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TECHNOLOGY, ENTERTAINMENT AND INNOVATION

AN OVERVIEW 2009–2010

TUCK SCHOOL OF BUSINESS AT DARTMOUTH



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Welcome to our overview of the Britt Technology Impact Series (BTIS) on this year's theme of **Mobile Strategy: Technology, Entertainment and Innovation**. The series is a set of events offered by the Center for Digital Strategies for the benefit of the students, faculty, staff and other members of the Tuck School of Business and broader Dartmouth community. The series focuses on a particular theme each year, with the goal of bringing the business and personal implications of a set of technologies to life in a dynamic way.

The series is made possible by a generous donation from Tuck and Dartmouth alum Glenn Britt, CEO and Chairman of Time Warner Cable. In giving the gift, Glenn stated, "The role of business people is to understand the possibilities created by new technologies, recognize unmet consumer or business needs they could fulfill, and determine if the new technology and the customer needs can be put together in a business model that makes sense." We strive each year to ensure that the Britt Series highlights relevant aspects of a set of technologies, examines current business models and illustrates how consumers' needs are being met in the topic area.

We again hosted a great group of executives at Tuck this past year as part of this series on "mobile"—what a year to focus on this topic! Each of them brought his or her own unique perspective on "mobile" to the community, painting a picture of a dynamic and multidimensional space that is developing at a breathtaking pace. We hope that this summary of key learnings from the year's events provides you with a better understanding of the dynamics and challenges facing the telecommunications industry (but materially affecting so many others), as well as the changes in how people are using new mobile capabilities every day.

Hans Brechbühl
Executive Director
Center for Digital Strategies
Tuck School of Business at Dartmouth
June 2010

Mobile is more than voice

The world's love affair with mobile devices and services is growing at an incredible pace. Although experts have been predicting a mobile revolution for years, it is only now becoming real with the emergence of new devices and technologies capable of providing more engaging, media-rich experiences virtually anytime and anywhere.

Taking into account both traditional and smartphone connections, mobile phone penetration worldwide has quadrupled since 2002, with the International Telecommunication Union (ITU) reporting 4.6 billion global mobile subscriptions at the end of 2009, or a 67% penetration rate. Simultaneously, mobile phone penetration in developed markets approaches or even exceeds 100%.

But only recently has the bar been raised when it comes to the mobile user experience. Today, "smarter" phones and faster networks create a new kind of user experience, combining the convenience of everywhere connectivity with the capability of doing things only possible previously while tethered to a desktop PC or laptop. Projections for emerging markets are particularly compelling, where in the absence of existing infrastructure, huge numbers of people could bypass so-called old technologies altogether.

Despite overall penetration rates, U.S. smartphone adoption is still only a phenomenon among relatively small numbers of early tech adopters. According to comScore, only about 19% of U.S. mobile phone subscribers owned smartphones at the end of February 2010. However, dramatic smartphone market growth is expected in the U.S. based on a 72% quarter-over-quarter growth rate from 15 million subscribers in 2008 to 26 million in 2009 and projections from Nielson indicating that more than 50% of people in the U.S. will be carrying a smartphone by 2012. This dramatic



increase in device sales and the resulting explosive mobile data usage signals a fundamental change. Mobile is no longer just about voice.

According to Mike Abramsky of RBC Capital Markets, this "perfect storm" driving smartphone adoption is due to:

- ▶ Powerful, iconic smartphones like the Apple iPhone
- ▶ Rising demand for mobile email and mobile browsing, multimedia messaging (photo, video, etc.), mobile music, social networking, location-based services, etc.
- ▶ Momentum of mobile applications platforms and proliferation of third-party mobile applications
- ▶ Increasing buyer interest in customization (third-party applications, games, software, etc.)
- ▶ More affordable handset/data plan pricing trends globally
- ▶ Faster 3G networks and carrier focus on data
- ▶ Device convergence (GPS, music, camera, game console, media player, etc.)
- ▶ Mobilization of business

The convergence of PC computing power, accelerated investment in infrastructure, and revolutionary innovation of the user interface have set the stage for significant paradigm shifts both within traditionally fixed line industries and beyond. In the pages that follow, we take a closer look at the current opportunities and challenges from multiple industry vantage points offered by top executives who, during their visit to Tuck, shared their perspectives on how innovation of mobile technology and changing data consumption patterns are transforming the way people do business.

We have divided our research, presentations and interviews into three themes, focusing on the impact of the changing mobile landscape on: infrastructure delivery; value chain of content generation and distribution; and mobile as a channel to reach the customer.



From voice to data

Mobile network operators and handset manufacturers have long occupied very powerful positions, controlling most elements of the value chain. But times are changing.

As Yankee Group CEO Emily Nagle Green stated, “The mobile space is going from a closed ecosystem where an enormous amount of control was exercised by mobile network operators and to a lesser degree handset manufacturers, to a much more open world that looks more like the internet—because, in fact, it is the internet. It’s a mobile internet that also happens to facilitate phone calls.” A combination of technological advances and consumer demand are driving the changes. Faster networks, increased data usage and device convergence are all transforming the competitive landscape, introducing new players and forcing incumbents to rethink old business models in order to profit from the opportunities and remain relevant to consumers.

The march to convergence between the PC and the mobile phone may seem inevitable, however many relatively independent steps in innovation have made the smartphone possible. In 1999, massive infrastructure investment began as operators upgraded networks from 2G to 3G and voice service became available via voice over internet protocol (VOIP). Simultaneously, computers were enabled with Wi-Fi, allowing for internet connectivity without wires. In 2007, when the iPhone was introduced the smartphone revolution had begun.

Today, the resulting convergence of the IT and telecommunications worlds is drastically changing the game. As Mary McDowell, EVP and Chief Development Officer, Nokia explained, for incumbents in the traditional value chain, it means transitioning from a more vertical orientation, characterized by well-documented processes and orderly relationships with a known set of partners, to something altogether different. Although exciting and full of opportunity, it makes decision-making much more difficult and the results much less predictable.

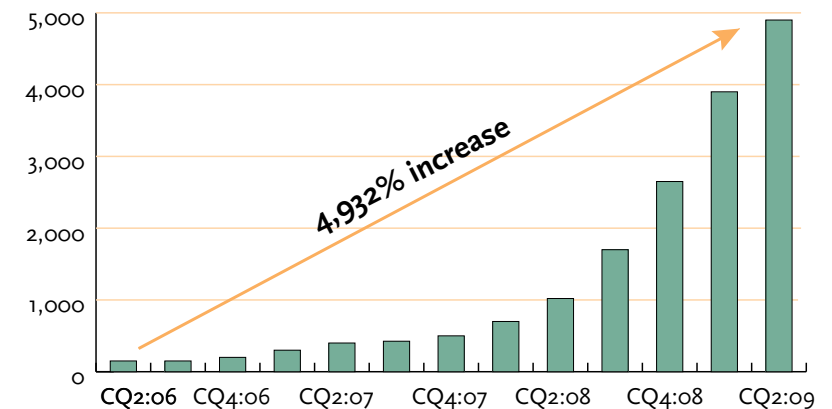


... business is shifting from a voice business to a data business.

The industry is also changing in other significant ways. “The first key message about how the industry is changing is that the business is shifting from a voice business to a data business,” said Terry

Kramer, Regional President, Vodafone Americas. In March of 2010, analyst Chetan Sharma reported that data traffic in 2009 (referring to all the digital data services people access through a mobile phone, excluding voice calls) exceeded voice traffic

New Devices Driving Higher Mobile Data Consumption 50x Mobile data traffic increase in past three years



Source: AT&T

for the whole calendar year—a first in the history of the U.S. wireless industry. With almost 400 terabytes of data traffic, data exceeded voice traffic by a significant margin, and the ratio is expected to double in 2010. However, revenue from data services grew at only 24% over the same period and is expected to grow just 20% in 2010. The bulk of this data growth comes from smartphones. Although smartphones currently account for only about 19% of total mobile phone users in the U.S., Nielson reports that they still account for about 50% of all mobile web users. And with the massive upgrade cycle predicted, the resulting growth of data consumption will continue to be dramatic, making network planning much more complex.

This explosive growth in data consumption beyond voice presents many challenges for mobile network operators. High data usage concentrated among smartphone users coupled with uneven consumption patterns among those same users poses an immediate challenge to more effectively monetizing data traffic while limiting the impact on operator networks. As Dan York, EVP of Content, AT&T emphasized, “Data consumption of iPhone users is ten times that of other smartphone users.” This is of particular concern to AT&T, who has been the exclusive U.S. carrier for the iPhone since 2007. Similarly, Terry Kramer pointed out that the top 1% of Vodafone users in their Northern European businesses use about 30% of network capacity.

The shift in data consumption patterns has left operators scrambling to find new monetization models to alleviate growing pressure on their networks and address the disproportionate relationship between data traffic and revenues, and in January, our visiting executives signaled inevitable changes to the existing business model. “Unfortunately, the precedent was set on the fixed side of the business,” said Kramer, referring to the current precedent of all-you-can eat data plans, in which consumers pay a flat rate and consume as much data that they want. This traditional model does

not address the disproportionate relationship between data traffic and revenues, and in January our visiting executives signaled inevitable changes. Indeed, in March 2010, AT&T announced data cap billing on the iPhone and iPad. It's a tiered pricing at \$15 for 250Mbps and \$25 for 2Gbps (with \$10 for overages). This new plan will be offered to new customers, but current customers will be able to keep their all-you-can-eat plans if they prefer.

Mark Lowenstein, Managing Director, Mobile Ecosystem, thinks the industry will need to be more creative moving forward with the evolution of wireless data pricing to meet consumer demand and retain customers. He cautioned against metered pricing, favoring bucket plans instead (in which consumers would pay x dollars for x megabytes of data), with a tiered structure and safeguards built in to avoid consumer backlash over excessive overage charges. His other suggestions included better accommodations for the growing numbers of groups and individuals with multiple connected devices, and greater flexibility to accommodate a more price-sensitive consumer. In March, both Verizon and AT&T indicated that the days of all-you-can-eat data plans were numbered, and indeed in early June, AT&T was first to announce it would start offering differentiated data plans.

Extensive upgrades are also needed to address critical network capacity issues. Forecasts from Coda Research estimate that if network capacity were frozen today, networks would reach 100% utilization at peak capacity by 2012. Terry Kramer explained that operators' ability to carry out the necessary expansion also hinges on some factors outside their control, like regulatory reform, which can impact both operators' ability to differentiate service levels and pricing and the allocation of additional spectrum needed for expansion.

In the U.S., the FCC determines the allocation of broadband and broadcast spectrum. This ability to shuffle and reshuffle spectrum has significant impacts on those industries that operate in a world where spectrum is such an important prerequisite



Terry Kramer (left), Vodafone Americas and Kevin Bradshaw, Buzzd.

for continued growth. In May of 2010 the FCC made public their intentions for the possible spectrum overhaul asking congress to give the FCC the authority to provide incentives and disincentives for the broadcast spectrum holders to relinquish some of their spectrum to broadband spectrum holders.

This proposal by the FCC provides significant support for the broadband license holders who would enjoy "a pay-off between \$500 billion and \$1.2 trillion in cost savings, increased usage for existing wireless services, and new services that can't be offered without abundant spectrum," says economist Coleman Bazelon. Ongoing battles are expected and broadcasters in particular have made it clear that they won't relinquish any of their spectrum without a fight.

Regulatory decisions on net neutrality are also expected to shape not only operator business models but also define the value of the internet as an inherent right versus a commodity to be paid for. Bloomberg Businessweek reports that in 2008 the FCC censured Comcast for blocking subscribers using software (requiring large amounts of bandwidth) often used to view videos, a decision hailed by consumer groups as a step toward keeping Web traffic free of obstruction from corporations. Comcast said it delayed some file transfers to alleviate network congestion. In a recent ruling, the courts favored Comcast to the frustration of companies like Google, Amazon and eBay who argue that the internet should remain free and open.

Handset manufacturers are also feeling the impact of a changing mobile ecosystem, as mobile data proliferation has brought the importance of the mobile operating system (OS) to the forefront. Whereas in the past, there

were less OS choices and the differences between them were less clear, today's more sophisticated user base distinguishes between them and is expressing preferences, making the OS part of the criteria for choosing a device. The result for handset manufacturers is additional layers of complexity in the development process.

As Nokia's Mary McDowell explained, "Our device manufacturing process is very well tuned to huge volumes and a lot of geographic and operator variations. But it also means that the software on the phone is much more dynamic, which has required new controls to ensure that the system continues to work smoothly." This is especially relevant in today's environment of multiple and competing operating systems, which vary both within and across markets.

So just how is the current environment of multiple operating systems impacting the business strategy of key players? Google has determined it will define the ecosystem by playing with new rules. Unlike Apple's walled garden approach, Google

... OS is now part of the criteria for choosing a device.





Emily Green (left), Yankee Group and Mark VandenBrink, Samsung Telecommunications America.

is incentivizing operators and handset makers to opt for Android-supported devices by making Android's source code available without licensing fees and by sharing revenue made through advertising and search—an aggressive strategy to capture scale in an extremely competitive environment.

But until definitive winners emerge in the fight for OS market share, top handset manufacturers seem likely to continue offering consumers the full range of options available. As Mark VandenBrink, VP of Technology Solutions, Samsung Telecommunications America said, “If you look out two years from now, there will be fewer operating systems that are important out there, but until the consumer makes that determination, we need to present all available choices.”



Perhaps the most distinguishing characteristic of the U.S. mobile industry—and one that may be ripe for change—is the way consumers purchase mobile devices and services. Under the current U.S. model, handsets are largely provided and controlled by a mobile network operator. Most phones are “locked,” which means that when you want to switch networks, you have to get a new phone. Despite the breadth of choices operators offer, U.S. consumers still run the risk of not getting the combination of phone and operator they want. AT&T's exclusive offering of Apple's iPhone is the most notable example, although recent announcements that Apple is developing a new iPhone compatible with other network technologies could soon change this.

The situation is different in other parts of the world. In Europe, for instance, consumers also have the option to buy “unlocked” phones directly from handset manufacturers' retail locations that they can load with applications from a variety of developers. When they buy an unlocked phone, the choice of operator is up to them. And because the devices aren't connected to any one operator, consumers are free to take their device with them when they switch operators.



... in order to drive adoption, operators had to subsidize device costs.

Barry West, Strategic Advisor to Clearwire, explained that the U.S. model is left over from the early days of mobile, when devices were far too expensive for the general public to afford. In order to drive adoption, operators had to subsidize device costs and sell

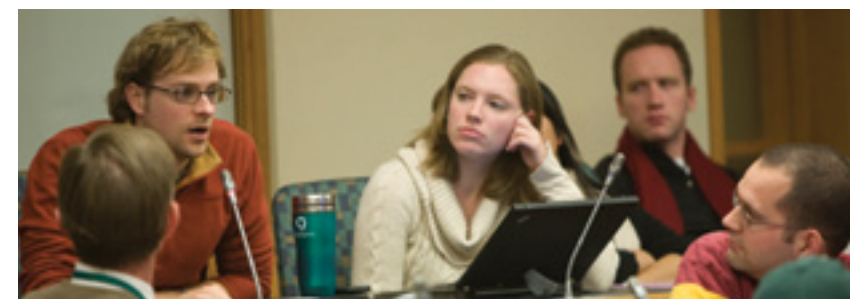
multi-year service contracts to recoup their investment. Today, even though device costs have gone down dramatically, the model has persisted. But in light of an increasingly demanding consumer, some people are wondering whether this model will ever change.

Google's recent direct-to-consumer attempt with its Nexus One phone is one indication that demand for this option is simply not there yet. The significantly higher upfront cost of unsubsidized handsets is one disincentive, particularly in an environment like the U.S. where consumers have long been accustomed to lower device costs. Google's sales model for the Nexus One hoped to bypass the networks and sell phones directly to customers online. But the experiment proved short-lived, as Google recently announced that it would be ending its online sales of the device. Along with the sticker shock of having to pay full price for the device at \$529, lack of adequate technical support was also cited as a major problem.

Samsung's Mark VandenBrink thinks we could eventually see more handset manufacturers going direct-to-consumer in the U.S., but lack of standardization of network technologies is one reason why it hasn't happened sooner. “Part of the complication,” said VandenBrink, “is that there are two different cellular technologies in the U.S., and devices aren't compatible across that.” The vast majority of operators worldwide, including AT&T, use GSM technology, whereas Verizon Wireless, Sprint Nextel, and a handful of operators in countries including Korea and Japan use CDMA technology. “When the next generation of network technology is rolled out on a large scale, these two technologies could merge, but that's probably still several years away,” said VandenBrink. “At that point, consumers should be able to buy a phone that works on any of the networks in the U.S.”

This next generation technology will be a mix of LTE and WiMAX. Long Term Evolution (LTE), a 4G radio technology is projected to increase network speed to 1Gbps and will allow GSM and CDMA networks to coexist simultaneously. LTE currently has the support of most operators around the world including MetroPCS and Verizon in the U.S.

Although momentum is behind LTE as the preferred next generation mobile solution, it is not the only technology showing promise. WiMAX, a 4G microwave technology that enables fixed and mobile internet access, is also seen as a solution for



“last mile” connectivity for cable and DSL providers. It is also projected to meet network speeds of 1Gbps and has a few years advantage over LTE in terms of the development cycle. Clearwire, with strategic investors including Intel Capital, Sprint, Google, Comcast and Time Warner Cable—not to mention significant spectrum holdings—backed WiMAX as their early technology of choice.

Although LTE and WiMAX are often pitted against one another in an environment requiring standardization to meet increasing demand of speed and flexibility from consumers, Barry West, Strategic Advisor to Clearwire, doesn't see this as a straight-forward technology war. “WiMAX and LTE are fundamentally the same at the technology level, making it possible for them to merge further down the line,” said West. “At the end of the day, the customer doesn't care whether it's WiMAX or LTE—they want a quality broadband experience.”



Capitalizing on the opportunities is a matter of determining where value exists and identifying a white space that needs to be filled.

Amidst the significant challenges facing the industry, our visiting executives reminded us not to lose sight of the tremendous opportunities that exist for those who can identify and deliver innovative services addressing specific needs. “Capitalizing on the opportunities is a matter of determining where value exists and identifying a white space that needs to be filled,” said FusionOne's Mike Mulica. For FusionOne, handset transfer represents a huge opportunity to facilitate the seamless transfer of data from old phones to new phones globally as users upgrade their phones in greater numbers and with increasing frequency. It serves a utilitarian purpose that Mulica believes consumers will be willing to pay for. Tuck alum Perry LaForge, Founder and Executive Director of the CDMA Development Group, also elaborated on some interesting opportunities on the infrastructure side, indicating that techniques such as smaller cell sites and different ways of carrying traffic off of operator networks need to be developed. “There are already some activities taking place in the venture community in these areas, which could be very hot areas for investment,” said LaForge.



Partnerships are key

As the mobile industry shifts from a voice to a data business, competitive differentiation will increasingly depend on how well the industry can meet increasing consumer demands for the content they want. While reliable infrastructure is a critical enabler, changing consumption patterns indicate that consumer attention is increasingly focused on content and services rather than infrastructure and basic connectivity.

The distribution of mobile content today is primarily characterized by two different approaches: the app and the browser. With apps, content is distributed through a series of vertical application “storefronts” where people can search for and download content for free or at a cost. The browser, on the other hand, provides a portal to content that lives on the internet where consumers can also access free or paid content, either through the traditional internet or websites adapted specifically for the mobile platform. Although an app might also provide access to a mobile website, it stands alone within an app store environment and lives permanently on the device.

The app is currently the dominant model for accessing content on mobile devices. Although others before have attempted the app store approach, the game changer for smartphones came with the success of Apple's app store introduced in July 2008. With a focus on crafting a truly enjoyable user experience, they were the first to deliver mobile content and services in a completely novel way, combining a developer-friendly app platform with a consumer-friendly way to browse, purchase and download apps.

In less than two years, Apple fundamentally changed the business drivers for handset manufacturers, and operators have had to change the capabilities of devices and expand bandwidth capability to accommodate the explosive growth of app consumption across all devices. Yankee Group research reports that every major smartphone OS provider now offers an online store for mobile apps, and the number of apps offered increases daily. When the iPhone app store was launched in 2008, there were 500 apps available. As of April 2010, Apple reported 185,000+ apps available, with a total of 4+ billion apps downloaded.

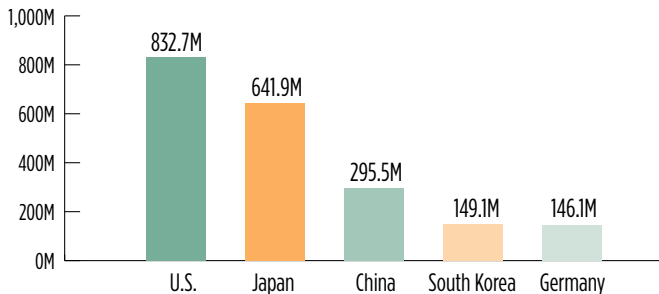
Free apps have been dominant to date, but Yankee Group reports that paid downloads are also becoming popular, with almost a third of downloaded apps paid, up from 18% in 2009. With the average prices of paid apps also rising, they predict that U.S. mobile apps will generate nearly \$1.6 billion in revenue in 2010—that's more than twice the amount of their previous forecast.

Consumers download gaming, search and social network apps the most



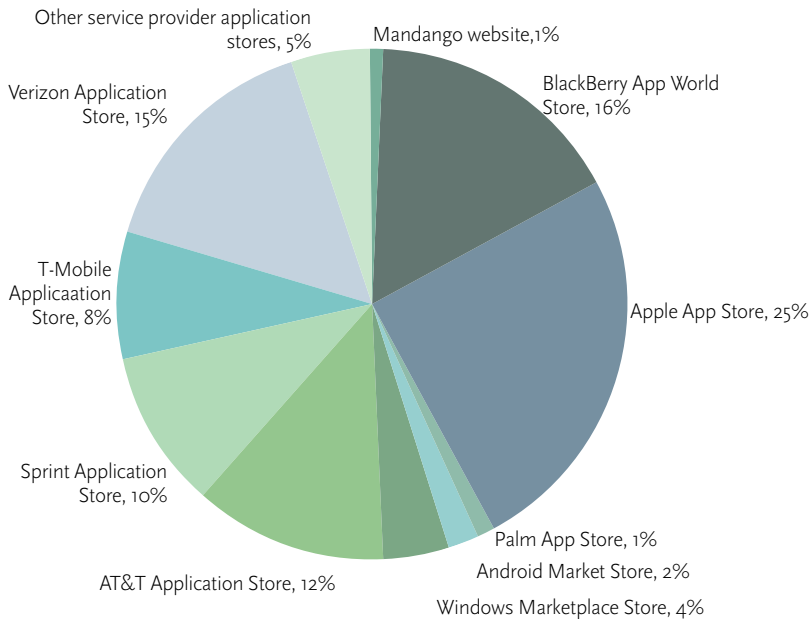
Source: Yankee Group's Anywhere Consumer 2009 U.S. Survey Suite, Wave 1-12

U.S. leads in app downloads (estimated downloads in 2009)



Source: Strategy Analytics, AT&T

Apple App Store, BlackBerry App World and Verizon Application Store are the most used app stores



Source: The Nielsen Company Q4 2009

While Apple iPhone owners and AT&T subscribers download more apps than any-one else (due in part to Apple’s early mover advantage and AT&T’s three year-old exclusive deal with Apple to carry iPhones), Google’s Android platform is quickly gaining ground, fueled by the increasing number of devices running the platform. In terms of app store growth, mobile search company Taptu reported that the Android store is seeing the greatest growth, with total apps offered at approximately 37,000 as of April 2010. Although this total pales in comparison to the number of apps Apple offers, it does represent an annual growth rate of 403%, compared to Apple’s 144%. In addition, market research firm NPD reported in March 2010 that Android-based smartphones outsold the iPhone in the U.S. for the first time. RIM (Research in Motion) still outsold both, with Blackberry being the preferred device choice among business users.

The app store explosion is driving growth in the mobile gaming market specifically, with Gartner research estimating that about 80% of all consumer app downloads are mobile games. Although up to 70% of all game downloads are free, worldwide mobile gam-

Worldwide mobile gaming revenues will exceed \$5.6 billion in 2010 . . .



ing revenues will exceed \$5.6 billion in 2010 and will nearly double by 2014. Gartner attributes the growing popularity to increasing demands from emerging markets, where alternative gaming media options are scarce and where micro-transactions like free or low-cost games appeal to groups with limited disposable income.

Despite the success of app stores, industry experts are questioning how long the growth will last and whether the app or the browser will represent the future of mobile content. According to some industry thought leaders, mobile apps currently dominate the content landscape partly because they are better adapted to the mobile device. But for developers, the fragmentation of software platforms, and specifically the fact that there is no “write it once and run it anywhere” solution to app development, poses problems. According Kevin Bradshaw, CEO of Buzzd, what makes a digital platform worth trying to innovate on is how it’s bundled. “I look for the ability of a company to aggregate enough of the different concepts required to give me a platform that enough people have for me to make a profit,” said Bradshaw.

The Wholesale Applications Community (WAC) recently announced an initiative to create a simpler, more profitable way for developers to distribute their apps to app stores at the Mobile World Congress in Barcelona. WAC comprises 24 global mobile network operators, plus device makers LG, Samsung and Sony Ericsson, who announced that their platform will be live on several networks by February 2011. But details of how they will achieve this ambitious goal are less clear, and business models they will offer to participating companies haven’t yet been finalized, leaving many to question whether or not this initiative will get off the ground.

As more people upgrade to smartphones, the audience may well be there, but the explosive growth of apps leads to other concerns over discoverability. In other words, how does an app get discovered in the sea of 185,000+ apps through which users must search to find it? The long-term usability of apps has also been called into question. According to Ben Kunz's March 2010 article in Adweek, a recent study by Pinch Media of 30 million app downloads found that only 20% of people continue to use a given smartphone application after 24 hours, and only 1% of users went back after 90 days.

Jason Spero, VP of Marketing, Admob, the world's leading mobile advertising marketplace, thinks the app and the browser are likely to coexist for awhile. Admob's strong position in the market caught the attention of Google, whose bid to acquire



... you will continue to see a combination of native apps and web apps ...

you will continue to see a combination of native apps and web apps, and I think they'll be highly complementary." Despite this, Spero thinks that browser-based solutions are ultimately the right way to address things, because it's better for developers. "In the long run," said Spero, "we think that HTML5 represents a very compelling standard as a browser-based solution."

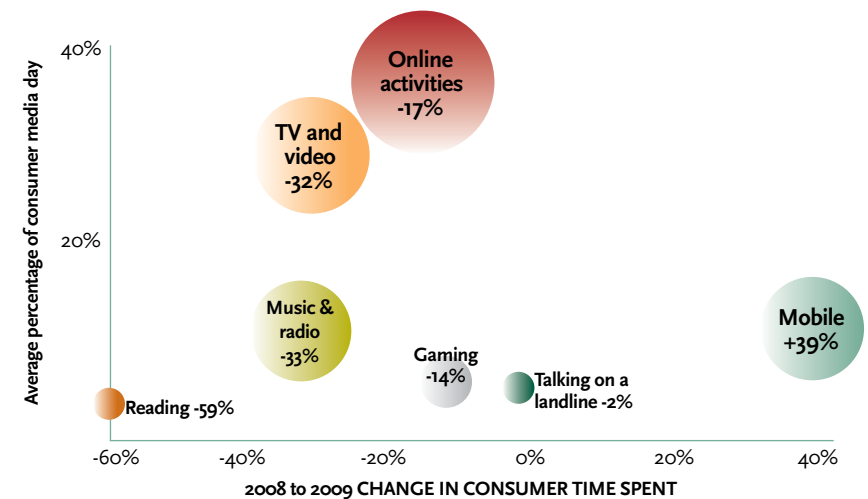
Taptu also released a report in February 2010 suggesting that the future of the mobile Web is likely to be dominated by cross-platform browser-based sites rather than apps built specifically for certain platforms, and other experts agree that the app explosion is unlikely to go on indefinitely. Yankee Group's Director of Consumer Anywhere Research Carl Howe said that while apps fill a necessary role today, dramatic improvements in network connectivity over the next five years will cause developers to question the need to develop apps for six or more different smartphone platforms, prompting a move toward more Web-based solutions that can work well on any platform with a full-featured Web browser.

Whether it's the app or the browser that dominates, content providers need to understand the kinds of content users like and figure out how to get it to them in a way that enables the continued production of quality content within a sustainable business model. This can be challenging in such a dynamic environment where the value chain is rapidly changing and expanding, making relationships much more complex.



The opportunity and the challenge for mobile content players is to meet the demands of consumers in the midst of much uncertainty. How do you meet the content demands of consumers across multiple platforms and devices in the absence of

Online activities are gaining attention, traditional media are losing it



Source: Yankee Group Anywhere Consumer: 2009 US Survey Suite, Wave 1-12

standardization? How do you get your content to the consumer when there isn't necessarily a clear vehicle for getting it onto devices? What can you do if you don't own the spectrum or the distribution channels? How does it work if you don't control the software or the networks to enable content delivery? The fundamental paradigm shift involves the necessity to create partnerships in an ecosystem that originally did not require them, and that was not built to support them. As quickly as consumer demands are changing, companies are re-crafting business models that will work in this expanded ecosystem, trying to land on something sustainable.

The fundamental paradigm shift involves the necessity to create partnerships ...



Many companies are rethinking their strategies and restructuring themselves in a collapsed timeframe as a result of consumers' shifting data consumption patterns, and the changes go beyond mere business model reconfiguration. ESPN, for example, experimented for a short time as a MVNO (mobile virtual network operator), but has since reverted to more of a pure distribution model. Qualcomm is positioning itself to capture a share of the profitable content market with FLO-TV by inventing a whole new business that facilitates the delivery of high-quality content on mobile.

When it comes to programming effectively for different platforms, ESPN and Disney are among the most forward-thinking content producers, recognizing the value of the mobile platform to their audiences about six years ago and attempting to reach that audience ever since. In the process, they've learned a lot about what works well in mobile TV content and how to tailor that content for specific platforms.



Jonathan Barzilay (left), FLO TV; Matt Murphy, ESPN; Dan York, AT&T; Professor Alva Taylor.

But when it comes to distribution of premium content on mobile, monetization remains a key challenge. While a number of business models are currently in use, the industry has yet to settle on a model that works for everyone.

The subscription model is one option, offering the consumer paid access to a specific body of content on a device. Bundled subscriptions offer access to a body of content across multiple platforms. The à la carte model gives people the option of choosing and paying individually for chosen content to be delivered to a specific device, such as individual songs, books, TV episodes and movies. This might involve electronic sell-through, where consumers own the downloaded content after purchase. Or it could also be some kind of subscription model, where consumers purchase access to a specific channel offering the content they want. Ad-supported models allow consumers to access content either for free at a lower cost than they might pay in an à la carte or subscription model, because they are willing to accept ads in exchange for content. And there's also free content, which consumers may get simply in return for paying for a mobile phone.

Business models currently vary, depending on the nature of the content and models in use for the distribution of that same content across other platforms. Buzzd, for example, uses an ad-supported model to provide its services free to the consumer. Though research indicates that people tend to tolerate mobile ads better in return for free content, mobile advertising is still in its infancy and has yet to prove itself profitable in the mobile space on a large scale. But the ad-supported model currently works well for a company like Buzzd, largely due to the nature of the location-based service it provides, which essentially involves advertising things that are going on at particular venues. As Buzzd's Bradshaw explained, this allows them to present advertising "in a very subtle, highly contextual way."

But the "value of content" debate plays out differently for those involved in the generation and distribution of premium content, such as television. As AT&T's Dan York explained, "There are myriad business structures around what consumers pay, if anything, and how content providers are compensated. Some are based solely

on advertising, some on revenue shares and some are a combination of these. It varies by platform." And because mobile TV is part of a much larger TV ecosystem, any changes to one part inevitably create a ripple effect throughout the system. For example, companies are careful not to make decisions for mobile distribution that disrupt other parts of their business, such as the larger and more profitable pay TV side. "There is an \$80+ billion per year pay TV business that really drives the creation of content and programming," said York. "If you start doing things that break apart traditional pay TV business models, you affect the business models for everyone who participates."

The consumer expectation of free or low-cost content is one reason why monetization can be challenging. The offering of free television content began years ago with traditional broadcasters offering their content for free, with content creation funded through advertising dollars. However, traditional advertising models and methods don't translate directly to mobile, and advertisers do not yet value mobile ads as highly as television ads. Simultaneously, app stores are putting arbitrary values on content that may not cover the cost of creating it, and networks only get a percentage of the revenue from purchase.

To offer another example, specialized TV networks like ESPN evolved from the cable model, which offers consumers subscriptions to access a body of channels. TV distributors pay ESPN for the unique content they make. But with the addition of new screens for viewing that content and new players in the ecosystem, it is unclear what the value of the content should be on different platforms or who ultimately decides.

Increasingly, consumers are in the driver's seat, and they are making known their desire for seamless access to content they are already paying for across all the devices they own. So it's up to the industry to get together and determine how to do this in a way that ensures enough revenue is running through the system for the creation of quality content to continue.

Matt Murphy, SVP, Digital Video Distribution, Disney and ESPN Media Networks, believes the key challenge for companies is to figure out both how to look holistically at all the different opportunities to get content across to the consumer, and how best to maximize the value of and monetize that asset across platforms. "It just can't be done by one group doing it free ad-supported over here, with another group taking that same asset and trying to do electronic sell-through over here, and another group trying to include it in bundled subscriptions over on this side," explained Murphy. AT&T's Dan York echoed many of the same sentiments. "What the whole industry needs to do," said York, "is settle on some business models that allow the current ecosystem to continue to thrive."

Changes to one part of the TV ecosystem inevitably create a ripple effect . . .



The concept of “authentication” represents one model on the table to address the monetization challenge and allow major companies like AT&T and Time Warner Cable to retain and increase their customer base. It’s based on providing subscribers with a password so they can access their television content seamlessly across multiple devices while paying a single subscription fee. “Once we as an industry get our heads around how to do it,” said AT&T’s Dan York, “this will really drive mobile video adoption.”



... bundle subscription model will ultimately be the best value for consumers.

Disney and ESPN’s Matt Murphy also believes that the bundled subscription model will ultimately be the best value for consumers and offer content providers the best way to monetize their content assets across platforms. “What

people ultimately buy,” says Murphy, “is value.” In other words, it will be the content, the brands and the services offered on devices that consumers desire. More specifically, they’ll be looking for where they can get the widest variety of content and services they want at the best price. And according to Murphy, “It just can’t necessarily be done on an à la carte or an ad-supported basis.”

Although these complex monetization issues are yet to be resolved, what we are likely to see in future, said Jonathan Barzilay, SVP, Programming and Advertising, FLO-TV/Qualcomm, “is a greater pollination among the screens and a simplification of billing relationships between them.”



Despite the challenges, there is a lot of excitement today surrounding mobile as an up-and-coming platform for television. There are approximately 260 million people in the U.S. with mobile phones, making the opportunities very attractive. And mobile offers television content providers the opportunity to be right there with this audience wherever they are.

FLO-TV represents chipmaker Qualcomm’s first foray into mobile content aggregation and delivery. Leveraging technological advantage to create a new version of a high-quality linear viewing experience, it transmits live TV to any device that has a FLO (forward link only) chip, and users pay a monthly subscription fee to access its twenty or so channels. The quality of FLO-TV’s picture represents a significant departure from the pixilated and jumpy experience viewers have known previously. And by using the analog spectrum that broadcasters vacated in June 2009, it doesn’t use up any of the valuable bandwidth on operators’ 3G networks.

FLO-TV’s Barzilay explained that TV viewing on a mobile device is differentiated by the opportunity it offers for people to stay connected to content that matters to

them wherever they happen to be. And while TV viewing patterns will likely continue to be defined by the best available screen, our visiting executives agreed that the most relevant TV content on mobile devices moving forward will have a high level of immediacy.

This is already reflected in FLO-TV’s viewing patterns. According to Barzilay, current viewership among FLO-TV subscribers is about 25-30 minutes per day, with huge spikes seen around major live events like this year’s Presidential Inauguration, the Michael Jackson memorial service, breaking news, breaking weather and live sporting events in general. Animation and children’s programs also do exceptionally well.

While the monetization challenge is ongoing, it’s clear that companies are targeting mainstream audiences for their mobile TV offerings – not just the early tech adopters. And they are introducing themselves to the world in the way that makes this clear. The series of TV advertisements that appeared during the Super Bowl these past two years by such names as Hulu, Vizio, TV.com, and FLO-TV indicates that the market is indeed moving, with consumers starting to adopt ways of watching TV beyond traditional linear TV in the home.

Will there come a day when consumers cut the cord on traditional pay TV? Our visiting executives thought that this scenario was highly unlikely. Despite the inroads being made by other devices, FLO-TV’s Barzilay reminded us that linear television viewing on a large screen has continued to increase. Nonetheless, he believes that “the laptop and the mobile phone and their progeny are going to be as relevant and as important to future consumption of media as the big screen.

... the laptop and the mobile phone and their progeny are going to be as relevant and as important to future consumption of media as the big screen.





YEAR OF LOCATION

As recently as 2008, GPS was a feature found only on high-end smart phones and the usage of location apps was limited to early adopters. Two years later commentators have hailed 2010 as the “year of location,” marking the point in time when location-aware apps have become part of the mainstream mobile experience.

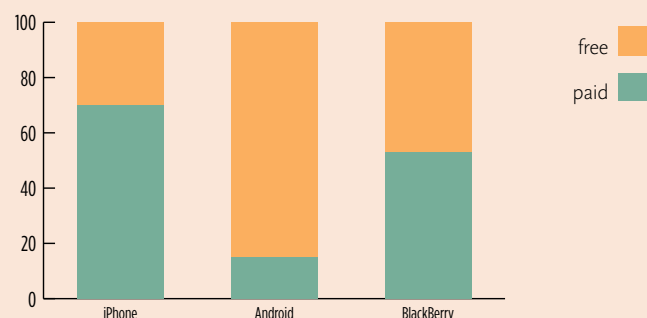
According to research by Skyhook Wireless there are almost 6,000 iPhone location apps, 900 on Android, and 300 on BlackBerry. One of the primary drivers has been the increase in GPS-enabled phones. Research firm Berg Insight reports that over 150 million GPS-enabled phones were shipped in 2009 and forecasts 770 million units by 2014. This is augmented by non-GPS positioning technologies leveraging cell towers and Wi-Fi, such as Skyhook Wireless’ hybrid positioning system that handles 250 million requests daily. This current excitement is not simply the result of this enabling technology maturing; several other factors have helped move location into the mainstream.

As an example, the growth of user-generated content enabled by companies like Tele Atlas, Google (maps), Yelp, and Buzzd have resulted in tremendous increases in spatial information flows, whether it is map content, user reviews or annotations.

A turning point occurred last year when Apple allowed navigation apps with the release of the iPhone OS 3.0 in 2009. Navigation quickly became one of the most popular categories on the Apple App Store. In November, Google announced that Android phones would have free voice activated navigation. Nokia followed suit early this year by offering Ovi Maps with navigation for free and hit one million downloads by February. In only 12 months the world of special-purpose devices made by companies such as Garmin or TomTom has been transformed to one where navigation is now a core feature of mobile phones.

The game dynamics of check-in apps have resonated with users and put location-awareness at the heart of social networking. The hype at SXSW about the “location war” between competing check-in apps FourSquare and Gowalla almost forgets that

iPhone, Android and BlackBerry LBS Apps paid vs. free by percentage



There is little pricing consistency for all location apps distributed on the three major app stores. Approximately 75% of location-aware apps in the iPhone App Store are paid. Android has less than 20% paid location apps. BlackBerry is the most balanced with paid and free apps at nearly half and half.

Source: Skyhook Wireless

we have had location-aware services such as Brightkite, Loopt and Google Latitude for a while. Plus Twitter already supports geo-tagging. However, in little over a year, FourSquare has attracted a million users—a remarkable achievement that has placed increased attention on Facebook’s anticipated location features.

The real excitement about location-aware apps arises from their potential to transform mobile advertising. Check-in apps allow companies to become part of the game. For example, checking in at Starbucks via FourSquare can earn you a barista badge and access to promotions. FourSquare has signed partnerships with a range of media and entertainment brands (Zagat, HBO and Bravo among others) that are clearly excited about the potential to better engage their customers. Streams of user data for location-aware apps will provide invaluable sources for customer insights and analytics in the future.

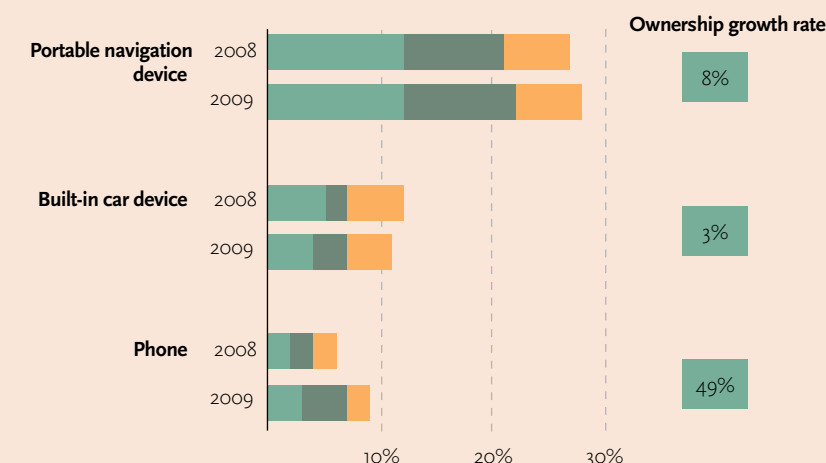
There are still challenges ahead. Developing cross-platform location apps remains difficult and costly. Research by Skyhook Wireless indicates that there are only 43 location apps available across iPhone, Android, and BlackBerry platforms. We can expect local search and mobile ad platforms enabled by location awareness to be major battlegrounds. The opportunities are tremendous. Forecasts suggest Apple’s iAd platform could easily generate a billion dollars per annum. With the biggest players and innovative start-ups battling for advantage, 2010 will be hailed as the “year of location.”

Contributed by: Daniel Hawkins T’10, MBA Fellow, Center for Digital Strategies, Tuck School of Business at Dartmouth

Phone-based navigation grew most quickly in the past year

Which of the following statements best describes your ownership/use of each navigation solution?

Own and use regularly Own and use occasionally Use occasionally but don’t own



Base: 5,264 North American adults

Source: North American Technographics Media, Marketing, Consumer Technology, and Healthcare Benchmark Survey, Q3 2009 (US, Canada) ©2009 Forrester Research, Inc.

Personalize the channel

The increasingly sophisticated capabilities of mobile devices and networks are transforming the way businesses relate to consumers in fundamental ways. This applies to businesses within the mobile industry and those who have traditionally connected with consumers through other means. As mobile and online activities are gaining attention, advertisers are beginning to recognize the scale and opportunity the mobile platform offers, allowing them to connect with a rapidly growing audience of active consumers, as opposed to passive targets.

Mobile advertising is still in its infancy and currently represents just a tiny slice of advertising business in the U.S. According to Yankee Group research, the size of the mobile advertising business is about \$242 million, compared to approximately \$42 billion and \$26 billion for television and internet respectively. But as internet advertising plateaus and television advertising suffers, mobile advertising is growing. And as major players like Google and Apple have made their intentions of dominating the space known through recent major acquisitions and creative initiatives that promise to transform the user experience, excitement over mobile as a viable platform for advertising is increasing.



Consumers will tolerate ads if it means they pay less for content and services.

To date, screen size has put considerable constraints on mobile advertising methods and approaches, and companies are only now just beginning to make ads more attractive and engaging for consumers. While there are indica-

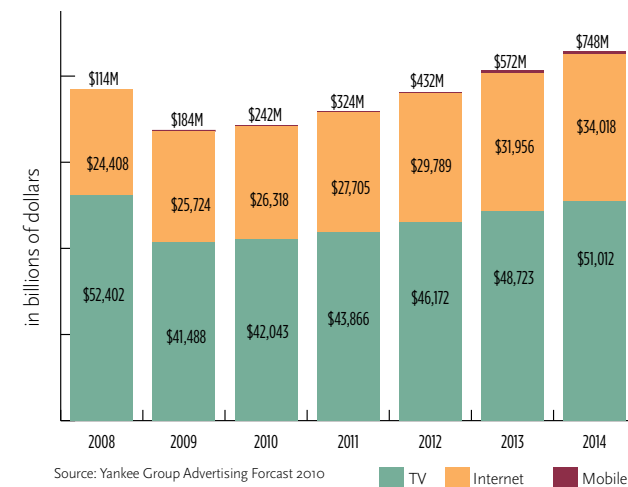
tions that attitudes are changing, consumer openness to mobile advertising is often contingent upon what they get in return for accepting ads, rather than an appreciation for the value of the ads themselves. “We’ve seen a real shift in consumer attitudes in the last few years, with consumers acknowledging that they’ll tolerate more if it means they pay less for content and services,” said Yankee Group’s Green. Terry Kramer also mentioned that Vodafone is conducting mobile advertising measurement trials to determine if people will accept ads in exchange for lower pricing. Depending on the result, this may be a precursor to monetizing, but Kramer indicated that this is probably still 2-4 years away.

Apple intends to accelerate the move toward mobile advertising through its iAd platform unveiled in April 2010. It signals the potential for a more visually interesting,

engaging experience than the classic banner or flat two-dimensional ad can offer, as well as for targeted ads tailored to specific audiences. “We’ve just seen so much growth and so many good developments over the last few years, that it’s hard to deny where we see the trend going,” said Tuck alum Lars Albright, Director of Publisher Partnerships & Alliances, Apple. Albright joined Apple through the recent acquisition of Quattro Wireless, a leading mobile advertising company he helped found in 2006. “The numbers already tell a pretty good story about people’s engagement and interaction with mobile ads,” pointed out Albright, indicating why companies like Apple and Google are investing heavily in mobile.

Despite the growing momentum, we have yet to see a significant shift in advertising dollars toward mobile. “In today’s market, we’re seeing people get very interested very quickly in how they can use mobile to further their objectives, but that’s not necessarily through advertising,” said Adam Cahill, SVP and Director of Digital Media, Hill Holliday, alluding to the fact that the term “mobile advertising” is sometimes used more broadly to include CRM (customer relationship management) and other marketing efforts.

Advertising is small, but fast-growing



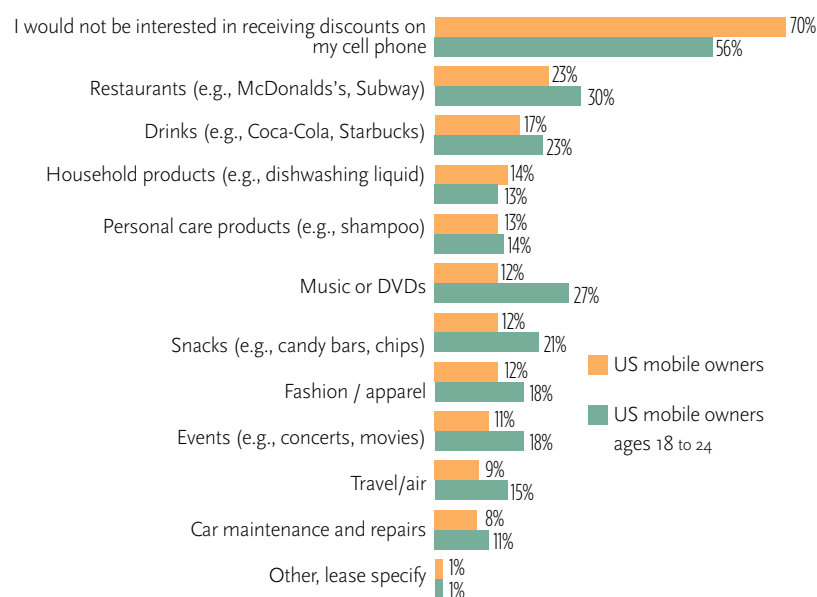
Source: Yankee Group Advertising Forecast 2010

That’s not to say that there haven’t been some great experiments in mobile ad campaigns. Hill Holliday, whose major clients include Dunkin’ Donuts, Chili’s, Bank of America, Liberty Mutual and TJX, was behind a particularly successful ad campaign for Dunkin’ Donuts which was built around the idea of people in offices who make “runs” to Dunkin’ Donuts for a mid-afternoon coffee break. The campaign included an iPhone app, which received a lot of buzz and won industry awards.

Cahill called the Dunkin’ campaign “a good early experiment” with mobile, but one which also raised issues from which all companies can learn. One issue was scalability, and a general concern over how to grow it. But the scalability issue may well

Fast food tops the list of promotions that consumers seek on their cell phones

What types of discounts or coupons would you be interested in receiving on your cell phone?



Source: North American Technographics Interactive Marketing Online Survey, Q2 2009 (US)

take care of itself in the longer term, especially if people upgrade to smartphones at the rate that researchers are predicting.

The more complicated challenge involves how to take an idea and actually implement it successfully. According to Cahill, "Great mobile programs connect different parts of a business." For this reason, they can be very difficult to pull off. "You get into questions like 'how do you tie in a marketing idea to a point-of-sale system when a company doesn't have one point-of-sale system.' You're talking to marketing people, but it's operations people that need to be in on it," said Cahill.

Encouraging brands to move to the mobile space is further complicated by a lack of clarity about the value of mobile advertising in the absence of standardized metrics to determine the worth and the cost of ad campaigns. The challenge for advertisers is that companies are risk averse, indicated Cahill, preferring to repeat what they know has worked well already. So with little or no experience with mobile advertising, brands are slow to move advertising dollars away from better known platforms into mobile. Apple's Lars Albright believes that greater sophistication in measurement will help change this, but it's currently an area where even well positioned companies are not yet fully formed.

Vast information about consumer behavior is available from the use of mobile devices. How companies make sense of it and use it to deliver effective advertising messages to targeted audiences is the ultimate question. Many of our visiting

executives see this as a tremendous opportunity for innovation. When different options can be presented to buyers in ways that enable better targeting and can illustrate the value of a mobile advertising campaign, it has enormous potential to change buyers' attitudes toward the medium.

Industry experts believe that the real potential in mobile advertising lies not only in connecting with customers in new and different ways, but in leveraging the fact that mobile devices enable people to instantly communicate their experiences with others. As social networks are being utilized in new ways through mobile, the social aspect of mobile devices combined with proliferation of location-based apps and services have tremendous game-changing potential.

Companies are increasingly taking advantage of social networks and finding value in people's willingness and desire to use them as a tool to learn more about the products they want. For advertisers, discoverability (being easily identifiable through search) becomes important, as does understanding the importance of location to engage customers in new and different ways. Social networking giants like Facebook are exploring the opportunity in this mash up between social and location by entertaining the idea of adding location to their offerings. Allowing people to identify where they are and express positive and negative impressions about what they're doing opens up new avenues for targeted advertising.

(For a deeper look at the location-based landscape refer to pages 22–23.)

It's also important to distinguish that the mobile advertising opportunity extends beyond smartphones to the increasing number of connected devices we see in the market today. The gaming industry, for example, positioned itself well by recognizing early that people want to take their gaming experiences on the road. This foresight, combined with a commitment to a quality user experience, have really set the standard for what people can and should expect from their mobile device, and advertisers have found opportunity in their ecosystems as a result.

Sony PlayStation has been in the mobile gaming space since 2005, and the company continues to explore new and innovative ways to enhance the console gaming experience away from home. According to Philip Rosenberg, SVP of Business Development, Sony Computer Entertainment America, "One of the most profound impacts mobile gaming has had on the mobile industry is setting a high standard of what high quality content looks like." This has in turn applied pressure on developers to really up their game when it comes to developing quality content for other mobile devices. And while the quality of content found on Sony PlayStation devices will probably never land on a mobile phone, the social and portable aspects of these devices have had a profound influence on the evolving device ecosystem.

Along with gaming, the publishing industry is also looking to mobile devices as a source for generating new advertising revenue. Since the launch of e-books in 2006 sales have experienced explosive growth. Last year alone sales increased 177% to \$313M, according to the Association of American Publishers. Sony e-Reader's Daniel Albohn, Director, Digital Reading Business Division, Sony Electronics Inc. sees these types of platforms as the logical evolution for an industry that is looking for new, sustainable business models.

Will Vincent, CDS MBA Fellow, suggests that with a next-generation device, such as the iPad, advertising may finally become viable. Ads can be delivered in real time for next to nothing and featured in multiple titles giving publishers the opportunity to segment the market.

With multiple industries looking to mobile as the platform that could finally support content production and distribution it remains unclear when expectations might be realized. "My sense," said Hill Holliday's Cahill, "is that this is the first annual



The next year will be very telling about where the space is moving.

cycle that people are going to be thinking about what they should be doing with mobile in a serious way. The next year will be very telling about where the space is moving."



Cultivating relationships with consumers through mobile also means leveraging the capability of today's devices with services that consumers truly want or need. A lot of innovation is taking place around this concept in emerging markets, where in many cases mobile devices represent people's first and only access to basic telephony and internet services. The globalization of mobile services represents a huge opportunity to reach underserved populations, where in the absence of legacy fixed-line infrastructure, people can skip previous generations of technology altogether.

Nokia's Mary McDowell pointed out that in many of these markets, basic access to information is the service that people want, and mobile devices are the ideal medium for communicating real-time information to specific groups. Ekgaon Technologies is one company involved in the design and development of technologies and information systems to meet the information needs of developing communities. One highlight of Ekgaon's service portfolio includes agricultural advisory services to add value to the work of farmers and agricultural entrepreneurs. Ekgaon's Co-founder and CEO Vijay Pratap Singh Aditya explained that this includes transmitting the latest, up-to-date market and supplier information, soil management services and disease alerts to help local farmers better manage their businesses.



Mobile financial services have also seen some success in emerging markets. Since there are roughly 4.6 billion mobile phone users around the world, compared to 1.6 billion global bank accounts, such services are especially popular among the "unbanked" or the "under-banked" (those who lack access to traditional banking services).

Although many mobile banking attempts have failed, the money service M-PESA is one promising example. First introduced in Kenya in 2007 by Vodafone affiliate Safaricom, M-PESA offers a mobile phone based money transfer service that enables users to deposit and withdraw money, transfer money, and pay bills without the need to visit a bank branch. The service capitalizes on the growth of mobile phone penetration in Africa, which Wireless Intelligence reports has gone from 3% in 2002 to 48% today, with an expected increase to 72% by 2014. According to Deputy Director Ignacio Mas and Associate Program Officer Daniel Radcliffe of the Bill & Melinda Gates Foundation's Financial Services for the Poor Team, M-PESA has been adopted by 9 million customers (or approximately 40% of Kenya's population) and processes more transactions domestically than Western Union does globally. A survey cited in their recent report goes on to say that 98% of users report being happy with the service, and 84% claim that losing the service would have a significant negative impact on their lives, illustrating the real life-changing potential these services can have.

Nokia is also looking at banking for the unbanked as a way to expand beyond their core business by leveraging their significant penetration in major emerging markets. Currently in the pilot phase, Nokia's Mary McDowell explained that they are looking to determine whether a Nokia retailer can act as an agent for cash-in and cash-out of mobile services. "If that works," said McDowell, you've now made banking possible in communities where it was impossible in the past." While very

similar to M-PESA, it's different in its aim to involve multiple banks and multiple operators, as opposed to one operator, one bank and multiple handsets. "We think that the network effects are critical for this to succeed," said McDowell. Nokia's service is enabled by a Java app loaded on low-end Nokia devices. McDowell also indicated that Nokia would be open to other manufacturers having the technology on their handsets, but since this is still in the pilot stage, they haven't developed those relationships yet.

While initiatives like these demonstrate the potential for mobile devices to replace wallets altogether, the situation plays out very differently across different markets, and particularly in U.S. The fact that development of the broader "mobile wallet" capability is lagging behind in the U.S. "is an ecosystem problem, not a technology

... banking made possible where it was impossible in the past.



problem,” said Mark Lowenstein of Mobile Ecosystem, because it requires the cooperation of a lot of different actors with competing priorities to make it happen. Patricia Partelow, VP, Network Emerging Payments, American Express agreed, adding that “although mobile represents a tremendous opportunity to enhance direct relationships with customers, it’s also a disruptive technology.” Compared to plastic cards which card companies control, mobile is much more of an open platform in which many pieces of the puzzle are not controlled by any one entity. So when you consider the issue of security, there is a question of who controls the secure place where data is kept, which may vary greatly across markets.

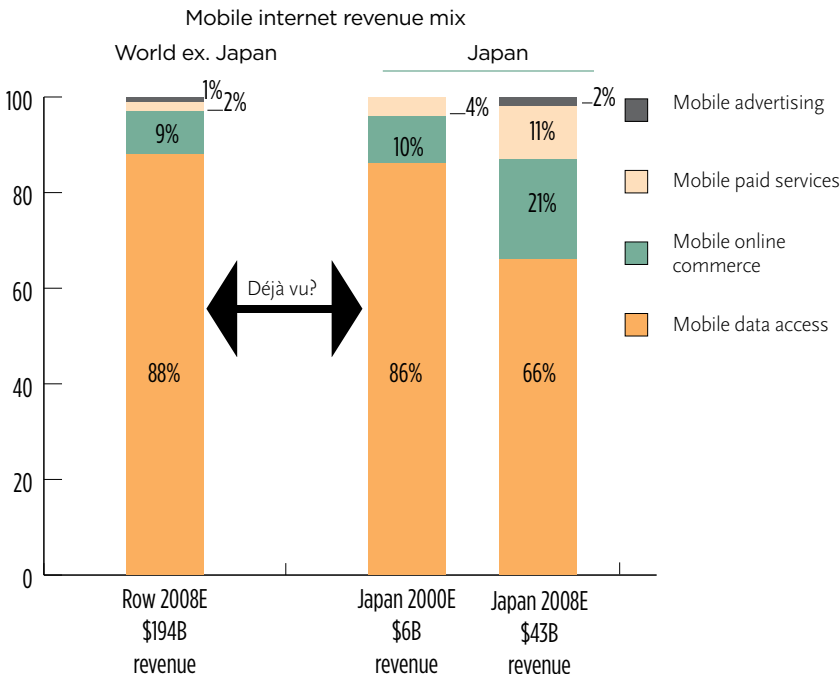


If we can get to standards, we can all play together.

Partnering is essential in such an environment, but it’s also difficult when each partner views its responsibilities and liabilities differently. For example, companies like American Express need to ensure that their decisions won’t alienate significant parts of their customer base. If a company chooses to partner with just one operator, what will happen to the relationship with customers who use another mobile network operator? According to Partelow, “If we can get to standards, we can all play together.”

Despite the barriers, the potential for the development and widespread use of mobile payment systems exists. Some companies are already looking to attract consumers with innovative mobile payment services that capitalize on the unique capabilities

Mobile internet revenue in Japan



Source: Naoah Nema/Hironori Tanaka for Japan data, Morgan Stanley Research

of smartphones. For example, PayPal recently announced a new iPhone application that will let people send or receive money by bumping their iPhone together with another user, resulting in an immediate transfer. While the new app is for individuals and small businesses, there are plans to create an app for merchants in the future. Square is another company offering a service that lets people turn their iPhones into credit card terminals. And Visa recently teamed up with DeviceFidelity to create a protective case for the iPhone that turns it into a credit card. Just hold it up to a scanner, and your credit card information is transmitted from an embedded chip.



The mobile channel presents significant opportunities for retailers to grow their customer base, build brand awareness, and grow revenue. ABI Research predicts that U.S. consumers will make a total of \$2.4 billion in purchases through their mobile phones this year, up 100% from \$1.2 billion in 2009 (a 203% increase from 2008). eBay enjoyed a share of that profit as a first-mover in the mobile space. In just a few years, their iPhone apps have attracted 8 million users and generated \$600 million in transactions in 2009, and the company says it’s on track to generate \$1.5 billion in 2010.

If we compare the evolution of a more developed market like Japan to the U.S. market today, we can perhaps catch a glimpse of what that U.S. landscape will look like in the future. And recognizing the trend that mobile phone users are rapidly becoming mobile internet users, and that the internet has become a place where consumers are comfortable making purchases, it stands to reason that mobile could follow the same path.



Christopher Perrien, IBM, event sponsor.

Vast Opportunity Amidst Ecosystem Challenges

Over the next five years the mobile landscape will continue to change significantly, as nearly two-thirds of U.S. mobile users are expected to move away from their feature phones and subscribe to smartphones.ⁱⁱ We have already seen what was once a fairly closed and stable value chain driven by voice, become a mobile data business with consumption expected to increase 39 times from 2009–2014.ⁱⁱⁱ These shifts are creating opportunity for innovative companies to take advantage of the rapid change.

The global app marketplace, supported by micro-transactions, has now reached \$1.94 trillion dollars and is expected to increase eightfold by 2013.ⁱⁱ These numbers demonstrate that unlike on the internet, mobile users are willing, if not eager, to pay for content that they want. This change in consumer behavior is a significant factor in the tremendous optimism that mobile will be a viable channel and support sustainable business models.

Premium content producers and distributors are racing to create new partnerships that will allow them to meet consumer expectations for access to their content anywhere on any device (including new device categories such as the recently introduced iPad). However, mobile as a new distribution channel and partnership opportunity presents challenges too. While eager to move to the mobile channel, premium content distributors currently determine the value of their content using established TV standards like advertiser interest and audience numbers as part of the formula. While mobile viewership is growing rapidly, audience size remains small relative to TV and advertisers are still experimenting with the platform. Distributors will thus have to find a model which prevents substantial disruption in the TV ecosystem and still allows content producers and distributors to realize the mobile opportunity profitably.

Smartphone innovation may be the most daunting challenge for operators they must meet increased network demands through intensive infrastructure investment and expansion while relying on a business model that is, at least for now, supported largely by feature phone data plans. Simultaneously, operators must ensure that they avoid becoming a ‘dumb pipe’. This risk of disintermediation from revenue streams flowing through their own network has required operators to rethink their position in the mobile value chain. Many look toward operator run app stores and premium services like ‘live TV’ to ensure that they secure a piece of the lucrative content pie.

Smartphone technologies such as LBS (location based services) represent an unprecedented convergence of industries that will allow for businesses to know their customers and enable very precise market segmentation. For this reason, companies with scale should view experimentation in mobile as a critical venture and worth

the risk of not getting it right the first time. Yet some industry standardization will be necessary in order to fully leverage the market potential. In the upcoming year consumer-facing companies will look to regulatory bodies to establish privacy and security guidelines, and operators and device manufacturers will look for network standardization in the U.S., both to facilitate open networks and increase choice for consumers. Simultaneously, Google and Apple will likely continue robust competition over open vs. closed OS and advertising platforms, increasing competition and choice for all.

What has become clear is that consumer preference and technological innovation will continue to drive mobile growth—but no one company can do it all anymore. Challenge and opportunity are two sides of the same coin for the mobile industry. Those companies currently succeeding in navigating this new data and content-driven mobile business are rethinking their old business models, developing partnerships both horizontally and vertically, and leveraging all of their assets to provide value to partners and consumers alike.

The pace of change in this dynamic space will continue to be dramatic. The anticipated growth of the mobile industry signals an overall optimistic future both for the industry and those who can benefit from what it has to offer. Exactly how things will shake out with the players in the industry is still unclear as the ecosystem continues to shift. A few things that do appear to be likely are:

- ▶ mobile is not just a technology—it is becoming a behaviorⁱ;
- ▶ smartphones are the mobile device of the future;
- ▶ mobile phones will overtake PCs as the most common web access device by 2013^{iv};
- ▶ the number of micro-transactions and the average fee for those transactions is increasing;
- ▶ customers expect companies to meet them on any device of their choosing;
- ▶ mobile is no longer an adjacency—mobile is a core tool for professionals and consumers alikeⁱ;
- ▶ mobile enables better relationship management—B-to-B, B-to-C, and within the enterprise;
- ▶ connected consumer electronics and vertical business apps will bring new revenue streams and allow for an up-sell in data plansⁱⁱⁱ;
- ▶ machine-to-machine will be a key component of growth for mobile operators; and
- ▶ continued innovation from new players will yield tremendous opportunity.

Realizing opportunities will hinge upon how well business can meet consumers’ mobile demands. As Yankee Group’s Emily Nagle Green writes in her 2010 book, *Anywhere*, “Profit is there for any firm. You just have to know how to look at it.”

Stay connected!

ⁱ Thomson Reuters; ⁱⁱ SNL Kagan; ⁱⁱⁱ Cisco; ^{iv} Juniper Research

The Center for Digital Strategies at the Tuck School of Business at Dartmouth promotes the development and implementation of digital strategies—the use of technology-enabled processes to harness an organization’s unique competencies and support its overall business strategies.

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