

# *Communications Review*

## Growing telecom revenues – what's next?



**pwc**

*A journal for telecom, cable, satellite and Internet executives*  
*Volume 16, No. 3*

Delivering the mobile wallet  
.....  
Creating successful m-health applications  
.....  
Growing rural telecom revenues  
.....  
Debating net neutrality – again  
.....  
Using your competitive assets  
.....

*The industry's revenue no longer will grow because of fixed connectivity. An expanding array of mobile-broadband-based services accessed by an ever-rising number of smart devices will fuel the future. Nobody has all the assets – or answers – to sustain success alone. The key is collaboration.*

*Communications Review*

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*by Colin Light*

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### ***An optimistic prognosis for mobile health opportunities***

All healthcare systems are facing the issue of how to provide ubiquitous access to care and to improve outcomes at the lowest possible cost. No technology shows greater promise in addressing these needs than does mobile health. Telecom operators must move aggressively to develop healthcare services and solutions with added value, which can lead to high-margin commercial and consumer revenue streams.

*by Christopher Wasden*

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### ***Building rural telecoms, one rupee at a time***

Industry executives in India – where ARPU is between US\$1 and \$2 – worry less about ARPU and more about usage. They realise that there are limits to what they can do to influence upwards the price of what they sell, and that there's more they can do to encourage consumption. But what does that mean when looking at rural expansion? Using India as an example from which others might learn, we look at how operators can find opportunities in rural markets despite low ARPU levels.

*by Mohammad Chowdhury*

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### ***Net neutrality: Why solve a problem that doesn't exist?***

Renewed concern over net neutrality comes at a time when mobile operators urgently need to revise their price plans and tune their business models to cope with the decline in revenues from text messaging and voice and to benefit from the surge of mobile-data consumption. The new mobile-data world requires collaboration among content and application providers to deliver new, differentiated, high-value services that customers want. In PwC's opinion, net neutrality would severely limit everyone's options.

*by Bart-Jan Sweers*

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### ***Putting your competitive assets to work***

The consumers coming of age in 2015 will be digital natives – an entire generation of people who never experienced the non-digital world. Battling for the attention, loyalty and spending power of these digital consumers will be protagonists with vastly differing business models: traditional fixed and mobile operators, cable providers, satellite broadcasters, search specialists, social networks, device companies and more. In looking for the keys to success in this market, PwC conducted research into where communications revenues are heading – and how operators can get there first.

*by Rolf Meakin*

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#### **Le m-commerce : à celui qui saisira l'opportunité**

Après plusieurs années de bataille médiatique, le commerce mobile s'apprête à décoller. Afin de saisir cette opportunité, un nombre croissant d'opérateurs mobiles cherchent à regrouper leurs ressources et leurs parcs d'utilisateurs pour offrir un marché grand public plus vaste et plus attrayant pour les services de commerce mobile. Ils sont confrontés à une forte concurrence de la part des géants de l'OTT (over-the-top) et d'un ensemble d'acteurs de l'Internet. Tous cherchent à tirer au mieux parti de leur puissance en ligne dans le monde mobile. Reste à savoir qui l'emportera, et l'enjeu est de taille.

*par Colin Light*

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#### **Un pronostic optimiste pour les opportunités en matière de santé mobile**

Tous les systèmes de soins de santé sont confrontés à la problématique qui consiste à déterminer comment fournir un accès universel aux soins et améliorer les résultats au moindre coût. Aucune autre technologie que la santé mobile ne semble être plus à même de répondre à ces besoins. Les opérateurs de télécommunications doivent faire preuve de dynamisme pour développer des services de soins de santé et proposer des solutions à valeur ajoutée pouvant générer des recettes de grande consommation et commerciales avec des marges élevées.

*par Christopher Wasden*

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#### **Construction progressive de télécommunications dans les régions rurales**

Les dirigeants du secteur en Inde - où la recette moyenne par abonné (average revenue per user, ARPU) est estimée entre 1 \$ et 2 \$ - se soucient plus de l'utilisation que de l'ARPU. Ils réalisent qu'il existe des limites à ce qu'ils peuvent entreprendre pour influencer le prix de leurs produits et services à la hausse et qu'il existe d'autres moyens pour encourager la consommation. Qu'est-ce que cela implique concernant l'expansion dans les régions rurales ? En prenant l'Inde comme exemple - qui sera instructif pour certains - nous nous concentrons sur la façon dont les opérateurs peuvent déceler des opportunités au sein des marchés ruraux malgré les faibles taux de recette moyenne par abonné.

*par Mohammad Chowdhury*

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#### **Neutralité de l'Internet : pourquoi résoudre un problème inexistant?**

Les inquiétudes concernant la neutralité du réseau refont surface au moment où il est urgent pour les opérateurs mobiles de revoir leur tarification et d'adapter leur modèle économique pour faire face à la baisse des revenus liés à la messagerie textuelle et à la voix et pour tirer profit de la forte augmentation de la consommation de données mobiles. Le nouveau monde de données mobiles nécessite une collaboration entre les fournisseurs de contenu et d'applications pour proposer les nouveaux services différenciés à haute valeur ajoutée que les clients recherchent. Selon PwC, la neutralité de l'Internet limiterait fortement les options de chacun.

*par Bart-Jan Sweers*

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#### **Utilisation de vos atouts concurrentiels**

En 2015, les consommateurs parvenant à l'âge adulte seront des natifs du numérique - une génération entière de personnes n'ayant pas connu le monde sans le numérique. Des protagonistes aux modèles économiques très différents se battront pour obtenir l'attention et le pouvoir d'achat de ces consommateurs numériques et pour les fidéliser. Il s'agit des opérateurs mobiles traditionnels, des câblo-opérateurs, des diffuseurs par satellite, des spécialistes en recherche, des réseaux sociaux, des sociétés spécialisées dans les appareils et d'autres encore. Pour trouver la clé du succès sur ce marché, PwC a étudié les futures sources de revenus des télécommunications - et comment les opérateurs pourront en profiter les premiers.

*par Rolf Meakin*

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#### **Comercio móvil: comienza la carrera para sacarle el máximo partido**

Tras años de expectación y despliegue mediático, el comercio móvil está listo para despegar. Para aprovechar esta oportunidad, un número creciente de operadores móviles estudia adaptar sus recursos y bases de usuarios y así poder ofrecer un mercado más amplio y atractivo de servicios de comercio móvil. Se enfrentan a la competencia contundente de grandes operadores y de una infinidad de otros operadores de Internet, que tratan de sacar el máximo partido de su fuerza online en el mundo móvil. Está por ver quién saldrá vencedor, pero el premio a ganar es enorme.

por Colin Light

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#### **Un pronóstico optimista para las oportunidades en el ámbito de la salud móvil**

Todos los sistemas de atención sanitaria se enfrentan a la dificultad de cómo ofrecer un acceso permanente a la asistencia sanitaria y mejorar los resultados al menor coste posible. No existe otra tecnología que muestre mayor perspectiva para dar respuesta a estas necesidades que la tecnología móvil aplicada a la salud. Los operadores de telecomunicaciones deben actuar con fuerza para desarrollar servicios de atención sanitaria y soluciones de valor añadido, que puedan generar flujos de ingresos de consumo y márgenes comerciales elevados.

por Christopher Wasden

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#### **La consolidación de operadores de telecomunicación rurales, rupia a rupia**

Los directivos del sector en la India –país en el que los ingresos medios por usuario se sitúan entre 1 y 2 dólares estadounidenses– se preocupan menos por los ingresos medios por usuario y más por el uso. Son conscientes de que existen límites en cuanto a condicionar al alza el precio de venta, y de que pueden hacer mucho más para fomentar el consumo. Pero, ¿qué significa esto a la hora de afrontar una expansión en el ámbito rural? Tomando a la India como ejemplo a seguir, se analizará cómo los operadores son capaces de encontrar oportunidades en mercados rurales, pese a unos ingresos medios por usuario bajos.

por Mohammad Chowdhury

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#### **Neutralidad de la red: ¿por qué intentar resolver un problema que no existe?**

La preocupación actual sobre la neutralidad de la red llega en un momento en que los operadores de telefonía móvil necesitan, de manera urgente, revisar sus planes de precios y poner a punto sus modelos de negocio con vistas a hacer frente al descenso en los ingresos por mensajería de texto y voz, y beneficiarse del aumento constatado en el consumo móvil de datos. El nuevo mundo del acceso móvil de datos exige la colaboración entre los proveedores de contenido y de aplicaciones, y así entregar servicios nuevos, diferenciados y de gran valor reclamados por los clientes. En la opinión de PwC, la neutralidad de red limitaría de forma radical las opciones de todos.

por Bart-Jan Sweers

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#### **Los activos competitivos se ponen a trabajar**

Los consumidores que adquieran la mayoría de edad en 2015 serán nativos digitales: toda una generación de personas que nunca ha vivido en el mundo no digital. Se intentará conseguir la atención, la fidelidad y el poder adquisitivo de estos consumidores digitales con modelos de negocio muy diferentes: operadores móviles y fijos tradicionales, proveedores de televisión por cable, compañías de difusión por satélite, especialistas en servicios de búsqueda, redes sociales, compañías de dispositivos y otros. En busca de las claves de éxito en este mercado, PwC ha realizado un estudio para analizar los futuros ingresos de comunicaciones y cómo los operadores pueden ser los primeros en llegar.

por Rolf Meakin

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#### **Mobile Commerce: Der Wettlauf um Möglichkeiten**

Nachdem Mobile Commerce lange theoretisch diskutiert und zum nächsten großen Hype ausgerufen wurde, ist mobiles Einkaufen nun tatsächlich startklar. Um die entstehenden Möglichkeiten zu nutzen, versucht eine wachsende Zahl von Mobilfunkbetreibern, ihre Ressourcen und Kundendatenbanken zu bündeln, um den Verbrauchern mehr überzeugende M-Commerce-Dienstleistungen anzubieten. Sie sind mit einer starken Konkurrenz von Over-the-top-Riesen und einer Reihe von anderen Spielern auf dem Internet-Markt konfrontiert, die alle versuchen, aus ihren Online-Stärken das Beste in der mobilen Welt zu machen. Wer gewinnt, bleibt abzuwarten, es steht aber viel auf dem Spiel.

von Colin Light

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#### **Gute Aussichten für mobile Gesundheitsanwendungen**

Alle Gesundheitssysteme stehen vor der Herausforderung, einen zuverlässigen Zugang zur Gesundheitsversorgung zu bieten und gleichzeitig die Ergebnisse bei möglichst geringen Kosten zu verbessern. Keine Technologie weckt größere Hoffnungen auf die Bewältigung dieser Anforderungen als mobile Gesundheitsanwendungen. Telekommunikationsunternehmen müssen jetzt aktiv handeln, um Gesundheits-Dienstleistungen und -Lösungen mit Mehrwert auf den Markt zu bringen. Denn diese können sich zu Einnahmequellen mit guten Umsatzrenditen sowohl im Geschäftskunden- als auch im Privatkundenbereich entwickeln.

von Christopher Wasden

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#### **Entwicklung ländlicher Telekommunikationsunternehmen: eine Rupie pro Monat**

Führungskräfte der Telekommunikationsbranche in Indien - wo der ARPU zwischen 1 und 2 US-Dollar liegt - machen sich weniger Sorgen um die Preise, sondern mehr um die Nachfrage. Sie erkennen, dass es deutliche Preisobergrenzen für ihre Produkte gibt und dass sie stärker auf Nachfrage- und Nutzungsförderung setzen sollen. Aber was heißt das für die ländliche Expansion? Mit Indien als Beispiel, von dem andere lernen könnten, untersuchen wir, wie Telekommunikationsbetreiber in ländlichen Märkten trotz niedriger ARPUs Geschäftsmöglichkeiten finden können.

von Mohammad Chowdhury

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#### **Netzneutralität: Warum ein Problem lösen, das nicht existiert?**

Neue Debatten um die Netzneutralität kommen zu einem Zeitpunkt, zu dem die Mobilfunkbetreiber dringend ihre Tarife überarbeiten und ihre Geschäftsmodelle optimieren müssen, um die rückläufigen Einnahmen aus SMS und Telefondiensten zu bewältigen und von steigender mobiler Datennutzung zu profitieren. Die neue mobile Onlinewelt erfordert die Zusammenarbeit zwischen Content- und Anwendungsanbietern, um neue, differenzierte und hochwertige Dienstleistungen, die von Kunden nachgefragt werden, zu liefern. Nach PwC-Meinung würde die Netzneutralität die Handlungsoptionen aller Marktteilnehmer wesentlich einschränken.

von Bart-Jan Sweers

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#### **Lassen Sie Ihre Wettbewerbsvorteile arbeiten**

Verbraucher, die im Jahr 2015 volljährig werden, sind digital natives - eine ganze Generation von Menschen, die nie eine nicht-digitale Welt erlebt haben. Der Kampf um die Aufmerksamkeit, Loyalität und Kaufkraft dieser digitalen Verbraucher wird von Akteuren mit höchst unterschiedlichen Geschäftsmodellen geführt: traditionellen Festnetz- und Mobilfunkbetreibern, Kabel-Providern, Satelliten-Sendern, Suchmaschinenspezialisten, sozialen Netzwerken, Geräteherstellern und mehr. Auf der Suche nach dem Schlüssel zum Erfolg in diesem neuen Markt untersucht PwC, wo die aussichtsreichsten Einnahmequellen im Telekommunikationssektor liegen - und wie Betreiber diese zuerst erreichen können.

von Rolf Meakin

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### 移动商务：抓住机遇跑马圈地

历经数年广告轰炸与热切期盼，移动商务终于准备起飞。为抓住此次机遇，越来越多的电信运营商通过集中内部资源并整合用户群，力图为用户提供更广泛的、更具竞争力的客户基础。强有力的竞争不仅源自于其他电信巨头，也来源于互联网服务提供商，这些公司都在积极寻求移动商务世界的霸主地位。鹿死谁手我们拭目以待，但胜利果实无疑相当诱人。

作者：Colin Light

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### 移动医疗：前途似锦

所有的医疗服务体系都面临同样难题：如何以最低的成本提供普遍的医疗服务并不断提高服务质量？移动医疗在众多技术中脱颖而出，为这一问题的解决带来了光明的前景。电信运营商必须行动起来，攻城掠地，积极发展高附加值的移动医疗服务和解决方案，才有望最终获得丰厚的收入和利润。

作者：Christopher Wasden

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### 印度村通工程，薄利多销

尽管印度电信用户的ARPU（每用户平均收入）介于一到两美元之间，但电信行业的高管们当前却更加关注提升电信业务使用量而非ARPU。根源在于运营商已经意识到未来抬高售价的运作空间将越来越小，然而提升业务用量及使用率的机会却广泛得多。在印度城市化进程持续快速发展的大环境下，这也意味着怎样的商机？电信运营商如何在低ARPU的乡镇通信市场中寻找机会，印度提供了一个绝佳的样本供他人效仿。

作者：Mohammad Chowdhury

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### 网络中立：庸人自扰的问题

当移动运营商急切地改变自身定价策略和商业模式，以应对语音与短信收入的下降并试图从移动数据用量爆发式增长中谋利时，对于网络中立原则的关注卷土重来。新的移动数据世界要求内容提供商与服务提供商通力协作，为客户提供前沿的、新颖的与高价值的服务。在普华永道看来，网络中立反而会极大地限制大家的选择。

（译者注：网络中立原则是指网络上的任何数据包，无论其内容、去处或来源，应该一律平等地传输。）

作者：Bart-Jan Sweers

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### 确保你的竞争资产物尽其用

2015年，数字原住民——指完全没有经历过传统的、非数字化生活的80/90后一代人——将成为主流消费人群。对于传统的固定/移动运营商、有线电视运营商、卫星广播、搜索引擎、社交网络、设备公司等而言，如何争夺他们的眼球、忠诚和钱包份额将成为最大的挑战。为寻找成功的密钥，普华围绕电信行业收入趋势以及运营商如何取得先发优势这些主题，开展了大量研究工作。

作者：Rolf Meakin

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## Message from the editor



Welcome to the latest edition of *Communications Review*, published as we prepare to begin what promises to be a watershed year. According to industry estimates, 2012 will be the year when household broadband revenues, globally, finally overtake household voice revenues. Perhaps more important in 2012, the number of 4G LTE mobile spectrum auctions, pilots and rollouts around the world will accelerate. And the industry's revenue no longer will grow because of fixed connectivity, but through an expanding array of mobile-broadband-based services accessed by an ever-rising number of smart devices.

As we all know, rapidly growing mobile revenues don't necessarily translate directly into rapidly growing revenue for mobile operators. Over-the-top players such as Google and Apple have proved highly adept at annexing what might be described as more than their fair share of consumers' wallets, in areas such as mobile advertising and applications. Without operators' networks, these revenues never would be generated. But the challenge is to make sure that the way revenues are divided reflects the true underlying value of high-bandwidth connectivity.

Against this background, the theme we've chosen for this edition is both timely and relevant: "Growing telecom revenues – what's next?" We tour the new and emerging frontiers of industry revenues, across services, geographies and regulatory considerations. Then, drawing on our recent industry research into the future of operators' revenue streams, we examine where operators should focus their existing assets to get the most from the digital consumer.

Most industry executives agree that in mobile lie the greatest opportunities. Our first article, appropriately, goes straight to one of mobile's most exciting and highest-potential areas: mobile payment and wallet services. In "M-commerce: The race to seize the opportunity," Colin Light examines the growing upsurge in initiatives and offerings that are trying to turn the smartphone into a fully functioning, secure mobile wallet for mobile-commerce transactions. As Colin highlights, operators are collaborating both within and beyond the industry in an effort to secure the resulting revenues. But the over-the-top giants also are targeting this huge opportunity aggressively. Their less collaborative manner sets the stage for a major competitive battle from which the only sure winner is the consumer.

Our second article moves on to another fast-emerging focus for mobile collaboration and services. In "An optimistic prognosis for mobile health opportunities," author Christopher Wasden sizes up m-health's unrivalled

potential to help healthcare systems provide ubiquitous access to care and better health outcomes at minimal cost. As with mobile commerce, collaboration between participants in the value chain plays a pivotal role in the solution. Healthcare is transitioning rapidly from a hierarchical system of independent segments that deliver care into a model that's more collaborative, transparent and inclusive of patients. As Chris points out, because operators can connect the clinical with the personal – inform and increase access among healthcare practitioners, systems and the patients themselves – they can open up major revenue opportunities.

Next, our third article – “Building rural telecoms, one rupee at a time” – shifts the focus away from emerging service areas to examine a challenge that operators and governments in many developing, and some developed, countries are facing: rural expansion. As an example of how operators worldwide can drive growth in rural areas, author Mohammad Chowdhury discusses how companies in India are beginning to expand their rural user base profitably, despite low average revenue per user. Success will come from giving users what they need – services that are micro-local and in their first language – and by developing service models fit for a varied user base. As Mohammad points out, India's rural model is expanding the mobile revolution to remote and often low-income segments of the population. Many countries and operators worldwide will aspire to do the same.

In our fourth piece, we revisit the issue of network neutrality – one of the most contentious items on the regulatory agenda in many territories. With the increasing focus on mobile data as the future engine for industry growth, net neutrality is back in the spotlight. In “Net neutrality: Why solve a problem that doesn't exist?” Bart-Jan Sweers responds to its re-emergence by explaining why net neutrality is still a fundamentally flawed concept more likely to stifle growth than foster it. He closes with a powerful statement about the Web's potential to create even greater benefits for people in the future – and points out that careless, even if well-meaning, legislation or regulation risks sacrificing much of that potential.

Our final article pulls together the threads from the previous pieces to examine what will be critical to success in the communications industry of the future. In “Putting your competitive assets to work,” Rolf Meakin begins by analysing how and why the next generation of consumers will differ from today's. He then investigates what operators will need to do differently to get their interest and their business. Rolf's analysis draws on PwC's recent quantitative research into revenue trends in five national communications markets in Western Europe. Rolf concludes, inescapably, that operators can either accept that value is moving away from traditional connectivity and towards new value-added services – or collaborate to fight the trend.

In reading each article in this edition, I found one recurring theme: collaboration. In the digital world that's now taking shape, nobody has all the answers or all the capabilities needed to sustain success. Only by sharing ideas and insights can the whole digital ecosystem achieve the best possible outcome for customers. In the spirit of collaboration, we are as eager as ever to hear your views and comments, whether on the issues raised in this edition of *Communications Review* or on topics to cover in future editions. So please feel free to send any comments you may have to me at [colin.brereton@uk.pwc.com](mailto:colin.brereton@uk.pwc.com), or to call me on [44] 20 7213 3723.



Colin Brereton  
Partner  
Global Communications Leader  
PwC

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# ***M-commerce: The race to seize the opportunity***

*After many years of hype and anticipation, mobile commerce is ready to take off. The next step is to turn the smartphone into a mobile wallet for m-commerce transactions.*

*To seize this opportunity, a growing number of mobile operators are now looking to pool their resources and user bases to offer a larger and more compelling consumer market for m-commerce services. They face strong competition from over-the-top giants, including Google, Apple, Facebook and a raft of other Internet players, all seeking to make the most of their online strength in the mobile world. These players have already cornered the lion's share of revenues from the growth of mobile advertising and applications, and – unlike operators – are unencumbered by the constraints of geographic user bases. Who will win remains to be seen, but what's already clear is that the prize on offer is huge.*

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## **By Colin Light**

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As the environment for mobile-handset-based transactions continues to evolve, a wide array of players are targeting the massive opportunities m-commerce services offer, from advertising to mobile wallets. In November 2010, mobile operators escalated their effort to occupy this space when three US operators – AT&T Mobility, T-Mobile USA and Verizon Wireless – announced their joint venture, ISIS.

Operating under the tagline ‘Mobile... Meet Phone’, ISIS aims to make its mobile commerce network available to merchants, banks, payment networks and mobile carriers – and thereby “fundamentally transform how people shop, pay and save”. The joint venture took a major step forward in July 2011 when it announced a partnership between ISIS, Visa, MasterCard, Discover and American Express.

The creation of ISIS underlines the growing acceptance by mobile operators around the world that collaboration no longer is just desirable but actually is required to fight off the threat of disintermediation by the non-telco competitors. To date, the likes of Google and Apple have been winning the competition for revenues from mobile applications and mobile media. The launch of ISIS shows operators’ determination to keep the same from happening in the potentially much bigger marketplace for mobile-commerce services.

### ***Operators worldwide gearing up for m-commerce***

This same determination is increasingly evident globally, in both developed and developing markets. In June 2011, three UK mobile networks – Everything Everywhere (itself a joint venture under the brands Orange and T-Mobile), Telefónica UK and Vodafone UK – announced a new mobile marketing and payments joint venture. If the European competition authorities approve the collaboration, the partners plan to create a single m-commerce ecosystem for UK advertisers, retailers and banks. They also would use near-field communication (NFC) to provide consumers with a secure mobile-payments wallet.

Since then, Vodafone, Telefónica O2 Germany and T-Mobile revealed plans to launch an NFC-sticker-based mobile-payment solution in Germany in early 2012. These commercial collaborative initiatives join a technical NFC collaboration that Orange, Telefónica Movistar and Vodafone announced in Spain in March 2011.

The momentum behind operators' m-commerce offerings is also building in other parts of the world. In October 2011, Etisalat announced plans to launch an NFC-based mobile payment system in the United Arab Emirates by the end of the year, in collaboration with MasterCard. And the M-PESA mobile money transfer service that Safaricom launched in Kenya in 2007 now has more than 14m customers and about 28,000 agent outlets across Kenya. It's also available in other countries, including Tanzania, Afghanistan and South Africa, and a pilot is under way in India. Many similar schemes are under way throughout Africa and South-East Asia, as operators try to reach the 'unbanked' mobile subscriber base.

Meanwhile, in a glimpse of the future, countries that lead in overall mobile Internet usage – Japan and South Korea – already have massively adopted mobile payments. According to comScore, more than 75% of Japan's mobile subscribers used their handsets to access Internet applications or to download content in 2010, and nearly 10% of Japan's mobile audience made a purchase with their mobile wallet in December 2010.

### ***A concept whose time has come***

In targeting the m-commerce opportunity, all operators know the scale of the competition they're up against, especially following Google's announcement of its NFC-based Google Wallet smartphone application in May 2011. Apple is widely expected to follow Google into mobile wallets within the next few months, joining several other players. Over the coming year, PayPal is set to roll out PayPal Wallet so that consumers can use their phones to pay from multiple PayPal accounts, store gift cards and receipts, and capitalise on special offers. PayPal Wallet will not be restricted to NFC-enabled phones. And Facebook already had created, in March 2011, the official subsidiary Facebook Payments to handle payments with the Facebook Credits virtual currency system.

All entrants are aware that m-commerce is about much more than simply payment tools. For example, the ability to target advertising on mobile will be critical – and companies like Google fully understand the power of advertising and reach when combined with the personalised nature of mobile. Google Analytics has become the default for Google advertisers, but players such as Sky (with its SkyIQ), Facebook and others are entering data analytics to enhance their offerings with comparable targeting capabilities.

All these competitors and collaborators are pursuing a potential market that has been a focus of intense innovation for well over a decade. In the 1990s, NatWest Bank developed a smartcard electronic cash system called Mondex, which underwent trials in the UK, the US, Canada and other countries before being bought by MasterCard International. In the early 2000s, T-Mobile, Orange and Vodafone founded a consortium called SimPay in the UK to create an interoperable solution for paying by mobile devices across all networks. Although it was closed in 2005, the founders continue work on a project called 'Payforit'.

It's clear that m-commerce is coming of age – and that the latest offerings have every chance of succeeding where their predecessors failed. This is because the elements are now in place to support the mass adoption and use of these services. One important element is how near-field communication is becoming increasingly widely accepted as a global standard for mobile data exchange and transactions.

### ***Vodafone's lifestyle vision***

Vodafone's UK Chief Executive Officer Guy Laurence recently set out his company's vision for the future of m-commerce. *"Currently people take their mobile, wallet and keys when they leave home,"* he said. *"In the near future, people will start leaving their wallet at home; and in the mid term, their keys may also be integrated into their mobile as near-field communication (NFC) allows the mobile to act as a digital access card."*

Another factor is the rapid adoption of smartphones and other smart devices (see Figure 1). Overall, PwC forecasts that smartphone penetration will reach 17% of the global mobile subscriber base by 2014, ranging from 55% in developed countries to 10% in developing countries. Research also shows consistently that, worldwide, smartphone penetration tends to be higher among people in the wealthier demographic groups and among the younger groups, who make up the future consumer base for mobile commerce.

More important than device penetration is the dramatically increasing use of mobile handsets to access the Internet. PwC estimates that global spending on Internet access over mobile devices will rise to US\$154.5bn in 2015, an 11.5% compound annual increase from 2011. Other PwC research shows that 39% of mobile Internet subscribers globally will be connecting to the Internet through smartphones by 2014, up from 13% in

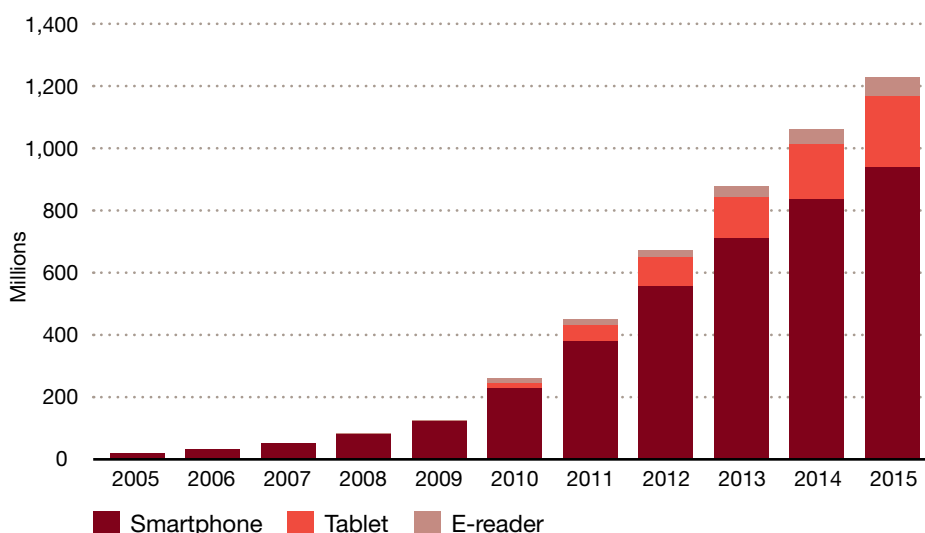
2010. And global mobile advertising – including paid search – is set to rise rapidly, from US\$2.8bn in 2010 to US\$8.7bn in 2015. That would be a 24.9% compound annual increase. In comparison, wired Internet advertising is projected to have a compound annual growth rate of just 12.4%.

### ***Making the case for m-commerce – and collaboration***

So, the opportunity is huge. Can operators seize it? PwC thinks the answer is yes. Given the current and projected growth rates for m-commerce services, and operators' established (and mostly trusted) billable relationships with their customers, PwC believes that operators around the world are quite right to be targeting m-commerce and mobile wallets proactively and aggressively.

In our view, the optimal way for operators to tackle this opportunity is through collaborating industry-wide with peers and competitors to bring the benefits of scale, standardisation and seamless access to consumers across their combined subscriber base. Scale is everything in advertising and payments – and the global, over-the-top players have a head start. Cohesion, cooperation and integration will be crucial for operators to achieve adoption on the scale they need, while remaining free to compete fiercely in how they deliver these products to their own customers.

**Figure 1: The growth in global sales of smart devices, projected to 2015**



Source: PwC Global Entertainment and Media Outlook: 2011–2015, PricewaterhouseCoopers LLP, Wilkofsky Gruen Associates.

There are sound defensive and offensive reasons for targeting m-commerce services in this way. On the defensive side, operators know that the over-the-top players are looking to secure customer relationships and revenues in m-commerce as successfully as they did in applications and mobile media. The international standards for some aspects of mobile commerce (such as NFC) already exist, but standards have yet to emerge in many areas, such as mobile advertising campaigns. So businesses and brands will be all the more attracted by the ability to reach all mobile customers in a marketplace in a scalable manner through a single contact point.

Even more important, knowing their own customer bases in detail puts operators in a strong position to create a single ecosystem that brings together advertising, coupons/vouchers, payments, loyalty and ticketing. This strength largely comes down to relationships: personalised and targeted advertising is fundamentally about creating a trusted relationship with brands or merchants; financial payments is about having a trusted and secure relationship with the bank; and the ecosystem is about having a trusted relationship among all parties and the mobile customers. No other player is better placed to know and deliver to these customers than are their mobile network providers.

On the offensive side, a strong positioning in m-commerce will help operators secure new revenue streams in a closely adjacent market as their traditional core communications revenues come under intensifying pressure. The smartphone-driven explosion in mobile data traffic is

increasing the costs of providing greater bandwidth – to the extent that in some customer segments, the cost of supplying mobile bandwidth may now exceed the associated revenues for the operators. The imperative for operators is not about making tactical changes and selling more mobile data or SMS, but about expanding into entirely new adjacent revenue areas and models. Mobile commerce fits the bill perfectly.

### ***A major behavioural shift***

The size of the revenue opportunity is apparent in the pace of change in consumers' behaviour. As well as using smartphones for browsing the Internet, people are now exploiting the potential of mobile to help them choose their purchases and capitalise on special offers. This echoes the early evolution of electronic commerce, which first enabled computer users to 'surf' for products to evaluate before buying them in physical retail stores, and then progressed to buying directly online. M-commerce is now following a similar – and probably much quicker – path to mass-market adoption.

Despite consumers' growing use of mobile-based discount services that send coupons and vouchers directly to mobile devices, businesses still lack a compelling, end-to-end proposition. Retailers complain that the current smartphone-based discount and voucher services tend to focus on price rather than value, and often fail to deliver merchants their hoped-for longer-term value. They believe a more cohesive, advertising-led approach is needed, with coupons/vouchers being only one of many tools that brands and retailers can use to reach customers over mobile.

In PwC's view, operators now have a narrow window of opportunity to take the lead in encouraging businesses and consumers to cross the threshold and participate wholeheartedly in m-commerce. Failure to do this almost inevitably will allow the over-the-top providers to take the initiative, the customer relationships and the revenues.

By collaborating to pool their subscriber bases, the mobile operators within a marketplace can enable the major m-commerce business users to reach the aggregated customer base across all the mobile networks involved. They also can harness the benefits of cost and scale that the single, standardised ecosystem affords. At the same time, each operator can continue to develop its own competing products and services tailored to its own customers, based on the infrastructure and services that the collaborative entity provides and maintains.

This approach allows propositions and offers to be targeted to a vast pool of willing individuals in a relevant, personalised way. As more and more businesses join the ecosystem, consumers will be able to leave their physical wallets at home and replace them with secure, NFC-based payment services. Crucially, supporting the entire ecosystem will be an inherent system of near-real-time feedback on consumers' spending and transactions – an attribute that even today's major loyalty schemes lack.

## A new service model

In PwC's view, mobile operators are strongly positioned to pull together and coordinate a new service model and ecosystem of this type, by uniting three interrelated services.

As Figure 2 illustrates, these services are:

1. A new **mobile advertising marketplace**. This will give brands and advertising or media agencies the ability to target consumer-focused campaigns direct to mobile. Of the many examples of mobile advertising ventures around the world, few have the scale and reach to specifically target the mass mobile customer base in any given country.

Just as brands and agencies can book and manage TV ad campaigns on a portfolio basis across various channels, they will be able to take the same approach with mobile as part of their wider digital campaigns. Some ad agencies may try to retain the overall campaign management role by treating the operator-led m-commerce ecosystem as another

element in the media mix for campaigns, alongside TV, print, radio and so on. But even when that happens, the collaborative model will offer the same benefits of the single point of contact, and the same attractiveness of the aggregate mobile-user base across networks.

2. A new, secure, standardised and convenient environment for **online and mobile wallet services**. As well as various payment cards (both debit and credit), the electronic/mobile wallet will be able to contain all the other cards and functions that consumers carry in their physical wallets, including loyalty schemes, vouchers, discount offers and travel tickets.

The advantages here are not only scale and consistency, but also that people can take their wallets with them to new operators, as they do today with their phone numbers when switching networks. A more important asset to operators is secure access to the SIM card, which makes sure payments, loyalty schemes, vouchers and so on all

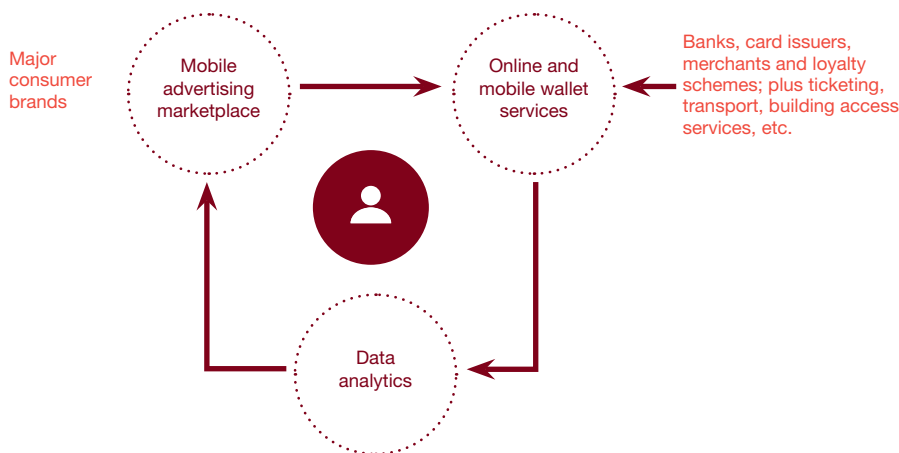
meet the kinds of strict security measures that banks, merchants and card issuers require today. Consumers get to enjoy the benefit of a consistent user experience at the till plus additional fraud prevention and security measures that can't compare to carrying their physical wallet.

Can Google, Apple and others replicate these services? Clearly, the answer is yes. But there is an advantage in being both device and operator agnostic while also having deep insight into the customer's history as a mobile user.

3. A back-office **data analytics** environment and capability. This will give brands and agencies anonymous insights into transactions and behaviours across the operators' aggregate customer base. As a result, companies will be able to target specific behavioural and demographic segments in specific locations at specific times, and to make the most effective loyalty, voucher and redemption offers. These activities will be carefully managed to stay within the relevant data protection and privacy laws.

As always, operators must tread a fine line. History shows that the media, politicians and consumers around the world can react adversely to any 'big brother' approach, and that service companies from BT to Facebook have suffered from this aversion at one stage or another. Striking the balance of remaining relevant to the person without intrusively gathering data is critical.

**Figure 2: Three interrelated services in the new operator-led m-commerce ecosystem**



Source: PwC analysis.

While these three elements are likely to be consistent across markets, the precise model for the ecosystem will vary with local conditions. It will need to reflect the fact that any collaborative strategy should benefit three main groups of businesses: first, the operators using the service; second, the (overlapping) group of operators who are the shareholders in the service; and third, the customers, including advertisers and various types of card issuers – payment, transport, loyalty and so on.

A common assumption has been that operators would try to generate revenue from transactions by taking a slice of the transaction value. Because that approach results in the operators competing against the most important potential customers, a more collaborative model is needed. Operators should generate their transaction revenues by giving card provision services to card issuers, effectively creating a mirror image in the mobile virtual environment of the commercial structure used in the physical world. In exchange for this ‘mobilisation’ of the physical cards, the venture is able to charge either for access or for leasing access to the venture’s secure SIM and service infrastructure.

### Benefitting consumers

For consumers, what makes the collaborative, operator-led ecosystem we’ve described a success will be the consistent, relevant and compelling experience it gives them. Figure 3 illustrates how a fictional brand creates that success through a coordinated, virtuous circle of improving experience, targeting and campaign effectiveness.

Further major benefits for consumers include improved security when they leave their physical wallets – and all the cards they currently hold – at home and no longer carry cash. The ability to hold stored value in the mobile wallet gives more flexibility and choice both to consumers and to operators, who can allow subscribers to use their mobile wallet to pay for anything from call charges to birthday presents. By using first-party branding of such services, operators potentially can cement their customers’ identification with and loyalty to their brand.

Indeed, just as some banks have ventured into the mobile market – as mobile virtual network operators – to create loyalty and use the mobile channel more effectively, so we expect to see an increasing number of mobile operators venturing into the financial services markets. Some

mobile operators in Europe already have applied for e-money licences. For example, O2 in the UK confirmed in February 2011 that it intended to apply to the Financial Services Authority for an e-money licence.

Besides making payments at the checkout, other services available in a mobile wallet bring advantages. Storing digital tickets for services like transport and concerts will prevent ticket touting and fraud, and will improve the efficiency, automation and targeting of discounts and off-peak offers. And there are huge opportunities in offering access services, ranging from office premises and homes to motor vehicles.

The access market is highly fragmented and lacking in standards. A consistent, easily managed NFC-based access service on mobile handsets would be attractive and cost-effective to customers from a host of industries – although, clearly, building scale and a consistent approach will take time.

The ability to make person-to-person payments over the network also has major potential. We usually think of that service as the successful M-PESA in Kenya and other emerging economies. But consumers in developed markets also will be ready to make person-to-person transfers, both in cash and in other forms of value. For example, someone who can’t make it to a bar or restaurant to meet friends not only will be able to contact them to say sorry, but also can send a branded voucher for free drinks or a meal.

**Figure 3: How Brand X can use the ecosystem to deliver a compelling customer experience**



Source: PwC analysis.

For once, the digital divide between rich and poor, and between developing and developed economies, poses no barrier to offering similar services to each. How they're offered may differ, though.

All markets have local and global brands trying to reach individual consumers (with mobile potentially being a more-effective tool in developing markets than in other channels); and the non-governmental organisations and industry bodies such as the GSMA have long highlighted the potential of mobile money for the traditionally 'unbanked'. With low-cost smartphones increasingly set to reach the emerging economies, delivering scale through collaboration could enable the operators to stimulate both economic growth (through more open market trading) and revenues outside their core communication offerings.

### ***Moving quickly to meet the challenges ahead***

While operators have a huge potential to lead the m-commerce revolution through industry collaboration, they still need to overcome three significant barriers if they are to succeed.

The biggest threat is the scale, speed and proven market muscle of the over-the-top service providers such as Google and Apple. They've already demonstrated those qualities in seizing the majority of revenues in the mobile applications and advertising markets, and they're looking to emulate their success in all other aspects of m-commerce. To prevent them from doing so, operators first need to move quickly to get their offerings and standards established and out into the marketplace before the over-the-top players' competing offerings gain critical mass.

Secondly, there are commercial and competition issues with collaborations – although, arguably, they pale when compared to the effects of the dominant operating system and/or handset players such as Apple, Google and Microsoft-Nokia embedding their wallet and advertising services into the device out-of-the-box. Nevertheless, competition authorities will need to be satisfied that operators' collaboration remains in the consumer's best interests. More important, the operators need to develop a commercial model that works for them, given likely imbalances in market share.

That said, delays on competition or commercial grounds could keep operators from creating a new, scaled ecosystem and could keep consumers from enjoying the resulting benefits. A further effect could be to hand the m-commerce and mobile-wallet markets to the same over-the-top players who already dominate mobile applications and media.

Thirdly, operators face the challenge of making sure NFC-enabled terminals get into retail outlets quickly. In many cases, card issuers are largely making this happen, but are doing so potentially in competition with the operator-led ventures. Visa now offers cardholders the option of using a microSD memory card with existing smartphones and paying for goods with NFC by using its downloadable PayWave application. Other NFC-based mobile-wallet offerings include MasterCard's PayPass and American Express's ExpressPay. A number of banks in developed markets are adopting such systems for their customers, and that's encouraging retailers to adopt NFC terminals.

### ***Embarking on the journey***

More and more consumers are embracing coupons, transport, advertising and other services on their smart handsets. That's opening a clear opportunity for mobile operators to take the lead in unifying today's fragmented mobile marketing and payments market, by collaborating to create a single new m-commerce ecosystem. If they can team up successfully to do this, then their potential to give consumers convenient, compelling experiences – and to develop new revenues for themselves – is enormous.

Success would mean new, collaborative ecosystems strengthening the growth of this embryonic market. Simultaneously, the ecosystems would offer genuine size and scale, allow consumers to get new and innovative services such as mobile wallets and let other consumer-facing businesses target relevant offers and deals to a large yet highly segmentable audience of mobile subscribers. And they would do it all by means of a single platform for sales, delivery and payment.

With commercial collaborative initiatives such as ISIS in the US and the three-way collaborations in the UK and Germany, plus technical ones such as the NFC-based collaboration announced in Spain in March 2011, operators have embarked on the journey to achieve these goals. From here on, speed is key. Time will tell whether the operators will reach their intended destination first – or whether the over-the-top providers will beat them to it once again.

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# ***An optimistic prognosis for mobile health opportunities***

*All healthcare systems are facing the issue of how to provide ubiquitous access to care and to improve outcomes at the lowest possible cost. No technology shows greater promise in addressing these needs than does mobile health. Telecommunications companies must radically transform the way they think about their services and move aggressively to develop healthcare services and solutions with added value. By connecting the clinical with the personal – informing and increasing access between healthcare practitioners, systems and patients – they can create high-margin commercial and consumer revenue streams.*

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## **By Christopher Wasden**

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Healthcare is rapidly transitioning from a siloed, hierarchical system of delivering care to one that's more collaborative and transparent and that involves patients. This shift is a leading force in the rapid growth of the mobile health market. Technological advances and the expansion of high-speed wireless networks are giving consumers access, tools and information. And the advances are changing the way consumers interact with the healthcare system, manage their health and make decisions about their care and treatment.

Remote monitoring devices and mobile health applications enable consumers to access their medical records online and monitor such personal vital signs as blood pressure, pulse, blood glucose levels and weight. Innovations in mobile health technology are also of great interest to physicians as they try to improve health outcomes, reduce costs, meet meaningful-use requirements and engage patients about health information.

What's making this transition happen is connecting patients, providers and product companies through one of the most personal technologies we will ever own – the mobile phone. This personal means of connecting is transforming the way to collect vital signs, monitor patients' adherence to treatment plans, share information, manage our health and wellness and fundamentally change our behaviours to become healthier and happier people.

At the nexus of connections is the telecommunications industry, creating the devices, infrastructure, services and solutions to power this revolution in care.

### ***A large market awaits***

PwC's Health Research Institute estimates that in the United States, the annual consumer market for remote and mobile healthcare-monitoring devices, services and solutions will exceed US\$7.7bn within the next five years. The international possibilities

will be even greater than those in the US, as mobile technologies represent the only means of delivering care to most of the people in the world. Such emerging markets as China, India and Brazil, which have limited physical healthcare infrastructures and a shortage of providers, are looking to mobile health technologies to expand access to care more cost-efficiently. Monitoring patients remotely with innovative devices and sensors, coupled with web- or text-based physician evaluations and consultations, has the potential to expand the reach of clinical care.

Is it any surprise that hundreds of mobile health applications are emerging every week, or that investors are pumping millions of dollars into companies to support such applications? Despite this potential, success in the mobile health market is not predetermined – significant uncertainties remain.

In the US, for example, the Federal Drug Administration (FDA) is working to regulate wireless medical devices, and reimbursement is still uncharted territory for many payers (insurance providers, governments and individuals). The pressures created by developers, patients and providers have led the FDA to create more clear-cut standards and regulations for approval, although much still needs to be done. California's Governor Jerry Brown just signed into law new healthcare reforms that enable providers to get paid more easily for offering mobile health services, an important step that will lead the way for other state reforms in this area.

In other countries, we're beginning to see similar reforms, enough to conclude that the competition to access mobile health markets globally will be fierce.

Despite the undefined variables, companies can assess themselves and calculate their value to position themselves more competitively. To create successful devices, applications, services and solutions for the mobile healthcare market, companies must focus on improving the healthcare experience for both doctors and patients, but also on lowering costs to the system as a whole and making care more accessible. For telcos to succeed, they must create value propositions that address these three needs: better quality of care, greater access, lower costs.

### ***Six principles for success***

Research by PwC indicates that companies with products that reflect six broad principles will have the best chances of succeeding. Very few applications or devices meet that threshold. That's the case today in spite of mobile health being among the fastest-growing areas of mobile technology, with more than 10,000 medical, healthcare and fitness-related applications available for use on smartphones and other devices.

Companies looking to enter the mobile health market must have products that consist of more than the ability simply to measure and transmit data. In today's results-oriented healthcare environment, mobile health products must deliver maximum value. This value can be articulated through principles that support developing products that are:

- integrated into the personal lifestyle of consumers and the service-care continuum with multiple devices and metrics
- interoperable with other applications, devices, software and personal health records
- intelligent and able to make sense of data, create meaning from information and provide real-time support that patients can act on to modify their behaviour
- socialised to sustain behavioural change through a community effect and interpersonal engagement
- outcome-oriented and able to document, measure and validate outcomes, both to confirm performance and results and to pass muster with payers and regulators
- engaging to provide motivational support that causes frequent use.

Comparatively few medical devices or other products offered today reflect all six of these core principles; many devices fulfil only one or two. Many medical devices still function primarily as proprietary, single-purpose products. An analogy is the basic cell phone. In the late 1990s, the cell phone could do one thing only and couldn't work in concert with personal digital assistants (PDAs) or other devices. Since then, cell phones have metamorphosed into multipurpose devices that are replacing many single-use products such as calculators, cameras and conventional PDAs.

Most medical devices and related products – lacking interoperability or plug-and-play functionality with other products – are where cell phones were a decade or so ago. PwC recently assessed more than 140 of the most successful and popular health and wellness applications to see how they scored on the six principles. The disappointing results (see Figures 1 and 2) showed why only 26% of applications are used only once, 74% are used fewer than ten times and only a third of consumers are willing to pay anything for them.

Making the leap to the expanded access and usability that the six principles collectively describe is crucial for developing mobile health products in the long term and for the success of the companies that develop them.

**Integrated.** Mobile health products should be designed to be integrated into the care continuum through multiple devices and metrics. Integration is the plumbing of mobile health – it enables information to be moved from place to place. It isn't only, or even mostly, about the technology. It's about clinical process and workflow. For many practitioners, adjusting the clinical process and workflow is the biggest hurdle to adopting mobile health technologies, bigger even than the capital expenditure involved.

For patients, integration refers to assimilating the product behaviourally and socially so that use, compliance and monitoring are as seamless, simple and specific as possible. Integrating these products into the existing systems of practitioners, payers or employers can improve not only access but also use and effectiveness.

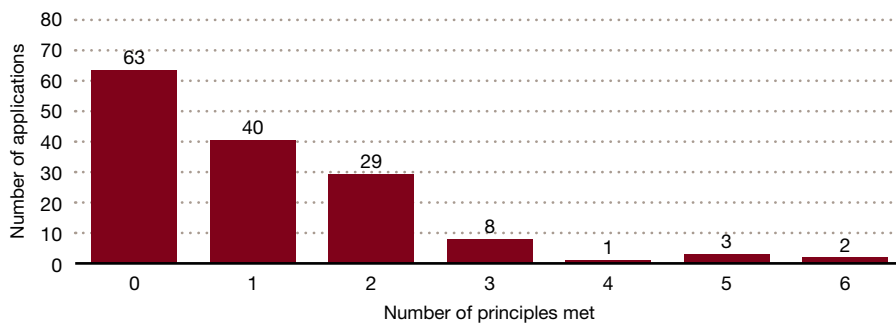
*Hundreds of mobile health applications are emerging every week and pressures created by developers, patients and providers have led to more clear-cut standards and regulations for approval.*

Although such arrangements can be exclusive initially, perhaps as part of pilot programmes, ultimately access should not be confined to any single network or platform. Devices should be capable of being integrated with the networks and devices of other mobile carriers and service providers. Expanded access will be crucial for patients, providers and payers to accept the devices.

Telecommunications companies have been successful in integrating their networked technologies into transportation and logistical value chains and services. They need to apply that same approach to integrating healthcare solutions into the workflow of patients and clinicians.

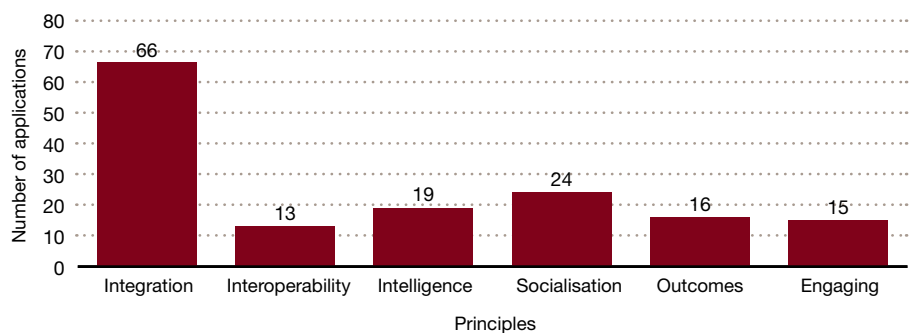
**Interoperable.** Interoperability includes full functionality with both electronic health records and conventional paper-based systems. In contrast to integration, interoperability entails setting standards and means that one system can communicate and interact with another. For instance, in the United States, a number of applications have been, or will be, incorporated into the electronic-health-records systems of either major providers, such as hospital systems, or payers, including insurance companies.

**Figure 1: Mobile health applications evaluated for meeting the principles for success**



PwC reviewed 146 mobile health applications for use by consumers and professionals. Surprisingly, less than one-third of those applications met more than two of the six principles that we've identified as critical for success in this market.

**Figure 2: The principles for success that mobile health applications most often meet**



Among the mobile health applications PwC reviewed, most met the principle of being easily integrated into consumers' lifestyles, but lagged in achieving the other success principles.

*For telcos to succeed, they must create value propositions that address these three needs: better quality of care, greater access, lower costs.*

Such relationships not only would expand the reach of new applications but also could let application developers see how practitioners have been assimilating these products into their daily workflows. That's a crucial consideration, because disrupting the routines of a practice is such a barrier. This relationship also gives developers data to help identify ways of improving their products.

Telcos already provide seamlessly interoperable networks for their core wireless and wired line services. They need to figure out how to do the same in the highly fragmented and disjointed healthcare ecosystem. Some organisations, including AT&T, are actively working with standard-setting bodies like the Continua Health Alliance, a cross-industry, not-for-profit organisation that sets standards for mobile healthcare to establish plug-and-play interoperability.

**Intelligent.** Perhaps more than any of the other principles, intelligence is the indispensable feature of any mobile-health platform. For patients or practitioners to find a platform useful, it should not simply collect and store data; the data need to be easy to exploit and use in actual care. Devices should analyse the data generated and provide support in real time and recommendations on how medication or behaviour should change.

Those kinds of recommendations are important because many applications don't identify what should be done differently based on the data that a patient generates. In fact, for many common conditions, the average clinical provider could wait months to add a second medication when the first is not working, even though it could take weeks to know whether the initial medication is effective. That's because the clinician lacks the real-time data to know that the patient is complying and the medication is working. Breaking through such clinical inertia can generate much more effective results.

Intelligence also provides a form of omniscience. At doctor's office visits, for example, many indicators are not close to what would be normal for a patient, because patients typically comply better with treatment plans during the time before they see their doctor. As a result, the doctor doesn't get a realistic view of the patient's condition.

Access to data in real time supplies a more comprehensive overview of a patient's status. More information alone is not necessarily better information. The sheer volume of data that real-time access could make available – say, a screen with 50,000 data points – could overwhelm rather than help practitioners. The data need to be interpreted, with recommendations for the patient, such as modifying behaviour somehow.

A service-oriented focus – adding things like call-centre support – is in many respects a subset of intelligence and also is crucial for mobile health products. Although many products have a service component, they can be significantly more effective and appealing if they give both practitioners and patients the tools and applications they can use to provide more targeted care and treatment.

One major challenge with intelligence that many organisations haven't yet figured out how to manage or mitigate has to do with risk. Who takes the clinical risk associated with intelligence that changes patients' behaviour? What if something goes wrong and the intelligence results in the patient becoming sick or injured or leads to death? Neither telecommunications companies, handset manufacturers, systems integrators nor insurance companies want to take this risk. Providers (those who normally manage this risk) aren't comfortable taking chances with patients who might use an application but aren't under their direct care.

So, there's a paradox. To be successful, these applications need the data to be intelligent, but most parties that can provide intelligent data are hesitant.

**Socialised.** The socialising of medical devices should generate a community effect of employing information to sustain changed behaviour. This process happens when patients engage with a community of supporters who help them modify their behaviour and achieve health and wellness. When practitioners receive the necessary information, they can recommend relevant subjects, such as visibility into vital signs and patients' adherence, lifestyle modifications and appropriate medications.

Social applications also enable patients to include family members or friends in their health and wellness activities, which creates a supportive network. Equally important, applications also let users set automated reminders and interventions based on the data received. A patient and a family member may be sent an alert for the patient to take a medication immediately or take other measures to control a condition, thereby averting a crisis.

**Outcome-oriented.** Mobile health technologies must be outcome-oriented. They must provide the data and information needed to analyse and validate the performance and results of a given value proposition – both from health outcomes in the numerator and from economic outcomes in the denominator of the equation. Such an approach proves that real value is being delivered. For example, each device or application would indicate how compliant patients were to their medication regime, how many pounds they lost, how well they were able to manage their stress levels, how many cardiac events were predicted and prevented and so forth.

Achieving this goal is a matter not simply of committing to implement technology, but also of taking a clinical perspective on technologies to identify medical and nonmedical indicators, such as treatment costs avoided. These goals should be consistent with what the relevant parties want, whether they are healthcare providers, payers, patients or employers.

By relating products directly and closely to such desired results, they can be developed in reverse (from the outcome) rather than forward, or, taking a given technology and identifying possible uses for it. By taking an outcome-oriented focus, a company can differentiate itself.

Focusing on outcomes and clear metrics from the start also can help a company's products gain regulatory approval, which, in some markets, is required to gain the acceptance of payers and practitioners.

In the US, for example, the movement towards ACOs (Accountable Care Organisations) requires providers to collect, monitor and report outcomes. But that daunting task means collecting information from thousands of devices, applications and people. Telcos play an important role here in providing health cloud mobile health solutions that perform these functions to make sure their customers have the data to get paid.

**Engaging.** Too often, health and medical applications focus on patients' failings, weaknesses or sicknesses. They also tend to be efficient and streamlined, but boring to a fault (they're sometimes designed without a strong sense for aesthetics). Not seen as fun, they don't motivate patients to use them consistently. As we saw with the evolution of video games, the first five principles mentioned above are the table stakes, the minimum, to have a successful gaming application. But if it isn't engaging – if it doesn't have this final principle – it will never be a hit. The same is true for mobile health applications.

This is by far the most difficult principle to incorporate. Unlike a mobile game, which provides instant gratification and rapid progress, health and wellness can take a long time to improve. People lose weight over weeks and months, not seconds and minutes. Improving health is a marathon, not a sprint. Most developers of mobile health applications haven't figured out how to generate engagement in an area that takes such disciplined and sustained effort to show improvement.

## **Conclusion: Be ready to cross lines**

Integrated into mobile and web-based applications, the six principles discussed in this article create a framework that companies can use when developing products to better connect healthcare providers and patients who are managing illnesses and chronic conditions.

But for long-term success, it's nearly as important for mobile health products to be scalable as it is for them to fulfil these six principles. Many patients are afflicted not only with a primary condition or illness but also with other problems. As a result, mobile health platforms can be used in managing other chronic conditions, such as those with cardiovascular, respiratory, diabetic or oncological factors.

The market for such scalability is significant. According to the Kaiser Foundation, nearly half of adult Americans and 7% of children suffer from a chronic condition. These chronic conditions result in care that has been estimated to consume as much as three-quarters of the US healthcare budget. The appeal of products that can cross lines is clear, whether to practitioners from a functional standpoint, to payers from the viewpoint of cost control or to patients from the perspective of convenience and results.

As average revenues per user are declining in most telecom markets, telcos need to find ways to give their customers more value by offering new solutions. Mobile health represents a way to increase the average revenue per user between 50% and 200% by offering healthcare solutions related to managing diseases, aging independently and staying well.

All these factors are creating an opportunity for mobile health technology and service providers to be a part of a dynamic and potentially sizable market.

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# ***Building rural telecoms, one rupee at a time***

*Telecom industry analysts are obsessed with a four-letter word: ARPU. The great and the good are forever pontificating over how to arrest the decline of average revenue per user. In India's mobile telecoms sector – with ARPU at US\$2, on average, or at US\$1, for new users<sup>1</sup> – the numbers could hardly get smaller.*

*Industry executives in India worry less about ARPU and more about usage. They realise that there are limits to what they can do to influence upwards the price of what they sell, and that there's more they can do to encourage consumption. But what does that mean when looking at rural expansion? We believe more can be done to nurture a profitable rural telecom business, firstly, from within the industry's current business model and, secondly, through new business models.*

*Here, using India as an example from which others might learn, we look at how operators can find opportunities in rural markets.*

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## **By Mohammad Chowdhury**

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Viewing the business opportunity in particular through the lenses of price and usage is making rural customers in India look less and less appealing. Rural users – according to common perceptions – are likely to spend less money, not be interested in data services, receive more incoming calls than they make outgoing calls and cost more than urban users to acquire, connect and serve.

In line with such perceptions are the insights we gained from one of the major Indian operators: the subscriber acquisition cost for a rural customer in a remote area can be as much as 50% higher than for an urban acquisition, due to higher distribution payouts; and on average the monthly

servicing cost for a rural user is around 25% higher than for an urban one. Coupled with lower ARPU, at US\$1.70 for rural versus US\$2.10 for urban, these numbers indicate adverse economics (see Figure 2).

Contrary to perception, though, outgoing minutes of use between urban and rural users are roughly the same. So rural users appear to be generating as much revenue from outgoing calls as urban users do. But rural users appear to take more incoming calls than their urban counterparts do. So if mobile termination rates drop any further in India, that may negatively impact rural profitability.

According to a survey undertaken by one of the operators in India in 2010, 65% of rural users don't know what a data service is. But of those who know, as many as two-thirds regularly use one.

When it comes to rural India, there certainly are some significant challenges:

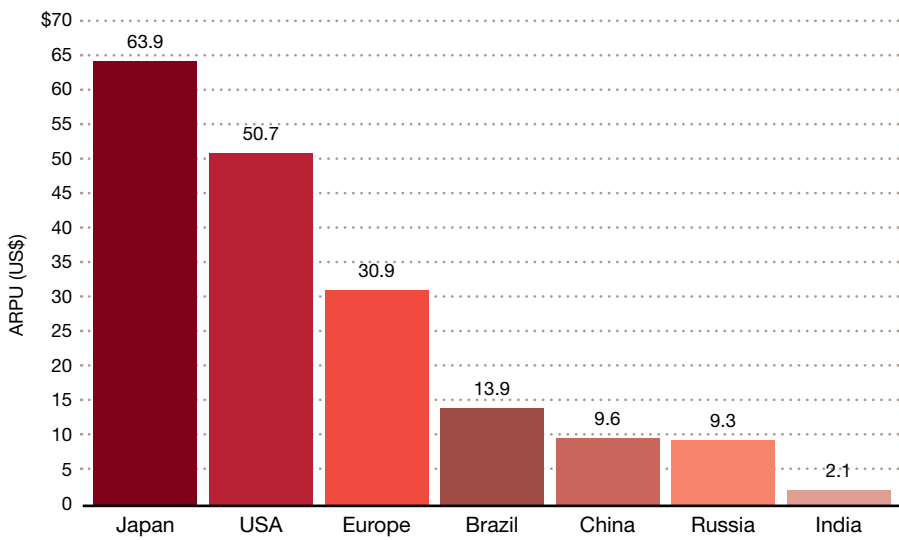
- **74% literacy rate.** The lack of literacy dilutes campaign effectiveness in many media.
- **Only 15% English literacy.** The low preference for English limits the adoption of most services, since they're not available in other languages.
- **Linguistic fragmentation.** India has no national language. Hindi and English both are relatively widely spoken, but 30 other languages are each spoken by more than a million citizens<sup>2</sup>.
- **Lack of infrastructure.** All-weather roads and electricity connections aren't yet a common feature of many Indian villages, and the outlook for improvement remains bleak. India spends only 8% of its gross domestic product on infrastructure, compared to 9% in China<sup>3</sup>.

1 Quarterly Indicators Report, June 2011, Telecom Regulatory Authority of India.

2 Government of India Census 2001, NGO and expert estimates for English literacy rate.

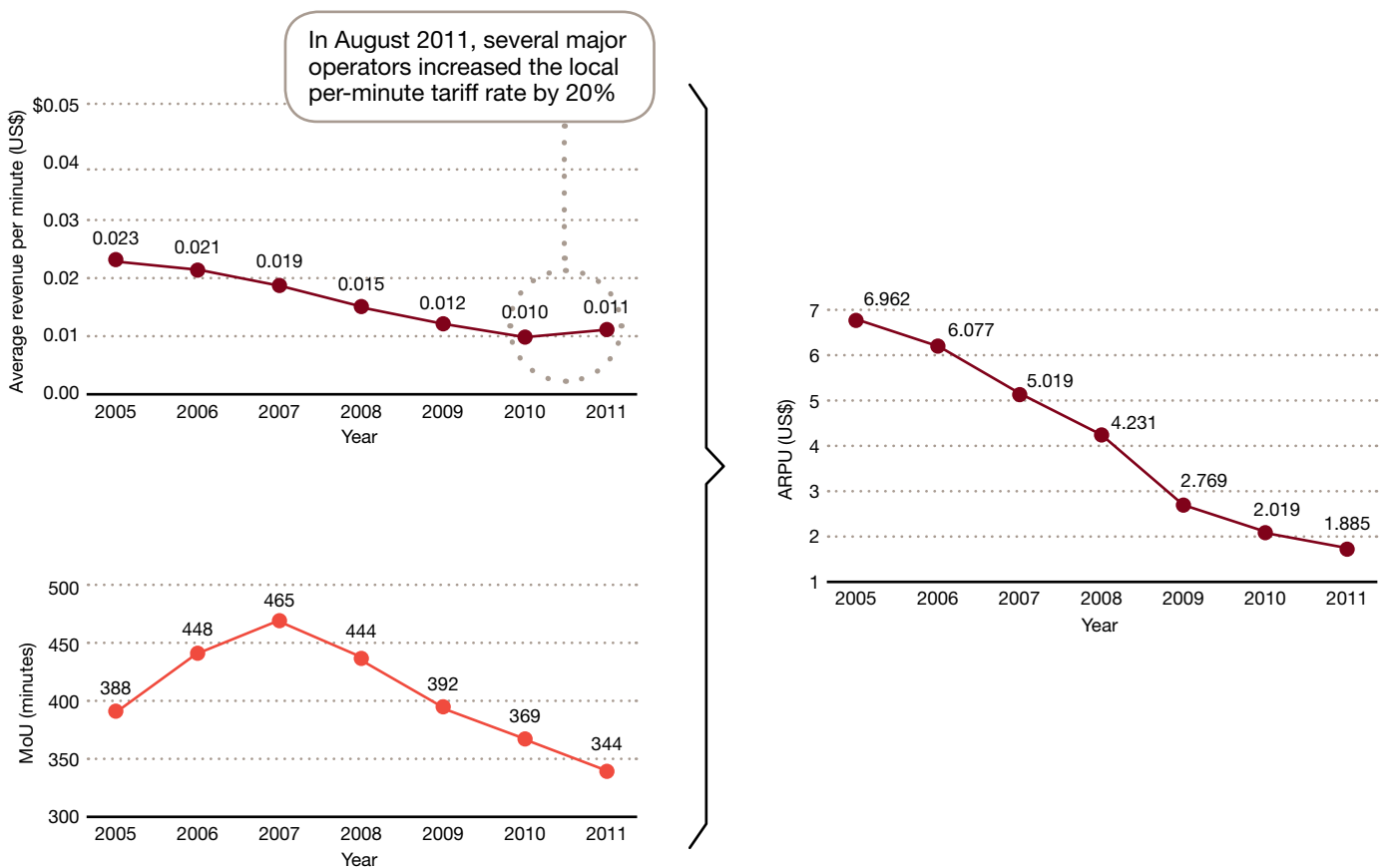
3 Secretariat for Infrastructure, India, 2011: "Investment in Infrastructure during the Eleventh Five Year Plan"; United Nations University, 2009: "Economic Reforms and Infrastructure Spending: Evidence from China and India."

**Figure 1: Examples of ARPU levels around the world**



Source: "Indian mobile services sector – Struggling to maintain sustainable growth", 2011, PwC.

**Figure 2: Historical overview of mobile key performance indicators in India, 2005-2011**



Source: Quarterly Indicators Report, June 2011, Telecom Regulatory Authority of India.

Yet the rural opportunity cannot be ignored and potentially is very significant. About 60% of the Indian population still lives in rural areas and contributes approximately 20% of the gross domestic product. In rural areas, 27m households today count as middle class, with annual income in the range of US\$1,000 to \$4,000. With the low-tier user base – those who use basic voice and text-capable phones – being relatively large, a modest 5% increase in low-tier adoption and usage could generate as much value as a 20% increase in adoption by smartphone users would.

Although some of what operators perceive about the profitability of rural users is grounded in truth, the reticence to do more in rural areas is more about operator constraints than lack of opportunity. More can be done to nurture a profitable rural telecoms business, firstly, from within the industry’s current business model and, secondly, through new business models. Operators will need to take three steps, discussed below:

- Understand the breadth of the customer base in rural areas better.
- Address users’ needs for services to be micro-local and in their language of comfort.
- Develop service models fit for a varied user base.

### **Better understand the breadth of the customer base in rural areas**

Usage is the major marketing focus in India, but in rural areas, adoption is in fact the bigger problem. Consider data services: while the majority of smartphone users in urban areas access a data service from their handsets at least once a month, for sub-US\$3 spenders using basic phones the figure is closer to 20%. According to a survey done by one of the operators in 2010,

only 36% of low-ARPU users are aware of non-voice and non-SMS services being available as well as know how to use them. As mentioned above, considering such low awareness, 20% adoption looks pretty good.

So the first problem is awareness, not usage. While some operators understand this, none has yet developed a solution for increasing awareness of data services.

The first challenge to doing so is the problem of the free rider: “If I spend millions of rupees educating the base, then what if half the customers leave and use the services offered by another operator?” Understandably, marketing officers in mobile operators see that as a risk. Distribution channels may hold the answer since they generally cut across operators at the rural level. They could start offering people who pop into their shops education in data services – for a fee that they would charge the operators – to be administered by a third party and charged back in a fair way. Millions could benefit as well as the operators.

If such a multi-operator mechanism were to prove too difficult to set up, though, the Department of Telecommunications could draw on the Universal Service Obligation Fund to fill in for this ‘market failure’. It’s likely that more public/private partnerships will have to play a role in championing Internet access in rural areas.

One example is the possibility of making more use of the postal service. In India, the postal service already gives access to mobile services. But the paradigm of that partnership could be shifted if post offices and delivery workers could be trained and deployed as a mobile sales force to encourage users to adopt new types of services.

Rural segments are as varied as urban ones are: they’re not only a generally poorer base but also more multilingual and more spatially dispersed, and they have differing social and professional needs and communication patterns. According to the National Census of 2001, 90% of the population of Kerala is literate, but in Bihar, only 44%; and 48% of the population of Orissa is below the poverty line, yet in Punjab, only 6%<sup>4</sup>.

Another misconception that arises is that rural Indian consumers won’t become active content buyers. Recently a leading TV channel recorded that in the state of Andhra Pradesh, as much as 25% of interactive TV responses came from rural areas. That figure indicates that non-urban consumers already form a sizable segment of engaged, interactive audiences. With ARPU below US\$2 a month, mobile services remain well within individuals’ affordability. And those services look even more affordable when household budgets are considered, given that rural households have some 2.2 earners each.

Compared to urban users, rural users – partly because of their remoteness – commonly depend more on mobile communications to stay connected and have a greater need for channels to deliver them all manner of services and goods. Operators have terabytes of customer-usage data that could help them untangle the rural mass into usefully understood and targeted segments. Yet they remain unable to use this information flexibly enough to generate distinctions between different customers with similar spending profiles.

4 Planning Commission, 2001, <http://agricoop.nic.in/Statatglance2004/Ecolndicator.pdf>.

*Rural users commonly depend more on mobile communications to stay connected and have a greater need for channels to deliver them all manner of services and goods.*

That isn't simply a failure to know one's customer. The inability results from the complexity of harnessing legacy information technology systems across various circles that can't generate uniform, analysable customer data. Most multi-circle operators of scale in India have grown through a mixture of acquisition and organic expansion. To date, harmonising systems has proven all the more difficult because of the growth pattern. Now that the major players have achieved circle-level expansion, consolidation has to take greater priority.

**Address users' needs for services to be micro-local and in their language of comfort**

Trying to attract developers to create applications for use in rural India hasn't worked and, given the current revenue-sharing arrangements, is unlikely to work. According to the latest Internet Mobile Association of India report on mobile value-added services, 75% of developers are motivated to write applications for a large market penetration. That explains their preference for creating applications for the iOS and Android platforms, to be used across multiple geographies. Convincing developers to write for multilingual local users, whose usage is unproven and whose handsets have multiple operating systems, is no easy sell.

The good news is that the Indian mass user market may not need 200,000 applications, which the iOS and Android platforms can boast. Perhaps more like five to ten 'hero services' with content that can be micro-localised and translated and that address specific, understood needs. Rather than trying to run developer stimulation programmes, operators can gather more insight about local areas, work out exactly what people want and offer a small number of services on a trial basis in a circle or two. To avoid having to pick the winners, let the best services pick themselves. In India, the operator that searches diligently for hero services may well find a handful of services that do have the potential to win over millions of users.

The vast majority of services available today are in English only, and only a very few can claim to be truly localised. Many services claim to be more local than they are, which disappoints users and leads to high dropout rates. Within a few years, technology will address the language problem when we get voice-based search in any language. I'll be able to ask my phone in Bengali for the theatre where I can see a certain film tonight, and it will give me the results from Google. If localisation has been harnessed by then, the film will be showing at my local theatre and not 30km away in another part of my city, as is often the case with current offerings.

Localisation has to be precise. A study by the Indian Institute for Social and Economic Change found that in the state of Karnataka, during the same month wheat prices can vary by a factor of 5x in markets separated by not more than a few hundred miles.

Some operators in emerging markets around the world are translating local service requirements into revenue streams that have encouraging prospects:

- *Chandamama* (Uncle Moon) is a children's magazine that began publication in July 1947, just one month before Indian Independence. The magazine has started its own application with a US\$1 monthly subscription. Currently available in nine languages, the application has reached 3,000 subscribers in the first few months since its release.
- *Kisan Raja* (Farmer King) is a GSM-based irrigation controller that sells for about US\$100 in the southern states of India. It allows farmers to check and control their irrigation pumps from their houses by using either a landline or a mobile phone. Extensive guidance on an interactive voice response system in local languages is helping to extend the reach of *Kisan Raja* into various regions.
- In Cairo, Egypt, a live traffic-alert service has become very popular. Commuters generate the content daily, using their handsets to type the traffic news as they travel to and from work. The content is in Arabic, and the information is highly localised.
- *Janala* is a language-tutoring service that an operator in Bangladesh offers to people interested in learning English on their mobile phones. It's targeted at those who can't afford college or other classroom tutoring, and adoption has been high.

*Partnerships are needed at the local level to enable better services and further-reaching distribution and sales.*

**Develop service models fit for a varied user base**

With such a variety of market segments to serve, India's mobile operators are heroic in achieving what they do in rural areas – through operations that were designed to support growth in the metropolitan areas. Those areas now boast 140%+ levels of penetration, and operators have stretched the operating model too far. It's time to think of better, more detailed ways of acquiring, retaining and serving customers in the rural market.

Just as in the late 1980s and 1990s the airline industry spawned a successful, no-frills segment to cater specifically to the business and leisure travel of lower-income groups<sup>5</sup>, we believe the mobile industry should develop a tiered service model. The industry might create, as an example, 'VillageCo' – a business designed to:

- Deploy networks more cheaply, possibly by using off-grid network solutions
- Differentiate service levels and components to pre- and post-paid users, depending on the user type and spending (similar to airlines' frequent flyer categories), and thereby reduce service redundancies and cut the average cost to serve
- Spend less, specifically on sophisticated customer service and care, possibly by offering more care through retail outlets and orienting staff to both solve problems and up-sell at the same time

- Brand more in local languages and localised themes, for example, by creating a sub-brand of an existing one or even an altogether new one
- Offer handsets that are customised to the village users' preferences, such as more phones with torch lights and loudspeakers for playing music
- Offer a concentrated set of micro-localised services, and collaborate with other operators to offer common platforms, toolkits and programmes so as to create a larger market opportunity for developers.

When VillageCo is established, the CEO should demand a high-growth, no-frills business that delivers 35%+ margins. The company should breathe new air into reaching the mass base in rural areas, where penetration is still less than 40%.

The mobile operator's own resources and systems will go only so far. More partnerships at the local level are needed to enable better services and further-reaching distribution and sales. New collaboration models are needed as well, and the possibilities are significant.

In regions where existing distribution channels have limited reach, new local channels could go further. In Bangladesh, BRAC, the world's largest non-governmental organisation (by beneficiaries covered), is embracing mobile in providing healthcare. BRAC's workers are having the effect of creating mobile diffusion in places that retail couldn't reach economically. While few national non-governmental

organisations in India have true depth of local reach, there are plenty with real scale at the state level, for example, in Gujarat.

From the experiences of other industries in India that are well aware of the extreme price sensitivity of the rural market, we find lessons that might be helpful to mobile service providers. When it comes to sales, service providers can eliminate the need to set up rural retail points. Instead, they can gain inroads into rural markets by identifying a select group of village residents and supporting them through appropriate training.

Hindustan Unilever, the Indian arm of FMCG major Unilever, employed a team of women to sell its products, including soaps and detergents. The initiative was successful, making sales in remote areas without high capital expenditure. In Egypt, one of the leading mobile service providers used direct rural selling as part of an initiative. The company's immediately recognisable corporate branding helped this service provider set up a hub-and-spoke model for distributing cards and recharges.

To overcome electricity shortages, Uninor, a 2008 entrant in India's mobile market, collaborated with The Energy and Resources Institute in training women to run solar lanterns and charging stations. The off-grid solution encouraged people to use mobile services in areas with either no or an interrupted power supply. To date, more than 200,000 people have received services in 650 villages in 16 of India's states.

Over the next few years we expect to see the refinement of the telecoms operating model at the rural level. The rural model will truly expand the reach of the mobile revolution into remote, and often low-income, segments of the population – and will dispel current notions by doing so profitably.

<sup>5</sup> Between 1996 and 2005, in the UK-EU while full service air traffic grew from 42m passengers to 47m, 'no frills' traffic grew from 3m to 51m. The proportion of all business travellers who were from lower to middle income groups rose from 36% to 47%. Source: UK CAA, report CAP 770, November 2006.

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# ***Net neutrality: Why solve a problem that doesn't exist?***

*Network neutrality has once again become a hotly debated topic. In Europe, it's re-emerging in the context of the mobile Internet, in particular. In the US, the debate continues with the Federal Communications Commission's release of its Final Rules on Preserving a Free and Open Internet.*

*Renewed concern over net neutrality comes at a time when mobile operators urgently need to revise their price plans and tune their business models to cope with the decline in revenues from text messaging and voice and to benefit from the surge of mobile-data consumption. The new mobile-data world requires collaboration among content and application providers to deliver new, differentiated, high-value services that customers want. In PwC's opinion, net neutrality would severely limit everyone's options.*

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## **By Bart-Jan Sweers**

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The network neutrality debate traditionally has been about fixed Internet access. The discussion began in the 1990s, with not much action taken by regulators worldwide. The European Commission has been reluctant to introduce regulatory guidelines, instead placing emphasis on access regulation and transparency to harbour existing competition. The existing European Directives, though, already give some guidance on matters related to net neutrality. The directives, for example, obligate regulators to promote the ability of end users to access information or run applications of their choice.

Europe now is actively debating net neutrality, triggered partly by mobile operators' reactions to the strains they perceive in both networks and business models. In a recent resolution (November 2011), the European Parliament advocated a more interventionist approach. This resolution was preceded in the summer of 2011 by the decision of the Dutch Parliament to incorporate net neutrality in its Telecom Act, which prohibits operators from differentiating their pricing based on the content or service that's being accessed. That decision made the Netherlands the second country in the world (after Chile) to enact net neutrality regulation, and may trigger similar developments in other countries.

In the United States, the Federal Communications Commission (FCC) released its Final Rules on Preserving a Free and Open Internet in September 2011. These rules forbid blocking of services and place some clear restrictions on price and quality differentiation. But on the latter point, the FCC proposes regulating mobile Internet more lightly than fixed Internet, dropping the non-discrimination clause.

With the tremendous growth of mobile Internet access over the last couple years, the focus of the debate has shifted, as illustrated by the Dutch case (see sidebar on page 35).

Mobile operators in advanced markets are confronted by a surge in data traffic, which requires large investments in networks. At the same time, over-the-top applications, like WhatsApp and Skype, are cannibalising voice and text messaging revenues, and that requires operators to adapt their business models. Net neutrality legislation would restrict the operators' options severely, so they should take notice and try to influence any regulatory debate on this matter.

Some differences between fixed and mobile access networks are relevant in the context of the net neutrality debate (see Figure 1). Due to these differences, the ability to differentiate on volume and quality of service is even more important for mobile operators than it is for fixed operators.

It's not so much a difference in the competitiveness of these two segments but, rather, the result of intrinsic differences in respective network economics. As a result:

- Fixed operators are less likely to infringe on the net neutrality principle, as they have less incentive to do so. This explains why there have been so few cases in practice.
- Mobile operators are more likely to try to differentiate their services. That may be a reflection of the underlying network economics, and not so much the result of anti-competitive behaviour.

The FCC seems to acknowledge the difference between fixed and mobile Internet access – its proposed net neutrality restrictions are less stringent for mobile operators.

## Arguments against net neutrality

To affect the outcome of the regulatory debate on net neutrality, mobile operators will have to speak the language. Too often, operators raise arguments that, from the perspective of a policy maker or regulator, just do not carry any weight. We heard one operator plead that its smaller economies of scale imply that it's entitled to higher termination rates than its competitors are (not a valid argument, though, because in principle its size is within the operator's own control). Another operator claimed that its high-frequency spectrum justified higher termination rates (while the regulator rightly argued that this factor already had been accounted for by the fact that all spectrum was sold at market prices).

**Figure 1: Differences between fixed and mobile networks affecting the net neutrality debate**

	Fixed operators	Mobile operators	Consequence
<b>Revenue model</b>	Internet access services are often bundled with voice and TV service. Internet tariffs depend primarily on the connection speed.	Internet access is bundled with a voice and SMS service. Internet tariffs typically are based on volume bundles.	The revenues of mobile operators are still driven largely by voice usage. For fixed operators, revenues are driven largely by the number of subscribers. As a result, mobile operators' revenues are sensitive to cannibalisation by over-the-top applications like WhatsApp and Skype.
<b>Network economics</b>	High operating leverage: the cost structure consists of a high share of fixed costs and a low share of variable costs, leading to low marginal costs of traffic.	Low operating leverage: the cost structure consists of a low share of fixed costs and a high share of variable costs, leading to higher marginal costs of traffic.	This difference in the underlying network economics is mirrored in the respective revenue models. Also, the relative scarcity of capacity in mobile networks makes differentiating on quality of service more important. Ultimately, the difference in the underlying network economics justifies the higher incentive for mobile operators to discriminate on price and quality.
<b>Market structure</b>	The degree of network competition varies, typically between 2 (network duopoly in the US) and 4 or more (by means of regulated access in the EU, and fibre in Japan and Korea).	Typically 3 to 4 networks compete, complemented by retail competition from mobile virtual network operators.	Generally speaking, competition is somewhat stronger in mobile Internet access than in fixed Internet access.
<b>State of development</b>	The market for fixed Internet access is saturated, and the content and application ecosystem is relatively mature.	The market for mobile Internet access is emerging, and the content and application ecosystem remains in flux.	The dynamics in mobile Internet make future developments difficult to predict. Regulatory intervention is particularly risky in such a dynamic area.

The key for mobile operators is to be well aware of the goal(s) of the regulator and to seek out arguments that are in line with those goals. Usually, this implies demonstrating that the operators' position benefits economic welfare, both in the short term and in the long term. Let's consider some arguments against net neutrality that meet these criteria.

### 1. The problem is overstated

Given the regulators' interest in net neutrality and the intensity of the debate, one would think that operators frequently are guilty of misconduct. In fact, since fixed broadband Internet emerged at the end of the 1990s, there have been remarkably few such occurrences. For example, the FCC mentions only two issues that have occurred in the US fixed telecoms market: one in which a cable operator interfered with traffic from a peer-to-peer video service, and another in which an operator blocked a competing voice over Internet Protocol (VoIP) service.

Having just two cases in ten years isn't bad. Apparently, operators feel they have more to lose than to gain from violating net neutrality. That attitude isn't entirely surprising. Experience with walled gardens, like AOL in the US or i-mode outside of Japan, has taught them that customers prefer open Internet access. Being intermediaries between customers on the one hand and content and application providers on the other hand, operators need to attract as many parties as possible on both sides. An alternative view might be that the threat of regulation was enough for them not to introduce discriminatory measures. In either case, ex-ante regulation seems premature.

It has to be said that concern may seem valid when it comes to mobile VoIP. But compare a mobile operator charging extra for mobile VoIP to, for example, a supermarket selling other brands' products as well as its own home brand. Such a supermarket apparently doesn't see any benefit in not selling the other brands. Instead, it sets the prices of both brands' products

so that it maximises profit. Using vertical action or integration doesn't necessarily harm consumers' interest – after all, it doesn't affect competition between competing value chains, but only redistributes profits among the various parties in the chain. In fact, better vertical coordination may offer efficiency benefits<sup>1</sup>. Such arguments have led anti-trust authorities to focus generally on horizontal integration instead of vertical integration.

### 2. The impact on economic welfare

Economic theory teaches us that price differentiation based on differences in willingness to pay is optimal from a social welfare point of view. Price differentiation makes sure that resources are allocated efficiently. In the context of Internet access, there are two broad forms of differentiated pricing:

1. Differentiating prices across offered content and applications, i.e. charging end users depending on the content or application they're accessing
2. Charging content and application providers, i.e. price differentiation across both sides of this essentially two-sided market<sup>2</sup>

### What is net neutrality?

Net neutrality has no single, precise definition. Generally, net neutrality is described as the principle that Internet service providers shouldn't place any restrictions on, or discriminate between, consumers' access to content, sites, platforms and applications connected to the Internet. The principle means that irrespective of their needs, their willingness to pay or the impact on other users, network operators and Internet service providers must treat all content and applications equally.

A technology sometimes mentioned in this context is Deep Packet Inspection, which allows Internet access providers to analyse the content of IP packets (as opposed to only their address). Then they can price more accurately or more discriminately, improve network management or analyse data traffic for the benefit of innovation and development.

1 Note that mobile VoIP providers basically exploit arbitrage opportunities that result from pricing differentials between standard data and voice services. The fact that operators themselves don't use the technique suggests that it's less efficient.

2 An operator mediates between end users, on the one hand, and content and application providers on the other hand.

In the first possibility, it's important to realise that on a price-per-bit basis, customers value a voice service significantly more than they value a video stream (see Figure 2). Net neutrality would limit the options for operators to incorporate such differences in their pricing of Internet content and applications. Prohibiting price differentiation would imply that one assumes that the welfare optimal price difference is zero. But there's no justification for that. Without such justification, a prudent regulator would refrain from interfering.

Net neutrality also would constitute a restriction on establishing an optimal price structure across the two-sided markets that operators are acting in. Two-sided markets are quite common. Their pricing structures differ remarkably. For example, eBay charges only the sellers, not the buyers. Cable operators charge their customers but typically pay for content (i.e. charge a negative price). Newspapers receive payments from readers as well as advertisers. Postal companies charge the senders, who can choose (and pay for) first- and second-class mail. These differences are explained by different price sensitivities in these markets, and between the sides of the markets.

Again, the optimal pricing structure depends on the relative price sensitivity, in this case between both sides of the market. The optimal pricing would be to charge high prices to the market side that's less sensitive, while taking into account how less demand on that side may affect the demand on the other side. Prohibiting operators from setting an optimal pricing structure across both market sides compromises economic welfare.

### 3. Net neutrality would discourage investing and innovating

Apart from direct effects on economic welfare (what economists would call static efficiency), net neutrality also could have long-term consequences on investments and on innovation (dynamic efficiency).

Net neutrality would dissuade operators from investing and innovating, because it ignores the fact that not all bits are equal in terms of costs. Some services need a high quality of service, e.g. by requiring bits to be delivered within tens of milliseconds. Mobile applications can be very costly because of requiring constant network signalling, even when not actively used. Prohibiting operators from charging at least the costs of the associated quality of service would

lead to underinvestment in network development. Operators aren't likely to offer the service even if content and application providers demand such a service. The results: operators miss out on an additional source of revenue; content and application providers can't provide a service that customers would have valued; and customers don't get the benefit of these lost services.

Proponents of net neutrality argue that without protection, the balance of power will shift to large operators, at the cost of all those small Internet companies. Bottom-up innovation, they argue, will be harmed. But they seem to base their argument on some sort of David versus Goliath sentiment. In fact, the market capitalisation of the three largest operators and the three largest Internet companies gives us a very different picture (see Figure 3).

These values suggest that (often local) Internet access providers are unlikely to dominate the ecosystem. In fact, the opposite could be true. Many content and application providers have an international reach and don't depend on a single operator to generate economies of scope, so they can be the dominant party. That's very clear in the Apple ecosystem, where Apple is known to have significant market power over mobile operators.

**Figure 2: Willingness to pay (indicative), based on typical pricing in advanced markets**

Service	Typical price (US\$/bit)
Text messaging	\$1.00
Mobile voice	\$0.10
Mobile Internet	\$0.01
Fixed Internet	\$0.001

#### 4. Effective competition can take care of net neutrality issues

Even if imposing net neutrality were the right measure to address concerns about the market power of operators, regulators simply couldn't skip the question that should precede any intervention. The question, of course, is: does significant market power really exist? If not, then customers who are dissatisfied with the Internet access they're offered can switch operators. That threat is then sufficient to avoid net neutrality issues.

Let's consider the competitive situation. There are usually several fixed (copper-, cable- and fibre-based) operators and mobile operators. Competition at the infrastructure level often is complemented by competition at the retail level. In Europe, providers using unbundled access on fixed networks and mobile virtual network operators on mobile networks are quite common. Customers face few barriers in changing operators, as the relatively high churn levels demonstrate, particularly in mobile telecoms. To some extent, 4G mobile networks will compete with fixed Internet access. That will blur the boundaries between these two markets and increase competition further.

What's more, technological developments still happen at a rapid pace. Nielsen's law, the bandwidth equivalent of Moore's law, predicts that 50% annual growth of Internet access speeds will continue. Such an environment isn't conducive to maintaining market power, even if there could be just a duopoly. Developments in the Netherlands serve as an illustration. At the end of the 1990s, the cable companies led the market for broadband access. With the introduction of ADSL, the incumbent operator, KPN, soon gained ground and took market share. In the last couple years, with the introduction of Docsis 3.0, cable operators have been gaining market share again. They expect to feel the heat of emerging fibre network operators soon.

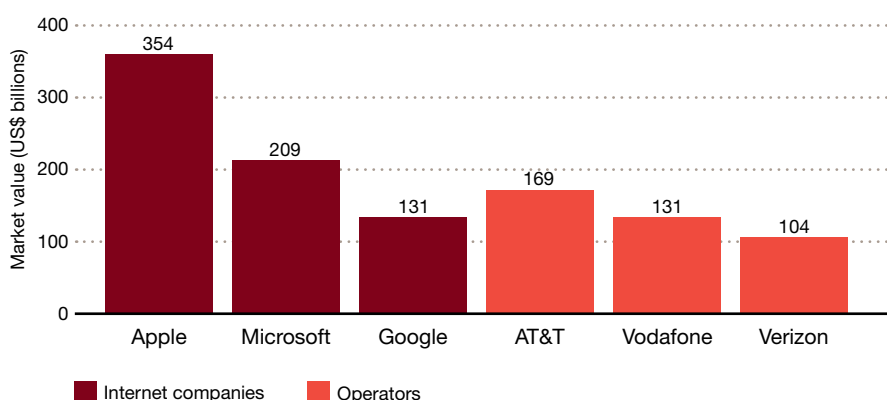
During all those years, higher bandwidths have been offered at ever lower prices. The highly fluctuating market shares and rapid decline in prices hardly illustrate a market in which providers have power over consumers.

Even if there are any issues, they should be dealt with by means of general competition law to regulate network access, by facilitating new entry and by requiring operators to be transparent about their pricing and network

management policies. For example, a VoIP application provider that appeals to the net neutrality principle to argue for access to an operator's customer base is, in fact, similar to a mobile virtual network operator seeking access to an operator's network. In the European Union, there has been considerable discussion about whether or not to regulate the market for access and call origination to facilitate mobile virtual network operators. Mostly, regulation couldn't be justified because market power couldn't be demonstrated.

If, for some reason, an EU regulator were to re-consider regulating this market, it would have to demonstrate a lack of effective competition by proving that: 1) there are high barriers to entry; 2) there is no dynamic towards effective competition; and 3) competition law is insufficient to deal with the issue. This step seems to be skipped in the net neutrality debate. And even if market power is demonstrated, the most common remedy is to provide cost-based access. Net neutrality proponents go a step further by proposing access at zero price.

Figure 3. Market values of largest telecom operators vs. largest Internet companies



Note: China Mobile has been excluded, as the net neutrality discussion is unlikely to be relevant to China.  
Source: FT Global 500, September 2011.

*Many content and application providers have an international reach and don't depend on a single operator to generate economies of scope, so they can be the dominant party.*

### **5. The challenge of regulating an evolving market**

In general, regulatory measures always come with regulatory risk. Regulatory measures may be based on incorrect analysis or assumptions, or they may be based on mistaken expectations about future developments.

The analysis that net neutrality proponents often use to back up their position usually lacks quantitative support. Often relying on unrealistic or unsubstantiated assumptions, their analysis can yield ambiguous, highly theoretical results. So regulators are unlikely to be better than the market in setting the optimal price (which should be zero according to net neutrality proponents).

Introducing regulation on the basis of ambiguous, theoretical results also means that the regulator is likely to be highly influenced by lobbying, the political process and the strength of interest groups that seek to influence regulation to their advantage. The mere fact that net neutrality is a more prominent issue in the US than in Europe illustrates this point. Ambiguous results, then, should be reason for a regulator to refrain from new regulation.

### ***Net neutrality legislation in Chile***

The National Congress of Chile amended its telecommunications law in June 2010 to preserve net neutrality. Its law now forces Internet service providers to:

*“...ensure access to all types of content, services or applications available on the network and offer a service that does not distinguish content, applications or services, based on the source of it or their property.”*

#### **The law also states:**

*“No [ISP] can block, interfere with, discriminate, hinder, nor restrict the right of any Internet user to use, send, receive or offer any content, application, or legitimate service through the Internet, as well as any activity or legitimate use conducted through the Internet.”*

The government of Chile published this law in the official gazette in March 2011, which implied that from then, Internet service providers had 120 days to comply and adjust their services. The Chilean telecom authority, Subtel, wasted no time – in July 2011, it started inspecting the provided Internet services to verify compliance with the amended telecommunications law.

Regulatory risk is particularly high in new, very dynamic markets like those for mobile Internet services. Regulation that may seem suited today may very well stifle future innovations. Net neutrality could, for example, hinder innovation in the area of remote medicine, which is likely to require a high level of quality-of-service differentiation. Other areas that are likely to be affected include online gaming, video conferencing and alarm signalling. Even VoIP, if networks are flooded with increasing traffic from high-definition video services, may require quality-of-service differentiation.

## ***Net neutrality legislation in the Netherlands***

In the summer of 2011, the Dutch Parliament voted in favour of including a net neutrality clause in the new Telecoms Act. Although this decision still has to be confirmed by the Senate, it's quite likely that the Netherlands will be the first European economy to introduce net neutrality legislation. Passing legislation would be in contravention of the current policy of the European Commission, which has taken a less interventionist position so far and is completing a study on a more definite position. Not surprisingly, the responsible European Commissioner, Neelie Kroes, has rebuked the Dutch for not awaiting the outcome of this study.

The proposed Dutch act states that operators: *“are not to impede or delay Internet services or applications, unless this is done:*

- 1. to avoid the consequences of congestion (while treating similar traffic in similar ways)*
- 2. for the benefit of the integrity and security of network and service*
- 3. to limit the transmission of unrequested communication to the end user, on his/her request*
- 4. to satisfy a legal injunction or lawful requirement.*

*Providers of Internet access services do not make tariffs for Internet access services dependent on the services and applications which are offered or used via these Internet access services.”*

The original Telecoms Act proposed by the Dutch Ministry of Economic Affairs didn't contain such a strict net neutrality clause. The Parliament initiated the requesting and ultimately the adopting of this clause, which seemed to have been triggered by some mobile operators announcing plans to introduce new price plans that either would require consumers to pay extra for services like VoIP, or would require content providers to pay for the delivery of their traffic to consumers. A casual remark by one of the operators at an investor meeting about its use of Deep Packet Inspection made matters worse. In hindsight, the mobile operators seem to have underestimated the political sensitivity of these issues.

Consumer protection, privacy concerns and freedom of speech arguments quickly convoluted the discussion in Parliament. Within a matter of weeks, the discussion ended with the adoption of the net neutrality clause (quoted above), and with an investigation by the telecom regulator OPTA and the data protection authority CBP into possible breach of privacy legislation.

The developments then forced operators to revise their pricing strategies. Instead of the price/service differentiation they had planned, they raised prices for mobile-data access across the board. They coupled voice/SMS bundles with data bundles to avoid losing their traditional revenue base by requiring heavy data users to also pay for a large voice/SMS bundle. Parliament – clearly unsatisfied with the outcome – has triggered a political discussion on reserving more room for new entrants in the 2012 spectrum auction. Moreover, on 6 December 2011, the Netherlands Competition Authority visited the Dutch mobile operators in an investigation into possible cartel practices on pricing for mobile Internet services.

These developments following the proposed amendment of the Telecoms Act should be noted by other law makers considering imposing net neutrality.

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*It is expected that the mobile Internet will soon have more users spending more time online than the fixed Internet does.*

And those are just the known applications. Others haven't been invented yet, but probably never will be if net neutrality is adopted and, consequently, quality-of-service support is limited. After all, the recent Internet history suggests a still emerging, highly dynamic industry. The end of the Internet boom (2001) suggested that the infant era had ended, but in fact some of the largest innovations, such as Facebook and the Apple ecosystem, didn't even exist at the time. The general expectation is that soon the mobile Internet will have more users spending more time online than the fixed Internet does. Almost certainly, five or ten years from now, new applications and companies that are yet unheard of will rise to dominance.

It's good practice in regulations to follow the anti-precautionary principle: if the consequences of ex-ante regulatory intervention are insufficiently known, better to leave it to the market than to intervene. Regulators should be careful trying to anticipate developments and regulate an unknown future, in particular if regulation would be based on rather subjective and qualitative analysis.

Apart from regulatory risk, the legal security of mobile operators that have purchased spectrum licences may be at stake. After all, imposing net neutrality can be seen as a significant change to the licence conditions of spectrum that's already been auctioned. This results in a significant loss of value for the operators, as can be derived from the results of the 2008 digital dividend (700MHz) auction in the US. Part of that spectrum was auctioned with a net neutrality clause, part without. The outcome of the auction was that the amount paid for the spectrum with imposed net neutrality was US\$0.76 per MHz/pop, while for the unrestricted spectrum it was US\$1.89 per MHz/pop, a 60% increase in value.

The outcome of the US auction suggests that collectively the operators who won spectrum in Germany's auction in 2010 will lose approximately US\$3.3bn in value if net neutrality is imposed on them. A change of licence conditions with such impact should have been made before the auction.

## **Conclusion**

All stakeholders in the net neutrality debate need to be aware that the Internet adheres to normal economic rules. In the long run, imposing net neutrality is not in the interest of any stakeholder.

Operators should get ready to engage their policy makers and regulators by developing convincing arguments against net neutrality legislation. With most regulators aiming to enhance economic welfare, arguments should be formulated with that perspective in mind. At the same time, operators need to be aware that rational arguments are unlikely to be sufficient. In parliamentary discussions, sensible economic arguments often are abandoned for unrelated issues such as freedom of speech or a unilateral focus on consumers' interests. So, operators should consider how their commercial actions might affect related regulatory discussions. Also, involving stakeholders in (price-) strategy formulation makes sense. Generally, having your public relations strategy in order is essential to avoid losing out in politicised discussions.

Content and application providers need to be aware that in the end, they and operators are mutually dependent. All parties have a shared interest in a collaborative approach to deliver new, differentiated, high-value services that customers want. Both operators and content/application providers benefit from a symbiotic relationship.

Regulators should be careful not to breach the anti-precautionary principle – don't regulate unless the need to do so is clearly demonstrated. Relying on qualitative analysis presented by large Internet companies with clear stakes definitely will produce lopsided new regulation. Regulators also should be aware that net neutrality may prove to be the wrong solution for a problem that doesn't exist anyway. Rather than contemplating whether or not to impose net neutrality, regulators should, if anything, question whether there is sufficient competition (or threat of new entry) in the market.

The legitimate regulatory objective of retaining an open, best-efforts Internet for all shouldn't be extended into restricting new, evolving, innovative business models that could enrich the future and possibilities for the Internet. We don't know what future evolutions of the Web will bring, but we can be certain that only a fraction of its potential has yet been tapped. Careless, albeit well meaning, legislation or regulation risks sacrificing much of that potential. The pivotal role the Internet plays in the development of new industries and in the productivity of existing industries makes the stakes high indeed.

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Woman and senior man on sofa



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# Putting your competitive assets to work

*The consumers coming of age in 2015 will be digital natives – an entire generation of people who never experienced the non-digital world. They'll use non-voice messaging more than they make calls, and will employ social networks for everything from managing their social lives to making buying decisions to finding and watching video content, all at the same time and through a device they choose. They'll also expect the companies they deal with to handle all their customer service requirements online, quickly and seamlessly.*

*Battling for the attention, loyalty and spending power of these digital consumers will be protagonists with vastly differing business models. The contestants will include traditional fixed and mobile operators, cable providers, satellite broadcasters, search specialists, social networks, device companies and more.*

*As these diverse contestants gear up, what factors will be critical to their success? To find out, PwC has conducted research into where communications revenues are heading – and how operators can get there first.*

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## **By Rolf Meakin**

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It's widely accepted that the consumers reaching adulthood over the next few years will exhibit behaviours and expectations very different from those of their predecessors. To an extent, this sort of divide has been true of every generation: the children of the 1960s had a radically different outlook from those who grew up in the 1950s, who in turn differed from those who lived through World War II. The big difference this time is the explosion in connected digital technologies since the turn of the twenty-first century – a revolution that has transformed consumer behaviour more radically, and on a more mass-market and global scale, than has any previous wave of technology innovation.

For communications operators worldwide, this new generation's arrival among the ranks of adult consumers in mature markets brings a host of questions. Will the proliferation of digital devices and consumption enable operators to generate higher returns from their assets, or will their contribution become commoditised and increasingly irrelevant in the eyes of the next generation? Is diversifying into new revenue streams, such as payments and advertising, a prerequisite for operators to survive and succeed – or a distraction from their core business that they'll pursue at their peril?

### ***An analysis by proxy***

To help operators answer these questions and more, PwC conducted a quantitative research study of five national communications markets in Western Europe, as a representative proxy for mature markets worldwide. Collectively, the markets we focused on – Germany, France, the UK, Spain and Italy – account for about 85% of total communications industry revenues in Western Europe.

In each of these countries, we set out to investigate three aspects of the marketplace. Firstly, where does the value lie in serving consumers in today's digital market? Secondly, in what direction is value migrating within that market? Thirdly – the 'so what' in our study – what are the implications of those market dynamics specifically for communications operators?

In a study like this, the first step is to define the scope and the shape of the market we're looking at. We divided it into five main blocks of value – namely, fixed telecoms, mobile telecoms, television, mobile value-added services and online content. These blocks are defined in more detail in the sidebar on this page.

### **The case for targeting new growth opportunities**

How does spending on digital communications currently break down among the value blocks, or segments? As Figure 1 shows, of Western Europe's total communications revenues of €251bn in 2010, by far the largest slices are those of mobile telecom services, at €119bn, and of fixed telecoms, at €60bn. Communications providers may find it reassuring that their 'traditional' core business of fixed and mobile communications still account for 70% of the total value across all these market segments.

If we factor in the relative growth rates of the various segments over the next few years, the picture for the future becomes somewhat less reassuring for operators (see Figure 2). The overall communications market is projected to grow at a compound annual growth rate (CAGR) of about 4% – approximately double the expected rate of growth of the Western European economy as a whole. The fixed and mobile communications element is almost flat, and is set to grow at only 1% over the four years to 2015, with fixed revenues actually declining. This near-stagnation contrasts starkly with growth projections in the mid-teens for the, admittedly much smaller, mobile value-added services and online segments.

In PwC's view, these diverging growth trajectories have two implications for mobile operators. The first is that to find revenue growth that exceeds the base 1% CAGR projected for traditional communications services, the only

viable option is to pursue those higher-growth segments. Diverse forces – price competition, the impact of regulation, the impact of encroachment by other types of players – are combining to drive down prices in the traditional fixed and mobile communications market. That means the only choice is to look elsewhere for growth.

The second, equally important, implication for operators is that, now more than ever, retaining the existing customer base and maximising its value is absolutely crucial. To keep customers, operators need to achieve the excellence and optimise the experience customers are looking for. In both areas, the communications industry as a whole has often been accused of falling short.

### **Disparate pockets of growth weighed against competitive assets**

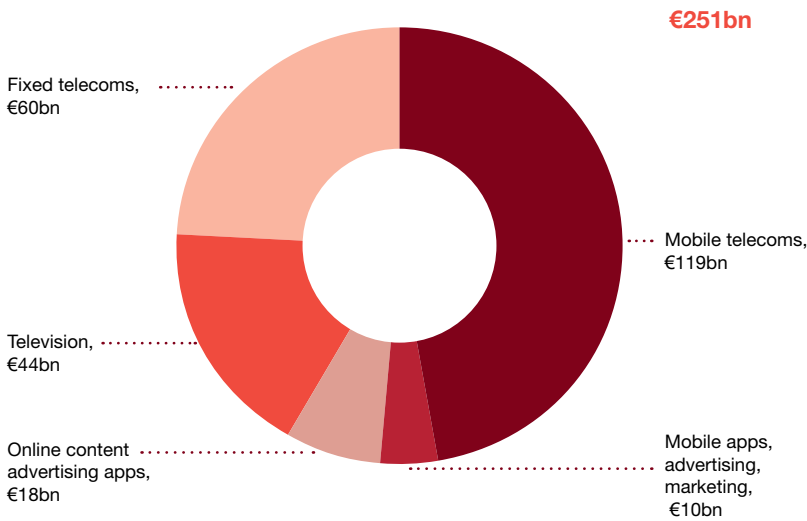
When we examine the two highest-growth areas, mobile value-added services (VAS) and online services, where will we find the growth within them focused? As Figure 3 shows, each of these value segments aggregates a collection of disparate service types, and each has its own distinct growth dynamics.

#### **Five blocks of value**

PwC's research focused on five distinct segments of the communications market in each country:

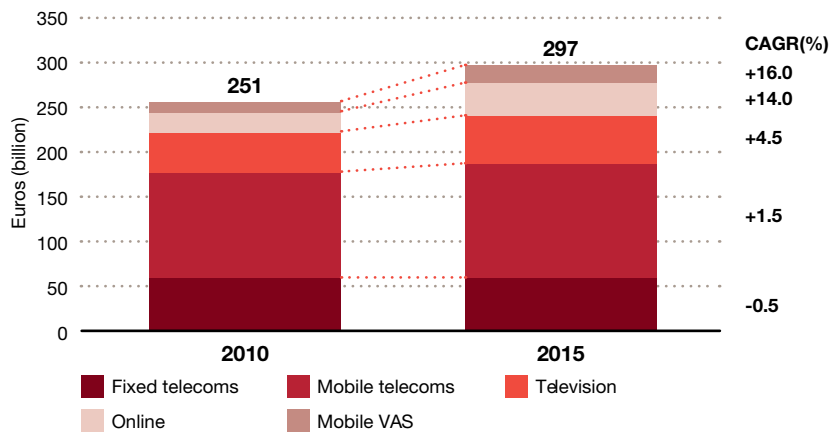
- 1. Fixed telecoms**, including fixed voice, access and broadband
- 2. Mobile telecoms**, including voice, data connectivity, SMS and legacy content such as ringtones
- 3. Television**, including net advertising revenue on spot advertising plus all types of subscription TV, but excluding public funding
- 4. Mobile value-added services**, including applications, advertising, marketing, payments and transactions
- 5. Online content**, including advertising and applications

**Figure 1: Value of Western European digital communications market, 2010 (€bn)**



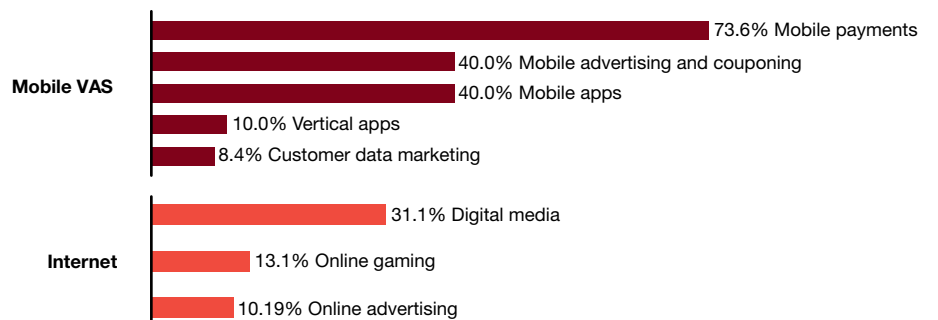
Source: PwC's analysis. Excludes public funding of television.

**Figure 2: Growth of value of the Western European communications market, 2010-2015 (€bn)**



Source: PwC's analysis. Excludes public funding of television.

**Figure 3: Rates of growth of digital communications market segments, 2010-2015 (% of CAGR)**



Source: PwC's analysis.

Mobile VAS has an overall CAGR of 16%. Spearheading that growth is mobile payments, growing at an explosive 73.6% compounded annually. Next come mobile advertising and couponing and mobile applications, with an impressive 40% CAGR. Vertical applications and customer data marketing follow.

In online services, digital media, including music downloads and e-books, will lead the growth with a CAGR of 31.1%. Online gaming follows, and then online advertising of all types, including display, search and classified.

Not surprisingly, these impressive growth rates are attracting intense interest from investors. When we look closely at the business models operating within the segments, though, we see a high degree of fragmentation and diversification, and operators not tending to hold a particularly strong position in any of them. For example, take mobile applications – an area into which mobile operators might have been expected to make inroads. The lion’s share of the revenues are actually being claimed by the application developers and the owners of the stores, not the communications providers.

Against this background, do operators have a real opportunity to participate in the growth within these segments, or are they trapped within the more traditional areas of the communications market? To answer those questions, we mapped the growth rates of the various segments of mobile VAS and online services markets against the potential for operators to build their position in those markets by making the most of their existing competitive assets.

Figure 4 shows the results of our analysis to 2015: the projected growth rate (the y-axis) of the high-growth segments we’ve been discussing and our estimate of the billions of euros of market value (the bubbles) of those segments. Our analysis shows online advertising to be the largest growth area in 2015. Despite its rapid growth, this segment will still be a relatively modest size in 2015 compared to the traditional revenues of fixed and mobile telecommunications.

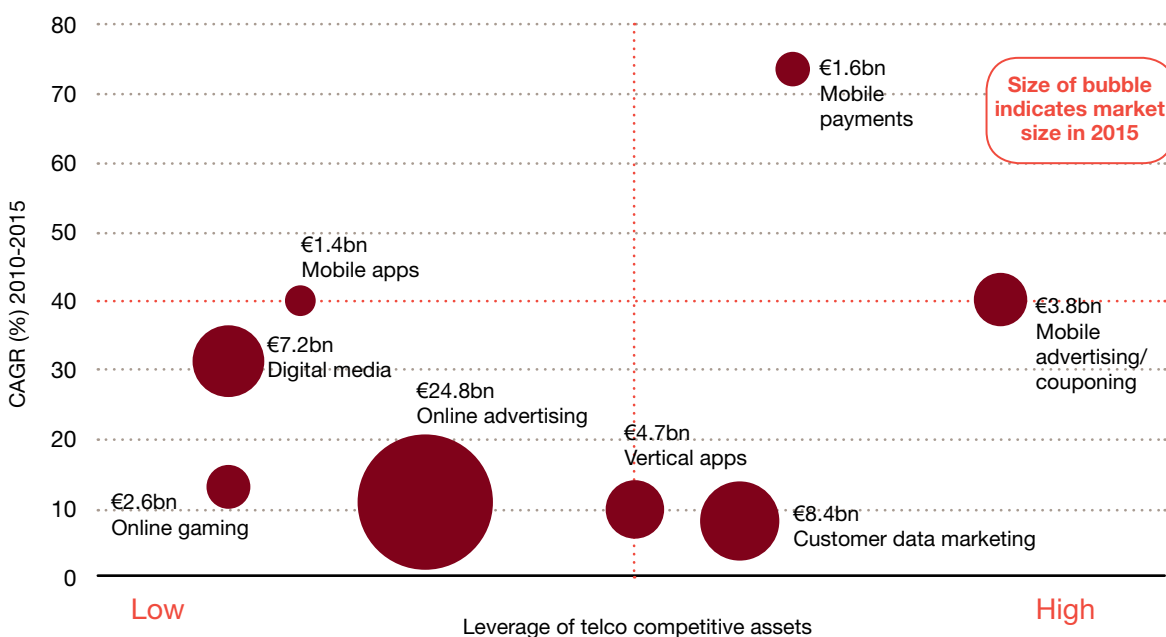
The figure also shows our assessment of the relative degree of fit between operators’ existing competitive assets and their ability to address each segment (the x-axis). The three main

competitive assets we identified for the purposes of this study are defined in the sidebar on the facing page.

Communications providers aren’t really playing in the fast-growing segments depicted in the figure. So the question we have to ask is, can they use their existing competitive assets to exploit each segment’s revenue potential? Or must operators build or acquire new assets to do so?

The further to the right a segment is located in Figure 4, the greater the opportunity for operators to go after it using their competitive assets. Those segments to the right of the vertical in the quadrant – mobile advertising/couponing, mobile payments, customer data marketing and vertical apps – are the segments we believe operators have the greatest opportunity to capture using their existing assets. In contrast are areas such as digital media downloads, online gaming, mobile applications and online advertising. Operators currently have a much more tenuous position from which to pursue those segments and probably would have to buy or build new assets to do so effectively.

**Figure 4: Operators’ potential to compete in Western Europe’s Internet and mobile growth segments, 2010-2015 (€bn)**



Source: PwC’s analysis. Excludes public funding of television.

## **Four steps to create a virtuous circle of growth**

Building on these findings, we believe in a potential ‘virtuous circle’ of growth for operators that would enable them to capitalise on the three segments on the right-hand side of Figure 4.

To initiate the circle – the first step – operators would create the ability to offer retailers and advertisers access to virtually 100% of the population by agreeing to pool the inventory of their respective customer bases. Clearly, such an agreement would require peer negotiation, collaboration and give-and-take, but we believe it would benefit all players in the industry.

The second step in creating the virtuous circle would be to commercialise and monetise this universal access by exploiting the access jointly with retailers and advertisers. They could employ services such as couponing and other types of commercial collaboration.

The third step would be for operators to use near-field communications (NFC) to participate in the payments value chain, which potentially could enable them to capture detailed information about transactions. This information would specify not just the location and the value of transactions, but also their type.

Finally, to complete the circle, operators would need to take the fourth step of reintegrating the wealth of captured information into their existing customer databases. They would need to be able to slice and dice the data – obviously, staying within the constraints of privacy regulations – and turn it into an asset they could market and sell.

## **The capability to develop new capabilities**

We believe operators can achieve the four steps, although – firstly – they’ll have to develop some additional capabilities. Perhaps most important will be new skills and different types of people, probably acquired from adjacent industries outside the

communications sector. Included will be some skills that typically don’t exist today within most operators, such as advertising sales people and financial-payment-technology specialists.

Secondly, the industry will need common standards in key service areas. Common standards can enable the required scale and can ease collaborating with adjacent industries on retailing and advertising platforms. A critical area here will be common systems, protocols and standards for NFC payments.

Thirdly, operators will need to develop new operating and charging models that strike the right balance between collaborating with each other at the business-to-business (B2B) level, and competing at the business-to-consumer (B2C) level. Achieving the balance will mean designing organisations and putting in place governance and career paths that enable and encourage companies to participate in the B2B organisations, while their shareholders are competing at the B2C level. On the commercial side, charging models will have to be put in place to encourage the maximum take-up of the B2B services and to stimulate the growth of mobile payments and mobile advertising – while yielding an appropriate economic return to shareholders.

Fourthly, operators will need the ability to manage and influence the complex, collaborative ecosystems and networks that deliver services in the adjacent industries they’re working with.

## **Operators’ competitive assets: the network and beyond**

Our analysis identifies three competitive assets that communications operators can use to go after high-growth service segments:

- 1. The addiction consumers have to their mobile phone.** The mobile handset is now firmly established as the device that a majority of the population has with them all the time. This asset may be a concept rather than a figure on the balance sheet, but it’s unique to operators in that operators are at least enabling these devices, if not designing them as well.
- 2. Network functionality.** Operators have the ability to know where people are, particularly because of their mobile networks. This asset means they can exploit that information along with other types of potential network functions, such as security and persona management.
- 3. Customers’ demographic information.** Operators can combine information about customers and their locations with customers’ demographic information. This asset enables them to customise, personalise and target relevant services and experiences.

## *Collaborate to innovate? Taking a leaf from Apple's book*

When we presented this study at PwC's 2011 Global Communications Forum, it triggered a lively debate about operators' ability to innovate, both within their own organisations and on a collaborative basis with others. The consensus was that operators, in general, have a culture that often fails to encourage both forms of innovation, thereby hampering their ability to gain revenues from new service areas.

A question that arose was whether operators' should make their organisational environments more conducive to internal innovation, or whether developing greater organisational agility to exploit other people's innovation would prove more effective. In this context, operators may be able to learn from Apple. Rather than attempting to commission and build all the applications in its App Store, Apple simply opened up an environment for others to do that.

Might there be an equivalent area in networks and systems that operators could open up collaboratively for other people's invention and innovation?

As Apple's experience emphasises, collaboration works best when all participants bring their core competence to the party. Historically, in collaborations between operators and non-operators, the operator typically has been the significantly bigger partner – and, often, the operator's functionally orientated organisation has hampered progress. The resulting need to involve internal areas such as network, information technology and finance with the external innovator has created rigidity and delays.

Instead, operators potentially could foster innovation and collaboration by creating a new commercial interface. That is, empower some employees to put themselves in the shoes of the smaller innovative collaborator and act as an interface, enabling the smaller player to work with the big one.

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*Operators need to innovate and collaborate more quickly and effectively than they've been able to in the past.*

Looking across all these capability requirements, we see a clear need for operators to innovate and collaborate more quickly and effectively than they've been able to in the past. What may be required is a cultural change to increase the extent to which innovating with third parties is encouraged and rewarded. As the accompanying panel on page 44 points out, operators may first need to learn some valuable lessons from other businesses.

The announcement in June 2011 by three leading UK mobile networks – Everything Everywhere, Telefónica UK and Vodafone UK – of a proposed mobile marketing and payments joint venture pointed clearly to the future. This collaborative alliance aims to create a 'one-stop shop' for mobile commerce, helping advertisers, retailers and banks reach consumers through their mobiles, and to give consumers a secure, NFC-enabled mobile payments wallet.

Forming the joint venture broke ground. And it implicitly recognises the need for collaboration – both between operators and with other players – if the industry is to claim its rightful share of value from the growing service segments.

***The final frontier: the operator's challenge of scale***

A final point our study raised is the question of how important scale will be in enabling operators to capitalise on the new high-growth segments.

On the issue of scale, an irony lies in the competitive dynamics operators now find themselves facing. Only two or three decades ago, communications providers in most countries were incumbents with a monopoly position. Then they went through various rounds of restructuring, deregulating, liberalising and re-regulating to create a competitive market. Today, operators are contesting new growth areas with players that have massive equity, such as Google and Facebook. Operators are effectively positioned as the upstart challengers to these recently-arrived but well-entrenched incumbents.

Given this situation, do the current market structures and dynamics provide a necessary or even a viable basis for competition? For example, it may be possible for operators to collaborate at the B2B level within a particular territory. But can they do that on a transnational basis, in the same way their monolithic, online players have shown they can do so easily in their particular markets? Or is a different approach required, such as letting the network flourish and taking part in it without attempting to aggregate or scale up the operations?

Such questions are for the future. For now, our study highlights several key considerations and imperatives for operators going forward. We've shown how quickly value is migrating and to which new service areas. To achieve anything greater than very slow growth, operators will need to target these new areas. While some of the target segments fit operators' competitive assets to a good degree, the fact is that operators also will need to develop some new capabilities if they're to pursue new segments effectively.

The message is clear. In the global communications market, the next generation of consumers will help accelerate the migration of value away from traditional connectivity and towards new value-added services. Operators can either accept their fate, or collaborate to fight back. We think they can find ways to choose the latter option.

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*The following publications, authored by partners at PwC, provide thought-provoking and informative discussions of interest to various segments of the industry. To obtain PDF files or hard copies of the publications, please visit the websites listed below.*

### **Technology Forecast: Transforming collaboration with Social Tools**

Business is inherently social, which is why collaboration and communications that scale are so fundamental. So why aren't enterprises making more effective use of social networking tools internally? Because most employees are already overwhelmed by distracting, irrelevant and numerous requests to communicate. This issue focuses on how to eliminate communication chaos, building social technology into enterprise workflow and examining the CIO's role in social enterprise design strategy and execution. To read or download the PDF file, please visit [www.pwc.com/techforecast](http://www.pwc.com/techforecast).

### **Global State of Information Security Survey® 2012**

According to the results of the *2012 Global State of Information Security Survey*, the majority of executives across industries and markets worldwide are confident in the effectiveness of their organisation's information security practices. Why are executives confident, and where have organisations made progress in addressing information security over the past year? What are the signs of vulnerability and weakness in security-related capabilities? And which priorities and opportunities should executives address now in order to prepare for the cyber threats ahead? To read or download the PDF file, please visit [www.pwc.com/giss2012](http://www.pwc.com/giss2012).

### **The new digital economy: how it will transform business**

Based on both quantitative and qualitative global research conducted by Oxford Economics and sponsored by PwC, AT&T, Cisco, Citi and SAP, this white paper identifies and delves into the six seismic shifts that are transforming the global playing field and outlines how they will affect companies in all industries. These shifts are:

- The coming of age of the global digital economy
- Industries undergoing digital transformation
- The digital divide reversing – moving from West to East
- The emerging-market customer taking centre stage
- Business shifting into hyperdrive – the pace of change
- Firms reorganising to fully embrace the digital economy

What should CEOs be doing to ensure their firms remain competitive in this disruptive environment? A set of imperatives and recommended actions are offered in the report. To read or download the PDF file, please visit [www.pwc.com/technology](http://www.pwc.com/technology).

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