



cutting through complexity

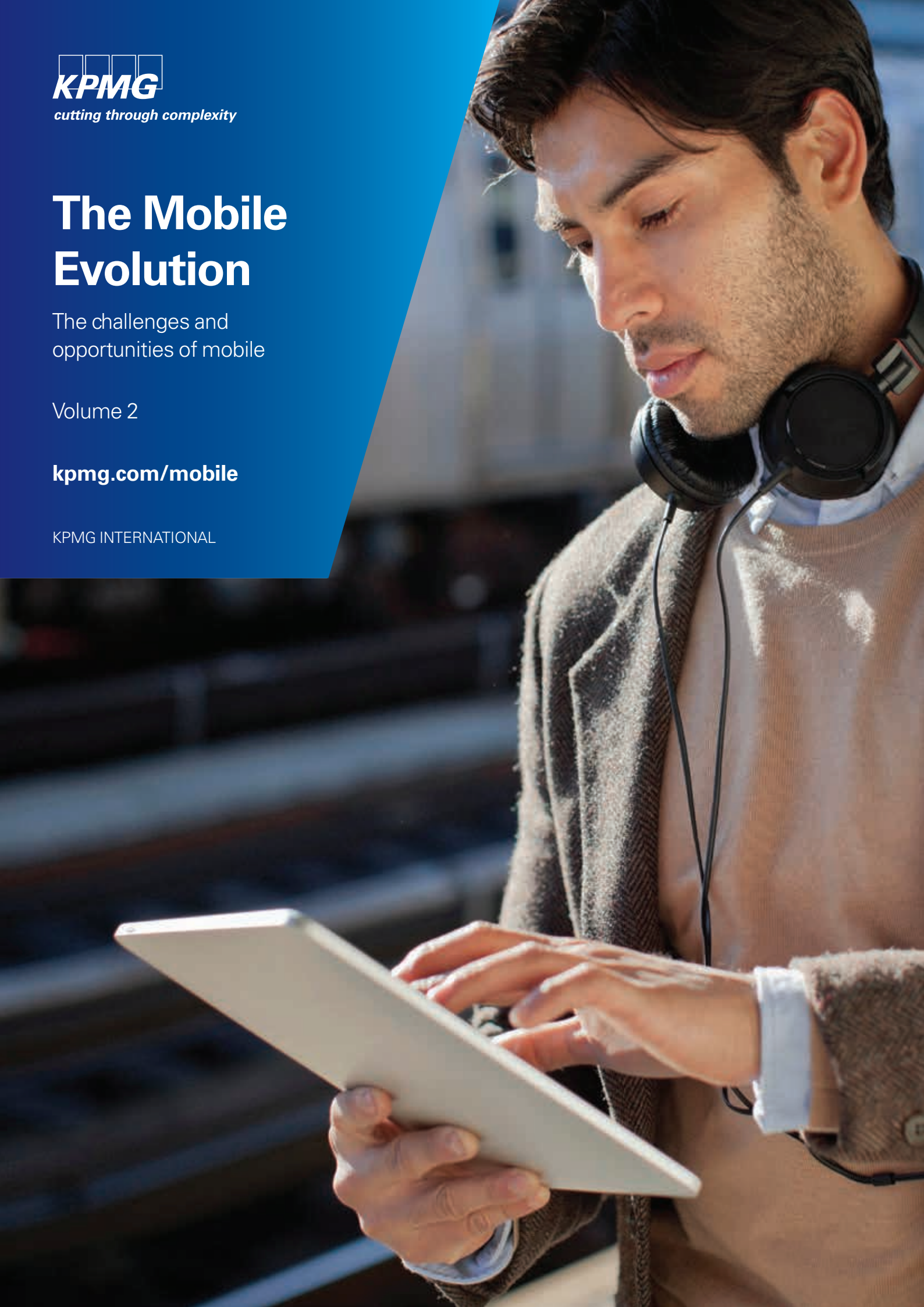
The Mobile Evolution

The challenges and opportunities of mobile

Volume 2

kpmg.com/mobile

KPMG INTERNATIONAL





Foreword

It's been a valuable and informative journey: over the course of 12 months, KPMG's *Mobile Evolution* article series has explored some of the challenges and opportunities that define this vast and transformative market.

We've addressed some of the difficult issues such as security, regulation and standards, and examined some of the opportunities that mobile is creating for the healthcare, automotive, financial services and media sectors. We've also tackled some of the key themes emerging in the sector such as partnerships, the Internet of Things and the future of mobile networks. And, throughout the series, we've sign-posted opportunities for technology, media and telecommunications organizations currently working to enable the mobile evolution.

A journey started

As we noted in the Foreword of *The Mobile Evolution: Volume 1*, the most important lesson to come from the series is that success in the mobile marketplace takes much more than financial investment. It requires a strong (and realistic) understanding of the landscape and environment, a comprehensive and achievable vision for the future, willingness and capability to learn from the mistakes and successes of others, the open-mindedness to work with competitors and appropriate resourcing to turn change into opportunity.

We also recognized that this would not be easy for business leaders. They will need to balance pace against prudence to ensure that their mobile strategies support the long-term goals of the enterprise and that investments are aligned to the needs of the business. In many cases, we suggested, the adoption of mobile will demand significant transformation as enterprises evolve their business models and enhance their operations in order to take full advantage of the benefits that mobile offers.

Collaboration is key

While each of the articles touched on critical issues for the mobile evolution, we also recognize that these issues and opportunities do not exist in a vacuum. Indeed, they are intricately intertwined and each has an impact and influence on the other. With this in mind, we have grouped articles into two digestible compendiums. This edition, *The Mobile Evolution: Volume 2*, brings together the second half of the series and provides an overview of some of the key themes emerging in 2013.

We hope that the articles and insights provide valuable guidance to business leaders as they develop a clearer understanding of the mobile marketplace.

On behalf of KPMG's network of mobile professionals, we would like to express our gratitude to all of those who participated in this series. In particular, we would like to thank Maciej Kranz, Vice President and General Manager of the Connected Industries Group at Cisco Systems, and Dan McDuffie, CEO of Wyleless, for their valuable contributions to our feature articles on the Internet of Things.

We encourage you to read the full series online or to download *Mobile Evolution: Volume 1 and 2* at kpmg.com/mobile. Alternatively, simply scan the QR code below. If you would like to discuss any of the articles in this series – or other mobile challenges facing your organization – please contact your local KPMG member firm.

To read the full series online please visit www.kpmg.com/mobile or scan the QR code below:



Sanjaya Krishna
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Executive summary



As this series clearly demonstrates, mobile technology is evolving at unprecedented speed (and often with disruptive implications). But it is also clear that the wide-spread adoption of mobile holds significant opportunity for all types of organizations.

For traditional enterprises, mobile offers a clear path to new revenue opportunities and business model transformation that – in many cases – will create unprecedented competitive advantage.

For new market entrants, mobile has emerged as a potential ‘golden ticket’ that reduces the cost of entry, levels the competitive playing field, and allows innovative ideas to become billion dollar businesses.

Looking back over the last six months of *The Mobile Evolution* series, three main trends seem to have emerged that are already having an immediate impact on organizations both inside and outside of the mobile sector.

The drive towards mobile-enabled business transformation

As **Tudor Aw, KPMG in the UK**, points out in his opening article on page 4, it is no longer an option for organizations to sit on the sidelines or take a cautious approach to mobile; today's businesses must get ahead of the mobile curve to survive.

However, he notes, businesses will likely struggle to manage a change agenda that – on the whole – is no longer being led by enterprises but by consumers and end-users. "If businesses hope to survive this market transformation," he says, "they will need to devote serious and senior

resources to ensuring that they are leading rather than lagging the mobile charge."

Yet even those that have developed their mobile strategies are struggling, particularly with implementing their plans in a constantly-shifting environment. According to **Egidio Zarrella, KPMG in China**, mobile transformation can be an exceedingly complex and challenging project to undertake. But, as he outlines in his article on page 6, with the right approach and preparation it is certainly manageable.

The emergence of new business models and opportunities

Around the world and across almost every business sector, the adoption of mobile is creating new opportunities for organizations.

For example, as **Alfred Koch, KPMG in Germany** suggests in his article on page 8, both mobile network operators (MNOs) and technology firms could be tapping into new revenue streams and turning risk into opportunity by developing smart mobile security solutions which can either be placed over the network or sold on to other organizations and clients.

MNOs in particular are finding new opportunities to improve their bottom line by entering into network

sharing agreements – often with competitors – to reduce operational costs and improve focus on customer service, as noted by **Bart Bastiaans and Lars van Zomeren, KPMG in the Netherlands** on page 10.

But the impact on business models has not been limited to telecommunications and technology organizations.

Indeed, many industry sectors are now struggling to adapt to new consumer trends forced on them by the rise of mobile and – as **Paul Wissmann, KPMG in the US**, suggests on page 12 – nowhere has this had a more disruptive effect on business models than in the media sector.

The rise of machines and the Internet of Things

While mobile may be having a distinct impact on the way people interact with their environments, it will be the ability to connect and interact with machines that may hold the biggest promise for the mobile sector and businesses in general.

In a pair of feature articles on pages 14 and 18, **Sanjaya Krishna, KPMG in the US** talked to executives at **Cisco** and **Wyless** about M2M and the 'Internet of Things' and how these trends are creating new opportunities for organizations in almost every industry sector.

But, as **Maciej Kranz of Cisco** noted, some hurdles still remain. "This is one of those areas where the entire industry needs to come together to solve some of the big challenges," he argues on page 14.

Dan McDuffie, CEO of Wyless, agreed. "The M2M market is very fragmented," he noted. "Those organizations investing in M2M are really struggling with bringing some simplicity to the technology."

One industry sector that is getting it right – and seeing significant growth as a result – is the automotive sector. As **Mathieu Meyer, KPMG in Germany** points out in his article on page 22, cars are quickly becoming more and more like mobile devices thanks to smart partnerships between operators, tech firms and auto OEMs. Other industry sectors could learn a thing or two from their experiences.

So what is the key take-away for those operating – or seeking to enter – the mobile marketplace? According to **Sanjaya Krishna's** concluding article on page 24, it is that – for mobile to have a truly transformative effect – stronger partnerships will need to be formed, cooperation both

within the industry and between industry sectors will need to grow, and collaboration across the ecosystem will need to flourish. What will remain to be seen, he suggests, is which players will take advantage of the opportunities being created by mobile and which will fall behind.

A brave new world



By
Tudor Aw
Head of Technology
KPMG in the UK

There should be little doubt that mobile is a game changer. It is a rare business that is not in some way impacted by the opportunities and risks presented by mobile – whether that be new channels to market, creative ways of interacting with customers and engaging employees, or opportunities to drive cost efficiencies for businesses. Indeed, it is hard not to be dazzled by massive potential represented by mobile and, over the past five years, we have been inundated by news stories advocating the virtues of mobile. If all the hype can be believed, it seems clear that mobile is already taking over the world and dominating the lives of both consumers and the enterprise.

The statistics are certainly compelling: mobile subscriptions have increased by 45 percent over the past four years and – by the end of 2011 – almost 85 percent of the world's 7 billion people had access to a mobile device¹; by the end of 2010, smartphone shipments had overshadowed PC shipments, making mobiles the *de facto* computing platform of choice²; and between 2008 and 2011, revenues for mobile apps and advertising grew by 153 percent (CAGR) to reach GBP12 billion.³

Will benefits materialize?

While all this may be true, when you look back at all the hype that surrounded the launch of 3G for example, it would be easy to argue that – in many ways – the progress that we have experienced in mobile to date does not match up to the innovation that was promised.

And as 4G/LTE begins to take hold, many are left wondering if today's projections will indeed materialize, particularly given the wild predictions now circulating: boosters paint a picture of populations using their phones for virtually everything, anywhere and at any time; from experiencing augmented reality shopping and conducting mobile video conference calls through to mobile payments and real-time mobile business intelligence tools.

Dialing up reality

Certainly, there are pockets of innovation that mark the path to this 'brave new world'. But the reality is that many of these developments are still not mainstream (some have yet to be perfected and commercialized), leading many to believe that we are still some way off from mobile becoming the truly disruptive technology that observers predict.

Depending on whom you ask, this belief can be attributed to a range of factors. Many businesses are reluctant to invest in a channel that they believe will cannibalize their existing business models. Others point to variable network quality, inter-operability

challenges and complex technology roll-outs. And almost everyone agrees that security and privacy concerns are slowing the pace of adoption and need to be quickly addressed.

As a result, we have seen some of the most innovative advances made – not by the traditional global powerhouses and industry stalwarts – but by relatively new start-ups such as Square, Shazam and Twitter.

A changing balance of power

What is plainly clear is that the pace of change and the opportunities created by mobile are unstoppable. For businesses, the simple reality is this: it is no longer an option to sit on the sidelines or take a cautious approach to mCommerce, businesses have to strive to get ahead of the mobile curve to survive. The 'consumerization of IT' will mean that the next wave of mobile business models is being driven by users – whether in a consumer or enterprise context. And the dramatic rise in BYOD (bring your own device) – employees using their own devices on office infrastructure – is testament to this shift. Change is therefore no longer being led by enterprises but by consumers and end-users, and they are dictating the mobile business agenda.

The bottom line is that those enterprises that are either not willing or not able to change their business models to meet this new mobile paradigm will almost certainly miss out. Moreover, business leaders must recognize that the pace of technological innovation and mobile adoption is only just starting to pick up speed and is set to accelerate massively in the next few years. If they hope to survive the market transformation – businesses will need to devote serious and senior resources to ensure that they are leading rather than lagging the mobile charge.

There should be no doubt that mobile is finally about to take off into the 'brave new world'. The real question is whether today's businesses are prepared to survive the ride.



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Security and privacy concerns are slowing the pace of #mobile adoption and need to be quickly addressed

Tudor Aw

Head of Technology
KPMG in the UK



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Turning mobile strategy into reality



By
Egidio Zarrella
Partner,
Clients and Innovation
KPMG in China

Developing a mobile enterprise strategy is one thing; implementing it successfully is another thing entirely. Indeed, while many enterprises are clearly awakening to the massive benefits that mobile enablement offers, many seem to be struggling with exactly how to move from strategy to reality.

Not just a technology problem

In part, this is because most organizations are burdened by the technology status quo: complex legacy systems, disparate software platforms, fixed assets and costly infrastructure all conspire to slow mobile adoption and create complexity. But while many people – both inside and outside of the IT department – believe that mobile enablement is, first and foremost, a technology problem, the reality is much more complex.

For one, process and culture change are key. As I travel around Asia talking to executives about their mobile strategy, I am frequently struck by the fact that few – if any – have fully anticipated the need for cultural and process change as a prerequisite to mobile success.

So while the choice of technology and selection of software is certainly an important decision in the mobile evolution roadmap, in my opinion, executives would be much better served by focusing their efforts on creating the right culture and catalyzing internal change rather than getting bogged down in vendor and platform selection decisions.

In fact, in today's marketplace, the reality is that many of these 'pure technology' integration challenges can rather easily be solved by the vendors themselves, many of whom have been working diligently to transform themselves into mobile integrators: SAP, Oracle, Microsoft and others are all rebranding themselves as mobile enterprise enablers.

And with projections that a new 'Mobile Backend-as-a-service' market may be worth some USD7.7 billion by 2017,⁴ it is not surprising that legions of smaller and newer vendors have developed somewhat compelling integration or 'middleware' solutions aimed at capturing this market.

Preparing for the journey

So if technology is not the problem, what is? For many organizations, it is a matter of skill set and resources. In my experience, mobile strategies are – more often than not – developed with little real understanding of

whether the organization is either capable or prepared to execute the strategy. Few have undertaken a thorough assessment of what processes and operational models must be changed, terminated or created to achieve their objectives; fewer still have a strong understanding of their internal capabilities and capacity for change.

In their quarterly evaluation of enterprise mobility services providers, Forrester notes that companies are increasingly starting to recognize that they need help with their enterprise mobility strategy and are therefore turning to mobility service providers to help design, develop and support their mobile applications.⁵ Mobile operators have much to gain too: Exact Ventures (an analyst firm focused on technology market intelligence) predicts that enterprise mobility services may grow into a USD100 billion for US and Western European operators alone.⁶

Taking the first steps

I'll be the first to admit that mobile transformation can be an exceedingly complex and challenging project to undertake. But – with the right approach and preparation – it is certainly manageable. When we work with our clients to develop mobile strategies, we always try to simplify the process down to three key questions: Where are you now, where do you want to go and how do you want to get there?

Knowing where you are now requires a deep understanding and assessment of not only an organization's technology assets and environment, but also the processes and culture that underpin it. Identifying where you want to go demands executives and business leaders have a strong vision for the future and clear insight into how mobile will enable the organization to achieve that vision.

The trick is to then develop a roadmap that effectively overlays the required cultural, process and technology changes against the capabilities and capacity of the organization in order to create a step-by-step plan of action for transformation.

Then all that remains is to get started.

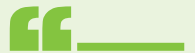


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Egidio Zarrella

Partner,
Clients and Innovation
KPMG in China



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Turning mobile security risk into revenue

By
Alfred Koch
Director
KPMG in Germany



There is no doubt that security is one of the greatest challenges – and barriers – facing the mobile marketplace today. But mobile security also represents a massive opportunity, particularly for telecom operators and technology providers.

The reality is that – as consumers and enterprises become increasingly reliant on mobile technology – the demand for mobile security solutions has spiked. Consumers are worried that all of their personal data that now resides on their smartphones – contacts, bank account numbers, emails and so on – will fall prey to identity thieves and crooks. The risk for corporations is higher still as mobile devices become integrated into the office environment and start to be used to access sensitive company information, customer records and valuable intellectual property.

As a result, ‘trust’ has become the byword of the mobile era. Consumers need to trust that their data and information is being kept securely when using mobile devices and services, while corporations need to trust that their service providers, technology environments and employees are adhering to their security protocols.

Creating opportunity from challenge

Herein lies the opportunity for telecom operators and technology providers. Working in partnership with Forrester Research, KPMG International examined the current mobile security market and looked at some of the key indicators for future success in this area.

We found that there are significant opportunities for telecom and technology organizations to achieve growth from mobile security. Indeed, there are already a number of telecom and technology companies making strong businesses out of mobile security solutions and creating new and sustainable revenue streams.

In the resulting report, Mobile Security: from risk to revenue, some of KPMG’s telecom and technology leaders from around the world took a look at these new opportunities and offer some of their own perspectives based on their experiences in the market.

Telecom operators leverage their position

Given the trend towards more commoditized data volume businesses, it seems inevitable that – regardless of how much volume mobile creates – telecom operators and carriers will need to differentiate themselves and renew their businesses to survive in longer-term.

We believe that those operators and carriers that can build and deploy smart security services built on top of their data traffic will not only deliver a superior and secure experience to their customers; they will also generate new and sustainable growth opportunities and revenue streams. Some of these opportunities include:

- Delivering personal ‘trust’ services to consumers: Includes targeted security

services such as personal fraud watch and management, consumer app risk management and personal trust management.

- Developing consumer identity management services: Operators and carriers can combine location information with detailed customer information to become third party consumer identity providers (IdP).
- Providing device and application management services: This would combine the benefits of consolidated telecom and mobile management billing with single-sourced support service and simplified vendor management.
- Offering mobile security services: The shift away from fixed infrastructure opens a valuable opportunity for carriers and operators to help organizations manage their security environment.

Unique technology solutions to help secure the mobile marketplace

Mobile is a veritable hothouse for technology innovation. What’s more, it’s still a fairly level playing field which means that small and nimble boutique firms with an interesting technology alternative to offer can compete head-to-head with more established players.

While the mobile security field is still somewhat nascent (it has, after all, only been 6 years since the commercial introduction of the first smartphone), the report found that there are a number of innovative security technologies and services rapidly emerging on the stage, creating new opportunities for small tech players and traditional stalwarts alike.

- Developing location-based security services: Adding real-time location information to security services offers security leaders greater context which, in turn, contributes to the robustness of decision making.
- Delivering enterprise-integration-as-a-service: There is a growing need for technology service providers that are able to integrate mobile applications into enterprise back-end services through a standard set of APIs (application programming interface), SDK (software development kit) or app-wrapping service.
- Offering secure content services: This includes the ability to offer separately hardened, separately certified, and vertically focused content services for critical and confidential business content.
- Deploying device and application virtualization technologies: Virtualization



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#Telcos and tech firms will need to rethink their value proposition and redefine their relationships with their customers to truly capitalize on this new market.

Alfred Koch

Director
KPMG in Germany



Mobile security business models are only just emerging and the field will undoubtedly open up a host of new opportunities for telecom and technology companies in the future.



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technologies look to provide virtual segregation, deployment flexibility, and seamless user experiences to help effectively segregate corporate content from personal data on mobile devices.

- Creating hardware-assisted security assurance technologies: Hardware-based security innovations, such as general purpose secure co-processors, and those that support encryption and biometrics, can add trust and verifiability in the mobile transaction value chain.

Too good an opportunity to waste

True; mobile security business models are only just emerging and the field will undoubtedly open up a host of new opportunities for telecom and technology companies in the future.

But given the speed of the technology’s adoption and the increased sensitivity of the traffic, we believe that industry leaders would be wise to start considering how they might transform their organizations to serve this new and growing market.

The future of mobile networks



By

Bart Bastiaans and
Lars van Zomeren

KPMG in the Netherlands

These are not easy times for mobile network operators. Margins have been squeezed by increased competition (particularly from 'free' internet-based options), revenues from voice and SMS are on the decrease and capital costs seem set to explode in many countries as operators and regulators move towards 4G LTE.

Not surprisingly, most mobile operators are now keenly focused on reducing both capital and operational costs. And while some continue to make good progress eking out savings through traditional organizational cost reductions and restructuring, others are taking the opportunity to fundamentally rethink the way they develop and manage their mobile networks.

New models emerging

Based on recent events and announcements in Europe, it seems that the sector is in the midst of breaking into three distinct business models:

- **The Private Access Network Model.** This remains the most common model where operators own their network assets and infrastructure. In markets where network quality and reach is a significant differentiator for operators, this model offers private networks – particularly those already established – with a strong competitive advantage. However, in markets where networks are no longer seen as a differentiator, private access network models most often result in high capital costs with little added value.
- **The Shared Access Network Model.** In this model, assets are shared between competitors to reduce costs and increase efficiency and scale. In some cases, only the passive assets (such as towers but not antennas) are shared while in other cases entire active mobile networks are shared and jointly managed – often through Joint Ventures. The rise of Everything Everywhere in the UK and NetWorks! in Poland (both operated as a joint venture between Orange and T-Mobile) shows that this model can successfully reduce costs while providing a competitive platform on which to differentiate.
- **The Mobile Virtual Network Operator Model.** A number of operators have started to evolve towards a model where no physical network assets are owned but rather leased from other operators/competitors. Strategies vary from the ‘full MVNO’ where everything outside of the network – such as billing and

customer service – remains with the operator, through to the ‘light MVNO’ that only takes on the marketing, sales and distribution. In the Netherlands, for example, a number of MVNOs have emerged to challenge the incumbents including Rabo Mobiel, Hema and Aspidier.

Outsourcing

Although the sharing option can be regarded as an alternative to outsourcing, often it is better considered as an intermediate step in a process of continuous improvement. After the sharing partners have merged their operations and have reaped efficiency gains themselves (by streamlining operations and existing contracts), the option for outsourcing is still open.

An evolution already underway

Already, we are seeing promising signs that these new models are delivering value and cost savings for mobile operators. For some, sharing is also done in other areas such as procurement, with Deutsche Telekom and France Telecom-Orange’s as a good example. Their shared procurement joint venture (BUYIN), aims to deliver cost benefits by pooling purchasing activity in handsets, mobile communications kits and large parts of their fixed network and service platforms.

Short-term pain leads to long-term gain

As with any business model transformation, the move towards shared assets and processes will have significant implications for operators. Consideration must be given to the operational impacts (ensuring that network quality remains high), commercial effects (maintaining focus on customer needs), organizational change requirements (such as the restructuring of business units), as well as regulatory aspects.

But while the transformation to new models will undoubtedly be difficult for many operators – sacred cows will need to be closely evaluated and hard decisions will need to be made – it is clear that network sharing is already delivering significant cost savings and competitive advantages for operators around the world.



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Bart Bastiaans and
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Anywhere, anytime: what mobile means to the media sector



By
Paul Wissmann
Head of Media &
Telecommunications,
KPMG in the US

The proliferation of mobile devices has created a dramatic shift in the world of digital media. Smartphones and tablets are having a dramatic impact on the digital media experience. They're creating a new world in which content is available on-demand and can be streamed anywhere and anytime.

It's this immediacy of online content that is the game changer for the media sector and, combined, these forces are changing the way people consume television, music, movies and news.

KPMG International's recent Digital Debate survey of 9,000 consumers in nine countries revealed that 70 percent feel the choice of digital content is broader than that offered by traditional media. In developing countries, adoption is even more profound: a recent Nielsen report found 39 percent of China's mobile subscribers and 43 percent of Brazil's had viewed mobile video in one 30-day period. The writing is on the wall for established media companies – both content owners and content distributors. Over the next several years, they will have to adapt to this increasingly mobile world. The question is, will they define that future or will it define them?

Lessons learned

Newspapers experienced this new reality most painfully of all. For years, newspaper advertising revenues have been cannibalized by the internet. As mobile devices took off, the impact became even more acute as readers accessed their news anywhere, anytime they want. Many newspapers have tried to stem the tide by instituting pay walls, but the revenue from digital subscribers is like trading dollars for pennies.

The record business experienced a similar disruption when Apple's iTunes* came on the scene in 2001. Apple* makes about 30 cents on the dollar as an aggregator for the music industry – and with 25 billion songs downloaded as of February 2013 that's a great business. The record companies take on most of the risk of signing and promoting artists, while Apple digitizes the content and presents it for sale. Apple continues to dominate the music aggregation business, facing off against the likes of Amazon for downloadable music, and upstart streaming services like Spotify and Pandora.

Now playing

In the equally venerable world of film and television we're seeing a similar scenario take shape. Content owners and their distributors – cable companies and satellite providers – have lived in relatively peaceful co-existence, each dependent on the other. While online streaming services like Netflix have shaken the landscape, content owners have been quite satisfied to license their media for online consumption and create a nice incremental revenue stream, that is as long as it is incremental. They like the current model because there is inherent risk in change, and they're dependent on the existing

ecosystem to bring in enough revenue to justify the cost of their content.

If online streaming is simply additive, content owners will continue to reap the rewards of yet another channel to market. There is a potential dilemma, however: if consumers start to move increasingly towards streaming through mobile devices – as evidence suggests that they are – content owners could lose some very profitable revenue streams.

Meanwhile, for the traditional distributors and aggregators in the cable and satellite business, online streaming offers a method for going around their infrastructure. The big question for that group is: how do we maintain our position when online availability can shut us out?

Direct to consumer?

Content owners should be concerned about any new model that lowers the pricing of their content. They also need to take a serious look at creating new revenue opportunities by developing a direct to consumer approach that gives them a bigger share of consumer spend on their product than the current model does. But how do you do that?

Hulu (a joint venture of NBCUniversal, Fox, and Disney) offers one such example by streaming on-demand content from several major studios and networks. But gaining consensus among a group of highly competitive industry players has proven difficult. Case in point: CBS continues to be the key Hulu hold-out, only delivering classic or cancelled shows through the platform.

The customer will decide

Ultimately, all roads lead to the consumer. They will drive how content is consumed, and the market will have to adapt to that new reality. Content companies need to plan for the future and not assume they have control. There is both upside and risk in changing to meet consumer demands for content consumption. Consumer preferences may influence content providers, distributors and aggregators to the point that they have to take significant risks in order to stay competitive. Then the question becomes: do they want to sit in the same position they are now, or take advantage of the change and get a bigger piece of pie?

The key is to devise a plan that keeps as much profit in their pockets as possible. Cooperation within the ecosystem will be vital to creating a direct-to-consumer model, or a new relationship between content owners, distributors and aggregators or – most likely – some combination of both.



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It's the immediacy of online and #mobile content that is the game changer for the #media sector and, combined, these forces are changing the way people consume television, music, movies and news.

Paul Wissmann

Head of Media & Telecommunications, KPMG in the US



The writing is on the wall for established media companies – both content owners and content distributors. Over the next several years, they will have to adapt to this increasingly mobile world. The question is, will they define that future or will it define them?



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The Internet of Things: how Machine to Machine (M2M) communication is changing the mobile environment



By
Sanjaya Krishna
KPMG in the US and
Maciej Kranz
Cisco Systems

As the mobile ecosystem moves from connecting people to connecting machines, **Sanjaya Krishna**, a Principal and Digital Risk Consulting Leader at KPMG in the US, sat down with **Maciej Kranz**, the Vice President/General Manager of the Connected Industries Group at Cisco Systems – one of the pioneers and leaders of the Internet of Things (IoT) movement – to find out where this market is going and how MNOs and businesses may take advantage of this new and emerging area.

The taxonomy of IoE, IoT and M2M

Internet of Everything (IoE) is the intelligent connection of people, processes, data and things to the internet, in a way that creates new opportunities and efficiencies.

Internet of Things (IoT) is a sub-set of IoE. It is the latest of many technology trends that together create IoE. IoT is focused on creating value through the flood of networked sensors, devices and things that are rapidly being connected to the internet.

The term **Machine to Machine (M2M)** has been in use for more than a decade, and is well-known in the Telecoms sector. M2M communication had initially been a one-to-one connection, linking one machine to another. But today's explosion of mobile connectivity means that data can now be more easily transmitted, via a system of IP networks, to a much wider range of devices.

Sanjaya Krishna (SK): What is the promise of IoT/M2M communications?

Maciej Kranz (MK): M2M communications – or the broader category of ‘the Internet of Things’ – is changing the way many industries go to market and operate. Pretty much everything these days is being connected. At Cisco, we have helped organizations connect trains to system controls; car manufacturers connect their products to networks; oil and gas companies connect oil rigs to command centers, and healthcare devices to diagnostic data centers.

I truly believe that this type of connection will have a much more profound impact on how businesses operate than the original internet did more than two decades ago. But today, we believe that only 0.2 percent of all devices that could be connected actually are, leaving 98.8 percent of devices yet to be connected. So this leaves a huge gap between what could be accomplished and what is already underway, and of course, that presents enormous opportunities.

SK: What is the opportunity for mobile network operators in all of this?

MK: M2M will fundamentally change how mobile network operators (MNOs) and service providers operate. We are already seeing some MNOs move towards offering managed services within individual verticals in order to offer a more end-to-end solution to their clients. But the emerging market has also created new opportunities for specialist vendors – such as Wyless (a leading provider of global M2M wireless connectivity solutions and managed services) and Axida (an award-winning home delivery software specialist in the UK) – who are bringing new value propositions to the market by offering these kinds of service creation capabilities.

To really capture this market, we think that MNOs will need to invest in some vertical expertise in order to develop solutions that align to the needs of each vertical industry that they plan to service.

On the one hand, oil rigs and vending machines are far less fickle about service provision than humans, meaning that – once a deal is struck – machine clients are often much more ‘sticky’ than consumers. But M2M also offers MNOs new opportunities to deliver higher value to their clients through the provision of more sophisticated solutions that, for example, combine customer analytics with inventory and maintenance schedules to ensure the right products are available at the right time.

SK: And how is Cisco helping to enable the movement towards wider connectivity?

MK: We believe that we have two important roles here. The first is to provide an effective infrastructure platform that enables the creation of stacks that combine connectivity, computer storage, data aggregation and even data policies. And – since there is nobody in the industry capable of creating these complete stacks on their own – we work closely with all key players in the industry in this regard.

We are also working at providing interfaces at the device level, at the network layer and at the platform layer so that we can integrate with other partners, whether they are specialized industry-specific partners or horizontal partners. Our strategy here is essentially to build lines of business relevance and architectural differentiation by providing directly relevant solutions with our partners based on horizontal platforms.

SK: What is slowing adoption of M2M technologies today?

MK: I firmly believe that this is one of those areas where the entire industry needs to come together to solve some of the big challenges such as the setting of standards, the development of business models, the management of some of the social implications and even the creation of new capabilities and new job functions.



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“Machine to machine communication will have a bigger impact on business than the original launch of the internet.” Maciej Kranz, Cisco

Maciej Kranz

Vice President/
General Manager of the
Connected Industries
Group at Cisco Systems



Today, we believe that only 0.2 percent of all devices that could be connected actually are, leaving 98.8 percent of devices yet to be connected. So this leaves a huge gap between what could be accomplished and what is already underway, and of course, that presents enormous opportunities.



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Much of the current activity underway in many industries is focused on vertical integration through proprietary end-to-end systems. Ultimately, we believe that the winners will be defined by how well they embrace the openness that will be required to achieve success in this area.

That being said, there is certainly a movement underway to bring greater collaboration to the ecosystem. This year, for example, Cisco will host the inaugural Internet of Things World Forum, which will unite leaders and innovators together to create a framework for collaborative industry innovation and market adoption that, in turn, should help accelerate the impact of the Internet of Things on the global economy, society and the environment.

SK: Are clients seeing a lot of value come from their IoT strategies?

MK: It really all depends on how well considered the use case is for connecting everything in that sector. For example, if you are running a car assembly line and truly understand the role that systems play in creating tangible benefits, you can likely reduce costs by around 20 percent and increase uptime – a key measure of manufacturers – by up to 75 percent.

The key will be in developing a business case that provides obvious benefits to providers and consumers. Smart meters in parking, for example, are a clear benefit to cities since parking is an important source of public revenue. For citizens and customers, smart meters in parking means that when you go out, your vehicle can find the closest parking spot, guide your car to it and even pay for it without any intervention from the driver. A clear win-win for everyone.

But other industry sectors are still working to articulate the benefit to customers and end-users. I think that everyone can intuitively understand that connecting medical diagnostic devices to a central monitoring system is a smart strategy, but so far there are few business models that clearly demonstrate what the actual return is on that investment. Clearly, much

of this will soon become apparent as more organizations start to explore the M2M/IoT space.

SK: And what impact will all of this have on the traditional CIO or CTO role at those companies adopting M2M technologies?

MK: I think this is a really exciting time for the technology functions. As more and more operations are connected to the network and automated, the role of the CIO or CTO will certainly start to transform. I think that the CIO or CTO of the future will need to have an equal mix of operational and technological capabilities in order to ensure the technology they are purchasing and integrating meets the needs of the business.

Ensuring data security, in particular, will become a key function of the technology function which – whether led by the CIO, CTO or CISO (Chief Information Security Officer) – will require not only a holistic view of the network but also a more consistent security architecture.

SK: Obviously, data security and privacy are already top of mind for technology companies and MNOs, but M2M brings other security challenges as well, right?

MK: Absolutely. Take the movement towards a more connected car. In five years or so, cars will start communicating to each other which will reduce accidents, enhance traffic flow and may eventually eliminate rush-hour gridlock. In this scenario, however, likely the bigger concern for security officials is preventing hackers from hijacking the car controls or feeding the computer fake data to cause an accident.

Another example is the Stuxnet virus. It was a wakeup call for the industry and showed that security would really need to be front and center for M2M to really enjoy widespread adoption.

SK: The rapid growth in M2M means a lot of data moving around the internet. Can our current infrastructure handle this rapid increase in usage?

MK: Basic connectivity applications (connecting vending machines, for example) can be handled using current networking architectures and paradigms. But when you start implementing more data intensive applications, such as data aggregation from sensors in oil-rigs or video analytics, the traditional network paradigm needs to evolve in order to meet the demand.

Simply put, we believe that you can't always take the data to the analytics. More often than not, you will need to take the analytics to the data in order to process and react to the data in real-time.

SK: So, like cloud and social media, M2M seems set to be yet another fundamentally transformational technology.

MK: It will be truly amazing. We recently did some research that found that the Internet of Everything's 'value at stake' – that is, the amount of private sector activity up for grabs, either through shifts or value creation – is predicted to be USD14.4 trillion over the next 10 years. Clearly, M2M is about to radically transform today's business operations into dynamic, intelligent, data driven and innovative business processes.

Sticking to the vehicle example, just think about the fact that around 10 to 15 percent of a North American's commute time is spent in traffic, or that – at any time – somewhere between 7 to 12 percent of traffic in North American cities is made up of people looking for parking, or that 10 to 17 percent of fuel is wasted in cities by drivers sitting at red lights when there is no cross traffic. And then just think of all of the productivity, environmental and quality of life benefits that IoT could offer in that situation. It's going to be big business.

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The Internet of Things: the evolving market for Machine to Machine (M2M) managed services



By
Sanjaya Krishna
KPMG in the US and
Dan McDuffie
CEO of Wyless

As we continue to explore the ongoing evolution of M2M on the technology, media and telecoms sectors, Sanjaya Krishna, KPMG in the US's Digital Risk Consulting Leader, spoke to Dan McDuffie, CEO of Wyless – a leading provider of global M2M wireless connectivity solutions and managed services – to find out how the M2M managed services sector is evolving. This article complements our previous piece on The Internet of Things (IoT)/M2M where we spoke with Cisco Systems about their view of the fast-moving M2M space.

Sanjaya Krishna (SK): Tell me a bit about Wyless' approach to M2M managed services and the role your company plays in the M2M value chain.

Dan McDuffie (DM): We see ourselves as offering a smarter approach to the challenges of M2M. We understand that every application has its own unique requirements and that customers need access to a wide range of highly-specialized services backed up by dedicated support.

We built our company on the realization that for the vast majority of customers, these needs cannot be met by the traditional mobile network operators (MNOs). No single large operator is capable of providing sufficiently flexible services or the high levels of technical expertise and support required to successfully deploy and manage innovative M2M applications.

That's why, over a decade ago, we developed a multi-carrier global wireless data network, along with advanced management software and a comprehensive suite of M2M services. We underpinned this with dedicated customer support teams and technical experts. And now, we offer a seamless end-to-end solution that currently powers some of the world's most advanced, scalable and reliable M2M applications.

SK: People often mistake Wyless for being a Mobile Virtual Network Operator (MVNO). What makes Wyless different?

DM: That's true. The simple explanation is that most MVNOs sprung up as virtual network operators on the voice side of the business, so they had no real infrastructure; much like a marketing company with a billing element connected to a mobile operator. Think Simple, Virgin or Boost Mobile.

The fact is that Wyless runs a physical network – we look more like a wireless ISP in that we have our own radius core, our own firewalls and routers – and we connect to the mobile operators through physical infrastructure. It's all about having a managed network. So while we most certainly buy data from mobile operators and then resell that as a managed service to our customers – ASPs, large enterprises and OEMs in the M2M space – we are really more of a managed network than an MVNO.

SK: What do you see as challenges in the M2M market?

DM: What we've seen over the past 10 years or so is that the M2M market is very fragmented. Those organizations investing in M2M are really struggling with bringing some simplicity to the technology,

particularly when they stretch across multiple mobile operators and geographies. What we do is provide an agnostic service layer that brings together all of the solutions they need to make that project a success.

Wyless started primarily as a managed connectivity business that effectively helped organizations connect to multiple mobile operators. But today we've really morphed into more end-to-end solutions that go far beyond the connectivity layer to include life-cycle management, engineering services, customer software development, support and billing and so on.

SK: Can you give me an example of this end-to-end view of M2M managed services?

DM: Say that you are a big OEM manufacturer of alarm panels that wants to embed cellular connectivity into your product. But since you are traditionally a manufacturer, you probably aren't prepared to do all the stuff that comes with that – such as activations, coverage analysis and trouble shooting for installations. More to the point, it would mean moving from a capital expenditure-based product to an operating expenditure model which is quite a different thing.

So we've really created a set of solutions and tools to deliver those services through an M2M managed service model. Maybe it's just that they need help handling the support, or maybe it's the full breadth from activations through to billing and customer service. Of course, that's on top of the 'bread and butter' services that other managed services providers deliver – assessing the data profile, the geography and the security requirements and then managing multiple MNOs to deliver a robust and secure connectivity service.

SK: What has the reaction been from the MNOs?

DM: Fantastic. We have already partnered with 15 MNOs including some of the world's largest, and we expect to have more than 20 MNO partners by the end of this year. What that means for our customers is that we have a wider geographic coverage and can help deliver services into markets where they do not have an existing relationship or network.

But it's worth noting that there has been quite a shift in the position of the MNOs where now they are really starting to recognize the value of their partnership ecosystem and – particularly over the past 12 months or so – have been exploring new ways to reduce the complexity of their business.



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Organizations investing in #M2M are struggling with bringing some simplicity to the technology.

Dan McDuffie, Wyless

Dan McDuffie

CEO of Wyless



I think the key to succeeding in these verticals, however, is data security and privacy. Whether it's over alarm data and connections, medical devices, point of sale devices and ATMs, devices that require PCI compliance and, in the medical field, HIPAA compliance; these are all verticals that demand an end-to-end view of security, privacy and policy management.



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I think there are three key areas where MNOs are now realizing the value that a managed services provider like Wyless can offer. First, we're able to help them cost-effectively capture the middle market which has faster and more reliable ROI than many of the larger targets they are chasing in-house. Second is that we can partner with MNOs to fill areas that are 'off-footprint' since we have networks and relationships with MNOs in other markets. And I think the third advantage that the MNOs recognize is that we have highly leveragable infrastructure that can help move bespoke projects forward faster and more flexibly.

Basically, we're the kind of guys that the MNOs go to when the Internet of Things becomes too complicated or too costly for them to do on their own.

SK: We've also seen some of the MNOs make significant moves into some of the verticals themselves. How is that impacting your business model?

DM: There's no doubt that some of the big MNOs are strengthening their M2M capabilities in certain verticals. Verizon and Sprint are very strong in some verticals like telematics, AT&T is doing some interesting things in the security vertical and DeutscheTelekom is doing lots of work in smartgrid technology in Germany for instance.

But we also recognize that few MNOs are about to start creating billing or customer care solutions for these verticals. So I see Wyless and our peers as the guys that fill in the gaps between all of these things; we're the ones that carry the tool box and medical kit and say to the MNOs, "let's really understand what you need to do in order to get your vertical products to market."

SK: And what are some of the more active verticals from your perspective?

DM: Obviously, the fleet sector was one of the first adopters of M2M so we – and most of our peers – have seen significant activity there over the past decade. Location security services is also one of those really big verticals that has matured well and continues to be quite active.

One sector that Wyless is particularly focused on is healthcare. On the one hand, we're seeing a lot of medical service companies come up with tools that use the professional's own handset – so BYOD or bring your own device models – and that's a particular challenge when you are rolling out M2M. It's also going to be a huge vertical because the home diagnostic market is just taking off, so while there are only about a million remote diagnostic devices in the US today, we think we'll see something like 50 to 60 percent growth (CAGR) in the market over the next few years.

I think the key to succeeding in these verticals, however, is data security and privacy. Whether it's over alarm data and connections, medical devices, point of sale devices and ATMs, devices that require PCI compliance and, in the medical field, HIPAA compliance; these are all verticals that demand an end-to-end view of security, privacy and policy management. So, clearly, this will be a critical consideration for MNOs and their clients.

SK: What are some of the big issues impacting the adoption of M2M today?

DM: One of the biggest barriers to entry in the US right now is the fact that 2G, 3G and 4G all have life-cycles to them – particularly 2G and 3G – and that means that there may not be a lot of customer service at times. So a lot of MNOs and their customers are talking about the move from 2G to 3G but really there are no guarantees as to how

long high speed packet access (HSPA), and the like, will be available in the market.

I think the question of SIM card portability will also become an issue going forward. Once a customer deploys hundreds, thousands or tens of thousands of devices on a mobile operator's network, their ability to change based on coverage or technology becomes quite prohibitive. I'm not sure that the FCC in the US has really considered how they are going to deal with that question, but it will certainly be important in driving adoption in the US.

SK: It sounds like the market is only just starting to open up.

DM: It certainly is. If I just look at the MNO side, I see a lot of money being spent in the M2M divisions and – from an outsider looking in – it seems like they are putting a lot of resources towards chasing bespoke type arrangements. But once these MNOs start to challenge the ROI behind some of that, they quickly start to think about outsourcing or partnering to deliver the solution faster, more flexibly and more effectively. That's where companies like Wyless really start to excel so that we can take advantage of these enormous opportunities in the market.

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Auto-Mobile: cars to be the hottest new mobile device



By
Mathieu Meyer
KPMG in Germany and
Gary Silberg
KPMG in the US

Ever since the late 1800s, the automotive industry has been one of the leading agents of innovation and economic growth. Small wonder, then, that the sector is now at the forefront of mobile technology.

Vehicles have long past the phase of being 'dumb' machines. Indeed, today's vehicles may have more in common with an iPad® than they do a Model-T. Vehicles now have the ability to communicate with each other, and it is this, combined with the availability of limitless new data, that will bring about the next major advancement in this sector. Engine control units have been computerized; integrated software systems and sensors have been embedded; while data on everything from engine performance to fuel consumption to tire pressure is monitored.

But while all of the computerization that has occurred over the past two decades certainly represents a giant step forward in the evolution of the car, we believe that it will be the integration of mobile technology that will truly unlock the next big phase of automobile development.

There's an app for that

Likely the most rapid mobile innovations to be commercialized within the auto sector are the use of in-vehicle apps. In Europe, Mercedes-Benz already offers news, financial market and parking locator apps through its onboard COMAND system. And just last year, Peugeot launched Connect Apps – initially available for the Peugeot 208 in France, but with an eye to expanding its use into other countries and other models down the road.

On the other side of the Atlantic, Ford and General Motors unveiled their app strategies earlier this year. GM announced that it was partnering with AT&T to connect most of its Buick, Cadillac, Chevrolet and GMC models with integrated 4G LTE modems starting in 2015. GM will provide apps directly from a vehicle's embedded touchscreen infotainment system. Meanwhile, Ford is counting on drivers to bring their own smartphones into the car and run apps through its Sync voice command system, developed with Microsoft.

Both car makers have launched software development kits to encourage developers to build apps for their respective platforms, but the differing strategies – embedded at GM, unembedded at Ford – reflect an evolution that is still in its infancy.

Driving Miss Daisy

While onboard apps add new options for entertainment and productivity, the progress towards self-driving cars promises to have an even more profound impact.

Google has drawn a lot of headlines for its self-driving car, but the phenomenon is more than just a passing fad. Traditional

automakers are also getting into the game. Mercedes-Benz' 2014 S-class will have partial self-drive capabilities enabled by the DISTRONIC Plus steering assistance system. At this early stage, Mercedes-Benz has included safety measures to control drivers' usage of the new functionality – shutting off the system after 15 seconds if the driver isn't applying torque to the wheels – but it is an important first step towards a self-driving future.

At KPMG, we believe that fully self-driving cars will be a reality within the next 10-15 years. In part, this is because consumers and governments alike are eager for new mobility options that could reduce congestion and pollution, while improving safety and quality of life. But as younger generations enter the driving populace, we expect that pace of change to accelerate; just as they expect to be entertained or informed on-demand, they'll have the same expectations for mobility.

In the not-too-distant future, we expect consumers in some parts of the world will start enjoying a very different commute from work than they do today. It will start by them opening up an application on their smartphones and summoning a car – perhaps one belonging to a car-sharing service like ZipCar – to take them home. Once aboard, it will glide easily into the self-drive lane, check live traffic conditions and calculate the ideal course home. Meanwhile, the 'driver' will be at liberty to sit back and use the car's on-board apps to search for a restaurant, finish up some work, and perhaps book a pick-up time for the next day's commute. And before they know it, they are home with their family and the car sets off to its next assignment.

Partnerships for the future

One of the greatest challenges slowing innovation in the auto sector, however, relates to a mis-match between innovation cycles and design cycles. Today, it takes 3-5 years to take a vehicle from drawing board to showroom, making it practically impossible for mass-market OEMs (Original Equipment Manufacturers) to ensure they have the latest technology in their cars once they hit the streets.

One solution is to create partnerships with technology companies, something that the auto sector has already been doing for decades. TomTom® or Garmin® drive navigation systems, and GM's OnStar® came from collaboration with partners like Continental, LG, and Motorola.

The ideas can flow in either direction. Volkswagen has a strategy for customers'



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It will be the integration of #mobile technology that will truly unlock the next big phase of #automobile development

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on-board experience, and may develop it themselves or partner with a technology company. Just as easily, Microsoft might approach Ford with an idea for its drivers' experience. Simply put, innovation will continue to come from partnerships that allow each party to do what they each do best.

Whatever the approach, one thing is certain: cars are becoming more and more like devices. And before long, they will be driving us, not the other way around.

Partnerships and collaboration are key



By
Sanjaya Krishna
Principal and Digital
Risk Consulting Leader
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In this final article of the series, Sanjaya Krishna looks back at the articles and focuses on one of the key themes of the series: partnerships.

If we've learned anything from the Mobile Evolution article series, it's that mobile enablement does not happen in a vacuum. No single organization has the capability, capacity or capital to 'own' the market outright; in fact, to succeed at all, stronger partnerships will need to be formed, cooperation both within the industry and between industry sectors will need to grow, and collaboration across the ecosystem will need to flourish.

The value of partnership

Frequent readers of the Mobile Evolution series will no doubt have noted a recurring theme of 'partnerships' across many of the articles in the series. Our two feature articles on the Internet of Things and Machine to Machine communications, for example, demonstrated that partnerships between customers, vendors and operators are key to developing more effective and efficient mobile solutions. As Maciej Kranz of Cisco noted, "this is one of those areas where the entire industry needs to come together to solve some of the big challenges." And it is largely through these partnerships that challenges like mobile security are now being overcome.

Nowhere was this made more clear than in our sector-specific articles. Whether it's making cars 'smarter', delivering more effective healthcare, deploying new and secure mobile banking solutions, improving retail sales and customer loyalty, or monetizing mobile for the media sector, our authors and industry experts consistently noted the need for greater collaboration across the value chain.

The series also demonstrated that growth opportunities in the mobile space will require vendors, technology companies and operators to work closely together in the future. Standards will need to be set and implemented; joint ventures will need to be formed, ecosystems will need to be encouraged and risks will need to be shared if the market is to grow. Internal collaboration will also be key as organizations seek to transform their organizations through mobile enablement.

The mobile evolution continues

What is also clear from this series is that the real mobile evolution is just getting started. Businesses are in the relatively early stages of recognizing the transformative benefits of mobile; vendors are bringing truly innovative solutions to the market; and operators are realizing the massive opportunities that mobile brings beyond simple volume and infrastructure plays.

What will remain to be seen is which players will take advantage of the opportunities being created by mobile. Some will seek to gain competitive advantage from new mobile solutions, others will leverage mobile to disrupt existing markets and create new business models. Still others will find mobile holds the key to unexpected operational efficiency and workforce productivity gains.

The willingness to experiment and innovate have always been keys to future success in mobile. But it will be those organizations that are able to create a culture that combines innovation and experimentation with an openness to partnerships and collaboration that will more than likely succeed in the long-run.

Take the lessons with you

Over the course of 20 articles and 12 months, the Mobile Evolution series has touched on many of the issues that matter most to those operating in the mobile world and serves as a valuable guide to executives exploring this evolving space.

On behalf of KPMG's network of Technology, Media and Telecommunications professionals, I would like to thank all of those who gave up their valuable time to contribute to this series; your insights, experience and advice have been greatly appreciated.

To learn more about the issues and topics raised in this series – or to discuss your organization's unique mobile objectives – I encourage you to contact your local KPMG member firm.



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Sanjaya Krishna

Principal and Digital Risk
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Mobile enablement does not happen in a vacuum. No single organization has the capability, capacity or capital to 'own' the market outright; in fact, to succeed at all, stronger partnerships will need to be formed, cooperation both within the industry and between industry sectors will need to grow, and collaboration across the ecosystem will need to flourish.



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