ericsson*