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Meeting the growth challenge in the open mobile era

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MEETING THE GROWTH CHALLENGE IN THE OPEN MOBILE ERA

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Abstract

Keywords: Platform Leadership, Open Innovation, Open Mobile, 4G, Platform Ecosystem

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1. Introduction

The mobile ecosystem in the U.S. is undergoing tremendous change, with an increased rate of innovation driving market competition in the mobile telecom, and adjacent technology and media sectors, to new heights (Scott and Hilke, 2011). In mobile, the traditional ecosystem controlled by incumbent players is now facing significant disruption. A variety of players from different segments including semiconductor companies, software application developers, Internet companies and system integrators are reacting to increasing consumer demand for mobile data services (Basole, 2009). Traditional standards and market boundaries are fast disappearing as players from all segments compete to provide value to consumers across the mobile sector and beyond (Scott and Hilke, 2011).

As a consequence of this disruption, the market leadership position of U.S. network carriers seems vulnerable, particularly in non-traditional areas of mobile growth. Threats to incumbent competitive advantage from new entrants who have little prior experience in the mobile industry are thought to be on the rise³. Competitive advantage seems no longer predominantly derived from traditional levers for growth. Instead, focus on competitiveness seems to be shifting to developing platforms⁴ that attract and stimulate innovation from beyond firm boundaries, which enables incumbents and new entrants alike to compete in the open mobile⁵ era. This era, characterized by rapid innovation in mobile web technology and software applications, and accompanied by a proliferation of open source technologies, is driving new mobile service growth and enabling a sense of *hypercompetition*⁶ to prevail across the sector (see figure 1).

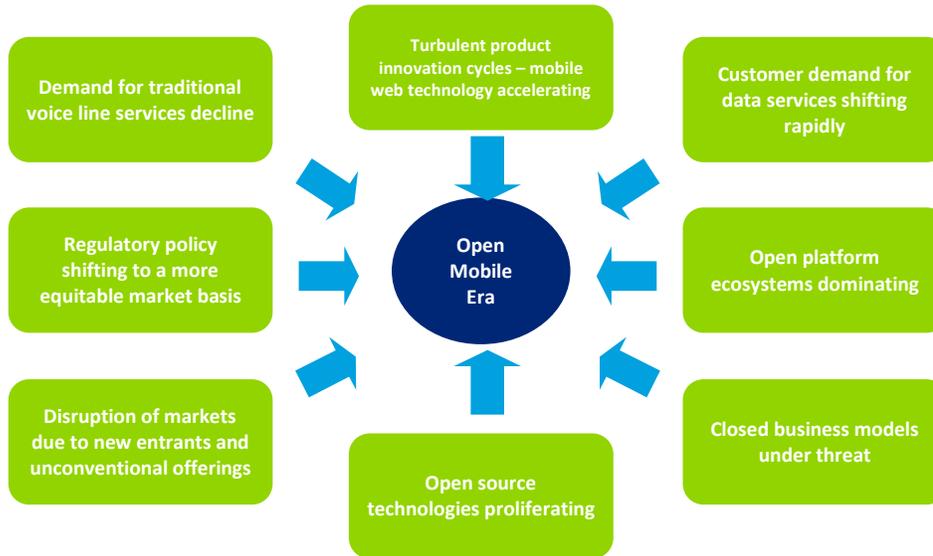
³ See for example Strategy Analytics “Apple Dominates Mobile App Space with Content while Android Aims for Numbers” (July 2011), www.businesswire.com/news/home/20110721005072/en/Strategy-Analytics-Apple-Dominates-Mobile-App-Space

⁴ Platform refers primarily to a "technology building block" of separate, inter-linked components; either hardware or software or both - which can be further developed/added to by third party developers and in some instances competitors

⁵ We define and use the term “open mobile” to denote the disruptive shifts occurring in the use and development of mobile web technology; the changing U.S. wireless telecommunications regulatory policy landscape as it moves to a more equitable market environment; and the transitions occurring in consumer behavior throughout the U.S. wireless industry as a new, less restrictive “open” era in market competition emerges.

⁶ The notion of *Hypercompetition*, as described by Prof. Richard D’Aveni, denotes hyper-inflated market competition that can emerge in sectors prone to rapid technological disruption with competitive advantage often difficult to sustain. D’Aveni, R., *Hypercompetition: Managing the dynamics of strategic maneuvering*, New York: The Free Press, 1994.

Figure 1: The hypercompetitive mobile landscape



Source: Deloitte Research 2012

Against this backdrop of heightened competition, the rollout of fourth generation (4G) LTE and WiMax wireless network technologies across the U.S. mobile sector is gathering speed, with major network carriers rapidly rolling out LTE networks in particular⁷. This long awaited network upgrade will provide the backbone for enhanced mobile products and services and will address voracious U.S. consumer demand for faster downloads and greater bandwidth. In addition, these enhanced networks promise to introduce a new wave of mobile ubiquity and stimulate product and service innovation across and beyond the mobile value chain. As a consequence, mobile incumbents may face new challenges in generating top-line growth presented by a more democratized industry, or continue to defend the business models of the past and protect traditional revenue streams.

Forging new alliances and partnerships to stimulate innovation in non-traditional mobile industries, such as mHealth and the smart grid energy sector, could be the most promising route to capitalizing on emerging growth opportunities. Orchestrating a consolidated ecosystem strategy across disparate industry value chains would then be an important element to gain competitive advantage. Taking a resource-based view of generating value from such a strategy means utilizing resources that are thought to be valuable, rare, in-imitable and non-substitutable (Barney, 1991). For example, in the context of a network carrier, its 4G network infrastructure could serve as one such resource.

Moreover, whilst the applicability of the resource based view is thought to be limited in “high-velocity” industries (Eisenhardt and Martin, 2000), the mobile industry is one example where

⁷ See for example Verizon Wireless, LTE Information Center, <http://news.verizonwireless.com/LTE/Overview.html>, accessed on May 21, 2012; AT&T Network Coverage, AT&T 4G LTE, <http://www.att.com/network/>, accessed on May 21, 2012

market boundaries are blurred, and the roles of the market players are ambiguous and shifting. In this instance, the development of dynamic capabilities may well be more applicable to create growth opportunities (Eisenhardt and Martin, 2000). Hence, the rising urgency for mobile incumbents to forge new organizational capabilities to create, compete in and capitalize on growth prospects in new markets.

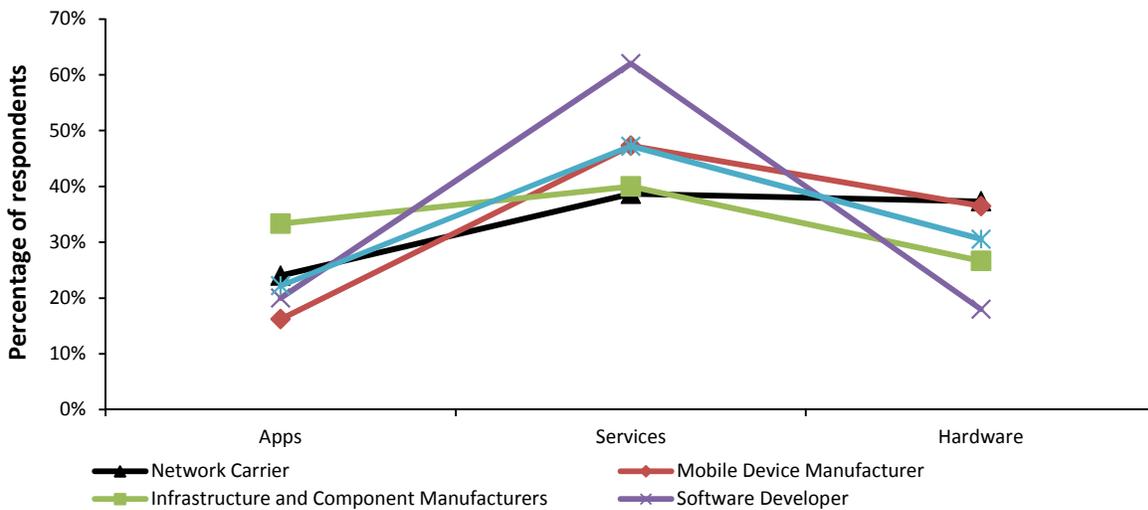
In this context, our research paper examines the impact of the open mobile phenomenon on the mobile telecoms competitive landscape. With particular emphasis on capability development for platform leadership, we explore how incumbent organizations are preparing to meet the growth challenge during periods of technological disruption. Drawing from a controlled survey of senior mobile executives across the U.S. mobile industry, we study the transformation, planning, preparation and overall strategy formulation taking place in a wide range of mobile technology-oriented companies today. Insight from the survey is then used to build an exploratory framework for innovation capability development in the open mobile era.

The paper is organized as follows: Section 2 highlights survey insights on selected growth opportunities for incumbents and new entrants alike in the emerging 4G era; Section 3 reviews the literature and theoretical background to the research; Section 4, follows with a description of the research methodology and provides results and analysis. The final section concludes with an overview of our contributions, the limitations of the study and recommendations for future research.

2. Growth in the 4G Era

From a consumer perspective, data from our survey suggests that mobile services will provide the greatest revenue opportunities in the next 3–5 years (see figure 2). Technological disruption in the form of mobile web technologies is forcing traditional mobile incumbents to seek new growth opportunities as voice service revenues decline (Scott and Hilke, 2011) and revenues from data services climb. This is emphasized in the device vendor context where services, rather than hardware per se, are expected to represent a greater source of value. In particular, services developed around mobile business models in popular consumer and enterprise areas such as entertainment, social networking, mobile payments, mobile cloud services and enterprise productivity are believed to hold the most revenue opportunities over the short-term three year period.

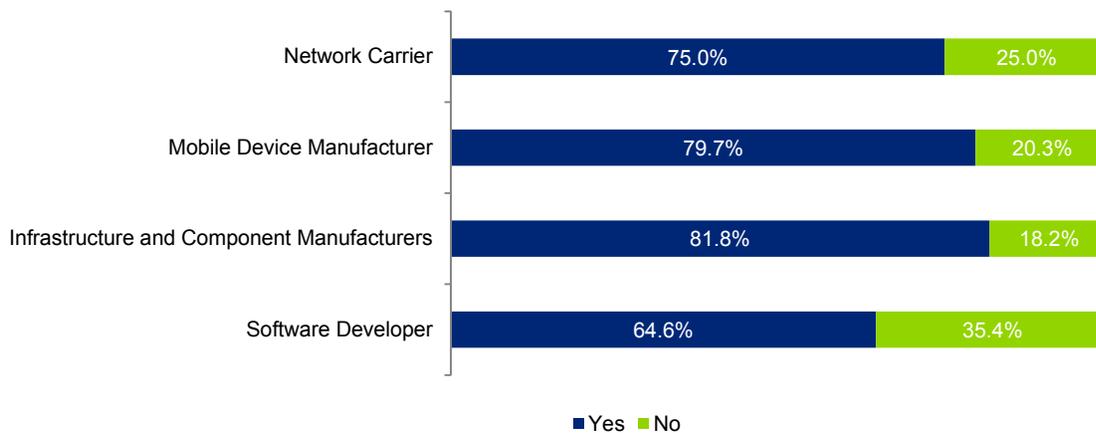
Figure 2: Mobile services will drive future revenue opportunities



Source: Deloitte Research Open Mobile 2012 Survey

4G technologies promise to usher in the next wave of mobile ubiquity, opening the doors for innovation to increase in all areas of the mobile value chain and beyond. The largest wireless service providers in the U.S. have announced support for the LTE standard, which is designed to be backward compatible with GSM and HSPA technologies. LTE will also provide network operators 2–5 times greater spectral efficiency than the most advanced 3G networks, reducing the transmission cost per bit and allowing better economics for both carriers and end users (NGMN, GSMA). LTE gaining ground against WiMax is also echoed in our survey (see figure 3). Analyst estimates continue to bear this position out with recent market forecasts suggesting LTE services will generate more than \$11 billion in service revenue in the United States by 2015 and that global LTE subscribers will number 744.2 million by 2014 (ABI Research, 2010; Sideco 2011a, 2011b).

Figure 3: WiMax as a carrier consumer data solution will decline by 2016



Source: Deloitte Research Open Mobile 2012 Survey

The surging apps economy

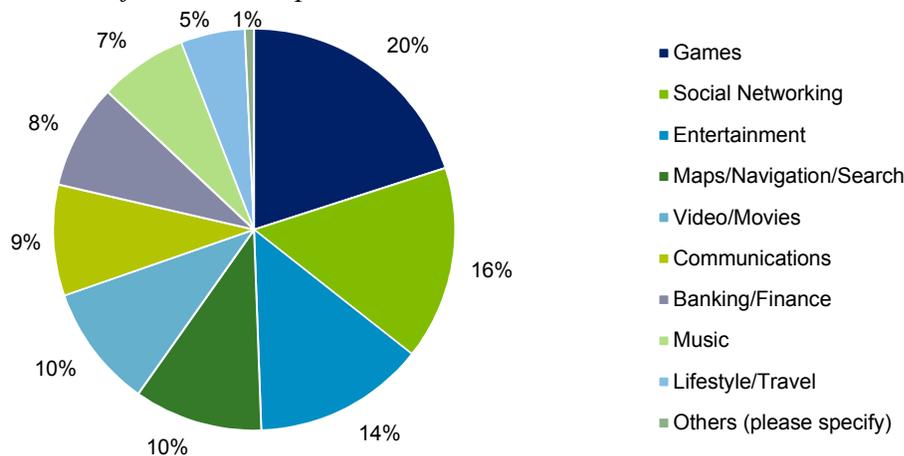
In just a few years, the mobile software applications market has grown from a fad to a phenomenon. Analysts predict the apps economy to reach \$2 billion in 2012 (Strategy Analytics, 2011). This rising “apps economy” is contributing to market turbulence and changing the way companies compete. More innovative apps serving a wider range of functions will help fuel consumer and enterprise demand, increasing the demand for carrier network data services.

Today, app stores are the major route to market for developers looking to commercialize their software across the mobile industry’s dominant OS platforms. The rise of the app store has in turn hastened the decline of the carrier controlled content-portals. For software app companies seeking to expand market reach, the choice of mobile platform, which will receive investment in terms of talent, skills and resources, is a major one. In parallel, companies which have developed a platform to accommodate a range of mobile devices, face the critical challenge of attracting the right developers to work on the platform. This has led to an intensifying race to attract developer *mindshare*⁸. For developers, revenue potential is obviously the biggest driver in deciding which platform to select (VisionMobile, 2011).

According to our survey, a majority of mobile executives think gaming, social media and networking, entertainment, and navigation will be the most lucrative app categories in the short-term. For enterprise apps, customer relationship management (CRM) and productivity hold the most potential value (see figure 4). Knowing where the revenue will reside is important for those companies using apps as a method to increase brand recognition. In many ways, organizations determining appropriate app strategies ask the same questions about customer reach and market penetration that developers face when deciding between platforms.

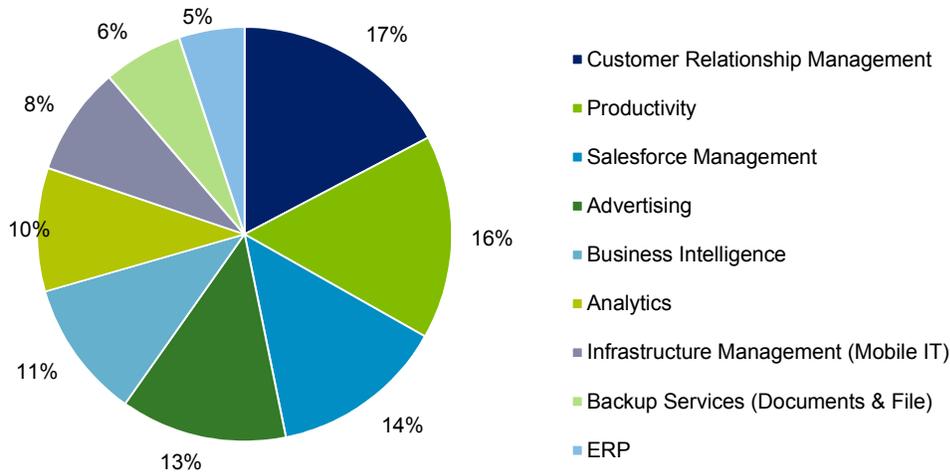
Figure 4. Digging deeper into where mobile Internet revenue will be five years out

Which of the following consumer app categories will have the most potential revenue value for mobile software developers?



By 2016, which of the following enterprise app categories will have the most potential revenue value for mobile software developers?

⁸The term *Mindshare* was first popularized during the initial dot.com boom period of the late 1990’s to indicate where intended, and actual, effort and resources were being targeted by developers.

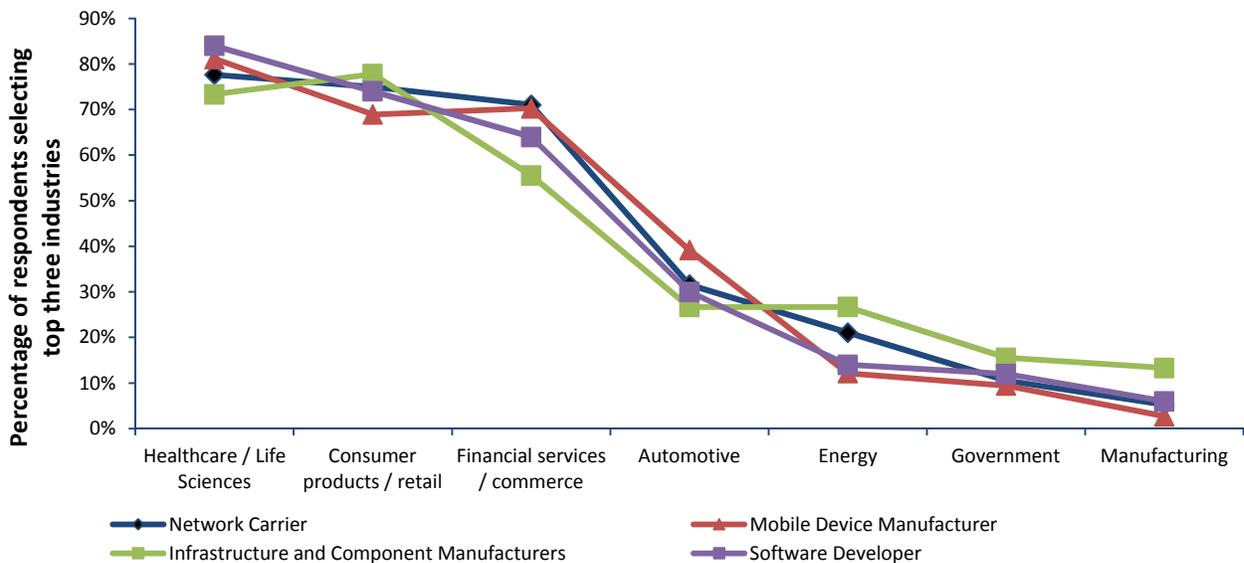


Source: Deloitte Research Open Mobile 2012 Survey

Mobile growth in non-traditional telecoms industries

Vertical industries adjacent to mobile that are thought to be front-runners in adopting emerging mobile technology are also an area of exploration in our study. Our survey respondents were asked to identify the industries with the most mobile growth potential in the immediate 3 to 5 year time period. According to our respondents, Healthcare, Consumer Products, and Financial Services are thought to have the most potential (see figure 5). This is broadly in alignment with current market trends — in particular, the rise of mHealth (and also Smart Grid energy) is offering significant potential revenue opportunities for mobile incumbents to expand top-line growth.

Figure 5. Which vertical industry has most potential for new mobile growth and value generation?



Source: Deloitte Research Open Mobile 2012 Survey

mHealth

Mobile Health (mHealth) is emerging as a significant growth opportunity for companies looking to capitalize on advances in wireless healthcare utilizing machine-to-machine (M2M) technology. Analyst forecasts estimate the potential value of the U.S. mHealth market to be approximately \$4.6 billion as early as 2014 (Yan and Flavelle, 2010). In the U.S. costs associated with chronic disease management account for more than four-fifths of the country's total healthcare expenditure, or \$2 trillion annually by 2009, and are expected to increase on average 6.1 percent per year over the projection period 2009-2019 (Baker et. al., 2011; Centers for Medicaid and Medicare). Wireless healthcare solutions offer a way to reduce preventable readmissions, which cost an estimated \$12–17 billion per year (Jencks et. al., 2009).

Costs associated with disease management can also be improved. Wearable body sensors and remote monitoring can keep chronic patients out of hospitals and improve their quality of life, while significantly reducing admission expenses. Widespread adoption of remote patient monitoring (RPM) technology is expected to save \$197 billion over the next 25 years (Litan, 2008). Innovation in mHealth software applications is also on the rise. Consumer-based applications which act as/aid in pill reminders, appointment scheduling, personal health alerts, information and feedback are contributing to a growing empowerment of patients who can take personal responsibility for monitoring and managing their own health (Wilson and Asmundon, 2012).

Clearly, the potential for value generation in mHealth could be significant for those mobile companies willing to capitalize on the emerging opportunities. Astute collaboration and platform development with Healthcare providers is seen by many as the first step towards mobile companies gaining traction in this emerging market¹⁰.

Smart Grids

The energy sector — specifically, the emergence of smart grid networks across the United States — offers perhaps the leading value proposition for exploiting M2M technology. Smart grid implementation in the U.S. has predominantly been driven by government initiatives in both the energy and telecoms sectors. To date, a total of \$8.1 billion in public and private investments have been made in the smart grid sector, much of which is from government stimulus packages (ZPryme, 2010). Government activity in the telecoms sector is driven by the Federal Communications Commission (FCC), which placed smart grids at the heart of the U.S. national broadband plan (FCC, 2010) by mandating that state governments ensure utilities provide real-time access on energy consumption data to consumers (FCC, 2010).

Growth opportunities are thought to be significant; analyst projections forecast the U.S. smart grid market expanding from \$21.4 billion in 2009 to \$42.8 billion in 2014 (ZPryme, 2009). In the U.S., the largest network carriers have already entered into a number of strategic alliances with smart meter providers, sensor manufacturers and utility companies. This will enable existing network infrastructure to be positioned for use in remote monitoring, automated metering and outage detection (AT&T, 2011; Engerbretson, 2010).

From an immediate benefits perspective, efficiency gains lead the way in this area. The Galvin Electricity Initiative predicts smart grids have the potential to reduce the need for U.S. infrastructure investments by between \$46 billion and \$117 billion over the next 20 years (Electricity Advisory Commission, 2008). The use of M2M technologies will also enable real-time communication across the grid enabling providers to remotely identify, locate and isolate outages much more efficiently.

To identify and act on emerging growth opportunities in both these areas and beyond, mobile incumbents must focus on developing appropriate distributed innovation and platform leadership capabilities. According to our survey respondents, these are the capabilities that are thought most important for competing in new markets in the open mobile era. In order to foster distributed innovation, firms need to build and manage network ecosystems that in turn can drive platform demand (Schilling, 2009). To date, the signs are positive that this is beginning to happen with many companies both in mobile and adjacent vertical industries collaborating in high profile alliances. A good example of this is the open mHealth consortium⁹ and the Continua Health Alliance¹⁰. The rise of these ecosystems points to a growing recognition that unlocking value in this nascent market will require sustained collaboration across traditional incumbent boundaries. Our research provides input into the formation of a preliminary framework that addresses the development of each of these capabilities in the context of generating new mobile growth.

3. Theoretical Foundation

Business Ecosystems, Platform Theory and Open Innovation

A firm's competitive advantage depends on its ability to create more value for its customers than its rivals (Porter, 1985). According to (Adner and Kapoor, 2010) greater value creation is dependent on a firm's ability to rapidly innovate creating new business opportunities. In this regard, Moore (1993) states a company should not be viewed in isolation but as part of the business ecosystem that spans across multiple industries. Ecosystems can be thought of as stand-alone networks of inter-linked companies working cooperatively and competitively and co-evolving capabilities around new innovation development (Moore, 1993; Chesbrough, 2006). In the context of "innovation ecosystems" firms may collaborate through a common set of standards creating a base architecture as a platform (Adner, 2006). In high-tech industries, a platform can be viewed not only as a technology, but also as an ecosystem characterized by high-level of interdependencies between players and high-level of potential for innovation for each player (Gawer and Cusumano, 2002; Gawer 2009).

For this research, we define a platform as a "technology building block of separate, inter-linked components; either hardware or software or both - which can be further developed/added to by third party developers and in some instances competitors." Our definition is closer to Bresnahan and Greenstein (1999) who define a platform as "a device for coordinating disparate rapidly moving technologies and for market coordination between buyers and sellers," and Gawer and Cusumano (2002) who define a "product as a "platform" when it is one component or subsystem

⁹ Open mHealth, <http://openmhealth.org/>, accessed on May 21, 2012

¹⁰ Continua Health Alliance, <http://www.continuaalliance.org/index.html>, accessed on May 21, 2012

of an evolving technological system, when it is strongly functionally interdependent with most of the other components of this system, and when end user demand is for the overall system, so that there is no demand for components when they are isolated from the overall system.” West’s (2003) definition of a platform as “a proprietary platform consists of an architecture of related standards, controlled by one or more sponsoring firms. For a computer system, the architectural standards typically encompass a processor, operating system (OS), and associated peripherals” is also pertinent to our research focus.

Platforms arise from ecosystems when a product gains a dominant position within the ecosystem. The firm controlling the core product directs the growth of the entire platform. Critical to the platform’s success is the existence of complementors that build upon a platform to provide greater value for customers (Cusumano & Gawer, 2002). The combination of complementors and adoption of users can lead to large scale network effects (Kato & Negoro, 2007). The personal computer and video games industries are good examples of core technology platforms being built up by networks of developers and where the inventive efforts of the subsequent complementors made the platforms a market success (Bresnahan and Greenstein, 1999; Boudreau, 2007).

To meet the increasing demands of users and to exploit network effects, platform owners are opening up interfaces that encourage innovation from third-party developers and resources located outside the firm. A number of studies on platform ecosystems (Eisenmann et al. 2008; Gawer and Cusumano, 2002; Gawer and Henderson, 2007; West, 2003; Boudreau, 2007) have subsequently focused on the choices faced by platform owners regards which elements of a platform should be made open to stimulate third party collaboration and which elements should remain closed and proprietary in order to generate value for the owner.

While platform owners encourage the development of complementary products or services to support a platform and exploit network effects, there is a fear that complementors can make inroads into platform owners’ markets via these same activities. Conversely, risks for complementors center on platform owners leveraging network effects to compete in their product markets (Gawer and Henderson, 2007). In addition to the threat from complementors who might want to expand their role within the platform (internal), platform owners also face threats from direct competitors (external), and from other ecosystems (external).

In the context of the mobile industry, studies have focused on the strategic implications of control over a platform. Basole (2009) analyzes the evolving structure of inter-firm relations in the mobile device platform ecosystem. While mobile network operators are identified as the central segment of the current ecosystem, operating system (OS) providers assume a central position in the converging mobile ecosystem. In this instance, there are strong relations between mobile network operators, network and infrastructure providers, silicon vendors and component providers, and device manufacturers. Likewise, there are strong ties between OS providers and application and software providers. However, the ties between OS providers and firms involved in the technological foundation of the ecosystem (e.g. mobile network operators, device manufacturers) are thought to be weak (Basole, 2009). Basole’s (ibid) model suggests that the absence of a single hub makes the mobile ecosystem resilient. From a case study on the Symbian mobile operating system, West and Wood (2008) shed light on this issue, in particular exploring

the dynamics of open innovation and platform theory, and its impact on ecosystem management strategy.

The study of distributed innovation has gained popularity with researchers in recent years (see for example the work of von Hippel, 1988; 2005). Stemming from this body of research, the term “open innovation” has been coined to define the practice of looking beyond the boundaries of the firm to seek and utilize “purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively” (Chesbrough, 2003). West et. al., (2006: 286) describe open innovation as, “both a set of practices for profiting from innovation and also a cognitive model for creating, interpreting and researching those practices.”

Telecommunications and electronics industries are using open innovation to develop and gain access to new knowledge and technologies in order to create new network partnerships, forge new markets and increase competitiveness. Rohrbeck et. al., (2009) highlight how Deutsche Telekom has embraced open innovation to successfully enhance the company’s innovation capacity. In similar vein, Iansiti and Lakhani, (2009) discuss how companies in the software industry have used open innovation strategies to simultaneously attract customers and partners to core technology platforms and thereby orchestrate ecosystems that create new ideas, work practices and generally aid in stimulating innovation. In this instance, the alignment and management of platforms and open innovation strategies is deemed critical.

Recent research in this area has explored the “mechanics” of executing open innovation strategies in various industries. Boudreau and Lakhani (2009) compare and contrast two methods of doing so: a ‘collaborative community’ approach where the participants have cooperative relationships aimed at increasing the adoption of the platform, and a ‘competitive market’ approach where the players are in competitive relationship and are driven by motivation to maximize profits. West and Wood (2008) identify challenges in managing an open innovation network through a longitudinal study on the creation and evolution of the Symbian mobile operating system. Similarly, Viskari et al., (2007) conclude that the open innovation strategy adopted by a company should be directed at creating value, though the extent of openness will depend on the individual business models. Mortara et al., (2009), through their study of various companies, clarify that open innovation has many different meanings in different settings and should be seen as an opportunity to confront business challenges.

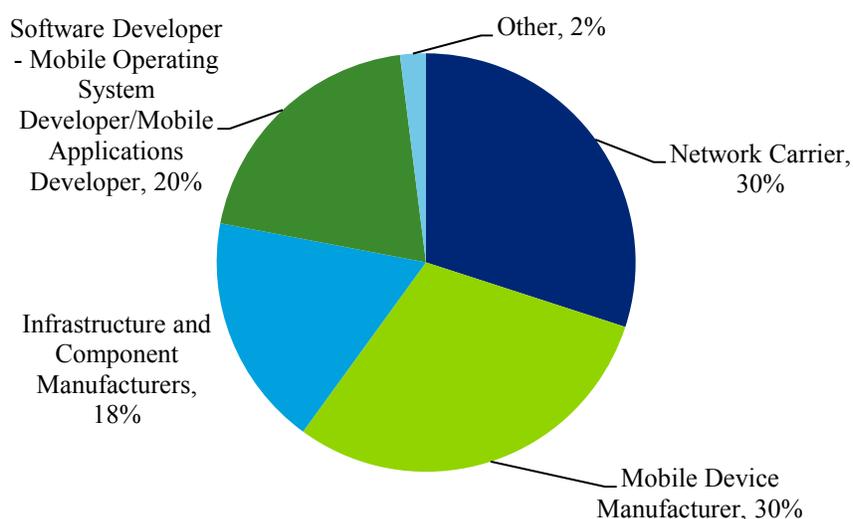
Our study contributes to this body of research by exploring the dynamics of ecosystem development and platform leadership used to approximate open innovation across and beyond the mobile industry. Insights from the research provide preliminary guidance into the development of dynamic capabilities used by mobile companies to remain competitive in the open mobile era.

4. Research Methodology

The nature of this research is exploratory rather than confirmatory and the research design used to structure the empirical work followed a case study approach - widely considered as a reliable and valid method for carrying out inductive, exploratory research (Eisenhardt, 1989; Yin, 2009).

The primary method for data collection was a survey of 250 senior wireless executives in the U.S. mobile sector. The survey was conducted in conjunction with LinkedIn.com. Respondents were selected from four industry subsectors – network carriers, mobile device manufacturers, software developers and infrastructure companies, all of which compete in an increasingly convergent and turbulent mobile sector. Participation was voluntary and anonymous. In some questions, multiple responses were allowed and accounted for accordingly. Qualitative analysis techniques, such of the type defined by Miles and Huberman (1994), were used to derive insight and form the basis of an exploratory framework for future case study based research. The survey analysis was completed in October 2011. The concentration of respondent segments in the mobile industry is as follows:

Industry Segment



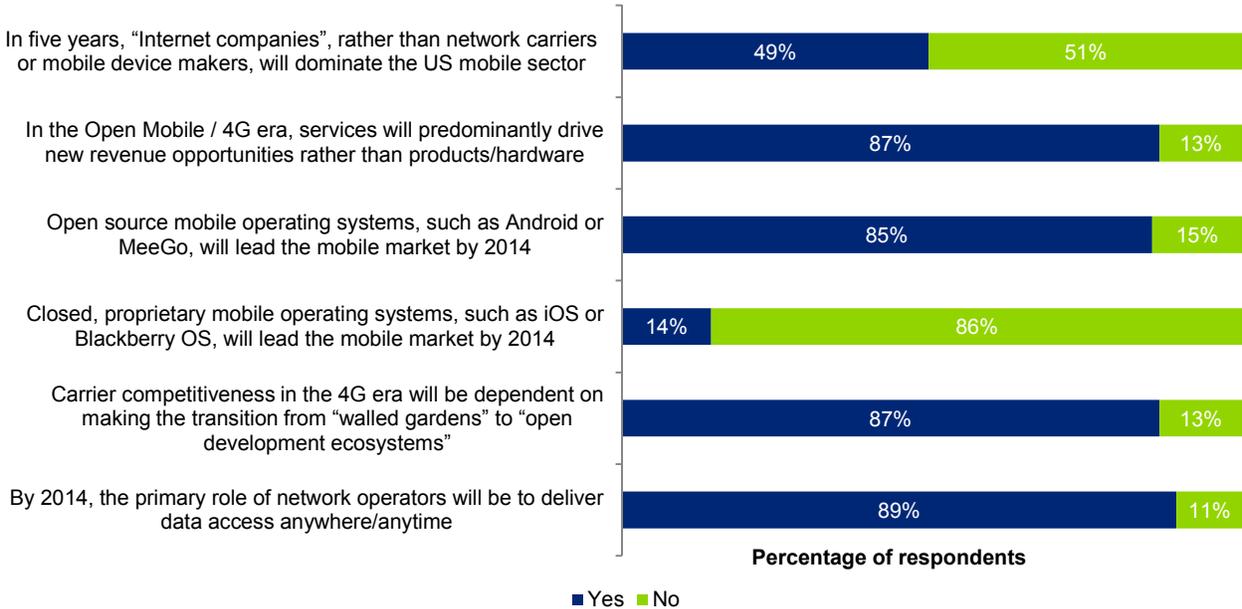
Source: Deloitte Research Open Mobile 2012 Survey

In the analysis below, we attempt to summarize the results from survey, and conclude by identifying the broad strategic focal points that incumbents should consider in order to remain competitive in the open mobile era.

Results and Analysis

Insights from our survey point to a series of shifts occurring throughout the technology, consumer and regulatory policy arenas, which together are leading to a more equitable, and competitive U.S. mobile market. Consequently, the locus of mobile innovation seems to be tilting towards non-traditional mobile industries. Approximately 50 percent of our survey respondents think that in five years, “Internet companies” (in the mold of Google, Apple etc.), rather than network carriers or mobile device makers, will dominate the US mobile sector (see figure 6). Additionally, an overwhelming majority of respondents – approximately 90 percent - think that open platforms and operating systems, such as the Android mobile OS, will lead the mobile market in the near to mid-term (see figure 6). An equal percentage of survey respondents think that conventional, proprietary “Walled Garden” business models are disintegrating and being replaced by new collaborative platforms (see figure 6).

Figure 6. Exploring the future mobile landscape



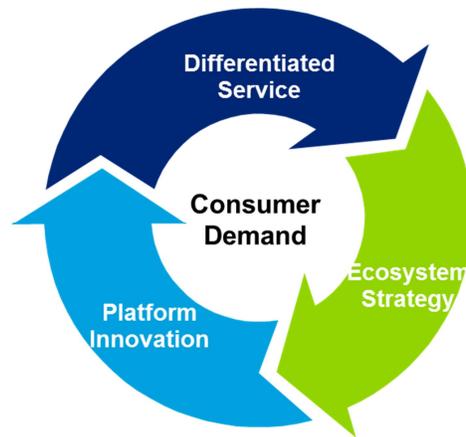
Source: Deloitte Research Open Mobile 2012 Survey

Meeting the Growth Challenge

Our survey results suggest that firms have started to plan for the open mobile era but are cautious in their approach. Most organizations reported advanced stages of planning for open mobile - 41 percent of the respondents stated that their firm has a strategy in place and is operational – and despite the recent economic downturn, executives are optimistic that investment in their firm’s open mobile strategy will increase in the near future. 31 percent of our survey respondents reported that their individual company’s commitment to planning for the open mobile/4G era had increased significantly.

To compete in the hypercompetitive era, where a wave of new entrants is innovating at a rapid pace, network carriers will require a broad range of capabilities. Our research identifies three key areas of capability focus: development of differentiated services, implementing an ecosystem strategy and the broader pursuit of platform innovation (see figure 7). By focusing on these areas, carriers can stimulate the broader innovation process and help them gain a competitive foothold in markets outside the traditional wireless sector.

Figure 7: Levers for growth in the open mobile era



Platform ecosystem strategy

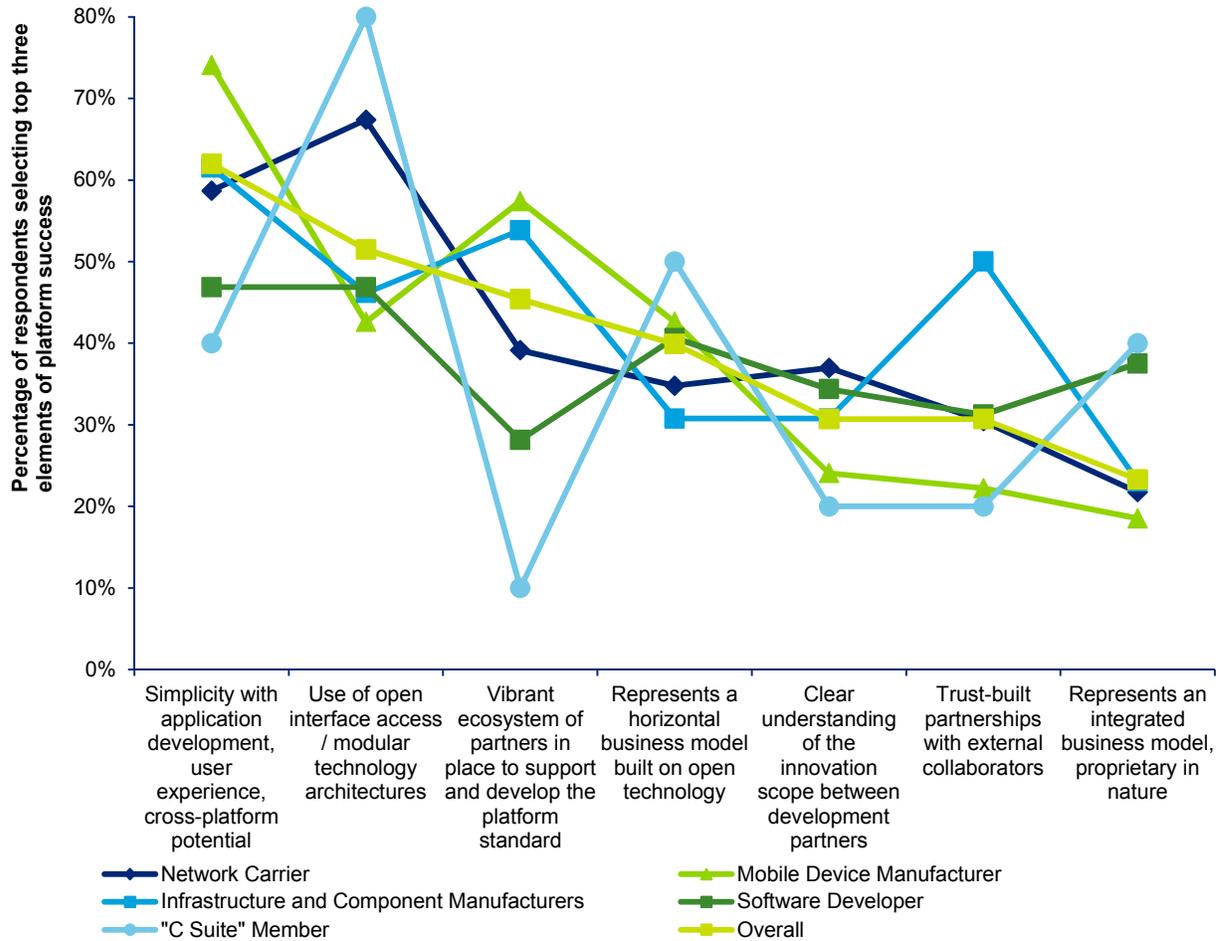
Our survey highlighted the critical role of networks in stimulating value generation and the use of a vibrant ecosystem to support and develop the platform standard. For incumbents, concerns are raised that industry-wide capability development in key functional areas remains inconsistent. Figure 8 reveals interesting results. Both network carriers and software developers ranked the use of ecosystems much lower in terms of platform success criteria. Digging deeper, only 10 percent of C-Suite respondents believed ecosystems to be a critical element. However, this seemed contrary to data collected on the most critical elements for value generation when developing a mobile OS platform. In this instance, the use of a large, developer ecosystem was deemed essential by a majority of respondents, edging out large market penetration.

Our research suggests network carriers face challenges in organizing appropriate ecosystems for new mobile growth in non-traditional markets. In particular, the ability to attract, incent and motivate ecosystem partners on a sustainable basis remains in doubt. Conversely, mobile software and mobile device companies have widespread experience in developing and mobilizing platforms and ecosystems to stimulate breakthrough innovation. Network carrier incumbents can learn from these firms, many of which are new entrants, and at the very least replicate their alliance building strategies to begin the process of capability development. At the core of this approach is the need to provide incentives to partners to participate in the form of increased knowledge and learning potential. These incentives must also be aligned to opportunities for lucrative future revenue generation. In addition, organizations with objectives in developing open platform innovation capabilities should perhaps look to learn from open source technology strategies typically used by software firms to enhance the collaborative elements of a product development ecosystem strategy.

Despite the reported reluctance of C-suite executives in accepting the importance of a vibrant ecosystem strategy, a majority of our survey respondents state their organizations have strategies

in place for either playing a leading role in orchestrating an ecosystem or acting as a participating partner in one. This could be viewed as indicative of a continuing confusion that surrounds ecosystem development across the industry.

Figure 8. Understanding the critical elements of platform leadership in the 4G era
Top 3 critical elements of the platform's success (by primary industry and functional role)



Source: Deloitte Research Open Mobile 2012 Survey

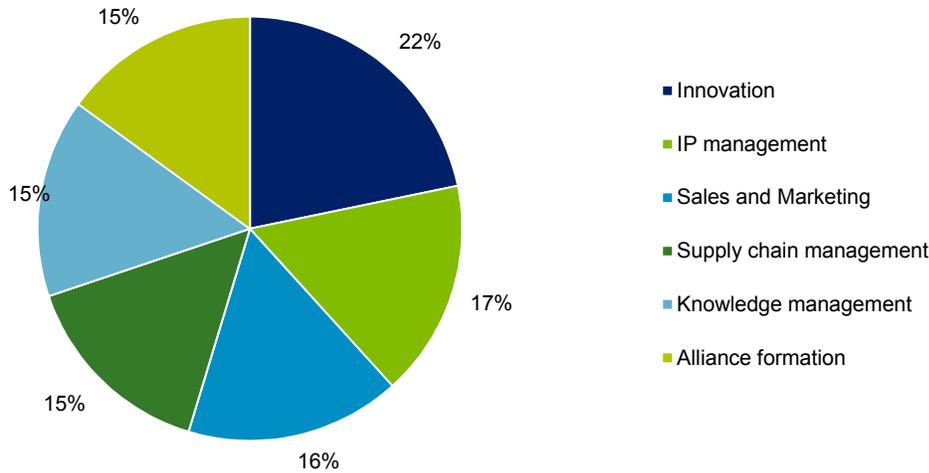
Platform innovation

According to recent research, fostering a culture of innovation through activities such as collaborative alliance formation is a fundamental capability for firms seeking to sustain top-line growth in turbulent markets (Sawhney, 2000). Our survey respondents ranked innovation as their leading capability although alliance capability ranked low (see figure 9). However, in the open mobile era, alliance formation continues to be a key pathway to stimulate platform innovation.

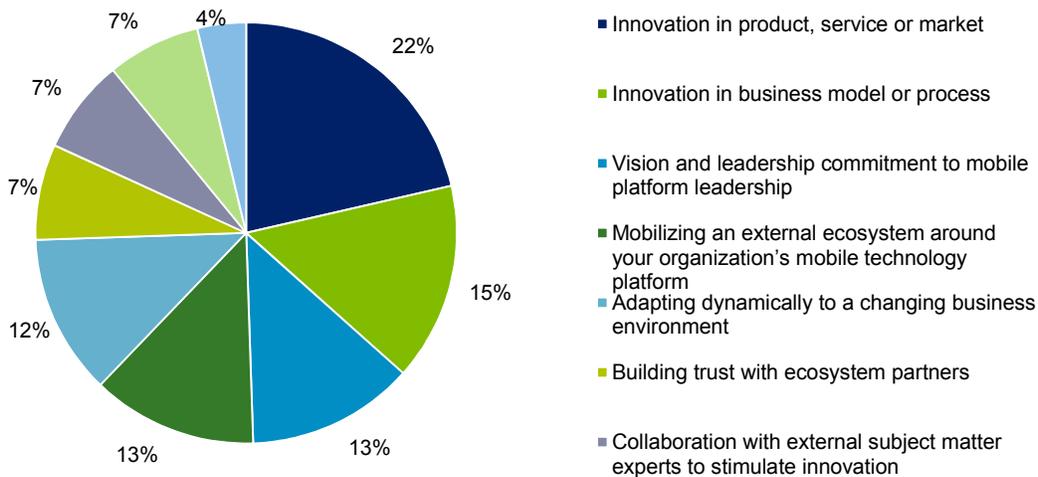
For example, the Wholesale Applications Community¹¹ (WAC) is an open global alliance of communication companies offering developers across the globe a single cross-operator platform to deliver innovative applications. Network and alliance partnerships are set to play an expanding role in delivering new mobile growth as new markets emerge outside of the traditional telecoms sector.

Figure 9. Ranking organizational capabilities

How would you rank your company's capabilities in the following functions?



How important are the following organizational capabilities in terms of competing in the 4G era?



Source: Deloitte Research Open Mobile 2012 Survey

Our research suggests that to seize the moment with emerging growth opportunities, incumbents must innovate at the product/service/business model levels by following what we describe as a

¹¹ Wholesale Applications Community (WAC), History, available at <http://www.wacapps.net/history>, accessed on May 21, 2012

“managed open strategy.” In this approach network carriers in particular, can balance open platform development with retaining proprietary control of certain core value-generating assets. As a first step carriers can extend collaboration to third-party developers (Bresnahan and Greenstein, 1999) in promising areas such as M2M in the healthcare and energy sectors. Next, they can develop supporting innovation communities that reconfigure talent, resources, and capabilities to serve and feed the platforms in these nascent markets all the while retaining proprietary control of the core assets.

Furthermore, from our analysis we have identified five instruments of open innovation that firms can adopt to complement this approach: *In-licensing external technology*, e.g. buying a patent portfolio, (Bresnahan and Greenstein, 1999; Chesbrough, 2003); *enabling third party complements*, e.g. Apple iTunes, (Bresnahan and Greenstein, 1999); *Shared architecture control*, e.g. IBM Eclipse, (West & Dedrick, 2000; West & O’ Mahony, 2008); *Information transparency*, e.g. software created under the creative commons license, (Lerner & Tirole, 2000; West & O’ Mahony, 2008); *Out-licensing internal technology*, e.g. IBM decides to sell hard disk technology, (Chesbrough 2003). Through adopting each element, carriers can ensure innovation is regenerated beyond their own four walls.

Differentiated Services

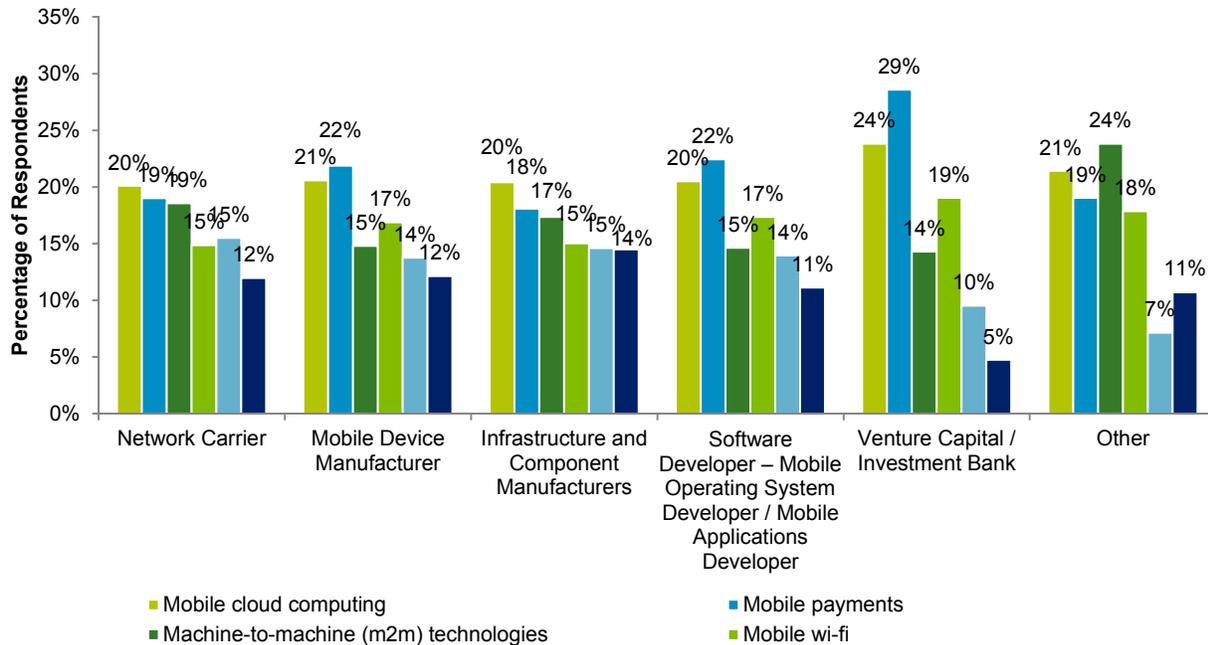
A majority of our respondents believe that network carrier competitiveness in the 4G era will be dependent on embracing a more open approach to generating growth through innovation. While our survey respondents agreed that openness can lead to enhanced customer satisfaction, uncertainty prevails when it comes to using similar tactics to compete against market leaders. In this regard, mobile carriers must find ways to remain unique and competitive. Currently, the primary role of the carriers is often viewed as restricted to delivering only data access. Taking prominent platform and ecosystem leadership roles in vertical industries that are experiencing growth in mobile technology adoption can help expand their competitive footprint. Insight from our survey reveals that 78 percent of respondents believe that emerging opportunities in mobile health (mHealth) held the most potential for mobile incumbent value generation, with the consumer products and financial services sectors close behind (see figure 5). These and other similar areas seem ripe for incumbent involvement.

Our research also reveals that differentiation can be improved by innovating at specific value layers such as the mobile OS and applications layers. In addition, 51 percent of the respondents believe that mobile services will drive future revenue opportunities. As carriers have control over their network infrastructure, their focus should remain on providing innovative services with guaranteed quality of service. However, the owners of the OS and applications value layers are predominantly software developers and mobile handset device manufacturers. With regards to future revenue potential, 43 percent of surveyed device manufacturers and 42 percent of software developers believe mobile cloud computing and mobile payments offer the most potential in service innovation (see Figure 10).

Clearly, in today’s mobile sector, the need to constantly innovate and differentiate through business models should be the top priority for those seeking sustainable growth. As our research suggest, digging deeper into what firms must do to become leaders in the open mobile era,

network carriers will require a broad range of deployable capabilities including ecosystem building, platform development, effective partnering with third parties and understanding customer needs.

Figure 10. Mobile cloud computing and mobile payment are viewed to hold most value potential three years out (response by primary industry)



Source: Deloitte Research Open Mobile 2012 Survey

Conclusion and Summary

At the broadest level, insights garnered from our research highlights the volatility surrounding the competitive landscape in the U.S. mobile sector. In particular, our focus at the capabilities level of the firm suggests the need for a more distributed approach to stimulating innovation in the mobile telecoms sector. Pursuing open innovation and platform leadership strategies at the service level and across adjacent vertical industries where wireless technology is set to disrupt established markets, could prove valuable for incumbents seeking to sustain their traditional market leadership. Fostering innovation in vertical industries such as healthcare, financial services, energy and retail will allow incumbents to reach beyond their traditional boundaries and explore new growth markets.

Our study also contributes to the growing body of research on the formation and use of dynamic capabilities to sustain competitive advantage. By exploring the elements of ecosystem development and platform leadership, across and beyond the mobile industry, our research provides preliminary insight into the evolution of dynamic capabilities used to generate

competitive advantage in the open mobile era. In this regard, Fig.7 highlights a preliminary framework synthesizing the critical areas of capability development, which we believe can be further refined through empirical research to understand the relationships between the resources and processes required in each area.

In conclusion, there are obvious limitations to what can be inferred from this preliminary analysis. Using a targeted - although biased - in-depth survey of mobile executives, the research objectives were to explore the shifts occurring in the competitive landscape of the U.S. mobile sector and subsequently to begin to understand the presence of dynamic capabilities within a particular platform innovation context. Although the results tentatively point towards the formation of a framework for capability development, the generalization of these findings is not possible.

Nonetheless, the evidence provided by this exploratory study could be a useful starting point for further research. Similar future studies should test the degree of generalizability of the concept developed in this case. In particular, the platform innovation process, discussed herein, has over the years suffered a paucity of analysis by scholars. Potential research on the formation of dynamic capabilities for this stage of the innovation process could be explored further. This would further strengthen the findings on open innovation, dynamic capabilities and platform leadership, providing a framework for mobile firms seeking growth in turbulent environments.

References

1. ABI Research, "LTE Services in the US Will Generate More than \$11 Billion in 2015," ABI Research, December 16, 2010.
2. Adner, R., "Match your innovation strategy to your innovation ecosystem," Harvard Business Review, 2006.
3. Adner, R., and Kapoor, R., "Value Creation in Innovation Ecosystems: How the Structure of Technological Interdependence Affects Firm Performance in New Technology Generations," Strategic Management Journal, Vol. 31, pp. 306-333, 2010.
4. AT&T Press Release, "Low-cost connectivity electrifies the smart grid industry", September 22, 2011. available at www.att.com/gen/press-room?pid=21261&cdvn=news&newsarticleid=32871&mapcode; For more on AT&T's smart meter alliance see www.zigbee.org; For more on AT&T's M2M services see; www.business.att.com/enterprise/Family/mobility-services/machine-to-machine/; <http://www.wireless.att.com/businesscenter/solutions/industry-solutions/vertical-industry/utilities/smart-grid-solutions.jsp> available at <http://www.gsmworld.com/technology/lte.htm>.
5. Baker, L. C., Johnson, S. J., Macaulay, D., and Birnbaum, H., "Integrated Telehealth And Care Management Program For Medicare Beneficiaries With Chronic Disease Linked To Saving," Health Affairs, Vol. 30, No. 9, pp. 1689-1697, September 2011.
6. Barney, J., "Firm resources and sustained competitive advantage," Journal of Management, Vol. 17, pp. 99-120, 1991.
7. Basole, R., "Visualization of interfirm relations in a converging mobile ecosystem," Journal of Information Technology, Vol. 1, No.16, 2009.
8. Boudreau, K. J., and Lakhani, K. R., "How to manage outside innovation," MIT Sloan Management Review, pp. 68-77, 2009.
9. Boudreau, K., "Does Opening a Platform Stimulate Innovation? The Effect on Systemic and Modular Innovations," SSRN, 2007. <<http://ssrn.com/paper=913402>>
10. Bresnahan, T. and Greenstein, S., "Technical Progress and Co-Invention in Computing and in the Uses of Computers," Brookings Papers on Economic Activity. Microeconomics, pp. 1-83, 1996.
11. Bresnahan, T.F. and Greenstein, S., "Technological Competition and the Structure of the Computer Industry," The Journal of Industrial Economics, Vol. 47, No. 1, pp. 1-40, 1999.
12. Centers for Medicaid and Medicare Services (CMMS), National Health Expenditure, https://www.cms.gov/NationalHealthExpendData/25_NHE_Fact_sheet.asp
13. Chesbrough, H. W., "The era of open innovation," MIT Sloan Management Review, Vol. 44, pg. 35-41, 2003.
14. Chesbrough, H. W., Open Business Models: How to Thrive in the New Innovation Landscape. Boston, MA: Harvard Business School Press, 2006.
15. Chesbrough, H. W., Open Innovation: The New Imperative for Creating and Profiting from Technology. Boston, MA: Harvard Business School Press. 2003.
16. D'Aveni, R. (1994): Hypercompetition: Managing the dynamics of strategic maneuvering, New York: The Free Press.
17. Eisenhardt, K. M., and Martin, J. A., "Dynamic Capabilities: What are they?" Strategic Management Journal, Vol. 21, pp. 1105-1121, 2000.

18. Eisenhardt, K. M., "Building Theories from Case Study Research," *Academy of Management Review*, Vol. 14, No. 4, pp. 532-550, 1989.
19. Eisenmann, T.R., Parker, G. and Van Alstyne, M.W., "Opening Platforms: How, When and Why?," SSRN, 2008. <http://ssrn.com/paper=1264012>.
20. Electricity Advisory Committee, "Smart Grids: Enabler of the New Energy Economy," U.S. Department of Energy, December 2008.
21. Engerbretson, J., "An Inside Look at Verizon's Smart Grid," *Telecompetitor*, September 28, 2010.
22. Federal Communications Commission (FCC), "Connecting America: The National Broadband Plan," Federal Communications Commission, March 16, 2010.
23. Gawer, A., and Cusumano, M. A., "How companies become platform leaders", *Sloan Management Review*, Winter 2008.
24. Gawer, A., and Cusumano, M. A., "The elements of platform leadership", *Sloan Management Review*, Spring 2002.
25. Gawer, A. and Henderson, R., "Platform Owner Entry and Innovation in Complementary Markets: Evidence from Intel," *Journal of Economics & Management Strategy*, Vol. 16, No. 1, pp. 1-34, 2007.
26. Gawer, A., *Platforms, Markets and Innovation*. Cheltenham, UK: Edward Elgar, 2009.
27. GSMA, "Long Term Evolution," available at <http://www.gsmworld.com/technology/lte.htm>
28. Iansiti, M., and Lakhani, K. R., "SAP AG: Orchestrating the Ecosystem, Harvard Business School Case, 2009.
29. Jencks, S. F., Williams, M. V., and Coleman, E. A., "Rehospitalizations among Patients in the Medicare Fee-for-Service Program," *The New England Journal of Medicine*, Vol. 360, No. 14, pp. 1418-1428, April 2, 2009.
30. Kato, K., and Negaro, T., "A Theoretical Review of Network Effects on Platform Products," Waseda University, ISSS Conference, 2007.
31. Lerner, J., and Tirole, J., "The Simple Economics of Open Source," February 2000.
32. Litan, R. E., "Vital Signs via Broadband: Remote Health Monitoring Transmits Savings, Enhances Lives," October 24, 2008; Kauffman Foundation/Brookings Institution report. available at <http://www.corp.att.com/healthcare/docs/litan.pdf>.
33. Miles, M. B., and Huberman, M. A., *Qualitative Data Analysis: An Expanded Sourcebook*, Sage Publications, 1994.
34. Moore, J. F., "Predators and Prey: A new ecology of competition," *Harvard Business Review*, Vol. 71, No. 3, pp. 75-86, 1993.
35. Mortara, L., Napp, J., Slacik, I., and Minshall, T., "How to Implement Open Innovation," The Institute for Manufacturing (IFM), The Center for Technology Management, University of Cambridge, 2009.
36. Next Generation Mobile Networks (NGMN), "Long Term Evolution," available at <http://www.ngmn.org/home.html>
37. Porter, M.E., *Competitive Strategy*, New York: The Free Press, 1980.
38. Rohrbeck, R., Holzle, K., and Gemunden, H. G., "Opening up for competitive advantage – How Deutsche Telekom creates an open innovation ecosystem," *R&D Management*, Vol. 39, No. 4, 2009.
39. Sawhney, M., "Communities of Creation: Managing Distributed Innovation in Turbulent Markets," *California Management Review*, Vol. 42, No. 4, 2000.

40. Scott, J. T., Hilke, C. M., Comments of Verizon Wireless in the Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, FCC, December 5, 2011, available at <https://prodnet.www.neca.org/publicationsdocs/wwpdf/12611vw.pdf>, accessed on May 21, 2012.
41. Schilling, M.A., Protecting or Diffusing a Technology Platform: Tradeoffs in Appropriability, Network Externalities, and Architectural Control. In: Gawer, A. (ed.) *Platforms, Markets and Innovation* MA: Edward Elgar 2009
42. Sideco, F., "4G LTE to Enjoy Blistering 300 Percent Subscriber Growth in Next Two Years," iSuppli, November 8, 2011a.
43. Sideco, F., "LTE Momentum Expected to Easily Overcome WiMAX Head Start," iSuppli, February 3, 2011b.
44. Strategy Analytics, "Strategy Analytics: Apple Dominates Mobile App Space with Content while Android Aims for Numbers," Businesswire, July 21, 2011. Available at <http://www.businesswire.com/news/home/20110721005072/en/Strategy-Analytics-Apple-Dominates-Mobile-App-Space>
45. VisionMobile, "Developer Economics 2011," VisionMobile Research, June 2011.
46. Viskari, S., Salmi, P., and Torkkeli, M., "Implementation of Open Innovation Paradigm Cases: Cisco Systems, DuPont, IBM, Intel, Lucent, P&G, Philips and Sun Microsystems," LAPPEENRANTA University of Technology, Research Report 189, 2007.
47. von Hippel, Eric, *Democratizing Innovation*, Cambridge, MA: MIT Press, 2005.
48. von Hippel, Eric, *The Sources of Innovation*, Oxford, UK: Oxford University Press, 1988.
49. West, J., and Dedrick, J., "Innovation and Control in Standards Architectures: The Rise and Fall of Japan's PC-98," *Information Systems Research*, Vol. 11, No. 2, June 2000.
50. West, J., and O' Mahony S., "The Role of Participation Architecture in Growing Sponsored Open Source Communities," *Industry & Innovation*, Vol. 15, No. 2, pg. 145-168, April 2008.
51. West, J., and Wood, W., "Creating and Evolving an Open Innovation Ecosystem: Lessons from Symbian Ltd.," Working paper, July 11, 2008.
52. West, J., "How Open Is Open Enough? Melding Proprietary and Open Source Platform Strategies," *Research Policy*, Vol. 32, No. 7, pp. 1259-1285, 2003.
53. West, J., Vanhaverbeke, W. and Chesbrough, H. W., *Open Innovation: A Research Agenda*. In: Chesbrough, H. W., Vanhaverbeke, W. and West, J. (eds). *Open Innovation: Researching a New Paradigm*. New York: Oxford University Press, 2006.
54. Wilson, S., and Asmundson, P., "mHealth: The Next Frontier for Mobile Service Growth," *Forbes*, *Forbes*, May 15, 2012, available at <http://www.forbes.com/sites/ciocentral/2012/05/15/mhealth-the-next-frontier-for-mobile-service-growth/>
55. Yan, S., and Flavelle, C., "Boeing Blocks GE, Philips Wireless Spectrum for Patient Monitoring Device," *Bloomberg*, July 22, 2010.
56. Yin, R. K., *Case Study Research: Design and methods*, Fourth Edition, California: Sage Publications, 2009.
57. ZPryme Research, "Smart Grid: 2010 U.S. Project Spending," ZPryme Research & Consulting, 2010.
58. ZPryme Research, "Smart Grid: Hardware & Software Outlook," ZPryme Research & Consulting, December 2009.

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