The Road to 'Cloud Nine'

How Service Providers Can Monetize Consumer Mobile Cloud

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Executive Summary

There are already close to a billion smartphones and tablets in the world today. And that number is expected to double in the next four to five years. Much of this growth reflects a rapidly expanding middle class, particularly in emerging and developing markets. Globally, this rising demographic is young, tech savvy, and poised eventually to outspend their middle-class counterparts in the developed world.[1] They are also looking for new Connected Life experiences from their mobile devices—services that will transform the way they learn and play, communicate, shop and pay, and control and monitor their day-to-day activities.

This explosive demand for Connected Life experiences, coupled with the proliferation of smart devices, offers tremendous opportunities for service providers (SPs) in emerging and established markets alike. The key lies in the mobile cloud.

In recent years, over-the-top (OTT) content players and device manufacturers have moved quickly to take the high ground in this market. This first-mover advantage has enabled them to shape new markets through mobile-cloud service innovation; gain greater control in the overall mobile-cloud ecosystem; and generate high market valuations, an important currency for inorganic growth. On the other hand, SPs are fast losing their turf and are in danger of being relegated to providing "dumb pipes." But SPs have many valuable assets within the mobile-cloud realm, including customer ownership, networks, data centers, and billing/mediation systems. These assets could enable them to facilitate a vast and growing segment of mobile consumers seeking enhanced, Connected Life experiences. On the other hand, focusing on traditional voice and short message services (SMS) may lead to missed opportunities.

The Cisco® Internet Business Solutions Group (IBSG) believes that there is a significant opportunity for service providers. Indeed, we project a more than $60 billion direct mobile-cloud service opportunity worldwide by 2016, with an additional cloud pull-through market of $335 billion.[2] Clearly, service providers must rise up to the mobile cloud and more fully realize this crucial avenue for growth and cost savings.

This paper will explore the current state of mobile consumer cloud, including its drivers and inhibitors. More important, it will present the compelling reasons for SPs to further adopt this game-changing market and technology transition, which promises services that might have been hard to imagine only a few years ago.

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[1] Cisco IBSG, 2012; "The Emerging Middle Class in Developing Countries," Kharas, OECD; U.S. Census Bureau.
[2] Cisco IBSG, 2012.

Cisco IBSG believes that every $1 invested in mobile-cloud services can bring up to $7 in return.[3] Average earnings-before-interest-and-tax (EBIT) margins of up to 30 percent[4] could also be achieved.

In illustrating how these targets are attainable, this paper will identify specific levers for revenue enhancement, including subscription, advertising, and personalization. Cost optimization levers will include data center, IP transport, mobile access, and customer acquisition costs. Furthermore, we will assert the need for an expanded network of ecosystem partners, and envision a "day in the life" for a typical mobile consumer partaking in some of the exciting services that are just over the horizon.

Why Mobile Cloud for SPs?

Shifting Demographics Drive Rising Demand

Around the world, shifts in consumer demographics make a compelling case for mobile-cloud services. Globally, these changes will drive significant changes in consumer spending habits. In 2011, the percentage of middle-class population in the world—those spending $10 to $100 per day—stood at 27 percent; by 2030, it is expected to be 59 percent. In 2030, that expanded middle class in developing and emerging markets will flex its consumer muscles by outspending the middle class in the developed world, $39 trillion to $17 trillion.

Furthermore, as the middle class in the developed world grows older, those in developing and emerging markets will remain young and tech savvy. In 2030, 58 percent of the middle class in developing and emerging markets will fall within the 15- to 55-year-old demographic; in the developed world, this population will be 48 percent.[5]

Crucial for SPs, this age group is expected to exhibit substantial demand for mobile-cloud services. So it is essential to understand the consumer behavior of this powerful new demographic and the kinds of services they will expect from mobile SPs.

Cisco IBSG sees them demanding enhanced Connected Life services that fall into four key categories:

1. **Learn and Play—**Gaming, video, information, productivity-enhancing services
2. **Communicate—**Video calls, social networking
3. **Shop and Pay—**Payments, healthcare, travel, location, context-based ads, mobile retail
4. **Monitor and Control—**Home automation, surveillance

The increase in demand for such services is already driving startling trends. Today, about 36 percent of worldwide mobile service revenues come from data; by 2016, it will increase to 46 percent. Similarly, the 1.3 exabytes per month of mobile data traffic generated today is expected to increase eight-fold by 2016.[6]

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[3] Cisco IBSG, 2012.
[4] Source: Gartner, 2011; ABI Research M2M, 2011; eMarketer, 2012; IAB, 2012; Cisco IBSG, 2012.
[5] Cisco IBSG, 2012; "The Emerging Middle Class in Developing Countries," Kharas, OECD; U.S. Census Bureau.
[6] Cisco IBSG, 2012; Cisco VNI; IDC.

Value Shift from SPs to OTTs

In terms of combined market capitalization for the top 200 technology, media, and telecommunications (TMT) companies, SPs had a solid 76.2 percent share in 2008. However, that share had shrunk to 60.6 percent by 2012. Over the same time span, OTTs increased their market capitalization share from 9.5 percent to 24.1 percent. Moreover, while AT&T, for example, achieved a market capitalization of $216 billion on revenues of $127 billion in 2012, Google achieved the same market capitalization on revenues of only $38 billion.[7]

For SPs, 'More of the Same' May Dampen Financial Performance

Over the last four years, mobile service providers have exhibited cyclical—but, on average, declining—revenue growth patterns. Overall, the momentum has fallen from an 8.9 percent growth rate in 2008 to less than half that rate (3.5 percent) in 2012. This trend has been observed in developed and emerging markets. In fact, growth rates in developed markets declined from 3.5 percent in 2008 to only 0.3 percent in 2012. Meanwhile, in emerging countries, it decreased from 19 percent to 8 percent over this time period.[8]

Had it not been for data, with service providers relying only on voice, SPs would have seen much lower growth rates (4.4 percent in 2008, declining to -2.4 percent in 2012). On the other hand, data revenue growth increased from 4.5 percent in 2008 to 5.9 percent in 2012. The implication is that data has helped generate a significant portion of the mobile SP growth.[9]

So far, SPs have not taken the lead in offering Connected Life services. That claim belongs to OTTs, such as Google, and device makers, such as Apple. These companies stepped forward early on and are now ahead in terms of service adoption, as reflected by usage intensity and maturity of service (see Figure 1).

On the other hand, most SPs are still at an early stage in terms of mobile cloud. A few breakaway SPs—including China Mobile, Verizon, and AT&T—are beginning to realize the value of offering mobile-cloud services through their own app stores or through linkages to outside app stores. Overall, however, SPs are behind the curve on this crucial opportunity.

But why do most SPs lag in providing mobile cloud? As we have seen, although limited in their network footprint compared with OTTs, SPs possess some of the key underpinnings for cloud success, including customer ownership, networks, data centers, operations support systems, business support systems, and managed services.

One reason for the current lag is that, initially, mobile-cloud services offer lower margins than traditional SP mainstays such as SMS. So, many established SPs have stayed with known routes to success, optimizing within their existing portfolios. Many mobile SPs, for example, already have solid EBIT margins of 20 to 25 percent through voice and SMS. This compares with 10 to 20 percent EBIT margins for many mobile-cloud services.[10] As a result, these SPs are reluctant to warm up to new offerings. Part of the solution is to embrace innovations that challenge the comfortable status quo but potentially can reap significant future benefits.
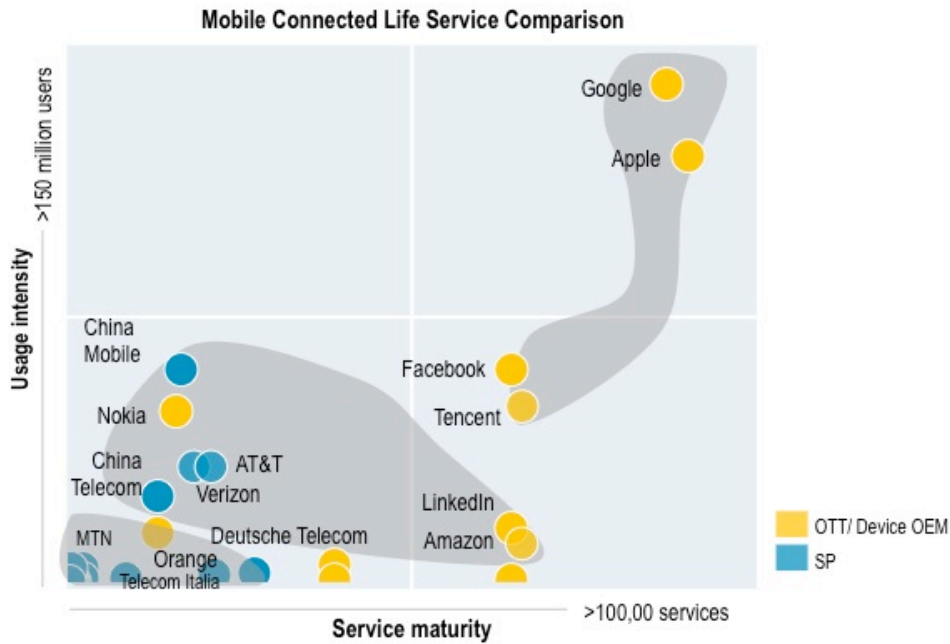
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[7] Cisco IBSG, 2012; Oliver Wyman SOI Analysis.
[8] Cisco IBSG, 2012.
[9] Ibid.
[10] "Market Trends: New Revenue Opportunities and Profitability for Telecom Carriers," Gartnter, 2011. The exception is social communications service, which could achieve margins margins of more than 40 percent.

Figure 1.   OTTs, Not SPs, Have Taken the Lead in Connected Life Experiences.

Note: Usage intensity is based on number of users. Service maturity is determined by the number of years since service launch and size of the offer portfolio.
Sources: Cisco IBSG, 2012; ABI Research

Another inhibitor to SP cloud services is the fragmentation of platforms and the lack of open application programming interface (API) standards for consistency. The fragmentation runs across different technology platforms, including 2G, 3G, 4G wireless, and Wi-Fi, all of which vary across different vendors and technologies. This reduces the ability to cross-leverage services to span fixed, mobile, or Wi-Fi. Moving across siloed business and enterprise solutions is also a challenge.

Some SPs have embarked on transformation programs to address some fragmentation issues. This is creating more flexibility to create new kinds of mobile-cloud-based services, with faster time to market and more precise targeting. Siloed business barriers also break down, and services can be leveraged with higher security and reliability by enterprises, businesses, and consumers alike. Such numbers, coupled with explosive demographic trends, create a clear call to action for SPs to reach for the cloud.
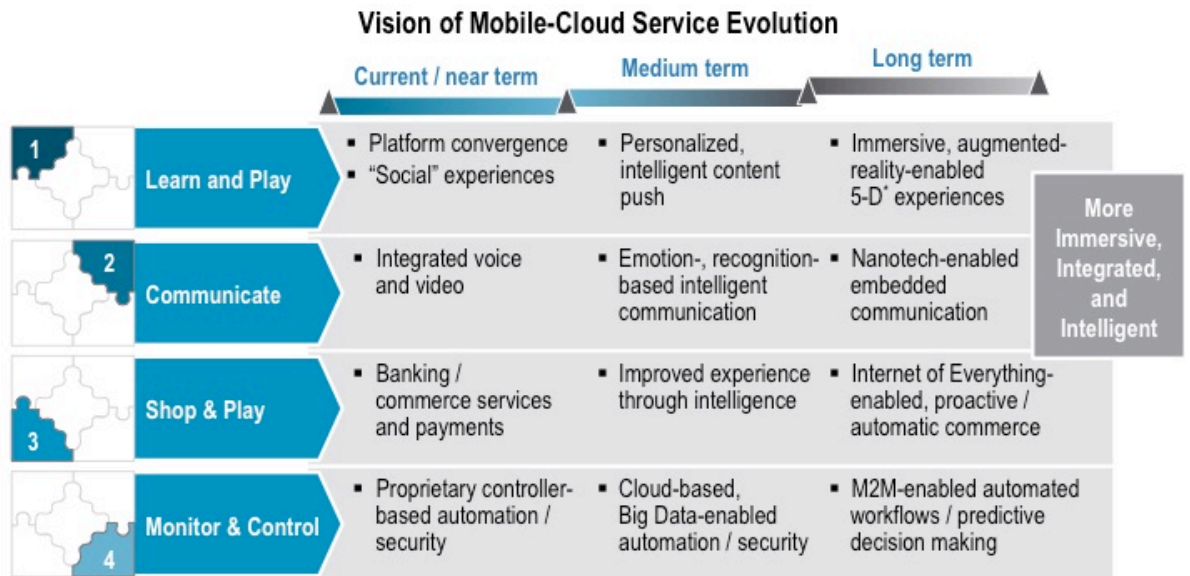
The State of Mobile-Cloud Services—Now and in the Future

In this section, we will gauge the current state of SP-generated services and gaze into the future to explore what awaits mobile consumers. In effect, how will those services evolve in the medium term (two to three years) to long term (five years and beyond)? And which services will generate the greatest value for SPs?

For starters, this evolution will make mobile services more immersive, while integrating them across different platforms. They will also be much more intelligent and able to incorporate Big Data capabilities such as predictive analysis. Figure 2 reveals some of the SP

opportunities available across the near, medium, and long terms for each of the four previously mentioned connected-service categories.

Figure 2. Four Key Areas Offering Mobile-Cloud Service Opportunities.

Vision of Mobile-Cloud Service Evolution

	Current / near term	Medium term	Long term
1 Learn and Play	▪ Platform convergence ▪ "Social" experiences	▪ Personalized, intelligent content push	▪ Immersive, augmented-reality-enabled 5-D* experiences
2 Communicate	▪ Integrated voice and video	▪ Emotion-, recognition-based intelligent communication	▪ Nanotech-enabled embedded communication
3 Shop & Play	▪ Banking / commerce services and payments	▪ Improved experience through intelligence	▪ Internet of Everything-enabled, proactive / automatic commerce
4 Monitor & Control	▪ Proprietary controller-based automation / security	▪ Cloud-based, Big Data-enabled automation / security	▪ M2M-enabled automated workflows / predictive decision making

More Immersive, Integrated, and Intelligent

* Also includes space, time, and senses.
Source: Cisco IBSG, 2012

Moving forward, it is possible to envision a "day in the life" of three typical mobile consumers in the near-, mid-, or long-term future, and how their activities will be influenced across the four connected-service buckets. It is worth noting that even the most far-reaching of these scenarios are already being experimented with or have reached prototype stage in labs and research institutions.

Let's start by imagining a typical day for Choan, a young, tech-savvy office worker in a contemporary suburb outside Seoul:

- **Shop and Pay**—Before work, Choan is able to engage in some fast-paced mobile banking from her smart device, checking her balances and paying bills. Before rushing out of her house, she does some quick shopping, guided by context- and location-aware ads targeted to her personal interests.

- **Communications**—Once in the office, Choan connects with her global company's far-flung network of partners and collaborators via integrated mobile presence, instant messaging, conferencing, and voicemail. Real-time translation services make such interlanguage communications easier. Then, after a hectic morning of virtual meetings and communications, Choan uses a bit of downtime to share blogs, videos, and pictures with the friends lists in her presence apps; in return, she receives real-time recommendations on products she might buy, places she might go, and videos she might watch.

- **Monitor and Control**—During her evening commute, Choan tries a new route, aided by a "virtual driver," advising on directions, traffic, and estimated arrival time.

- **Learn and Play**—Back home, Choan takes advantage of converging platforms for cutting-edge entertainment experiences. This enables her to select content on demand, whether from Internet protocol TV, video on demand, pay per view, catch-up TV, or user-generated content via OTT. Using n-screen capabilities, she moves seamlessly among TV, PC, tablet, and smartphone. Before the evening is over, Choan's gaming activities are integrated into social networking, enabling her to share those activities with friends and user groups.

Within five years or less, another mobile consumer, Andrei, will see his enhanced Connected Life experiences in Moscow transformed through Big Data analytics, human-machine interactions, and the Internet of Everything:

- **Monitor and Control**—Andrei will wake up in a home where all lighting, energy, surveillance, and appliances are connected to the cloud and capable of being monitored or controlled via his smart device, even after he leaves for work.
- **Communicate**—In the office, Andrei will benefit from a torrent of new data streams rapidly analyzed to forecast new trends and future movements.
- **Shop and Pay**—Andrei's retail and banking experience will involve image identification, voice identification, or other biometric authentication, negating the need for cards or mobile devices. Meanwhile, Andrei's mobile device will provide reminders of budgeting constraints during shopping and identify which coupons or offers will optimize a purchase.
- **Learn and Play**—Relaxing back at home, Andrei will take advantage of the intelligent analytics capabilities of his mobile devices, which "learn" from his posture, gestures, and past usage behavior, and then offer video, music, or game content suited to his mood, time, and location.

Beyond five years, augmented reality, machine-to-machine communications, and nanotechnology will further transform the life of Maya, an information worker in Bangalore, India:

- **Monitor and Control**—Maya's "Virtual Butler" will awaken her, update to-do lists for the day, warn of abnormal appliance conditions in the home, and send shopping lists to her in the supermarket (if her refrigerator is low on milk, for instance, it will "know").
- **Communicate**—Maya's work life will benefit from cross-platform communications available on any device. This will extend to nanotech-enabled devices embedded in her body, which will also monitor and share data on her health.
- **Shop and Pay**—If Maya chooses to shop from home or work, she will try on clothing "virtually," as her mobile devices connect with the online store to visualize the fit to her specific size and appearance.
- **Learn and Play**—Once home, she will enter a multi-dimensional world of augmented, immersive entertainment where she will view, sense, and smell content for enhanced visual impact. Hyperreal, holographic video images will be presented with a 360-degree viewing perspective, from any angle, as Maya interacts and role-plays in real time with the characters on screen.[11]

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[11] Cisco IBSG, 2012.

These possibilities represent a vast potential market that SPs should further target. Today, they are tapping into only a fraction of a substantial addressable total market. Cisco IBSG predicts that the combined revenue from services in these four areas could grow from $39 billion in 2012 to $64 billion in 2016. The combination from other areas addressable through cloud—including video streaming, file/content sharing, online gaming, and machine-to-machine (M2M) services—is estimated to bring an additional pull-through of $335 billion in 2016, for total mobile-cloud revenue of close to $400 billion.[12]

Figure 3.   By 2016, a $64 Billion Direct-Service Opportunity and Potential $335 Billion Broadband Pull-Through.
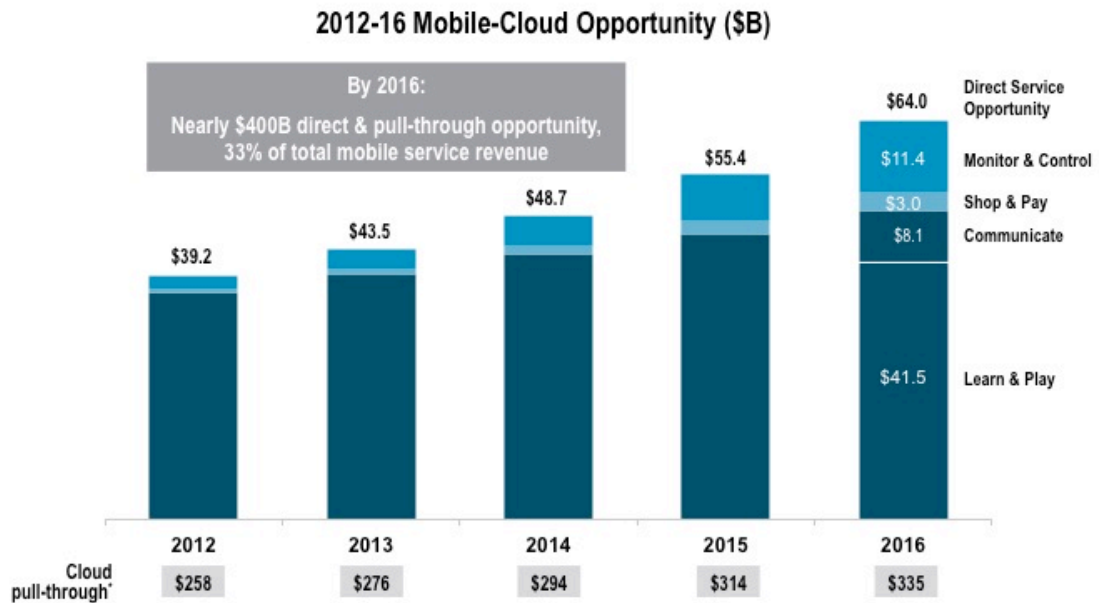
* Cisco VNI: 70-80 percent of data traffic from video streaming, file/content sharing, online gaming, M2M addressable through mobile cloud.
Sources: Ovum, 2011; Gartner, 2011; ABI Research M2M, 2011; eMarketer, 2012; IAB, 2012; Cisco IBSG, 2012

How Can SPs Extract Greater Value from Mobile Cloud?

We have explored the compelling arguments driving SPs to mobile cloud, along with some of the exciting and intriguing possibilities. But how will SPs reach the concrete reality of monetizing those services and realizing greater cost savings?

In Figure 4, we examine how each dollar of SP investment in the mobile cloud could return up to $7 in revenue, based on Cisco IBSG research and customer engagements. Using a breakdown consistent with our previous service categories, we see the effects of adding advertising revenue or value-added features such as turbo-mode broadband service to the already-paid service.

However, while the return on investment capital (ROIC) is generally better for mobile-cloud services than for traditional SP voice and SMS services, EBIT margins are better for traditional services. Because many of the cloud-based services require an investment only on top of the pre-existing network infrastructure, they provide superior returns compared

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[12] Ovum, 2011; Gartner, 2011; ABI Research M2M, 2011; eMarketer, 2012; IAB, 2012; Cisco IBSG, 2012.

with mobile voice, SMS, and multimedia messaging services (MMS) when measured in terms of ROIC. Notable exceptions include mobile video services, which often require significant investments to expand network capacity, acquire content, and subsidize end-user devices. In terms of profit margins, however, mobile-cloud services appear to lag significantly behind traditional mobile services.[13]

Figure 4.   For SPs, Mobile-Cloud Services Bring up to $7 in Revenue Per Dollar Invested.
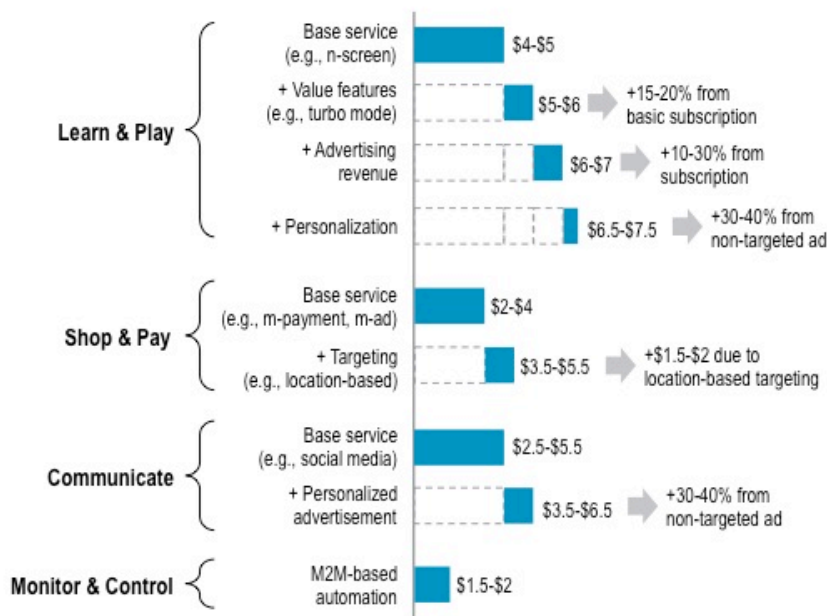
Source: Cisco IBSG, 2012

There could be a number of factors that explain this profit dilemma, including: 1) use of expensive but spectrally efficient 4G/LTE networks to accommodate the ever-increasing need for broadband; 2) lack of sophistication in the pricing of new services, which leads to subpar margins; and 3) dearth of personalized advertisements (or absence of advertising strategy altogether), which limits an SP's ability to charge more for its advertising inventories.

So, given these challenges, how can SPs better monetize mobile-cloud opportunities? The key is to find revenue and cost levers that can be used to improve profitability.

Figure 5 demonstrates how some specific levers—including subscription revenue, advertising, and personalization backed by analytics—can grow revenues (up to 40 percent), while others—including data center, IP transport, mobile access, and customer acquisition—can cut costs (as much as 20 percent).[14]

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[13] "Market Trends: New Revenue Opportunities and Profitability for Telecom Carriers," Gartner, 2011.
[14] Cisco IBSG, 2012.

Figure 5.   Optimizing Key Revenue and Cost Components Can Improve Profitability by up to 50 Percent.
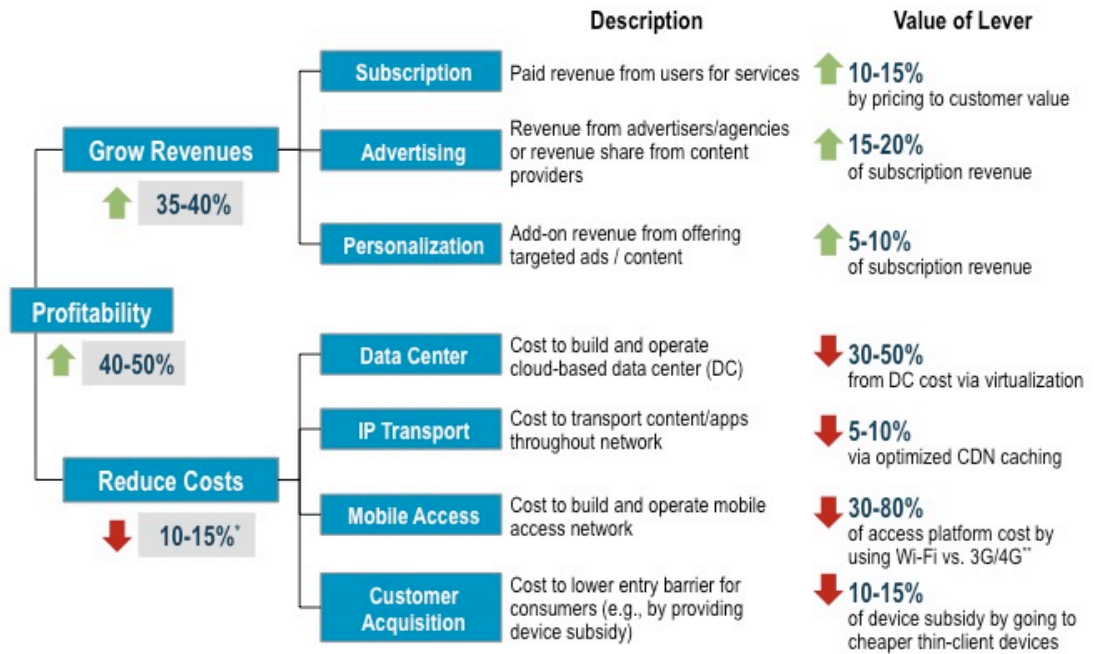
* Assumes CoGS at 50 percent of OpEx, SG&A at 30 percent, D&A at 20 percent. ** 3G/4G costs exclude spectrum costs.
Source: Cisco IBSG, 2012

Some of these levers vary in relevance between emerging and developed markets. Subscription revenue, for example, would be more applicable to developed markets, owing to a greater ability for consumers to pay. Advertising, while important in any market, would be more relevant in developing markets, where the ability to pay for services is less of an issue. Personalization will be important in both emerging and developed markets, as Big Data analytics proliferate.

As for reducing costs, four key components apply: data center, IP transport, mobile access, and customer acquisition. Of these, data center and IP transport are equally important in developing and developed markets; low-cost mobile access alternatives are being extensively explored in developing markets (for example, through greater use of Wi-Fi); and customer acquisition efforts, such as device subsidies, are a key issue in developing markets, where user price sensitivity is acute.

Figure 6 explores the specific value of the levers, and how they will improve profitability by raising revenues and reducing costs, increasing the average EBIT margin of mobile-cloud services to 30 percent (versus 20-25 percent for mobile voice and SMS services) and producing a cash flow margin of 25 percent. We show how money will flow from $1 of paid revenue and calculate the effect of levers such as advertising, personalization, and value pricing.

Figure 6. Mobile-Cloud Services Produce Average EBIT Margin of up to 30 Percent and Cash Flow Margin of up to 25 Percent.

Money Flow Based on $1 Paid Revenue
(average across mobile-cloud service categories)
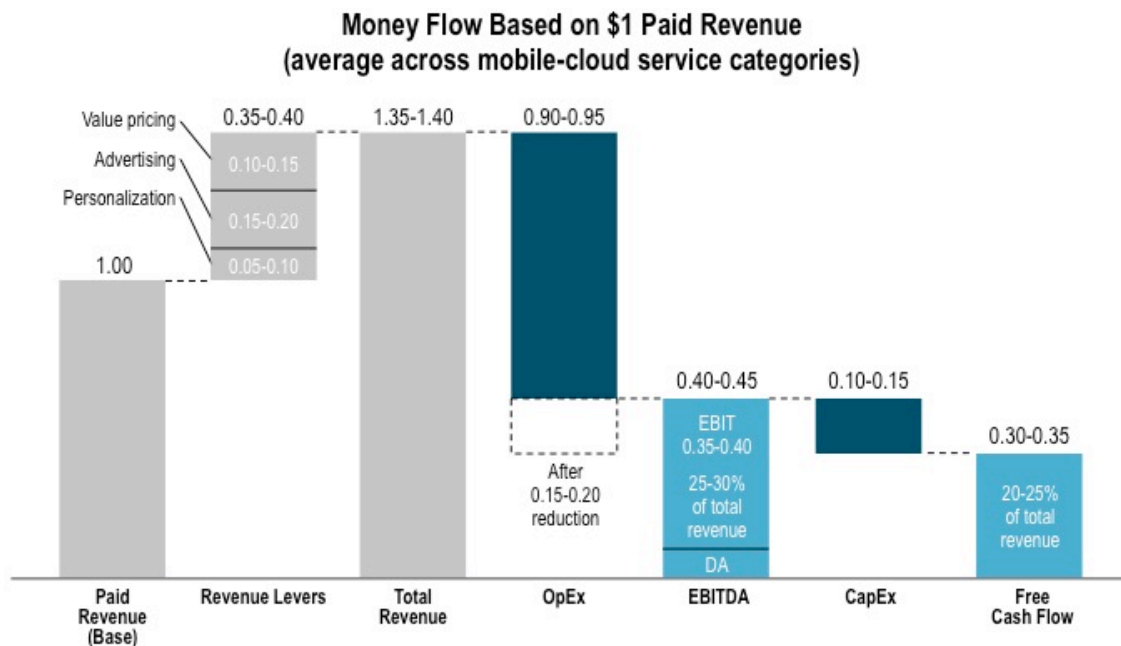
Note: 30 percent EBIT margin improvement assumes full utilization of all revenue and cost levers.
Sources: Gartner, 2011; ABI Research M2M, 2011; eMarketer, 2012; IAB, 2012; Cisco IBSG, 2012

Key Cloud-Related Imperatives for SPs To Grow Revenues & Profits

In the area of **subscriptions,** the goal is to gain additional customers and persuade them to pay more. Some potential SP actions include moving from flat-rate/one-size-fits-all pricing to tiered and capped pricing; pricing to customer value; and, in the case of developing markets, lowering broadband access pricing to increase cloud-service penetration. In fast-growing emerging markets such as India and China, lower access costs and sub-$50 entry-level tablets are boosting service adoption.[15] Pricing to customer value (or value pricing) is a lever that SPs are starting to utilize. This includes intelligently pricing the mobile-cloud service add-ons for guaranteed bandwidth, reduced latency, or traffic prioritization for a limited period. One example is Elisa, the Finnish mobile SP, which introduced "turbo mode." This brought a 20-Mbps speed boost for $4/month—a 30 percent increase over its standard mobile broadband offering.[16]

In **advertising,** the goal is to supplement subscription revenue, especially in low-affordability markets, by increasing ad rates and user tolerance of ads. Increasingly, Big Data will further expand this revenue opportunity as it drives personalization and better-targeted ads. Using subscriber and network analytics (for example, based on subscriber demographics, usage behavior, type of content/services accessed, and social network attributes), SPs could personalize content and ads, resulting in greater monetization opportunities. As an example,

[15] Source: web searches.
[16] Elisa home page; Cisco IBSG, 2012.

France-Telecom Orange charges up to 85 percent more for personalized ads placed in topical sections such as sports pages (versus generic ads on its home page).[17]

New opportunities will arise as the OTT challenge is met. Greater collaboration and partnerships—including with content providers and OTTs themselves—will be key. Considering the success of mobile-cloud services offered by OTTs, integrated app stores are fast emerging as table stakes for SPs seeking differentiation. Through app stores, SPs could weave in disparate mobile-cloud services. These could include highly monetizable examples such as multiscreen video. Others, including communications, gaming, and social networking services, would require SPs to share revenue with OTTs and content providers. For instance, AT&T acquired the app store Plusmo; Sprint partnered with Hanmark, another app store; and SPs in China, Korea, and Japan are actively looking to grow their app libraries organically.

Besides app stores, enabling new innovative content and app creation is also crucial, and utilizing a platform-as-a-service (PaaS) development architecture is a decisive place to start. While Apple has successfully monetized its platform, many SPs have a long way to go. Another successful example, however, is Telefonica's BlueVia, which rewards developers with a share of revenue for using Telefonica's voice, messaging, and carrier-payment APIs.

Here are some key cloud-related imperatives that SPs can adopt to reduce costs:

Data center is at the heart of mobile-cloud services. Increasing costs from power, cooling, space, and management have caused the traditional paradigm of one application workload per server to come under significant pressure. To reduce data center costs, SPs can consider migrating to a virtualized cloud-based data center. Within SPs' data centers, virtualization technology enables multiple workloads to run on a single server. This will help them realize improved utilization, multi-tenant efficiency, and economies of scale. Aggressively virtualized cloud data centers can deliver total cost-of-ownership savings of more than 30 percent over traditional data centers.[18]

IP transport costs must be capped or reduced in the face of ever-increasing mobile-data traffic. Potential solutions include optimally deploying content delivery network (CDN) caches throughout the IP network to realize transport cost reductions ($4-$12 per Mbps per month) and increase quality of service to end users.[19] The CDN functionality could be included in the device, Wi-Fi access point, wireless controller, cell site, or other upstream aggregation points. Coupled with user analytics capabilities, CDNs could also help generate incremental revenues from personalizing content and ads.

Mobile access is often constrained by spectrum issues, including bandwidth shortage and high costs. As an alternative to traditional radio-access networks (RANs) for delivering bandwidth-hungry mobile services, SPs should consider Wi-Fi to supplement 3G and 4G, especially in dense public areas such as stadiums, airports/ trains and train stations, shopping malls, and restaurants, as well as residential/commercial areas. In studying the Wi-Fi deployment of one Asian SP, Cisco IBSG found that Wi-Fi could help offset 90 percent of 3G costs in high-capacity situations. In fact, the five-year total cost of ownership for Wi-Fi

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[17] Orange advertising rate card, 2011.
[18] Based on virtualization projects by VMware and Microsoft.
[19] VMware, McKinsey, Microsoft, Cisco IBSG.

(versus 3G) as the last mile was more economical when only 10 percent of the sites were fully utilized during busy hours. Commensurate figures for Wi-Fi breakeven (versus 4G) resulted when 40 percent of sites were fully utilized during busy hours. (These results were calculated when the initial 3G/4G spectrum costs were not even included.)

In addition, in their quest to reduce the network costs while maintaining quality and experience, mobile SPs are virtualizing RAN elements by moving baseband processing to the cloud and leaving only antenna function and amplifiers at the network edge. A virtualized cloud RAN solution can reduce CapEx (by 20 to 25 percent) and OpEx (by up to 70 percent).[20]

Other key infrastructures critical to mobile data, such as the packet network, are being virtualized. Combined with the use of cloud RAN technology, the virtualized evolved packet core (EPC) can deliver 15 to 25 percent CapEx reduction from reduced node requirements, improved utilization of IP transport network resources, and use of software upgrade (rather than hardware upgrades) to enhance network functionality.[21]

Customer acquisition costs can be impacted by mobile cloud as well. With processing and storage concentrated in the cloud, mobile providers can reduce potential device subsidies by enabling less powerful and less expensive "thin-client" devices. A mobile-cloud-based handset can be 10 to 15 percent cheaper than a comparable smartphone given lower processor, memory, and application license costs.[22]

Conclusion

As this paper has shown, it is imperative for SPs to heed the call to consumer mobile cloud. The rise of a young, tech-savvy middle class translates into ever-growing consumption of mobile services. Increasingly, these consumers are being served from the cloud. The next generation will use mobile-cloud services in many aspects of their lives—for learning and playing, communicating, shopping, and even for ensuring the security of their homes.

Despite the wealth of opportunities presented by mobile-cloud services, SPs will need carefully planned strategies if they are to win in this market. Future-proof business and technical architectures will be a crucial starting point; in turn, they will enable revenue-enhancement levers such as pricing optimization, service personalization, and targeted advertising. But SPs must also invest in cost-reduction options such as virtualizing data centers and mobile networks; employing Wi-Fi to supplement 3G/4G access technologies; and offering "thin-client" handsets or tablets to reduce device subsidies. In addition, SPs will need to join forces with ecosystem partners on the journey to cloud. These could include media companies, content providers, and application developers. Other potential partners could be the OTTs themselves—indeed, SPs will need to complement their core competencies with the requisite capabilities that even erstwhile rivals bring.

For many SPs, the road to mobile-cloud success is just beginning. But a vast scope of opportunities awaits all SPs who venture into the mobile cloud. The time to reclaim the high ground is now.

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[20] China Mobile. Based on 180,000 new sites, 90 percent of which have fiber backhaul resources.
[21] Cisco IBSG interview with major mobile providers.
[22] Morgan Stanley, INQ; Cisco IBSG, 2012.

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