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Hype Cycle for Consumer Services and Mobile Applications, 2012

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This Hype Cycle covers a range of consumer applications and services, including communication, entertainment, productivity and collaboration. It examines the status of and prospects for consumer services and apps in an era of the personal cloud and advises vendors on how to profit from these trends.

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What You Need to Know

An important theme of this year's Hype Cycle is the role of the personal cloud and how it extends to a multitude of devices such as the PC, TV, media tablet and smartphone. We expect to see features that are key to the personal cloud, such as storing, syncing, streaming and sharing, to be adopted by more services as well as applications. This trend will probably be a key benefit for vendors looking to differentiate themselves as well as integrate their offerings into the widest range of platforms and devices.

Two other notable areas are the integration of social features into many services and applications, and mobile finance and commerce. As consumers look to not only consume content but share their experiences throughout their social graph, social networking has expanded beyond the traditional experience to activities such as TV and gaming and has served to increase both user loyalty and frequency of use. Mobile financial services have also attracted a large amount of interest in relation

to both mobile payments and transactions and commerce. Gartner believes that these financial services opportunities in emerging markets are realistic and worth pursuing, while those in developed markets are more distant — due to weak demand — despite the growth in both mobile commerce and app store payment systems for merchants.

The Hype Cycle

Consumer services and applications include those that consumers use online — while mobile as well as at work or at home. They involve multiple devices, such as phones, media tablets, PCs and TVs, with a greater emphasis this year on the seamless flow of those services and apps from device to device and location to location. We note, as part of our consumer wallet research, that consumers will spend $2 trillion (70% of the their total $2.8 trillion consumer wallet) on personal-cloud-based services, applications and content by 2016, with only the remaining $800 million on the devices themselves.

This Hype Cycle contains advice for technology and service providers offering consumer solutions, and for companies trying to reach customers through consumer services.

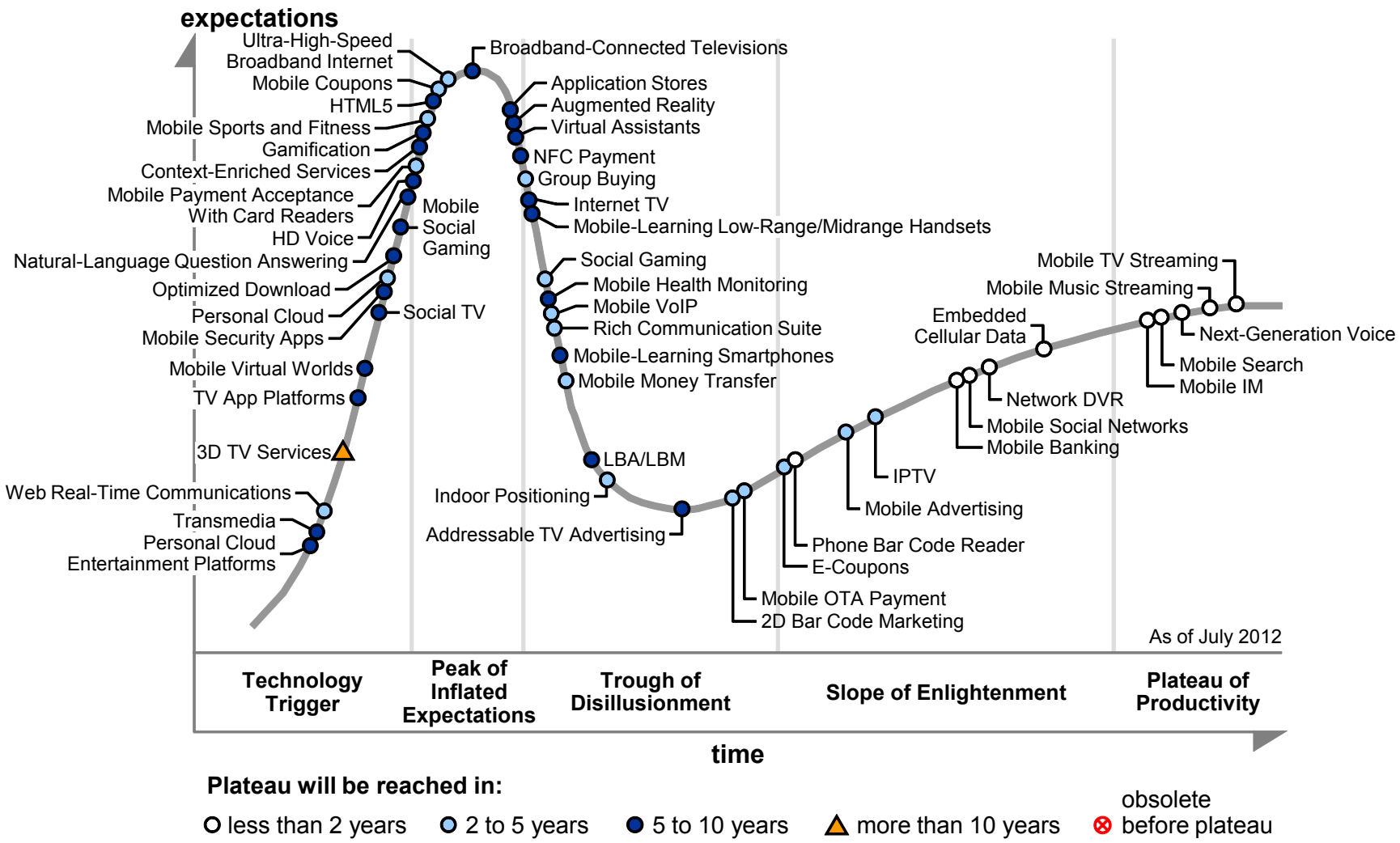
We have made several additions to this year's Hype Cycle:

- **Transmedia:** Is an important new concept that we define as a style of storytelling that employs a collection of complementary elements which can be experienced in a variety of forms and contexts. Transmedia is not a new concept, but it does show a new mind-set that allows content creators to assemble a vast and varied array of forms of media asset across multiple mediums and devices in a manner that enhances the time-honored tradition of telling a story.
- **Mobile Payment Acceptance With Card Readers:** As noted, the area of mobile commerce and payments is a key service we are exploring in 2012. What's new is the addition of mobile payment acceptance through card readers. This technology enables small or midsize businesses as well as individuals to accept card payment for point-of-sale purchases using consumer mobile devices. The service requires a card reader inserted into the audio jack of the mobile device, together with a mobile app installed on the device, to process the payment. This new technology adds a new dimension in the consumer mobile payment experience, as well as allowing virtually any business or consumer to accept credit card payments for transactions.
- **Mobile Social Gaming:** Social integration was a key part of the 2011 Hype Cycle. This year, we expand that focus to cover mobile social gaming, a new phenomenon generating both excitement and hype within the industry. Mobile social gaming refers to social games that users play with friends on mobile connected devices such as smartphones, media tablets and connected handheld gaming consoles. The games are integrated with the consumer's social graph (often through services such as Facebook). The growing momentum for mobile social gaming is evident from the growing interest of gaming companies for this market, with recent acquisitions selling for hundreds of millions of dollars. We expect this momentum to continue for several years, as mobile and social networks continue to intersect and new services and apps are created to capitalize on that intersection.
- **TV App Platforms:** In addition to the foundation technology of IPTV and the rise of connected TV services and social TV experiences, a new world of connected TV services and applications

has emerged. These apps and Web services are delivered via TVs that are connected to a broadband network either through a Wi-Fi or Ethernet cable. The services are an aggregation of Internet TV services and other apps, cloud storage, and Web browsing with search functionality. The services themselves will be delivered via widget-based apps stores, and the initial focus will be on online video services — with other services such online gaming and e-commerce coming later. We believe this new ecosystem of TV-related apps will continue to see traction in the coming years, as the TV and living room become the next major battleground for both application stores and personal cloud services.

- **Virtual Assistants:** Virtual assistants are another concept that, while not new, have seen an explosion in terms of both hype and growth — due in no small part to Apple's inclusion of its Siri technology in the iPhone 4S. We define the virtual assistant as a conversational, computer-generated character that simulates a conversation to deliver voice and/or text-based information to a user via a Web, kiosk or mobile interface. Virtual assistants incorporate natural-language processing, dialogue control, domain knowledge and a visual appearance (such as photos or animation) that changes according to the content and context of the dialogue. The primary interaction methods are text-to-text, text-to-speech, speech-to-text and speech-to-speech. With the popularity of Apple's Siri we expect to see more competition in this space in the coming years, as well as further refinement of the technology by Apple and the integration of virtual assistants into other devices beyond the smartphone.

Figure 1. Hype Cycle for Consumer Services and Mobile Applications, 2012



Source: Gartner (July 2012)

The Priority Matrix

Personal cloud services will have a transformational effect on a number of consumer services; we expect the biggest impact to be on the ability to synchronize content and services across devices and locations.

Context is also a key attribute across applications and services. Using information about time, location, activity, personal preferences and demographics, merchants can target consumers better and fulfill their needs contextually as well as actually capturing and changing intended behavior. These contextual services involve many user data points and multiple players, such as location service providers, advertising networks, social networks, mobile carriers and device vendors. We expect sophisticated context-enriched services to emerge as mobile, social and location-based services further intersect. We expect the full impact of this intersection to become more pronounced during the next five to 10 years, when the technology has fully matured and the intersection and integration is complete.

We have also raised the overall benefit rating of connected TVs — including applications, services, social aspects and foundational technology — to transformational, because we have reached an inflection point at which this collection of technologies can begin to disrupt the traditional models in the home.

Figure 2. Priority Matrix for Consumer Services and Mobile Applications, 2012

benefit	years to mainstream adoption			
	less than 2 years	2 to 5 years	5 to 10 years	more than 10 years
transformational		Web Real-Time Communications	Context-Enriched Services Internet TV Natural-Language Question Answering	
high	Mobile Music Streaming Mobile Social Networks Next-Generation Voice	Indoor Positioning Mobile Advertising Mobile Money Transfer Mobile OTA Payment Mobile Payment Acceptance With Card Readers Personal Cloud	Application Stores Augmented Reality HTML5 LBA/LBM Mobile Security Apps Mobile Social Gaming Personal Cloud Entertainment Platforms Social TV Transmedia Virtual Assistants	
moderate	Embedded Cellular Data Mobile Banking Mobile IM Mobile Search Mobile TV Streaming Network DVR Phone Bar Code Reader	2D Bar Code Marketing E-Coupons Group Buying IPTV Mobile Coupons Mobile VoIP Rich Communication Suite Social Gaming Ultra-High-Speed Broadband Internet	Addressable TV Advertising Broadband-Connected Televisions Gamification HD Voice Mobile Health Monitoring Mobile Virtual Worlds Mobile-Learning Low-Range/Midrange Handsets Mobile-Learning Smartphones NFC Payment Optimized Download TV App Platforms	3D TV Services
low		Mobile Sports and Fitness		

As of July 2012

Source: (July 2012)

Off The Hype Cycle

Mobile Browsers and **Location-Based Services** no longer appear on the Hype Cycle because they have reached the Plateau of Productivity.

TV Widgets are now **TV App Platforms**, in order to better reconcile the evolution of the connected TV experience.

On the Rise

Personal Cloud Entertainment Platforms

Analysis By: Andrew Frank; Mike McGuire; Allen Weiner

Definition: Personal cloud entertainment platforms (PCEPs) are cloud-based services comprising applications, devices and download stores or services that enable consumers to subscribe to or purchase premium content, as well as content from their existing libraries. Users can access content via applications on any device built or supported by the PCEP vendor. PCEPs directly license content, or the platform serves as a gathering of different content services. Personal consumer content storage is sometimes offered, but not as the core value of the service.

Position and Adoption Speed Justification: This new technology really describes a collection of ecosystems for each vendor. These ecosystems comprise devices, software platforms, developer sub-ecosystems, application stores (controlled by each vendor), consumer-facing online retail stores or subscription services, and consumer-facing cloud storage services. These ecosystems are rapidly forming to create what amounts to universes of content options for consumers that parallel incumbent media markets such as traditional pay-TV service providers. The emergence of these PCEP platforms in the past two years has undoubtedly influenced the incumbent media industries. One has to look no further than the development of TV Anywhere/TV Everywhere offerings from incumbent pay-TV providers for evidence of this influence.

Each PCEP vendor has developed a relatively seamless connection between its device/software and content stores/services, some with greater success than others. Apple's iOS/Mac platforms and its popular hardware devices have more or less set the standard for the PCEP class, at least in terms of the (relative) seamlessness of the consumer experience and revenue generation. The iTunes store has been driving, on average, $1 billion in revenue (a combination of content sales and rentals, application sales and accessories) for the past few quarters. Google, Sony, Microsoft and Amazon are all enhancing their PCEP offerings, while Facebook remains a bit of a wild card. However, the influence of the dominant social network on consumer habits is hard to underestimate.

A significant factor, perhaps the most significant factor influencing the future success of the PCEP platforms, will be how they manage their relationships with all content companies over time. PCEP platforms represent a disruptive threat to most of the media and content companies' long-standing relationships with broadcasters and multichannel video programming distributors (MVPDs).

User Advice:

- Media companies and rights holders must continue to develop platform- and distribution-network-neutral content strategies — including investing in select industry consortia focused on common standards for metadata, content recognition, rights management and access control.
- PCEP vendors and media companies will benefit from enabling a broad set of third-party developed search/recommendation services and applications for media, and must avoid risky

lock-in strategies, while encouraging the use of industry-approved technologies for recognizing and integrating content with applications.

- Advertisers and advertising agencies must develop internal and industry best practices for use and interchange of consumer data. PCEP vendors must provide transparent consumer data opt-in/opt-out policies.
- Telecommunications providers must assess emerging PCEP vendors using the PCEP snapshot, as they consider developing their own PCEP offerings or partnering with vendors covered in this research.

Business Impact: An emerging ecosystem of social media tool providers and social networks is disrupting media, particularly the relationships between consumers, content companies and service providers. Entities such as Facebook, Google+ and Yahoo are extending their core promotional and awareness capabilities to include generating and fulfilling content transactions and content consumption. Thus, these services have content hubs that they develop and provide themselves or, as in the case of Facebook, they have a platform that serves as an aggregation point of different content services.

Although some storage of personal consumer content might be available or offered, it is not the core value of the service. Moreover, their native mobile, television and Web applications tend to be isolated in terms of access to the content.

PCEPs, in contrast, seek to unify the cloud-based aspects of entertainment access and experiences across devices (even if the user experience design may vary considerably). They apply ensemble design techniques to enable synchronized dual-screen experiences that may employ a smart TV, media tablet, smartphone or multiple instances of these devices in a group setting, as well as wide-area synchronized-access scenarios built on social graphs.

The media industry is a collection of messy and complicated relationships with monetization rooted in the economics of complex licensing models and practices. Of the most unsettling and disruptive effects of these emerging PCEP vendors on established media companies is the likelihood that they will flatten the distribution models of content in such a way that the operational silos and carefully constructed distribution strategies of the past, such as the staggered release-windows used by the movie industry, will be toppled. This means that successful media companies will not only have to readjust their business models to focus on a set of new intermediaries — PCEP vendors — but also have to do so while adapting their historical businesses to an online-centric world.

Daunting as those transitions are, they also represent an unparalleled opportunity to redefine distribution strategies — and experiment with multiple models — by putting tactical and strategic maps in place that enable media companies and content rights holders to revalue content by playing incumbent and new distribution partners off each other. In the next three to five years, Gartner expects to see even more tense negotiations for content license rights, such as the recent battle for the Starz movie catalog or, in the music industry, big-name bands withholding new albums from online subscription services in favor of a la carte download stores, such as iTunes or Amazon, to maximize revenue in the initial sales cycle.

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Sample Vendors: Amazon; Apple; Facebook; Google; Microsoft; Sony

Recommended Reading: "Amazon, Apple, Facebook, Google, Microsoft, and Sony Lead the Fight for Media Supremacy in the Clouds"

Transmedia

Analysis By: Allen Weiner

Definition: Gartner defines "transmedia" as a style of storytelling that employs a collection of complementary elements such a video, text, photos and games that can be experienced in a variety of forms and contexts. Transmedia content is being deployed by media companies and advertisers using a range of open and proprietary applications.

Position and Adoption Speed Justification: Transmedia has become the "flavor of the moment" across the media landscape, despite the fact it lacks a concise, universally accepted definition. Transmedia is not a new concept, but one that represents a new mind-set that allows professional and consumer content creators to assemble a vast and varied array of media asset forms — print, video, images, social content — in a manner that enhances the time-honored tradition of storytelling.

Advertisers, TV programmers and their agency partners have been at the forefront of transmedia experimentation. One of the earliest was the ABC-TV show, "Lost," which provided a blueprint for extending a TV show well beyond its time slot. The story's complexity prompted viewers to form online communities, and a fan created the "Lostpedia" wiki. There were games, a novel "written" by a character, websites for fictional entities in the show and a series of mobisodes (mobile episodes). In its 2011 report, "Transmedia Rising," JWT spoke of the opportunity transmedia offers advertisers: "With transmedia entertainment properties, brands have opportunities to mesh organically into content in various forms, as multiplatform story extensions are generally built in early on."

The current state of transmedia efforts is marked by the lack of easy-to-use integrated ecosystems, which provide professional content creators who lack design skills to seamlessly mix and match content types to create new content experiences. For the most part, professional creators — such as authors — are relying on third parties (including firms that specialize in transmedia work) to mash together books with video, or music with written works (liner notes) to create compelling experiences. In an effort to avoid diluting their current opportunities in the professional space, traditional content management system (CMS) providers, and tool/platform providers such as Adobe, have avoided developing entry-level solutions that would enable professional creators (authors, musicians and artists) to build content experiences without advanced design or programming skills. This continued dependence on outside technology expertise is a major obstacle to the impact of transmedia across media sectors.

User Advice:

- Media companies and individual creators must push content management and publishing service providers to build new platforms that allow professional creators to add new layers to their works without the burden of coding or design prowess.
- IT professionals at media companies should encourage consumerization efforts that bring new transmedia tools into the workplace, and select from among them the better services to deploy across the organization.
- Content owners and licensees need to make their assets "transmedia ready," using bookmarklets and similar user-friendly technologies.
- Transmedia platform providers must not be perceived as inducing users to commit copyright violations.
- Existing companies, such as Dropbox and SoundCloud, which serve the consumer content creation space, should explore transmedia service opportunities.
- Marketing leaders must get up-to-speed on the role transmedia could play in their marketing strategies, and look for agency partners that are skilled at transmedia campaigns.
- Content creators must consider the additional layers of media that will enhance their stories without diluting their core value.
- Creative agencies must develop the skills, or develop partnerships, to allow them to offer transmedia project design and execution.

Business Impact: The business opportunity for transmedia is as debatable as the trend's very definition. For incumbent publishers, it may be less about making money than maintaining brand. To reach new, digitally inclined consumers, there is an ongoing need for powerful, engaging stories. Newspapers, for example, which are able to improve their storytelling tools, may be better-positioned to make the digital transformation. For book publishers, on the other hand, transmedia may represent a premium asset that can be sold for more than a one-dimensional e-book. Advertisers seem to have the most to gain by using transmedia in their campaigns, not only to tell stories that can reach different target groups across different channels, but also to create differentiation.

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Adobe; Apple; Storify

Recommended Reading: "Transmedia Is Changing the Nature of Storytelling Across the Media Landscape"

Web Real-Time Communications

Analysis By: Geoff Johnson

Definition: Web Real-Time Communication (WebRTC) is an HTML5 standard being drafted by the World Wide Web Consortium (W3C). It's an open-source framework that will enable real-time communications to be delivered from within Web browsers. Applications like voice calls, video chat and peer-to-peer file sharing are expected in early developments, but WebRTC is also expected to eventually facilitate the fundamental building blocks for high-quality communication for business use of browsers in broadly based networking, audio, video and collaboration components.

Position and Adoption Speed Justification: The WebRTC framework was released as open source in June 2011. It built on original work by Ericsson Labs, and is supported by Google, Mozilla Firefox, Opera and Microsoft. The group's early ambitions are to develop adequate APIs so that broad developer adoption can occur. The companion RTCWeb group at the Internet Engineering Task Force (IETF) is working to define a set of protocols that will also facilitate real-time communications in Web browsers.

Google integrated WebRTC into its Chrome development channel in January 2012, opening use of the WebRTC API. Mozilla integrated WebRTC into its Firefox alpha release in early 2012, providing audio mixing in a media stream. In April 2012, Mozilla released a demo of WebRTC video calling running inside its Firefox browser. Microsoft has begun implementation of the WebRTC API (for Internet Explorer). Google Talk has a video chat plug-in for the WebRTC framework. The FreeSWITCH project (January, 2012) supports the iSAC audio codec. Doubango Telecom (May, 2012) provided an HTML5 SIP client using WebRTC.

Given the interest and active development support from major vendors, it is likely that WebRTC will become a platform that is more than just a vehicle for delivering compound communications for mobile devices and consumers in the short term.

User Advice: Within the next two years, major vendors and the open-source community working on WebRTC developments are likely to solve many of the initial issues required to enable communications from browsers as part of the patchwork of HTML5 solution sets being devised at present. Beyond the next two years, there is significant motivation for a wide range of users and suppliers in very diverse arrays of communications applications to be interested in exploiting WebRTC concepts and practices, and to extend them into mainstream enterprise networking.

WebRTC uses iLBC, iSAC, G.711, and G.722 codecs for audio, and VP8 for video.

Enterprises should expect that WebRTC will eventually become robust enough for use in communications applications generally. Prepare for WebRTC to be used in browser- based unified communications and collaboration (UCC), contact center and video conferencing.

A useful indication of how it may develop comes from Kaazing and its full-duplex, but asynchronous, real-time Web communications for enterprises. Its WebSocket solution uses W3C standards, but has been developed outside the HTML5 standard. It shows how Web application developments may provide communications that are necessary to support massively scalable, low-latency, real-time Web apps. Kaazing's customers use these in financial services, gaming and social networking, and in telecommunications applications.

One obvious weakness of WebRTC deployment for enterprise use, or by communications service providers, is the lack of a central player to provide a managed directory for users. That role will be diffused for some time, unless enterprises or communications service providers (CSPs) act to fill it. Expect enterprising third-party directory facilitators to emerge, but no broad mainstream adoption before 2014 to 2015.

Business Impact: WebRTC applications will become particularly useful when used as an SIP endpoint. Do not confuse the potential enterprise-grade WebRTC developments with today's use of browsers to deliver chat.

Expect communications infrastructure vendors to provide a number of versions of HTML linked to popular mobile devices and applications, initially using the common WebRTC for various media. The popular demand for bring your own device (BYOD) will encourage use of WebRTC for interoperation and federation for tablets and smartphones.

Within contact center operations and communications-enabled business processes, WebRTC can create browser pages as real-time communications objects to be used in workflow, e-commerce and business process applications. As such, WebRTC has the potential to transform industries.

Similarly, WebRTC Web services applications can use a browser to create real-time video connections to other WebRTC devices or to WebRTC media servers using RTP.

Many operational technologies (OT) using thick-client or thin-client applications over limited bandwidth networks will benefit from the ability to derive and provide a rich suite of communications from a Web browser associated with their applications.

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Ericsson; Google; Microsoft; Mozilla (Firefox with Greasemonkey); Opera

Recommended Reading: "HTML5 and the Journey to the Modern Web"

"Magic Quadrant for Web Conferencing"

"The (Not So) Future Web"

"Application Frameworks for the New Web"

"Cool Vendors in Web Computing, 2012"

"Manage the Risks of Real-Time Collaboration Tools"

"Magic Quadrant for Web Content Management"

"IT Market Clock for Enterprise Mobility, 2011"

"Predicts 2012: The Rising Force of Social Networking and Collaboration Services"

3D TV Services

Analysis By: Fernando Elizalde; Mike McGuire

Definition: 3D TV services deliver 3D images to TV sets using stereoscopic imaging: where two slightly different images are superposed and transmitted to each eye. There are several technologies currently used to deliver 3D images on TV sets. They fall into two broad groups: those that require glasses, and those that don't.

Position and Adoption Speed Justification: 3D content availability is increasing as the main Hollywood studios, such as Disney's Pixar, produce most content for 2D and 3D release as well as re-releases of classics for 3D viewing. Other studios, such as Sony Pictures, 20th Century Fox and Warner Bros., continuously release what are expected to be blockbusters in 3D. And these studios are interested in extending the reach of the cinema experience to the home, creating additional pay-TV revenue streams for this growing portfolio.

TV operators haven't given up on 3D TV as the next premium TV experience after high-definition TV (HDTV). The well publicized launches by ESPN, Virgin Media, Sky U.K. and others, have been followed by Pan-European cable provider Liberty Global in some of its operations; France Telecom/ Orange in France and Spain; SingTel in Singapore; and a 3D TV test channel in China, among many others. Additionally, subscription-based 3D video-on-demand (VOD) services have been launched in France, Germany, Poland and Norway, among other countries, while TV manufacturer Samsung offers a 3D VOD service on its connected TV platform. However, some pay-TV operators, like AT&T's U-verse and French Canal+, discontinued broadcasting in 3D due to the lack of interest among their subscribers in 2H11.

Despite the growth in content and the broadcasters' and pay-TV operators' push, the content that is available is not quite enough for genre-dedicated channels. Content remains limited to sports events and documentaries and most launched 3D services consist of a single 3D channel for linear TV, showing mixed programming. With a much larger installed base of 3D TVs than in 2010, the London 2012 Olympics may well be a stronger test than the last FIFA World Cup was. Still, the BBC announced that it will only broadcast the 100-meter men's race as well as the opening and closing ceremonies live. Additionally a daily program of highlights will be shown in 3D.

Commercially available technologies require either the use of special glasses to view the content in 3D, or special glasses and a filter for the TV screen (or even a new set) for an experience that, ultimately, may not be optimal.

But the biggest issues holding back anything like mass-market adoption are the need to wear special glasses to see the 3D effect and the limited viewing angles at which one can appreciate the 3D effect. 3D TV sets that don't require glasses won't be available at mass-market prices for many years to come.

User Advice:

- Vendors and service providers interested in this market must set up a process to keep track of how the uptake of these services progresses in the different geographic markets, and remember that successful early trials do not always translate into commercial mass-market opportunities.
- Industry players must set up industry standards quickly and avoid creating a market with fragmented technologies for 3D TV services. Standards that would be able to deliver a single stream that could be decoded by both 3D and HDTVs should be considered.

Currently, the 3D content available for TV viewing is restricted to films and sports events and continues to be limited. The genres most suitable for 3D viewing are horror, sports, action, documentaries and children's animation; plus certain types of performance, such as music and dance. These types of content, with the exception of live sport events, are very suitable for VOD. The appeal of 3D for soap operas, situation comedies, reality shows and news remains questionable.

Business Impact: Consumer electronics' manufacturers will continue to introduce 3D-ready equipment and increase production of this product type in the coming years. However, demand will be concentrated in markets where multiTV-set households are starting to replace their second TVs, and where sports bars are popular.

Despite the hype and the initial commercial launches, it is not clear that the consumer market is ready, as yet, for 3D TV that requires wearing special glasses. However, for the more specialized and less family-orientated content for which people are willing to pay for better quality experiences (such as sports TV), 3D offers a chance for service providers to differentiate their services from those of their competitors and drive additional revenue.

Benefit Rating: Moderate

Market Penetration: Less than 1% of target audience

Maturity: Emerging

Sample Vendors: BBC; ESPN; LG; Orange; Samsung; SingTel; Sky; Sony; Virgin Media

Recommended Reading: "Survey Analysis: Why Consumers Are Tuning Out of 3D TV"

"Market Insight: 3D TV, Larger-Than-Life Expectations?"

"Dataquest Insight: 3-D TV; A Mass-Market Product or a Niche Technology?"

TV App Platforms

Analysis By: Andrew Frank; Shalini Verma

Definition: TV app platforms (formerly TV widgets) enable a class of small, portable applications designed to run in a digital television environment and display on a TV screen. They can run in a set-top box (STB), a smart TV or a TV peripheral, and the apps can be distributed over broadband, through service provider channels or preinstalled by a manufacturer, although the prevailing model

is for platform providers to publish a software developer kit (SDK) and distribute apps through a moderated app store in the style of mobile apps.

Position and Adoption Speed Justification: Like many interactive television concepts, the idea of TV apps or widgets is not new. The ideas behind it date back to at least the 1980s. In 2008, the concept re-emerged as a new Technology Trigger in various forms, with numerous announcements and deployments — most notably by Yahoo, whose Connected TV software was initially licensed by Samsung, LG, Sony and Vizio. Shortly after this, TV manufacturers and service providers began offering their own connected TV platforms (notably, Samsung @TV and Verizon FiOS). In 2010, CableLabs (the R&D arm of the U.S. cable industry) enhanced its interactivity standard, Enhanced Binary Interchange Format (EBIF), to support persistent TV apps (widgets/gadgets), which it refers to as "unbound applications." (EBIF previously supported only "bound" applications, which were delivered along with video streams as program enhancements that would not be persistently stored.)

In 2012, Google's Android-based TV platform got a strong boost when major manufacturers (the same four that had previously licensed Yahoo) announced its inclusion in their next generation of smart TVs. Some independent STB software providers, such as Boxee, also offer open SDKs and app stores for their platforms; however, as of this writing, Apple has not announced an open TV app platform for developers (although AppleTV does include apps from licensed developers, such as Netflix, and iOS apps running on newer devices can use Airplay with AppleTV to achieve TV display).

Although there is some mounting evidence of consumer interest in TV apps, adoption is proceeding relatively slowly, especially compared with the mobile world. Impeded by platform fragmentation, hardware limitations, slow TV replacement cycles, usability issues and general lack of breakthrough consumer value proposition, TV apps have yet to generate much hype. On the positive side, Samsung, whose app store hosts more than 1,000 apps, claims that consumers have downloaded more than 20 million apps, while Yahoo claims that more than a million users per month engage with apps on its platform, which hosts over 200 apps, and recently announced developer support for second-screen integration with Android smartphones and tablets. Google recently announced social enhancements for its TV app platform, and platforms are evolving to include support for personal cloud storage services and more branded feature content from major TV networks.

Manufacturers currently see apps as a way to differentiate and drive demand for new products. Panasonic offers an app that allows you to stream content to your TV from your smartphone or tablet. Samsung's ES8000 Smart TV includes limited voice command and gesture or companion app based control. Microsoft's Kinect for Xbox 360 is bringing innovations like gesture control to the TV app world, and speculation is running high on what Apple might do.

For the moment, however, media tablets, smartphones and social platforms have captured the imagination of app developers and users, and it appears that the journey of TV apps and the platforms that support them to the eventual Plateau of Productivity will be slow and erratic, and will take at least five more years.

User Advice:

- TV manufacturers need to balance the desire for platform-based differentiation with the recognition that a certain level of standards-based interoperability is required to attract top-tier developers. The desire to replicate Apple's success at unilaterally disrupting the mobile ecosystem with breakthrough television features must be moderated by realistic expectations of the secondary role TV apps are likely to play compared with passive TV viewing enhanced by second-screen interactions.
- TV app platform providers should not get too ambitious about porting different types of apps on the TV platform, but should focus on building a native experience for apps that is relevant to a living room experience.
- Given the early stages of service adoption and competition among platform providers, content providers and developers can expect favorable terms from platform providers eager to build a content repertoire.
- At the same time, broadcasters and content providers should advocate for open-standards-based platforms that can support Internet protocols to avoid distributor or platform provider lock-in, and work with platform developers and manufacturers to adopt standard channel-independent digital video stream-based signals that can trigger app-based events, on both TV and companion devices, such as media tablets, to best leverage the connection between main screen content and interactive features.
- Communications service providers (CSPs) and personal cloud providers should examine the opportunities to use apps to provide differentiated personal cloud capabilities, such as personalized program guides and programmable alerts, multiscreen access to content, and support for triple-play home-networking features, such as video telephony and device synchronization to display cloud-stored photos and videos and play music. Service providers should also explore opportunities to power first- or third-party app stores that can leverage consumer billing relationships.
- Ad agencies and marketers should view apps as a highly valuable source of direct-response ordering, as well as a superior source of engagement metrics and a way to ensure that attention is focused on the screen during commercial breaks. Agencies should work with specialists to understand the technical and creative potential of apps.

Business Impact: The TV industry is well aware of the disruptive effects the Internet has had on the music and newspaper businesses, and it can see clear indications, such as the rapid rise of audiences for YouTube, Netflix and Hulu; the inclusion of broadband connections in the next generation of TVs; and the growing consumer ability to connect TVs to other digital devices. There will inevitably be many failures on the road to TV app success. However, ultimately, the parties that control the standards and marketplace exchanges for apps will gain power in the television ecosystem, not least because the next generation of program guides (which, like Google, are starting points that control the flow of traffic to media destinations) will appear as apps offering superior navigational, social and advertising features.

TV app services add to the fragmentation of the TV service market and will increase content acquisition costs as competition for premium licenses heats up among incumbent pay-TV service

providers; over-the-top challengers, such as Google and Netflix; and platform manufacturers, such as Apple and Samsung.

Benefit Rating: Moderate

Market Penetration: Less than 1% of target audience

Maturity: Emerging

Sample Vendors: AT&T; Boxee; Ensequence; Google; Intel; Roku; Samsung Electronics; Sony; TiVo; Verizon; Vizio; Yahoo

Recommended Reading: "The Blocking of Broadband-Connected TV Content by a South Korean CSP Provides Lessons for the Consumer Industry"

"New Television Meets Context-Aware Computing"

"A Scenario for the Future of Television in the Cloud"

Mobile Virtual Worlds

Analysis By: Monica Basso

Definition: A mobile virtual world is a simulated environment where subscribers inhabit and interact via avatars running on mobile devices. It can be either a mobile extensions of a PC or Web based virtual worlds, or pure mobile service. Users create avatars on the Web and host them on mobile devices (similar to a Tamagotchi, an electronic pet or friend with a personality). Virtual worlds may display as pure 3D worlds (isometric views) or live video as part of that 3D world.

Position and Adoption Speed Justification: Around 2008, a number of mobile virtual worlds appeared on the market to access either Web-based virtual worlds or pure-play mobile environments. These extensions enable mobile access to conventional virtual worlds for virtual community members as a sort of keyhole to those worlds. The obvious limitations of mobile devices, in terms of screen size, hardware resources and bandwidth (as opposed to the huge demand for resources from PC virtual worlds), made it difficult to build an acceptable experience on such small-form-factor devices, so adoption was limited and slow. Experiences such as Mini Friday (a mobile virtual world running on the Nokia S60 handset, with approximately 1.7 million users, developed by the Finnish company Sulake) ended in 2010.

Since then, the technology and business cases for virtual worlds have progressively merged with augmented reality, games and social networks, and mobile virtual worlds have changed. For example, now Sulake runs a service called Bobba, a virtual bar for flirting and hanging out, available also on iPhones, iPads and Nokia smartphones in native mobile applications downloadable through the application store.

In the area of mobile gaming, MoiPal (by the Finnish company Ironstar Helsinki) is targeted mostly at teenagers, and is a cross-platform mobile game with an online environment for customizing the

players' virtual content. Users can create their avatars (pals) on the Web, then transfer them to a phone. The avatar lives in the mobile phone as a friend, and can travel to a virtual city and report back to the user about its adventures upon returning. Users can purchase game extensions and content using Short Message Service, PayPal or a credit card. Indirect revenue comes from advertising, sponsorship and more. MoiPal is also a Facebook application. A number of other mobile games put the participant directly in the action and merge self-representation, context-aware properties and 3D graphics (e.g., Viewdle, the new Transformers game, and Paranormal Activity: Sanctuary from Ogmento). Also, some virtual worlds' functionality is built into augmented reality apps, such as Junaio, Layar, Wikitude and Tagwhat. i-Citizen 3D from the U.K.-based company Micazook enables users to create avatars on the Web that can wander around different geographical locations such as London, Barcelona and New York.

With the iPad and other media tablets, the potential to run bigger virtual environments becomes more realistic. With the extreme popularity of Facebook and browser-based gaming (e.g., FarmVille), keeping track of endeavors via a mobile device becomes a high probability that would create even greater stickiness and the need to return to the virtual world more frequently. The screen limitations that have constrained mobile gaming and virtual environments may ease, at least in some sections of the market.

Finally, mobile virtual assistants are emerging to help in the area of customer service. For example, Indisys offers a mobile assistant that can interact with users through natural-language dialogues and in written or spoken chats with speech synthesis. Conceptual prototypes based on this technology include a sports and diet assistant on smartphones that can suggest healthy and balanced diets and daily exercises based on health conditions and personal objectives.

Mobile device capabilities have significant 3D graphics capabilities (e.g., Nvidia CPU's now included in many Android phones/tablets), OpenGL for Embedded Systems (OpenGL ES) and engines like Flash 3D, Unity and other mobile 3D developer services will drive the different types of mobile virtual worlds being created. These technology areas will continue to merge and impact use cases.

User Advice: Evaluate the emergence of mobile virtual worlds as an opportunity to pursue innovative mobile marketing and advertising strategies in the business-to-consumer context. These technologies will see further development and adoption. They have the potential to significantly change user interface paradigms on mobile applications for consumers and enterprise users.

Business Impact: Mobile virtual worlds are aimed at young users (tweens or teens), mostly to support gaming or social networking on mobile devices. However, these new mobile application paradigms might innovate traditional mobile application interfaces and significantly transform the interaction style and application designs during the next three years. Areas that might see benefits from adoption include marketing, advertising and customer service. Security concerns also may arise, for example, from location-based solicitations, which will become a new form of phishing in mobile worlds.

Benefit Rating: Moderate

Market Penetration: Less than 1% of target audience

Maturity: Emerging

Sample Vendors: Creative Virtual; Indisys; Ironstar Helsinki; Micazook; Sulake

Recommended Reading: "Emerging Technology Analysis: Mobile Virtual Worlds"

Social TV

Analysis By: Michael Gartenberg

Definition: Social TV describes communication and social interaction in the context of watching television or related to TV content though broadband connected TVs, or through the use of companion screens such as media tablets.

Position and Adoption Speed Justification: Social TV is just emerging. There is evidence that uptake in companion screen apps (such as GetGlue, Viggle and Shazaam) is on the rise. In addition, the incorporation of Twitter usage in programming, such as media personalities responding to live tweets on camera and the adoption of Twitter metrics as pseudoratings for TV show popularity, indicate how social networks and TV can combine to create a new experience.

New, broadband-connected TVs are slowly coming into the market, but their initial uptake by consumers has been slow, and these devices — with their app ecosystems — have a strong social network component. While the current wave of interest in all things related to social networking and social networks is driving the hype, consumers are less interested in the connected-TV experience. Obstacles such as home network complexity, lack of keyboards for interaction in the living room, and a general lack of interest among consumers in accessing the Internet on their TVs all present hurdles to adoption. If consumers can be offered contextually relevant experiences that are tied into the TV, as well as service offerings that are differentiated and related directly to the TV experience, more consumers will become engaged, especially given the generally shared nature of this experience, and how a shared experience can be driven beyond the living room. Hardware vendors that reduce the complexity of the connected-TV experience have the greatest chance of driving the social TV experience.

User Advice: It remains unclear, and perhaps doubtful, whether social TV will benefit from any innovations directly in the TV set, although vendors will attempt to incorporate these features.

Second-screen experiences don't require additional hardware beyond a tablet, smartphone or PC, and most social TV efforts should be focused on this space.

TV can be, and often is, a social experience beyond the individual watching the content. Extending the user's ability to share experiences, comment and critique, and offer recommendations all mirror social network facets that have been successful in other areas. To be successful in this space, existing social networks must target the specific properties of the TV in much the same way as they've targeted the specific properties of mobile services. Attempting to replicate the experience of the Web on the TV would be a fundamental mistake, and such efforts are unlikely to be successful.

Business Impact: New social TV services targeting the viewer have an opportunity to take hold before the market is saturated with undifferentiated offerings. In particular, early loyalty programs, such as Viggle, that are seen to offer value to consumers will help drive consumer engagement in TV content, and further social engagement will be difficult to displace by later offerings.

Customer service providers (CSPs) can use the social TV experience to drive revenue opportunities, if the CSPs create proper partnerships to help engage consumers. Social TV has an opportunity to create a superpanel of registered viewers consistently logging viewing, and potentially enhancing or disrupting traditional metric methodologies. Connecting companion screens to the experience will give a persistent and unique identifier that can be connected with behavioral history, and can offer accurate measures of real consumer engagement and loyalty.

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Sample Vendors: ABC; Apple; Digimarc; Facebook; Google; HBO; LG; Orange; Samsung; Sky; Sony; Twitter; Yahoo

Mobile Security Apps

Analysis By: Sandy Shen

Definition: Consumer mobile security applications protect mobile devices against security threats and help users manage their privacy and device performance. Typical features include antivirus scans, privacy management, device performance optimization and theft protection.

Position and Adoption Speed Justification: There have been a number of security breaches on consumer devices in the last several years, although the damage has been relatively contained. Most malicious software (malware) tried to get data (such as mobile phone numbers), track voice calls or SMSs, track and share location data, or direct users to phishing sites. Android is the primary target for malware because it is the No. 1 smartphone OS by market share, but most malware comes from the third-party app store rather than the official store, which has the filtering capability. The fragmented nature of Android and device models makes it difficult for any malware to undertake a massive attack on all devices. As for iOS, the device software, hardware and app store are tightly controlled by Apple, which has strict rules for applications and runs a routine scanning process for the store. Unless the user has a jailbroken device and accesses third-party app stores, it is difficult for hackers to launch massive attacks. Other OSs, such as Symbian, Windows Mobile and BlackBerry, are less of a target for hackers because of their small user base or the closed nature of the OS.

Viruses and malware can attack mobile devices in a number of ways:

- As disguised legitimate applications, such as a game, a media player or a banking client.

- As pirated applications distributed through third-party app stores, many of which offer the pirated version free of charge and for jailbroken devices. Malware developers can "unpackage" the pirate application, add malicious code and repackage it as the original application.
- As pirated applications distributed through the official app store. Malware developers unpackage and repackage the application and distribute it in the official app store.
- By directing users to a URL, which is either a phishing site or where malware is downloaded from.
- As SMS and Multimedia Messaging Service attacks.
- As call interceptions and by hacking cellular or Wi-Fi data communications.

The damage that these viruses and malware cause includes:

- Sending sensitive user data (such as location, login credentials and device identification numbers) to a remote server
- Downloading applications in the background without a user's permission or awareness
- Making unauthorized calls, sending SMSs to premium numbers or sending SMS spam
- Changing device settings, such as Wireless Application Protocol gateways to direct traffic to another gateway
- Controlling the function and data of a device
- Rendering the device unusable via denial-of-service attacks

Mobile device vendors, especially those using Android, have already preinstalled mobile security software. However, antivirus applications on the device alone cannot effectively secure the user device and data, and Gartner believes users have to rely on mobile device management (MDM) tools to have effective protection. Some communications service providers (CSPs) have used MDM tools to offer antivirus and anti-theft services, and this is a more effective way for consumers to obtain protection. Such service is not widely available from CSPs yet, and consumers are not fully aware of the service value to be willing to pay a subscription. It will take a long time to educate the market and several major security breaches to make users see the value.

User Advice:

- Mobile OSs and app store owners should tighten their application approval processes and install store-level scanning platforms to reduce the risks of malware.
- Mobile device vendors, especially those using Android OS, should either preinstall the mobile security application or offer the application via their own app stores.
- CSPs should consider using MDM tools to offer mobile security services to customers to enhance user loyalty and increase revenue.

Business Impact: Mobile security breaches will lead to unauthorized activities on the device and charges to users, which will have a negative impact on service providers and their devices. By taking precautions, device vendors, OS/app store owners, and mobile carriers can improve user experience and loyalty, as well as generate incremental revenue.

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: AVG; F-Secure; Kaspersky Lab; Lookout; McAfee; NetQin; Trend Micro

Recommended Reading: "iPhone and iPad Security Assessment"

"Android Smartphone and Tablet Security Assessment"

Personal Cloud

Analysis By: Neha Gupta; Martin Reynolds

Definition: Personal cloud is the individual's collection of digital content, services and apps which are seamlessly accessible across any device.

The personal cloud is not a tangible entity as such but the realization of four different types of experience in which users store, synchronize, stream and share content on a contextual basis, moving from one platform, screen and location to another. Founded on interconnected services and applications, it both reflects and sets consumers' expectations for how next-generation computing services will work.

Position and Adoption Speed Justification: The personal cloud experience must be contextually tailored for each device and provide a seamless experience as the user moves across platforms. Personal cloud is a transformational force that will reshape the way applications are designed and content is delivered.

Online backup and synchronization companies have been offering services for some years but it's the growing adoption of mobile and portable devices with limited internal storage that has set the stage for the transformational shift to personal cloud. As more users become exposed to what the concept offers so will the expectation that it will always be there for them. The shift to the personal cloud will accelerate rapidly in the next 12 months as users learn how to use new services on new devices. By 2014 the personal cloud will have replaced the personal computer as the center of users' digital lives.

At a technical level personal cloud is a virtual, federated amalgamation of different services that each user will assemble, either explicitly or implicitly, based on their personal needs, tastes and work styles. Once assembled, each user's personal cloud will serve a repository for their data, the place they go to stay in touch with their family, friends and colleagues and the collection of sites they visit in order to purchase things; be informed and entertained; and to do their jobs. The

personal cloud will not be static but will evolve over time with new content, collaborations, places and contacts.

User Advice:

- Don't tie offerings to a specific device or platform. Make them broadly available across multiple ecosystems to maximize adoption.
- Make it easier for users to integrate existing personal cloud services. When offering streaming and content access, take account of the user's present state and context in order to deliver an appropriate and seamless experience. Services should reflect a consumer's past actions as well as the device he or she is currently using and mediate the type and quality of content accordingly. Users need to feel that content flowing seamlessly across their devices and that their usage and workflow is accompanying them everywhere they go.
- Create partnerships to give as many users as possible access to common devices and platforms. All applications do not need a proprietary online storage solution or synchronization engine but they should be tied to popular systems already used by consumers.
- Empower your users — establish a "bring-your-own-devices" program, including policies and support processes that enable personal cloud usage while maintaining corporate security standards.
- Embrace a self-serve approach to outfitting users.
- Move toward device-neutral development processes and stop building for specific physical devices.

Business Impact: The distinctiveness of the personal cloud will force business leaders not only to rethink how they *approach* markets but, more importantly, how they *define* markets. It will have a direct impact on digital content, services and applications. It will also have a direct impact on IT organizations designing applications that must coexist in the personal cloud to gain acceptance.

There will undoubtedly be many examples of successful individual personal cloud services but, on the back of these successes, there will also be attempts to create larger ecosystems for users. These might be tied not just to particular devices or even platforms but to specific vendors and their services. Users who use a particular provider for cloud-based document synchronization, for example, may well be more likely to use the same vendor for media purchasing and consumption, photo sharing, content creation and other interconnected applications and services, even if they do not use those services on the same vendor's OS or device.

This doesn't necessarily equate to a "winner takes all" scenario but it does mean that larger players who can demonstrate ecosystems, as opposed to just individual features or services, stand more chance of persuading consumers to adopt more than one feature or service.

IT organizations will be just one of the service providers delivering content to a user's personal cloud and must be prepared to integrate into a their chosen environment with minimal disruption or administration.

Benefit Rating: High

Market Penetration: Less than 1% of target audience

Maturity: Emerging

Sample Vendors: Amazon; Apple; Cloud Engines; D-Link; Dropbox; Facebook; Google; Iomega; Mozy; SugarSync; YouTube

Recommended Reading: "The New PC Era: The Personal Cloud"

"Market Trends: The Personal Cloud From Consumers' Perspective"

"Competitive Landscape: Consumer Personal Cloud"

"Market Insight: The Consumer Personal Cloud, Ready to Eclipse the Personal Computer for Consumers"

"Forecast: Consumer Digital Storage Needs, 2010-2016"

"Competitive Landscape: Consumer Cloud Storage"

"How Mobile Networks Can Play a Bigger Role in Personal Clouds"

"Market Trends: Scenarios for Consumer Storage, 2011"

"Survey Analysis: Consumers Avoid Cloud Storage"

"Market Trends: U.S. Consumer Electronics Vendors Are Creating Products More Suited to Business Than Consumer Infrastructures, 2011"

"Market Insight: Opportunities and Models for Consumer Digital Content Storage"

Optimized Download

Analysis By: Jessica Ekholm

Definition: Optimized download is a solution designed for distributing media content to consumers and enterprises using the most optimal networks and times available. Media content is cached on a user's device and can be viewed in an offline mode, and during network congestion.

The solution allows communications service providers (CSPs), for example, to push less-time-sensitive content to a device during times of lower network activity and stops content from being sent to a consumer situated close to a congested cell.

Position and Adoption Speed Justification: Two of the most critical challenges that CSPs are up against are developing new pricing models and reducing the cost of running their networks as demand for mobile data increases. Also, as demand increases, CSPs are looking for ways to lower the load on their networks, whereas consumers are increasingly looking to reduce their mobile data costs. Optimized download could be one way of optimizing the distribution and network load of

media content. This will become even more important as we are moving toward the personal cloud era where consumers will be synching, streaming, sharing and storing content across all their connected devices at a higher rate than seen previously.

At all times, the idea with optimized download is to make sure that the fastest network is used to distribute content to consumers, whether that is High-Speed Packet Access (HSPA), Long Term Evolution or Wi-Fi/femtocell.

As with all content distribution, the drawback is that CSPs, by offering such an integrated content distribution service, need to obtain the correct rights to distribute multimedia content to a device. Furthermore, the solution may also involve the consumer to some extent — and his or her willingness to sign up for the service and mark content that is of high relevance to them. It is not always possible to tell how much time and effort a consumer is willing to spend to set up preferences for "smart loading," so uptake may be hampered.

Consumers would automatically use their home Wi-Fi/femtocell network, rather than the HSPA network, to upload and download content and, therefore, wouldn't have to use their mobile data allowance. By opting to disable HSPA content download and enable "Wi-Fi-only" download while roaming, consumers could save themselves from potential bill shock. Additionally, if the consumer's device is running low on battery or storage capacity, content will not be sent to this device.

In terms of vendors pushing these services, Alcatel-Lucent is testing its Mobile Smartloading solution and we are likely to see similar integrated solutions being launched by other network service providers in the future. In the meantime, however, other providers are currently offering caching and adaptive streaming solutions to avoid congestion. Additionally, some apps are already using caching options and HTML5 enables significant offline caching of information for application functionality without a network connection.

User Advice:

- CSPs should look into solutions that cache content on a device and that utilize the best network and the best time to push and pull content — to lower the mobile data network load.
- CSPs could use optimized download to offer a host of new data plans that are tightly integrated with the solution, such as reducing the per-megabyte data cost for those consumers willing to download video content during times of lower network load.

Business Impact:

- Optimized download can help CSPs lower the network load and reduce data costs for consumers and, potentially, lower mobile churn.
- CSPs are also able to create a host of new tiered data plans, by linking and utilizing the possibilities of the optimized download solution.

Benefit Rating: Moderate

Market Penetration: Less than 1% of target audience

Maturity: Emerging

Sample Vendors: Alcatel-Lucent

Recommended Reading: "Competitive Landscape: Mobile Video Optimization"

"Forecast: Mobile Broadband Connections, Worldwide, 2009-2015"

"Forecast: Mobile Data Traffic and Revenue, Worldwide, 2010-2015"

Mobile Social Gaming

Analysis By: Shalini Verma

Definition: Mobile social gaming refers to social games that users play with friends on mobile devices such as smartphones, media tablets and handheld gaming consoles that connect to cellular or Wi-Fi networks. The games are integrated with social graphs and their support of social elements can range from minimal (such as shared leaderboards and sharing functions to unlock virtual goods) to extensive (such as turn-based gaming).

Position and Adoption Speed Justification: The momentum behind mobile social gaming is increasing, as is evident from the growing interest of gaming companies in this market. The popularity of games such as Words With Friends and Draw Something points to the fundamental ability of mobile platforms to help titles scale up in terms of usage, on the back of the growing adoption of smartphones and media tablets. Draw Something, which was designed for real social interaction, with players taking turns to guess each other's sketches, had been downloaded 50 million times and been used to create 6 billion drawings as of April 2012.

While some markets, such as Japan, have long had a lucrative mobile social gaming market, other regions are only just starting to pick up because of interest from some of the larger games companies, such as Zynga. Games developers are extending their social games to many mobile app stores — Zynga, for example, has launched two Android games on the GetJar Gold store. Usage of Words With Friends, Zynga's most successful mobile game, increased once it allowed cross-platform play between iOS, Android and Facebook. Zynga's 1Q12 financial report showed that although its Facebook users had not grown, its mobile games users had grown, which prompted it to focus on the latter. Zynga's monthly active mobile users rose from 12 million in 4Q11 to 21 million in 1Q12.

Both social platforms and games companies are investing in mobile social gaming. Japanese social gaming providers like DeNA and Gree are trying to extend beyond Japan. Gree has acquired Funzio, a mobile social game developer, for $210 million to address the needs of Western gamers. CrowdStar, the maker of Happy Aquarium, plans to reduce its focus on Facebook and invest in mobile Web games using Facebook's social graph, Gree's social gaming network and Apple's Game Center. Facebook's mobile aspirations are apparent from its upcoming mobile developer platform, and it is also reportedly working with HTC to develop a Facebook phone. These efforts could pave the way for a broader and stronger industry "play" in mobile social gaming, especially for emerging markets.

User Advice: In the next 12 months, technology and service providers should plan to be part of the mobile social gaming value chain in order to benefit from the industry momentum.

Gaming companies, social networks and mobile platform providers should build into mobile games social mechanics that are relevant and contextual for mobile scenarios — location-based gameplay that challenges gamers in or near bars or coffee shops is one example.

OEMs selling devices in emerging markets should partner with developers of successful mobile social games to provide experiences more "native" to their devices for a couple of games. They should also consider partnering with communications service providers to offer bundles that include limited hours of free mobile data service along with entry-level devices and mobile social games. This would improve the value proposition of these devices and let users get a taste of mobile gaming and mobile data services — a win-win proposition for all.

Advertisers should explore the potential of in-game advertising in popular free mobile social games. But they must have clearly measurable outcomes and benchmarks for effective advertising in this segment.

Business Impact: The success of mobile social gaming could alter the structure of the gaming market. Firstly, mobile social gaming is proving more lucrative than other types of social gaming. If this trend continues, games companies will start to invest less in PC-based social gaming and more in mobile social gaming. The demands of mobile social gaming would outweigh those of PC-based gaming and influence how PC-based games are designed, given the limited development resources of games companies.

Furthermore, if mobile social gaming proves engaging for a large population of smartphone and media tablet users, it would start to attract more advertising revenue, to the disadvantage of other forms of gaming and mass media entertainment.

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Apple; DeNA; Electronic Arts; Facebook; Gree; Zynga

At the Peak

Natural-Language Question Answering

Analysis By: Whit Andrews

Definition: Applications that provide users with a means of asking a question in plain language that a computer or service can answer with a meaningful response in a reasonable time frame.

Position and Adoption Speed Justification: IBM's virtuosic performance with its Watson application-computer combination on television quiz show "Jeopardy" was enormously successful from a marketing perspective and captured the attention of the world in February 2011. It was a benchmark in the progression toward cognitively effective reasoning by artificial actors. It joins a long line of immediately fascinating if broadly constrained custom-made knowledge calculation devices. And later in 2011, Apple's Siri joined it as a new way for users to interact with informational systems by incorporating speech-to-text technology with natural-language processing query analysis to wow users (at least some of the time).

Another example is Wolfram Alpha, a Web answer engine that converts queries to mathematical values and does some natural-language analysis. However, the challenges in effective interpretation of idiomatic interrogative speech, matching it to knowledge bases of potentially infinite scope, and the selection of a limited number of answers (even just one) remain profoundly difficult. Simple answers such as the one answer available for a trivia question are far easier than the multivariate, nuanced answers inherent in real human communication (cold or flu? why not cold AND flu!).

Solutions ultimately must discover means of communication with humans that are intuitive, effective, swift and dialogic. The ability to conduct even a brief conversation, with context, antecedent development and retention, and relevancy to individual users is well beyond conception — for now. However, nonconversational, information-centered answers are indeed already possible, with the right combination of hardware and software, and surely as in all technology categories, the availability of such resources can only become cheaper and easier. More than five years will pass before such capabilities are commonplace in industry, government or any other organizational environment, but they will be available to leaders in such categories.

User Advice: The computing power required to accomplish a genuinely effective trivia competitor is great, but will become more accessible with time. Any projects founded on such facility must be experimental, but in the foreseeable future will include diagnostic applications of many kinds, as well as commercial advice and merchandising and strategic or tactical decision support. "Augmentation" is the key thought. No decision support application springs, full formed, from the ether — it will be expert humans who build it, design the parameters and develop the interface, and humans will, similarly, evaluate its advice and decide how to proceed.

Business Impact: Ultimately, the ability for line workers or unschooled consumers to achieve effective responses from machines without using expertise in framing queries (which is the necessary case even in simple-interface applications such as Google.com) will generate new kinds of information exploitation by diminishing information friction yet more. Given a limited set of answers and an effective means of capturing plain language requests, it is easy to see computers more effectively providing guidance in various environments. Business cases such as diagnostic support in healthcare — whether for expert or non-expert users — consumer services (such as those Siri provides) are some use cases.

Benefit Rating: Transformational

Market Penetration: Less than 1% of target audience

Maturity: Emerging

Sample Vendors: Apple; Autonomy; Cognitive Code; EasyAsk; IBM; Microsoft; Vlingo; Wolfram Alpha

HD Voice

Analysis By: Anshul Gupta; Neha Gupta

Definition: High-definition (HD) voice is also known as wideband voice. Compared to traditional telephony voice over public switched telephone networks (PSTNs) and cellular, HD voice uses double the sampling rate, reproducing a much larger sound frequency and delivering all, or most, of the frequencies of a user's voice. HD voice's major advantage is the ability to communicate with clearer audio and have improved and more intelligible conversations over fixed line, cellular networks and voice over Internet Protocol (VoIP).

Position and Adoption Speed Justification: HD VoIP has been around since 2006 along with HD-capable IP telephone devices. Communications service providers (CSPs) also began upgrading their networks to support HD voice some time after, with the first commercial launch in 2009 by Orange Moldova. Currently, HD voice supports Global System for Mobile Communications (GSM), wideband code division multiple access (WCDMA)/Universal Mobile Telecommunications System (UMTS) and Long Term Evolution (LTE) networks. Ericsson has successfully demonstrated HD voice on CDMA technology, but HD voice over CDMA networks is yet to be commercially launched.

CSPs' adoption of HD-capable networks is on the rise — the number of HD-capable networks rose from 16 across 15 markets in April 2011 to 39 networks across 31 markets in February 2012. Similarly, while HD-capable mobile devices are not yet a mainstream technology, more than 70 such devices were available in the market as of February 2012.

HD voice will help CSPs to differentiate their offerings. It will help in providing high-quality services not only to voice-dependent businesses like call center services, information services and emergency services, but also to consumers as high voice quality has resulted into longer calls and improved customer satisfaction.

Even though HD voice adoption is rising, mass deployment is still many years away. The greatest commercial hurdle is that both handsets and networks have to be upgraded to deliver HD voice. This will require significant investment by CSPs in upgrading networks without any direct revenue enhancements, while the high cost of HD voice-enabled devices will result into limited use for at least the next two to five years.

User Advice:

- CSPs should factor in the cost of upgrading infrastructure to support HD voice and HD-capable devices, keeping in mind that this may not result into direct revenue enhancement — rather, it will simply offer improved customer satisfaction and a means of differentiation.
- HD voice can be offered as a special service to voice-dependent businesses. Similarly, HD voice can be offered as premium voice service over traditional voice services to enterprises.

- Coupling HD voice with mobile devices equipped with dual noise cancellation technology will further enhance voice quality and experience of HD voice.

Business Impact: HD voice can significantly enhance the communication experience over telephony, including fixed-line, VoIP and cellular networks. It also offers a rare opportunity for CSPs to position voice as a premium service or at least use it as a differentiator to keep competitors away.

The greatest benefit from HD voice will be longer in coming and will be in HD voice's contribution in the area of real-time communication language translation, which could aid globalization.

HD voice's greatest benefit in the home will be its contribution to using voice as a man-machine interface.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Cisco; Ericsson; HTC; Nokia; Polycom; Texas Instruments

Mobile Payment Acceptance With Card Readers

Analysis By: Sandy Shen

Definition: Mobile payment acceptance with card readers enables small or midsize businesses (SMBs) and individuals to accept card payments for point of sale (POS) purchases using consumer mobile devices. The service requires a card reader inserted into the audio jack of the mobile device, along with a mobile application installed on the device, to process the payment.

Position and Adoption Speed Justification: Depending on the card reader and the mobile application, the service can process cards with magnetic strips, chips or contactless technology. PayPal also supports check payments. All services charge a flat fee per transaction for the merchant fee, and they have different rates for swiping the card versus manually keying in the card data since the latter is perceived to bear higher security risks. Some providers offer a lower rate with a monthly fee for high-volume merchants so that they can save on total merchant fees. Depending on the service provider and types of account, funds can be made available immediately or in a few days.

For SMBs and individual sellers that don't want to invest in payment acceptance terminals or get locked into long-term contracts, the service offers an easy way to accept card payments so that they don't lose sales. For customers, they can pay in the usual way they do, with no behavioral changes required.

Due to the low investment and behavioral barriers, the service has seen fast adoption and attracted many entrants. Square is the first company that came up with the idea, launching the service in May 2010. It reported processing transactions at an annualized rate of $5 billion ($13.7 million per day) in

April 2012, two years after launch. It had more than 1 million merchants using the service as of 2011, although most are SMBs and one-shop retailers. Besides Square, Intuit, PayPal and VeriFone have also entered the market.

Security is a top concern for consumers, and it needs to be adequately addressed before we see larger-scale uptake. Since the service relies on low-cost card readers and mobile applications to process card credentials, it presents several vulnerabilities. Some services rely purely on software encryption of the mobile application, and the card data is sent in clear sight from the card reader to the mobile device. Others use hardware encryption within the card reader, and the encrypted data is then sent to the application to be processed. This offers better security than the software-only approach. For payment that requires a PIN, the soft keypad on the mobile device is another vulnerability. There are readers coming to market with a physical keypad, but this is not a mainstream solution and obviously increases the cost of the reader. In response to the increasing popularity of such services and the remaining security concerns, the PCI Security Standards Council published a guideline in May 2012 to advise merchants to use certified hardware accessories and validated point-to-point encryption solutions to control risks.

Beyond SMBs, some large companies with extensive field service are also showing interest in this service. Companies in logistics, delivery, fleet management and consumer goods can use it to collect payments from the field. For example, Square is piloting the service with the New York City Taxi and Limousine Commission to use iPhone and iPad for taxi payments, replacing the current display and payment technology.

With new entrants coming into the market with lower rates, price competition will threaten the long-term viability of the service. We believe nonpayment value-added features are needed to sustain growth. For example, Square has launched Register — a service that allows merchants to customize their inventory with names and pictures, offer loyalty programs, personalize receipts, set employee permissions, and view analytics. Intuit has acquired AisleBuyer, a mobile commerce platform provider, and it also launched a geolocation feature that automatically calculates the sales tax based on the city, state and special tax district of the transaction. This will help SMBs use the service beyond payments and assist them in promoting sales and enhancing in-store experience. However, we do not expect such services to be adopted by Tier 1 retailers anytime soon, even with the value-added features.

The U.S. is the leading market for the service since this is where the service originated, and Square still restricts its service to the U.S. only. PayPal has brought the service to the U.S., Canada, Hong Kong and Australia, with more countries planned in the future. We have seen local "copycats" in Europe and China, although uptake remains relatively low.

User Advice:

- SMB merchants without a payment acceptance terminal should investigate the service and see how it can help increase sales from card payments. Be aware of the security vulnerability, and select providers with a strong security solution.

- Enterprises with a large field collection service should investigate the service to see whether it can help shorten collection cycles without significantly increasing costs. Look for services with a monthly plan that can help lower fees.
- Card reader and service providers should first and foremost address the security issue to include end-to-end encryption and to make your solution compliant with the PCI Data Security Standard. Also, they should look beyond a payment service to include value-added features, such as portfolio management and loyalty programs, to integrate payments with an enhanced shopping experience for both merchants and customers.
- Established POS terminal vendors should consider entering the space to capture the SMB market that is often beyond the reach of existing products.

Business Impact: The service can help SMBs and individuals acquire sales with card payments, without making expensive investments and being locked into long-term contracts. This doesn't cannibalize the existing POS terminal market but has created a new market of SMBs. Payment processors can see significant volume from these services if the market takes up on a large scale.

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: iBoxPay; iZettle; Intuit; PayAnywhere; PayPal; QFPay; Square; VeriFone

Recommended Reading: "Market Trends: Mobile Payment, Worldwide, 2012"

Context-Enriched Services

Analysis By: Anne Lapkin

Definition: Context-enriched services are those that combine situational and environmental information with other information to proactively offer enriched, situation-aware and usable content, functions and experiences. The term denotes services and APIs that use information about the user to optionally and implicitly fine-tune the software action with better situational awareness. Such services can proactively push content to the user at the moment of need, or suggest products and services that are most attractive to the user at a specific time.

Position and Adoption Speed Justification: Context enrichment refines the output of services and improves their relevance. Since Gartner began covering this topic more than five years ago, context-enriched services have gone beyond simple scenarios (for example, one category of context information — such as location) to more complex services that use several categories of context information (for example, location, group behavior and purchase history) to further refine the output. The majority of implementations today are consumer facing, in mobile computing, social computing, identity controls, search and e-commerce — areas in which context is emerging as an element of competitive differentiation. Gartner believes that enterprise-facing implementations, which use context information to improve productivity and decision making by associates and

business partners, will begin to emerge in the next several years (see "Context-Enhanced Performance: What, Why and How?").

Current context-aware solutions are fragmented — they are individually designed, custom-developed and deployed and, because of their competitive importance, are often not widely distributed or advertised. The movement in social computing toward open and shared social relationship (social graph) information is an early step toward the standardization of context-aware computing APIs; however, most of the required standardization effort has not yet begun. Context-enriched services will require multiple stages of innovation and platform technology evolution before their essential benefit is well-understood in the broad mainstream computing markets.

Context-enriched services continue to steadily climb toward the Peak of Inflated Expectations in 2012. We are seeing an increasing number of applications that, while they may not use the term "context-aware computing," are clearly using context information to improve the user experience. In addition, we are seeing "platform level" services offered by context providers such as Apple and Google that allow advertisers to plug content into certain situations. Previously, these services were custom-built for a specific service.

Currently, most services are reactive: that is, while they may use some information about the user to personalize the interaction, they fundamentally provide content to a user based on a specific request. As context-aware computing becomes more prevalent, proactiveness will become the norm. That means that a service will deduce what the user requires based on detection of a context event (for example, the appearance of a user in a particular location), an analysis of all the available information (including situational and environmental information) pertaining to that user and a determination of the best course of action. This course of action may be the presentation of a personalized offer or content, or it may be "do nothing" if it is determined that the user is not receptive at that time.

User Advice: Application developers and service providers should take advantage of the wide range of contextual opportunities in their e-commerce, security, social computing and mobile computing systems. Some early context processing can be achieved using event processing and complex-event-processing technologies; enterprises need to plan to incrementally develop or source more context-enriched services in step with their ambition levels for improving the user experience.

Business Impact: Context-enriched services will be transformational for solution providers; context enrichment is the next frontier for business applications, platforms and development tools. The ability to automate the processing of context information will serve users by increasing the agility, relevance and precision of IT services. New vendors that are likely to emerge will specialize in gathering and injecting contextual information into business applications. New protocols such as real-time bidding will allow for the mashing up of and delivery of context-enriched services. Most context-aware applications are likely to arrive as incremental enhancements to service-oriented architecture, without a major disruption to the prior architecture. However, the new kinds of business applications — especially those driven by consumer opportunities — will emerge, because the function of full context awareness may end up being revolutionary and disruptive to established practices.

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Apple; Atos; Google; Microsoft; Pontis; Sense Networks

Recommended Reading: "Cool Vendors in Context-Aware Computing, 2012"

"Predicts 2012: Context-Aware Computing Changes Consumer-Facing and Security Strategies"

"Context-Aware Computing and Social Media Are Transforming the User Experience"

"A World-Class Patient Experience Is the Disney Family Cancer Center's Focus"

"Evaluating Privacy Risks and Business Benefits in Four Context-Aware Technologies"

Gamification

Analysis By: Brian Blau; Brian Burke

Definition: Gamification is the use of game mechanics to drive engagement in non-game business scenarios and to change behaviors in a target audience to achieve business outcomes. Many types of games include game mechanics such as points, challenges, leaderboards, rules and incentives that make game-play enjoyable. Gamification applies these to motivate the audience to higher and more meaningful levels of engagement. Humans are "hard-wired" to enjoy games and have a natural tendency to interact more deeply in activities that are framed in a game construct.

Position and Adoption Speed Justification: Gamification can be implemented with software systems and applied to many different challenges relating to customer engagement, education, employee performance, innovation management, supply chain management and healthcare, for example. While the concepts behind gamification are not new, its first use in 2007 coalesced specifically around using game mechanics derived from video games. Now, gamification is emerging as a trend in enterprise. Its current "sweet spot" is the consumer market and it is a key aspect of marketing campaigns, customer loyalty programs, product design of mobile apps and services, and is intended to increase customer interaction and engagement.

Early adopters, such as mobile smartphone apps and consumer services, report that gamification has a significant positive impact on user engagement rates when applied in a suitable context. However, gamification also has significant challenges to overcome before widespread adoption occurs. Designing games is no easy task — during four decades of video game development many games have failed, despite their developers having the best intentions. A basic level of game mechanics (a points system, leaderboard, achievements, awards or basic challenges) is often not enough to sustain increased engagement, as incentives and rewards must be aligned to motivate the target audience. Gamifying activities represents another challenge, one that requires careful planning and execution, and iteration. Overcoming these challenges will require successive integration of gamification in a wide variety of consumer and enterprise scenarios.

User Advice: Gamification of consumer services, applications and enterprise processes can increase user interactivity and change behavior, resulting in greater user engagement. For example, users who have fun can are more likely to become loyal users. Gamification has many uses that target consumers, customers, employees or another defined audience and it impacts many areas of business and society.

Organizations planning to leverage gamification must clearly understand the target audience they intend to engage, what behaviors they want to change, what motivates the audience and maintains their engagement and how success will be measured.

Gamification technology comes in three forms; "gamified" platforms (such as Foursquare, SCVNGR and shopkick), software services that integrate with custom-developed applications (such as Badgeville, BigDoor, and Bunchball) and purely custom implementations.

Recognize that simply including game mechanics is not enough to realize its core benefits and that making them sufficiently rewarding requires careful planning, design and implementation with ongoing adjustments to keep users interested. Before designing the game mechanics, it is essential to determine an appropriate tempo and stimulus to reinforce desired behavior, along with appropriate rewards or penalties.

Enterprises seeking to encourage new behaviors can use gamification to motivate employees. For example, enterprise architects might use it for scenario planning exercises or future state visioning during enterprise context sessions, or it could be used to advance adoption of social media either internally, with employees, or externally with customers. Organizations should examine where gamification can be used as a mechanism to inspire and reward new business options and markets and to recognize contribution and participation that augments and furthers the purpose of their businesses and their customer communities.

The intended behavioral learning and the rewards that users will associate with gamification depend on the nature of a game's mechanics, the setting and context of the scenario and progression of the process. Implementing gamification means matching game mechanics and incentives to target business outcomes to attract and sustain a deeper level of interactivity, relationship or engagement with users.

Business Impact: Gamification techniques can be used in a wide range of scenarios to enhance product and service strategies. Its use is relevant to marketing managers, product designers, customer services managers, financial managers and human resources staff, among others, whose aim is to bring about longer-lasting and more meaningful interactions with customers, employees or the general public.

Even though gamification can be beneficial, it's important to design, plan and iterate on its use to avoid negative business implications through unintended consequences, such as behavioral side effects or gamification fatigue.

User engagement is at the heart of today's "always connected" culture. Incorporating game mechanics encourages desirable behaviors, which can, with the help of carefully planned scenarios and product strategies, increase user participation, improve product and brand loyalty, advance

learning and understanding of complex process, accelerate change adoption and build lasting and valuable relationships with target audiences.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Badgeville; BigDoor; Bunchball; Foursquare; SCVNGR

Recommended Reading: "Marketing Essentials: Strategic Alternatives for Increased Engagement Using Gamification"

"Innovation Insight: Gamification Adds Fun and Innovation to Inspire Engagement"

"Gamification Primer: Life Becomes a Game"

"Marketing Essentials: How to Create a Mobile Game for Your Brand or Product"

"Maverick* Research: Motivation, Momentum and Meaning: How Gamification Can Inspire Engagement"

"Market Insight: Lessons and Trends From the Evolution of Video Games"

Mobile Sports and Fitness

Analysis By: Jessica Ekholm

Definition: Mobile ecosystems are used for tracking and monitoring sports and health-related efforts. The ecosystem can include anything from mobile apps to stand-alone pulse readers that connect wirelessly to PCs. Advanced fitness apps use short-range wireless technology such as Bluetooth to gather data such as heart rate and distance run. Users wear sensors, either on the body or placed within a heart-rate monitor or step counter, which relay information to a mobile phone and its apps.

Position and Adoption Speed Justification: We can expect to see an encouraging growth in interest for mobile sports and fitness apps and ecosystems, due to market players such as mobile handset vendors, fitness application software developers and fitness equipment manufacturers pushing devices and services to the market.

For example, mobile handset vendor Sony launched its Experia active smartphone in 2011, which comes preloaded with sports apps that enable consumers to track their fitness levels. Users can set their ideal training route using the built-in GPS, barometer and compass. On-screen heart rate and pulse can be monitored in real time — enabled by ANT+ wireless networking technology (promoted by the ANT+ Alliance) — while the MapMyFitness app can monitor day-to-day performance. Additionally, Facebook inside Xperia allows consumers to share their progress and experiences with friends. Samsung, in conjunction with Adidas and miCoach, launched the Samsung Adidas F110 device in 2008, which uses a small chip attached to the user's shoelaces to calculate stride, speed

and distance covered, and then relays this information to the miCoach phone app. The miCoach sports ecosystem is now growing rapidly and offers the " Speed Cell" tracker, which can be attached directly to specialized miCoach shoes and which syncs wirelessly right from the pitch — via miCoach Connect — onto the user's iPhone. In addition miCoach has teamed up with health insurance company PruHealth in the U.K. and is offering a £50 heart-rate monitor bundle for iPhone users which can be linked to a PruHealth user's vitality program.

The proliferation of the Apple App Store and Android Market has brought in a selection of healthcare and fitness apps, with prices ranging from free to just a few dollars per app. For example, sportswear giant Nike (one of the leading sports ecosystem providers) launched its Nike training app, which has in-built workout session programs with audio guidance, and several apps are using a handset's GPS to track running, walking and cycling routes. Finnish sports instrument and heart-rate monitor provider Polar offers its WearLink+ transmitter. WearLink+ utilizes Bluetooth, is compatible with all major mobile training apps (such as the Sports Tracker, Endomondo, and RunKeeper) and supports the Android, Symbian and Windows platforms — thus reaching millions of mobile training apps users around the world. U.S. company Fitbit's step counter Fitbit Tracker has seen a strong uptake and lets users see the number of steps taken, stairs climbed, calories burned and floors climbed. It syncs wirelessly through a Fitbit mini base station, but steps are not synced automatically to the mobile phone; however, Fitbit does offer an app for iPhone and Android users to log food and drink intake and workouts. Devices such as Fitbit Tracker, Motoactv, NikeFuel, the Up band (from Jawbone) and GPS watches are all currently driving this market with connections into apps and services.

Workout plans and personal health and fitness information can sometimes be preprogrammed onto a mobile device, and also monitored by a stand-alone fitness company or personal trainer. Alternatively, information related to workout performance and body statistics is sometimes sent to a personal trainer and the fitness company via the mobile Web. Less advanced apps are also available to download onto mobile devices; for example, body mass index calculators, training advice, fitness programs, calorie counters and stress-reducing apps.

In the initial stages of the fitness ecosystem, we can expect sports enthusiasts and fitness devotees to be the first to sign up for and use their downloaded fitness apps on a regular basis. However, as smartphones and app stores become more common, access to sports and fitness apps will reach a wider, more casual audience.

In addition, further growth can be expected from an increased interest in personal health record platforms, such as Microsoft HealthVault. Personal health record platforms provide consumers with an online repository to store health and fitness information, which can then be made available to clinicians and nutrition counselors.

Large health insurance companies are a potentially fruitful future market; offering discounts on their premiums to members who, for example, take more than 10,000 steps per day or who can provide evidence of doing more than 30 minutes of exercise per day.

User Advice:

- Mobile handset manufacturers wanting to enter the health and fitness market, should capitalize on their products' potential by integrating GPS technology and accelerometers and making good use of customers' vital information. They should also make themselves appealing to developers by giving access to sensors and features in the device, or by choosing a partner with sufficient appeal to drive stickiness.
- Fitness equipment manufacturers should consider incorporating Wi-Fi and cellular chips and/or ZigBee and Bluetooth low-energy technologies into products aimed at gyms and individual consumers. They should also offer support for Bluetooth 4.0, which requires lower power consumption and, therefore, less need to recharge.
- Software developers should design apps that are easy to use and create "stickiness" by motivating users and enabling them to monitor their progress. They should also design apps that enable users to store and share data on mobile devices and online, such as online running or diet journals for tracking and monitoring purposes, progress charts and averages, and the ability for the user to share achievements on social networking sites. Additionally, work on the longevity of the app, tie-in SMS reminder functionality and, potentially, add device functionality such as bar code scanners to further enhance the offering.
- Health insurance companies, gyms, diet clubs, employers and governments should consider integrating mobile fitness apps into their policies and health programs: to monitor activity levels, increase both health insurance and gym customers' satisfaction, and reduce churn.

Business Impact: Fitness equipment manufacturers, large health insurance companies (and their members), diet clubs and sports clubs could see an impact — in both usage and revenue benefits — from new software developments around interaction, reporting and tracking of users' fitness activities.

Mobile device manufacturers could see results in terms of higher customer loyalty and, ultimately, some revenue impact from fitness enthusiasts when offering customers a full mobile fitness ecosystem service. This ecosystem should include one or more apps that could be linked with GPS and an online tracking and monitoring site — which can be linked to social networking sites.

Mobile health and sports apps offer revenue opportunities for mobile carriers in the form of:

- Application revenue (from operators' on-portal sales).
- Data revenue (mostly from the traffic associated with sports and fitness application searches and downloads).
- Advertising and subscription revenue.

Benefit Rating: Low

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Apple; Nokia; Omron; Samsung; Wayfinder Systems

Recommended Reading: "Emerging Technology Analysis: Mobile Health Monitoring"

"Market Insight: Mobile Fitness and Wellness Applications and the Prospects for an Ecosystem"

HTML5

Analysis By: David Mitchell Smith; Ray Valdes

Definition: As the heir apparent to HTML4, HTML5 is a next logical step in the development of HTML. However, the term "HTML5" is often used to mean more than the formal specification, and less simultaneously (see "HTML5 and the Journey to the Modern Web"). HTML5 is the proposed specification for the next generation of HTML. It is important, because it brings to the Web much of the rich Internet application (RIA)-like capabilities that have required additional software.

Position and Adoption Speed Justification: HTML5 has increased in visibility and has garnered extremely charged opinions as a result. The extreme opinions range from "HTML5 will make everything else (especially Flash) irrelevant" (see "HTML5 and the Future of Adobe Flash") to "It will take more than a decade for HTML5 to be ratified, so we don't need to pay attention to it until then." The reality is, as usual, somewhere in between, and is time- and scenario-dependent.

HTML5 is not one thing. At one extreme, the hype and aura around the term can lead to using it to mean one particular feature (e.g., video). At the other extreme, treating it as if it is one large, inseparable thing will lead to a "wait until it's done" approach, which will be a bad choice for most companies. HTML5 consists of many components, including video, canvas, audio and offline capabilities. In addition, other modern Web capabilities, such as JavaScript, CSS3 and WebSocket, are closely related and are often grouped together.

The working subset and de facto standards may be driven by mobile devices. OS fragmentation continues to be a significant issue in mobile. However, most mobile browsers for smartphones are, or will be, based on WebKit. OS fragmentation increases the need for a viable cross-platform strategy. The common technology base of WebKit and the evolution of working subsets and the de facto nature of HTML5 pieces may fit this need.

HTML5 usage and stability will appear first in mobile environments, then on the desktop. HTML5 usage and stability will be driven by desktop and mobile use scenarios, and there will be different drivers for both environments.

User Advice: Developers should:

- Familiarize themselves with the components of HTML5, and the browsers that support them.
- Exploit the available features of HTML5 now, but recognize that they are based on a draft standard and are subject to change. Higher-level frameworks can help insulate developers.
- Consider HTML5 when designing applications that require the broadest reach across the most browsers and devices.

Business Impact: There is visible momentum around HTML5; however, as with most technologies, especially on the Web, interest is occurring primarily outside the enterprise sector — among progressive Web designers and among mobile application developers. Web developers are starting to design around new elements in HTML5, such as canvas, offline mode and video. Developers of RIA-based sites that rely on Flash and Silverlight need a strategy that relies less on Flash and Silverlight. Mobile developers are interested in HTML5 as a cross-platform technology that doesn't rely on "native" applications and proprietary app stores.

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Adobe; Apple; Google; Microsoft; Research In Motion

Recommended Reading: "HTML5 and the Journey to the Modern Web"

"Flash, Silverlight and the RIA Dilemma in a World of HTML5"

"Browser Vendors' HTML5 Strategies Are Not the Same"

"HTML5 and the Future of Adobe Flash"

Mobile Coupons

Analysis By: Gale Daikoku

Definition: A mobile coupon is a form of e-coupon that comes in two forms: a specialized, targeted offer delivered as a unique, identifiable serialized code, bar code or other means, sent to a mobile device via SMS, mobile application, mobile URL or other mobile technology; or the communication of an offer via SMS that might normally be available to any customer.

Position and Adoption Speed Justification: The retail industry is still maturing in its distribution and redemption of mobile coupons, and in its communication of promotions via mobile phones. Gartner consumer surveys show that there is a growing willingness by consumers who use smartphones to adopt mobile coupons and promotions; however, the vast majority of these shoppers (79%) are not that interested. Many Tier 1 retailers, such as The Kroger Co., Safeway, Target and JCPenney, are trialing or using mobile coupons, which Gartner estimates has penetrated slightly more than 5% of Tier 1 retailers.

Hype around mobile capabilities, utilizing context-aware technology specifically (such as location awareness on mobile phones) and print-to-mobile coupons (such as scanning a Quick Response [QR] code or bar code, or texting a code advertised on print material) continues to emerge rapidly in retail. Coupled with the desire of retailers to improve their ability to personalize and develop more relevant offers in real time, it has driven real-time offers and this technology to near the peak of hype, and we expect this hype to continue for at least the next year or so.

User Advice: To get a quick start with mobile couponing, retailers can use outsourcers and mobile-only coupon technology vendors. However, in the midterm to long term, mobile coupons will have to be part of a multichannel e-coupon strategy that is aligned with how consumers are using their mobile phone as part of the shopping process. Consumers will want to be able to access and redeem coupons in any channel, so retailers will need to ensure that technology used in the mobile coupon process is multichannel-capable. Tight integration between campaign management systems and the couponing systems of the brand manufacturers will be required. Retailers must monitor the relevancy of their offers and play an active role in managing customer opt-in and privacy settings to avoid spamming customers.

Business Impact: The biggest advantage mobile coupons have over e-coupons is they are immediately execution-ready for customers and do not have to be printed or brought to a store. The benefits of mobile coupons center on increasing the frequency of visits to the store and increasing the overall transaction value. Sales, margins and customer loyalty are all targeted to increase as a result.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Cellfire; Coupons.com; Scanbuy; You Technology; Zavers

Recommended Reading: "How Can Retailers Get Started in Mobile Commerce?"

"Mobile Consumer Shopping Preferences, 2010: U.S."

"Creating Real-Time Personalized Offers for Consumers"

"Consumer Survey Shows What's Ahead for Retail Coupon Management"

Ultra-High-Speed Broadband Internet

Analysis By: Fernando Elizalde; Amanda Sabia

Definition: Gartner defines ultra-high-speed broadband Internet as residential services that support download speeds of more than 50 Mbps.

Position and Adoption Speed Justification: Ultra-high-speed broadband services are based mostly on fiber to the home (FTTH), fiber to the building and 100Base-T Ethernet access technologies. Fiber to the node (FTTN), VDSL2 and Data-Over-Cable Service Interface Specification (DOCSIS) 3.0 technologies are also included in the definition. We consider 50 Mbps to be the threshold for ultra-high-speed broadband because, in our view, this is the point above which speeds exceed the needs of current Internet-based applications and open the door to new applications and services.

Service introduction and adoption, with some exceptions, has been slow. However, factors such as rising numbers of connected devices in the household (simultaneously accessing the Internet) and the ever-increasing popularity of online video (which in turn constantly increases in resolution quality, challenging bandwidth throughput) are creating a favorable environment for the adoption of ultra-high-speed broadband services. Added to this is an increased dependency on the personal cloud for such things as digital content storage and access. Also, services like broadband-based "TV everywhere" experiences, will increase the appeal of ultra-high-speed broadband.

At present, only Japan and South Korea have mass-market ultra-high-speed broadband Internet services, accounting for a large proportion of the broadband connections in those two countries. Speeds are typically 100 Mbps, but in Japan they rise to 1 Gbps on shared and unshared FTTH. More than half of the broadband residential connections in South Korea are on 100 Mbps; Japan is similarly placed. In Hong Kong, another fiber-rich market, operators are offering up to 1 Gbps. The controversial Australian government's plan to deploy an open FTTH network reaching 90% of households with broadband speeds of 100 Mbps by 2017, started to be rolled out in 2011, and will connect about 20,000 households by the end of 2012. Singapore and New Zealand have also implemented national broadband strategies. Singapore's open-access Next Generation National Broadband Network, delivering connections up to 1 Gbps, reached 100,000 subscribers and is expected to cover 95% of households during 2012. New Zealand's open-access network is expected to reach 75% of the population with FTTH by 2019 and will provide services to businesses, schools and health services as early as 2015.

In the rest of Asia, the U.S. and Europe, deployment (and consequently adoption) is much slower, with many carriers still choosing to increase speeds incrementally using asymmetric DSL 2+ (ADSL2+) or VDSL technology over copper cables. In Europe, cable operators have been quicker than telcos in deploying ultra-high-speed broadband, with Virgin Media in the U.K., Ono in Spain, Kabel Deutschland in Germany, Zon in Portugal and UPC in several markets, offering broadband speeds of at least 50 Mbps. The Nordic countries, France, the Baltic countries and a few other Eastern European countries have considerable FTTH deployments and are slowly introducing ultra-high-speed broadband services into their portfolios. In the U.K., BT Group increased its fiber to the cabinet service from 40 Mbps to 80 Mbps in April 2012, while Virgin Media announced in January 2012 an 18-month upgrade programme that will bring three of its five broadband speed offers at or above 60 Mbps. In the Middle East and Africa, companies such as STC in Saudi Arabia, Qtel in Qatar, and du and Etisalat in the UAE, have already started deploying ultra-high-speed broadband services on FTTH technology and have strong commitment to cover most of these countries with this type of technology. As of the end of 2011, there were approximately 500,000 households subscribing to broadband services above 50 Mbps in the region.

In North America, both cable operators and communications service providers (CSPs) have been offering ultra-high-speed broadband during the last couple of years. The highly touted Google experimental FTTH project offering 1 Gbps broadband service to Kansas City, has once again been delayed with an announcement expected this summer. However, service uptake is still moderate and is estimated to reach around 350,000 households in the region.

Ultra-high-speed Internet deployments in the U.S. and Europe are becoming more ubiquitous but service providers seldom release customer takeup numbers. CSPs have overcome their fears that ultra-high-speed broadband access might undermine their plans to sell content and applications by

making it easier for customers to use the Internet instead. However, it is not yet clear whether consumers will be willing to pay much more for faster services. In South Korea and Japan, ultra-high-speed services are only slightly more costly than lower-speed services, encouraging takeup by consumers. However, most of the world's CSPs will want to charge a substantial price premium for much faster Internet services — which will discourage takeup.

User Advice: CSPs should watch the leading countries for ultra-high-speed broadband Internet, to see how consumers adopt and use these services. They should look for indications of four things in particular:

- How much extra they can charge for future speed increases
- Use speed upgrades as a retention strategy
- How video streaming to (increasingly) multiple connected devices on the same connection is impacting broadband consumption
- The extent to which very fast Internet access affects a carrier's ability to make money from content

They should also consider wireless technologies, such as Long Term Evolution (LTE), that can deliver ultra-high-speed broadband (either by themselves or through partnerships) to complement their offerings for reaching remote and rural areas, as well as urban/suburban areas where FTTH and FTTN technology will not be deployed as it is not economically viable.

Business Impact: Ultra-high-speed broadband Internet access will open up a new kind of "digital divide" between the few countries with affordable, mass-market access to the fastest connections (mostly within urban regions), and those with lower-speed links based on copper access lines. Mass-market ultra-high-speed broadband Internet to the home will be transformational. It will enable a whole new breed of applications and services, such as simultaneous multiscreen video experiences, online access to digital content and the personal cloud, and remote healthcare services. Countries with ultra-high-speed broadband will be at the leading edge of innovation, developing and selling new higher-bandwidth consumer Internet applications. Fixed CSPs should consider four things:

- The trend toward multiple connected devices in the household, for accessing standard and high-definition video over the Internet that could have an impact on the consumer experience if adequate speeds are not provided.
- Bundling ultra-high-speed broadband in triple-play services that include some form of over-the-top content as well as TV everywhere within the home — positioning it as the best provider for broadcast, on demand and online digital content of any type.
- The evolution and adoption of personal cloud which can enable the adoption of their ultra-high-speed offerings.
- If wireless broadband services are not already part of the portfolio of service offerings, follow wireless CSPs' activities regarding High-Speed Packet Access Evolution networks and LTE closely, looking to cooperate to offer complementary or bundled services.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Sample Vendors: Comcast; Iliad/Free; KT; NTT Data; Orange; PCCW; Verizon; Virgin Media; Zon

Broadband-Connected Televisions

Analysis By: Mike McGuire; Andrew Frank

Definition: Broadband-connected televisions utilize connectivity to a broadband network to deliver streaming video and other Web services directly to the television via an Ethernet or Wi-Fi connection to a broadband home network. Services are delivered via applications or virtual channels. Apps can be invoked via a TV remote control or a smartphone- or tablet-based application. TV manufacturers are deploying proprietary and standards-based software on the device.

Position and Adoption Speed Justification: Market demand for connected TVs has sharpened in the past years, with companies such as NPD reporting that sales in 2011 for connected TVs grew 50% over 2010. Forecast penetration is predicted to hit as high as 70% of TV shipments in 2016, according to various market estimates. Connected-TV solutions were prominent at the International Consumer Electronics Show (CES) in 2012, and Internet connectivity seems to have trumped 3D content in terms of core TV technologies contributing to new sales. Consumer interest in online video, and the growth in online video distributors (e.g., Netflix), provides the consumer demand, which justifies hardware manufacturers using connectivity as a differentiator. There are some factors that will impede rapid widespread adoption:

- Diversity of vision and standards for software functionality
- Relatively long TV replacement cycles
- Relatively low penetration of broadband connectivity for consumers in developing markets

Yet, for semiconductor manufacturers, broadband-connected TVs offer an important new target for the latest generation of chipset designs, as evidenced by ARM's push into the space, while for broadcasters, broadband-connected TV offers a potential to extend consumer engagement with interactive content and offers more value to advertisers. For consumer-facing brands, such as Google, Apple and Yahoo, and startups such as GetGlue, Miso and Boxee, broadband-connected TVs represent some opportunities for creating unique, converged TV-Internet experiences.

As noted in last year's Hype Cycle, broadband-connected TVs continue to " ... raise vexing questions about the future relationships among broadcasters, communication service providers (CSPs), media cloud providers, manufacturers, and entities that regulate TV transmission and licensing agreements." However, Gartner believes that while online content will continue to find its way onto TV screens, second-screen applications (which include the ability to transmit content from the device screen to the TV screen), over-the-top set-top boxes (OTT/STBs) (e.g., Roku and Apple TV) and game consoles are likely to eat into any strategic opportunity for broadband-connected

TVs, particularly in the U.S. The longer it takes for software and application standards to emerge — and 2012 saw increases in the sales of connected TVs but no major shifts in software standards — the greater the opportunity for these alternatives. For that reason, we are shifting the benefit rating to moderate.

Because of the disruptive potential of this technology, Gartner expects adoption to be relatively slow overall, with different adoption rates for different regions. It is more likely that consumers, especially in the U.S., will adopt OTT/STBs, or second-screen apps on mobile devices, thus insulating their TV hardware investments from the vagaries of application and software standards.

User Advice: Consumer electronics manufacturers need to pursue common standards, especially in application development environments to drive wider adoption. Conversely, CSPs should press for adoption of their applicable standards in a uniform way by manufacturers.

Broadcasters and content companies need to take the strategic view that broadband-connected TVs and second-screen applications (on smartphones and media tablets) are likely to be competing with OTT/STBs for consumers looking to access online content and content from TV service providers as indicators for the need to start or maintain investments in centralizing and automating licensing and rights management platforms. The ability to exploit Internet-based content delivery options will continue to be a pressing requirement and leverage point.

Broadcasters should also work with their industry associations to negotiate with manufacturer associations to specify standards for how control might be passed directly from a video signal to broadband user agent software, to provide a competitive alternative to CSP plans to control this essential access point, which is of high value to advertisers.

Business Impact: The delivery of broadband-delivered content to the television is likely to add value to the television at a time when the Internet and the PC are drawing attention away from television. Technology advances in connectivity for the television should significantly accelerate the opportunity for broadband services delivered to the television.

The disruptive potential for broadband-connected TVs to supply an alternative distribution channel for video programming on TV will focus attention on net neutrality issues as a key factor in the future role of TV service providers.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Sample Vendors: LG; Samsung; Sharp; Sony

Application Stores

Analysis By: Monica Basso; Ian Finley

Definition: Application stores support application discovery and downloads through a local storefront client or browser. Public stores categorize applications in games, travel, productivity, entertainment, books, utilities, education, travel and search, etc., with ratings and comments. Enterprise application stores are private, cloud-based or deployed on-premises, and help organizations deploy applications for employees and partners.

Position and Adoption Speed Justification: Consumer application stores are at the heart of the success of modern smartphones and media tablets. Apple boosted the application store concept in 2008 with its App Store and free, advertisement-based or priced applications, which drove the success of the iPhone and iPad, and reached over 500,000 apps by May 2012. Other handset and OS manufacturers own application stores as part of their value propositions (e.g., Google's Android Market, Research In Motion's BlackBerry App World, Microsoft Windows' Marketplace for Mobile). Carriers own application stores for feature phones, focusing on billing, location and messaging, e.g., Orange App Shop and Vodafone 360. Third parties such as Handmark, GetJar and Qualcomm offer white-label solutions to carriers.

Public application stores are relevant for enterprises, because consumerization and bring your own device (BYOD) models drive adoption in the mobile workforce, and mobile business-to-consumer (B2C) application initiatives targeting end customers must leverage public application stores for application distribution and discovery by target users.

Enterprise app stores are the enterprise analog, but they are private and implemented on internal servers, or delivered in the cloud. They often offer native, Web and cloud apps for mobile devices, desktops or both. Unlike consumer app stories, enterprise stores offer selected applications that meet enterprise standards. An increasing number of enterprise portals promote applications that employees should, or are recommended to, download by pass-through to the store or local download. Private mobile application stores are critical for organizations to support easy discovery and distribution of applications to the mobile workforce, as well as end customers. Mobile device management vendors such as MobileIron, AirWatch, Zenprise, Fiberlink and BoxTone offer app store capabilities enriched with management and security in their mobile data management (MDM) offerings. Application management vendors such as Partnerpedia, Nukona (now Symantec), Apperian and AppCentral offer similar capabilities. Mobile application development platform vendors such as Kony offer them integrated with their development platform. Citrix Systems and VMware offer private store capabilities across a range of client and mobile devices.

The hype around enterprise app stores continues to build, with enterprise implementations in the initial stages, and it may take up to five years before large numbers of enterprises adopt them as the standard software distribution mechanism. Many factors will limit the broad adoption of enterprise app stores in the short term, including lack of market maturity, ROI data and app-store-friendly applications in legacy portfolios. However, as employees increasingly rely on mobile, Web and cloud apps to do their work, and as enterprises appreciate the risk of employees sourcing apps from consumer websites and app stores, the pressure to implement a safe, enterprise alternative will grow. Hence, we expect a growing number of organizations to implement limited enterprise app stores during the next few years.

While we anticipate the number and types of enterprise app store options to expand dramatically during the next few years, the current market is immature. Consumer app stores continue to

multiply and innovate, redefining what it means to be an app store. Basic enterprise app store functionality is available from a few software vendors and cloud providers, but no single vendor provides a comprehensive solution for all scenarios. In addition to pure-play vendors, some device management, application platform and software as a service (SaaS) vendors offer overlapping functionality. We expect system integrators and other service providers to enter the market with outsourced enterprise app store services. As a result, the market is likely to remain noisy (hyped, with announcements from vendors, but no clear signal about where it is headed) and immature for several years.

Overall, we expect the use of public and private mobile application stores to accelerate rapidly to the Plateau of Productivity in two to five years, given the rapid adoption of smart devices, both as individual and corporate tools. Application stores for PC and desktop Web applications may take much longer to mature.

User Advice: Enterprises should evaluate opportunities that originate from application stores to target end customers with mobile applications, e.g., to engage them in community-based activities to implement market campaigns, collect customer feedback and preferences, and provide new services. Enterprises can help improve the modularity, user experience, standards compliance, platform compatibility, provisioning, security and deployability of the application portfolio.

Application providers and developers should look for application stores that are associated with popular handsets and can create a good user experience, and should weigh these against the difficulty of developing and porting applications with their potential popularity. It is important to choose application stores with good distribution outlets and service from the application development community. Other features of application stores that benefit developers include advertisement support (like the Google model, to allow vendors to be "top of deck"), user reviews, rankings and recommendations (as with Amazon), and good billing and reporting features.

Application stores are a scale game, and those offering applications need to create unique selling points that bring developers to their stores, rather than to their competitors. An ecosystem needs to be created in which developers have the tools to easily write and port applications; individuals can easily access, download and use applications; and all sides have visibility into the accounting of application sales, and an efficient billing system that allows everyone to get paid in a timely manner.

Business Impact: Reduce the risks: Enterprise app stores can help security leaders reduce risk through better management of application and data assets. Employees are increasingly comfortable using mobile and cloud apps they source from public consumer app stores on enterprise devices with enterprise data. However, these apps can be security threats to the enterprise. The situation is particularly acute for mobile devices, because enterprises often don't control the device or provide many mobile apps to employees, leaving them to fend for themselves. Security leaders can reduce enterprise system and asset risks by discouraging the use of unsafe app sources, and providing an enterprise app store as a safe alternative.

Lower the costs: Enterprise app stores can help software asset managers lower administration overhead and drive cost accountability. An app store can help manage traditional software licensing models, SaaS subscriptions and other, more elastic, on-demand cloud provisioning models by

automating the capture of license, subscription and cost assignment data during check-out. More mature enterprises can use app store data to manage ongoing maintenance and support costs, and drive better accountability through more sophisticated and accurate chargeback models.

Increase productivity: Enterprise app stores can help application strategists increase business productivity and application innovation through application choices and competition. Consumer app stores did not just simplify software distribution; they improved consumer productivity by letting people choose the best app for their needs, and triggered a sustained wave of innovation by creating a new, highly competitive market for applications. Properly managed, enterprise app stores can produce the same results for enterprises.

Application stores are likely to have an impact on brands that can advertise and segment customers based on applications, and on application providers, giving them access to additional customers in a well-organized ecosystem.

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Sample Vendors: AppCentral; Apple; Citrix Systems; Embarcadero; Google; Microsoft; MobileIron; Nukona; O2; Orange; Partnerpedia; Research In Motion; SAP; Vodafone; Zenprise

Recommended Reading: "Marketing Essentials: How to Decide Whether to Start a Mobile Application Store"

"Dataquest Insight: Application Stores; The Revenue Opportunity Beyond the Hype"

"Enterprise App Stores Reduce Risk and Improve Business Results"

"The Impact of App Stores on your Application Strategy"

"Enterprises Can Apply an App Store Approach to Support Employees' Smartphones and Tablets"

"Best Practice for Software Asset Management: Take an App Store Approach to Help Manage and Chargeback Software Costs"

Augmented Reality

Analysis By: Tuong Huy Nguyen; CK Lu

Definition: Augmented reality (AR) is the real-time use of information in the form of text, graphics, audio and other virtual enhancements integrated with real-world objects. It is this "real world" element that differentiates AR from virtual reality. AR aims to enhance users' interaction with the environment, rather than separating them from it.

Position and Adoption Speed Justification: The maturity of a number of mobile technologies — such as GPS, digital cameras, accelerometers, digital compasses, broadband, image processing

and face/object recognition software — has made AR a viable technology on mobile devices. As all these technologies converge in maturity, AR has also benefited from a growing number of open OSs (promoting native development), the increasing popularity of application stores (increasing awareness and availability of applications), and the rising availability of overlay data, such as databases, online maps and Wikipedia. The combination of these features and technologies also allows AR to be used in a number of different applications, including enhancing user interfaces (UIs), providing consumers with information and education, offering potential for marketing and advertising, and augmenting games and entertainment applications. We also believe that AR will play a role in mobile contextual interactions, and will be particularly powerful for:

- Discovering things in the vicinity
- Presenting real-world objects of potential special interest
- Showing a user where to go or what to do
- Providing additional information about an object of interest

Most current efforts in AR do not fully leverage the potential of this technology, but given the extended adoption curve, they are moving in the right direction.

There are currently two approaches with regard to the content displayed within the AR application and the underlying delivery technologies and processes: object-specific/private data and shared/public data. Marketing and branding are the most prevalent applications for AR and fall into the former category. They focus primarily on logos, product images, bar codes and quick-response codes. Examples include Tesco's price drop campaign, Yoplait gamification to promote charitable giving, and Weetabix's cereal box AR game. AR has also been trialed in sales-oriented environments, such as Macy's Backstage Pass program and Zugara's Webcam Social Shopper. Most recently, Google's Project Glass announcement increased the hype for AR but at nowhere near the level seen in 2010. We expect efforts and adoption in this type of AR to continue steadily, as brands, marketers and advertisers look to inspire engagement with their user base.

On the other hand, we expect a number of factors will slow adoption of the more advanced form of AR, which relies more on shared/public data. These issues include:

- Device requirements for AR in mobile devices are rigorous; so, although mobile services provide a great use case for this technology, it will be restricted to higher-end devices. Mobile devices have smaller screens than other consumer electronics devices such as laptops and even handheld gaming consoles, restricting the information that can be conveyed to the end user. Tablets have good potential to overcome some of these challenges — providing a good mix of portability and screen real estate. The interface (a small handheld device that needs to be held in front of you) limits use to bursts, rather than continued interaction with the real world. GPS technology also lacks the precision to provide perfect location data, but can be enhanced by hardware such as accelerometers, gyroscopes or magnetometers.
- As with other location-based services (LBSs), privacy is a potential concern and a hindrance to adoption.

- Always-on connectivity is required — data cost and battery drain are concerns of users.
- As a newer solution, there are also issues with compatibility: Competing AR browsers are using proprietary application programming interfaces and data structure, making the AR information from one vendor's browser incompatible with that of other browsers.

User Advice:

- **Communications service providers:** Examine whether AR would enhance the user experience of your existing services. Compile a list of AR developers with which you could partner, rather than building your own AR from the ground up. Provide end-to-end professional services for specific vertical markets, including schools, healthcare institutions and real estate agencies, in which AR could offer significant value. A controlled hardware and software stack from database to device will ensure a quality user experience for these groups. Educate consumers about the impact of AR on their bandwidth, to avoid being blamed for users going over their data allowance.
- **Mobile device manufacturers:** Recognize that AR provides an innovative interface for your mobile devices. Open discussions with developers about the possibility of preinstalling application clients on your devices and document how developers can access device features. Build up alliances with AR database owners and game developers to provide exclusive AR applications and services for your devices. Secure preloading agreements and examine how you could integrate AR into your UIs or OSs.
- **AR developers:** Take a close look at whether your business model is sustainable, and consider working with CSPs or device manufacturers to expand your user base; perhaps by offering white-label versions of your products. Integrate AR with existing tools, such as browsers or maps, to provide an uninterrupted user experience. Build up your own databases to provide exclusive services through AR applications. Extend your AR application as a platform that individual users and third-party providers can use to create their own content. Explore how to apply AR, through different applications and services, to improve the user experience — with the aim of predicting what information users need in different contexts.
- **Providers of search engines and other Web services:** Get into AR as an extension of your search business. AR is a natural way to display search results in many contexts.
- **Mapping vendors:** Add AR to your 3D map visualizations.
- **Early adopters:** Examine how AR can bring value to your organization and your customers by offering branded information overlays. For workers who are mobile (including factory, warehousing, maintenance, emergency response, queue-busting or medical staff), identify how AR could deliver context-specific information at the point of need or decision.
- **Brands, marketers and advertisers:** Use AR to drive increased engagement with your user base.

Business Impact: AR browsers, applications and seamless integration will be the focus of innovation and differentiation for players in the mobile device market in 2012. There are interesting branding opportunities for companies and businesses. Points of interest can be branded with a "favicon" (that is, a favorites or website icon) that appears when the point of interest is selected.

Companies such as Mobilizy are offering white-label solutions that allow core Wikitude functionality to be customized. AR products such as Wikitude can lead to numerous LBS advertising opportunities.

CSPs and their brand partners can leverage AR's ability to enhance the user experience within their LBS offerings. This can provide revenue via set charges, recurring subscription fees or advertising. Handset vendors can incorporate AR to enhance UIs, and use it as a competitive differentiator in their device portfolio. The growing popularity of AR opens up a market opportunity for application developers, Web services providers and mapping vendors to provide value and content to partners in the value chain, as well as an opportunity for CSPs, handset vendors, brands and advertisers.

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Sample Vendors: GeoVector; Google; Layar; Metaio; Mobilizy; Nokia; Research In Motion; Tonchidot; Total Immersion; Zugara

Recommended Reading: "Emerging Technology Analysis: Augmented Reality Shows What Mobile Devices Can Do"

"Contextual Smartphone Applications Will Exploit Augmented Reality"

"Innovation Insight: Augmented Reality Innovations Add Business Value"

Virtual Assistants

Analysis By: Johan Jacobs

Definition: A virtual assistant (VA) is a conversational, computer-generated character that simulates a conversation to deliver voice- or text-based information to a user via a Web, kiosk or mobile interface. A VA incorporates natural-language processing, dialogue control, domain knowledge and a visual appearance (such as photos or animation) that changes according to the content and context of the dialogue. The primary interaction methods are text-to-text, text-to-speech, speech-to-text and speech-to-speech.

Position and Adoption Speed Justification: The front-end visual appearance of the digital VA character has a direct impact on its ability to create interest and keep and maintain that interest throughout the customer interaction. Poor quality graphics of stationary images are classified as a Generation 1 VA and has little visual appeal and mostly text-to-text based interactions. Generation 2 VAs display some form of animation but still consist of a cartoon-type character with mostly text-to-text based interactions. Generation 3 VAs look like humans and have good visual appeal with mostly text-to-speech based interactions. Generation 4 VAs look human due to high-quality animated graphics with mostly text-to-speech based interactions. Generation 5 VAs have excellent, humanlike video quality moving images with mostly speech-to-speech based interactions.

Generation 6 VAs are the most complex, have speech-to-speech based interactions and provide support on mobile platforms in addition to Web-based platforms.

Computer-generated characters have limited ability to maintain an interesting dialogue with users; they need a well-structured and extensive knowledge management engine to become efficient, self-service productivity tools. As organizational knowledge engines become increasingly well-structured and intelligent, self-service deployments relying on this source for knowledge are increasing. VAs in service, sales and education are starting to be adopted, with deployment from some Fortune 1000 companies.

End-user acceptance of VAs, driven mainly by their larger presence, is becoming less of a challenge than it was a few years ago. Growth in the art of image rendering has also seen increasingly sophisticated humanlike forms take over for the cartoon-type characters associated with Generation 1 and Generation 2 VAs. Generation 4 through 6 VAs are more easily accepted by many users, as opposed to the Generation 1 VA depictions of cartoon-based characters. The organizations that successfully deploy VAs often support implementation through the use of artificial-intelligence engines that assist natural-language dialogues.

VAs can also be classified as a gamification technology that places game-type characteristics into Web-based interactions to capture the attention of Web users and hold that attention longer for a higher ratio of successfully completed interactions.

User Advice: To use VAs successfully in customer service, focus the VA on one specific area, and do not apply the VA to all of your organization's products and services. Use VAs to differentiate your website and increase the number of self-service channels available to your target market. Support VAs with a strong knowledge management engine for self-service to create meaningful and productive interactions, and focus on delivering a similar experience in this and other self-service channels. In addition, support VAs through invisible Web chat agents once the knowledge delivery of the VAs drops below an 85% relevance-of-response rate.

Business Impact: The business case for VA's are twofold: (1) The need to move interactions to a less expensive self-service channel and (2) the need to put humanity back into the interaction by putting a face in front of the Web customer. Effective use of a VA can divert customer interactions away from an expensive phone channel to a less expensive, self-service channel. The use of a VA that is voice-enabled in a kiosk or an automated teller machine can alleviate the need for typed interventions, and can assist in creating an interesting interaction for a nontraditional audience.

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Anboto; Artificial Solutions; Cantoche; Creative Virtual; eGain; Icogno; NextIT; Umanify; virtuoz

Recommended Reading: "Enhance Enterprise Feedback Management With a Virtual Assistant"

"Toolkit: RFP Template for a CRM Virtual Assistant Application"

"Virtual Assistant Vendor Landscape, 2011"

"CRM Web Customer Service Application Framework, 2012"

NFC Payment

Analysis By: Sandy Shen

Definition: Near Field Communication (NFC) allows users to make payments by waving their mobile phone within 10 cm of a compatible reader. Users can use their bank card or mobile wallet as a payment instrument and can view account activities or top up from their phone.

Position and Adoption Speed Justification: NFC payment hasn't taken off as quickly as many technology and service providers expected. The much slower than expected adoption of Google Wallet has even forced Google into looking to share revenue with its competitor, Isis. Meanwhile, in the U.K., Barclaycard has begun to offer NFC stickers (which attach to handsets) to its cardholders, while working in partnership with Orange for a SIM-based solution. These moves highlight how the slow adoption of NFC payment has pushed providers to seek alternative solutions. Industry players are coming to realize that NFC payment isn't gaining the market traction that they expected. In addition, Project Oscar (a joint venture comprising the U.K.'s three major mobile operators), which aims to offer NFC services and which excluded the smallest player, is being investigated by European regulators. This is something else that could potentially slow down the deployment of NFC payment services in the country. We think the main challenges that NFC payment face are:

- Lack of NFC mobile phones and the contactless reader infrastructure. It will take time for both to reach penetration levels of at least 20%, and thus make the service appeal to consumers and merchants.
- Lack of coordinated efforts among stakeholders, with many working on their own projects with no plans for interoperability. Here we use France as a best practice example where coordinated efforts are guiding all players to move in the same direction.
- Lack of value proposition to consumers. Payment alone won't be enough to persuade users to give up their existing behavior and adopt NFC payment. The industry needs a comprehensive set of applications to make NFC appeal to consumers.
- Security concerns among consumers. Consumers need to be educated about the security features of the service before they are comfortable using it. Security is a top concern for consumers when it comes to using mobile phones for payment.

Some good news is that major mobile phone vendors are including NFC in their new products, and this will see NFC included in about 50% of smartphone shipments in 2015. A number of cities in the U.S. and Western Europe are migrating public transportation to the open-loop systems that can support contactless bank card payment. This will help lay the infrastructure for NFC ticketing. Nevertheless, these efforts will not be enough to combat the challenges mentioned above, and the industry will need a coordinated effort to get NFC payment adopted by the mass market.

User Advice: Service providers should form industry alliances with other players that include standard bodies, technology providers, application providers such as banks, transportation providers, universities and governments. They should agree on a common set of specifications to ensure interoperability and a rich ecosystem that supports various applications ranging from ticketing, couponing, loyalty to personal ID, campus and government services.

Vertical industries such as public transportation, airlines, retail and healthcare should explore areas in which NFC technology can improve efficiency and customer services. Look for areas where NFC can reduce costs and improve efficiency.

Business Impact: NFC payment will have a low impact on service providers' business because of low adoption in the early years. Also there is not much money to be made from payment service alone. Service providers will have to seek revenue from non-payment services such as loyalty programs, proximity marketing and social networking. Enterprises can use NFC for authentication, data recording and monitoring to improve efficiency. Examples include over-the-air ticket purchase to reduce the investment in ticketing machines and commissions paid to agents.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Apple; Cassis; Gemalto; Giesecke & Devrient; Google; Inside Secure; MasterCard PayPass; NXP Semiconductors; VeriFone; Visa payWave; ViVOtech

Recommended Reading: "Japanese Contactless and Mobile Payment Systems: Beyond the Hype, the Lessons You Must Learn"

"Near Field Communication is a Long-Term Opportunity"

"Forecast: Mobile Payment, Worldwide, 2009-2016"

"Competitive Landscape: NFC Semiconductor Vendors, 2011"

Sliding Into the Trough

Group Buying

Analysis By: Gene Alvarez

Definition: Group buying is a type of social commerce in which an offer is made by an organization using socially based techniques and capabilities to potential customers. However, the offers are contingent on a certain number of buyers partaking in the offers, as well as other participation conditions.

Position and Adoption Speed Justification: Group buying typically involves a limited-time-only offer that is specifically designed for customers who share a common interest or location. This offer

is delivered through an online channel, such as email, blog subscriptions or alerts from social networking sites.

Often, the offers require customers to join an online community, participate in a refer-a-friend program, complete registration forms or engage in some other activity that ultimately supports the organization's customer-oriented goals. By requiring online registration, for example, group-buying initiatives enable organizations to collect information about potential customers that influences sales organizations and informs marketing and customer service programs. Because the offers are based on common interests or locations, customers are more likely to feel that the organization "knows who they are." If organizations nurture these relationships, customers given an online "voice" will be more likely to advocate key products and services to other potential buyers.

Group-buying programs typically fall into three categories:

- **Private Sales —** Online sales available only to registered members (or individuals referred to the site by a registered member), usually for a limited time or on a first-come, first-served basis
- **Daily Deals —** Websites require users to visit every day to take advantage of one-day-only offers
- **Local, Offer-Specific Advertising —** A variety of vendors and techniques that help sellers increase "foot traffic" by using a combination of area-based advertising, discounted products and services, and online customer communication channels

A core set of variables differentiates the vendors, but each approach starts with an especially enticing offer available to customers located near the seller.

Other attributes include:

- **Participation Requirements —** This typically represents the number of people required to make the advertised offer a valid one that the seller will honor. Some vendors require a minimum number of people to commit to buy before the offer becomes valid. If that number is not reached, then the offer is withdrawn, and no one will receive the item or the service at the advertised price.
- **Time Limits —** Some deals last only 24 hours; others can be valid for as long as a week.
- **Reward Options —** For example, people who convince enough of their friends to commit to buy may get the offered product for free or receive points toward a voucher that can be used like cash on other deals. Another spin on this theme is the concept of escalating discounts — if the number of people a customer brings to the business hits certain targets (such as 25, 50 or 100 customers), then the discount improves at each benchmark. Customers that bring 25 people may receive a 10% discount, which increases to a 25% discount for 50 people and so on. However, there is generally a maximum discount level in this model (e.g., a customer supplying more than 100 people receives a 50% maximum discount).

In addition to these variables, some vendors advertise offers in a limited number of locations, such as in only one major city, while others support several cities or carry advertised offers that are valid anywhere in the U.S.

Group-buying enablers range from fast-moving startups to offerings being made by communities and other dominant Web players, such as search engines. Many have become successful at penetrating the local advertising marketing in cities and are now moving to national plays. Because the startups are being hyped in the press and the dominant Internet players are announcing their own offerings, this is a fast-moving market, with the potential for acquisitions of smaller players by larger technology providers.

User Advice: The choices consumers and enterprises have for private sales, daily-deal sites and offer-specific advertising continue to grow, as new startups gain traction, established vendors enter the market, group buying gains popularity and the market hype escalates. Weigh your options based on your organization's needs:

- Vendors should assess whether group buying has the potential to bring in untapped revenue, rather than just siphoning sales from existing e-commerce programs. Some organizations may find it easier and more economical to create their own daily-deal sites to clear out-of-season products, factory-refurbished merchandise or other excess inventory, particularly if the organization needs to control how the products are packaged and sold on the site.
- Organizations that need to offload merchandise quickly should consider working with a partner that already has a large network of followers. This built-in community of potential buyers could move the items in a matter of hours or days, rather than weeks.
- Service organizations that rely on foot traffic, such as restaurants, should consider offer- or location-specific group advertising that will bring customers into their establishments.
- Organizations that need to test products in a safe environment should consider using partner sites as a launching pad to gauge consumer response to a product or service.

Additionally, organizations that sell products and services directly to consumers should run proof of concept (POC) tests with group-buying vendors. POCs should test the ability to move products, or drive leads or traffic for your organization. Users should understand that the offers are a form of discounting, and should be reserved for items the organization is willing to discount.

Business Impact: The business impact of group buying is that an organization can use this technology to quickly drive demand for a set of its products and services. This enables the organization to leverage social zealots/advocates to draw in friends to take the offer within the time period at a lower cost and for a shorter time period. However, some organizations have discovered that this approach does not build loyalty. Instead, it may create "cherry pickers," which are customers that only come for the deals and return only when there's another deal. Therefore, this should be a part of an organization's social commerce strategy and not the only part of the strategy.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: BuyWithMe; Gilt City; Groupon; LivingSocial; Rue La La; Tippr

Internet TV

Analysis By: Andrew Frank; Mike McGuire

Definition: Internet TV is the video streaming of licensed professional content (typically TV shows, live events and movies). "TV" here refers to the nature and status of the content. It drives the key requirement that access be selectively controlled, based on licensing arrangements, which place restrictions on who may see the content (that is, subscribers only), and where and when the content may be seen. Broadband connected TVs, game consoles, open set-top boxes, PCs, smartphones and media tablets are all considered receivers of Internet TV.

Position and Adoption Speed Justification: "Internet TV" is sometimes used interchangeably with "over-the-top (OTT) TV." Gartner is using "Internet TV" to refer exclusively to licensed content delivered to any screen, while OTT often focuses on the use of Internet as an alternate method of video delivery to TV sets, putting emphasis on its bypassing of legacy closed TV delivery architectures.

As doubts fade about the technical viability of Internet streaming for high-quality video (both linear and on demand), incumbent TV service providers are facing off against online video distributors in a complex contest to win content licenses, subscribers and advertisers for the growing portion of TV programming consumed over the Internet. Since the legacy television business is highly regulated on a national level, this contest is playing out differently in different regions around the world. In countries with high levels of publicly funded programming, such as the U.K., national public broadcasters are using Internet delivery to extend programming and add social features as private distributors follow suit with little external competitive threat. In regions with less regulation, Internet video delivery is often associated with content piracy, and broadcasters face major challenges with copyright enforcement. Many regions still look to the U.S. as the historical pioneer of the television business and the epicenter of digital disruption for direction.

In the U.S., incumbent TV distributors are leveraging their existing distribution relationships through the strategy called "TV Everywhere," which seeks to extend subscriber access to licensed content to any device at any time and place by developing a universal login capability with suitable authentication. Meanwhile, online video distributors, such as Netflix, Hulu and Apple, have largely allayed earlier fears that it might be impossible to monetize or secure online video streams. Netflix, in particular, having weathered a customer rebellion and now facing sharply increasing licensing fees and friction with ISPs, continues to attract customers to its streaming service, both in the U.S. and worldwide.

Such competition can be expected to favor both consumers and content providers, although both can be threatened if the ecosystem becomes too unstable to support the production of high-quality programming, which has been an increasingly risky business since well before the current wave of digital disruption. The question of whether the TV industry can avoid the kind of Internet-based

disruption that has diminished the music and newspaper publishing industries is still at issue. In the case of television, the stakes are in some ways higher due to the regulatory framework that has historically protected broadcasting and discouraged the unbundling of content. These regulations are increasingly difficult to reconcile with online distribution, contributing to the instability of the situation. Meanwhile, recognizing the weakness of the position of being a pure distributor in the TV value chain, most online video services have announced plans to create original content, following the model of pay-TV cable networks, like HBO and Showtime, which have sought to increase their brand appeal to consumers with exclusive original programming. Whether the economics of online distribution are sufficient to support the production of content of sufficiently high quality to make a difference remains to be seen.

In any case, the transition to increasing Internet TV consumption patterns among consumers is unlikely to be a zero-sum game, and the ubiquity and efficiency of Internet delivery are bound to produce significant winners and losers over the next five years.

User Advice:

- Content owners should keep a close watch on the evolving business models and get intellectual property rights management (IPRM) to maximize syndication opportunities.
- Broadcasters and other content licensees should negotiate for complete rights packages, rather than distinguish among Internet, TV and mobile rights distinctions.
- TV, Internet and triple-play communication service providers should actively pursue multichannel conditional access models and bundles that elevate the role of ISP operator affiliation in TV service delivery.
- All parties, as well as regulators, should recognize the significance of the net neutrality debate, as consumer demand for Internet video quality grows and strains existing Internet delivery infrastructures.

Business Impact: It appears increasingly unlikely that the impact of Internet TV can be constrained by concerted efforts. Although winners and losers remain unclear, Internet TV will ultimately redefine TV distribution services and overtake the DVD market for premium content distribution. Cable networks and other broadcasters that rely on current cable licensing arrangements (such as retransmission consent rules) will need to rethink their positions in light of Internet TV delivery possibilities.

For many broadcasters, content providers and advertisers, Internet TV opens new opportunities and markets. It also has the potential to drive interest in new devices that can leverage the growing demand for Internet TV, while limiting the potential of proprietary STB-based interactive standards to achieve ubiquity. Last, but not least, it offers marketing organizations the possibility of a more efficient and effective advertising and communication channel that combines the impact of video with the targeting, interactivity and cost-benefits of the Internet.

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Amazon; Apple; BBC; Comcast; Google; HBO; Hulu; Netflix; NeuLion

Recommended Reading: "The Blocking of Broadband-Connected TV Content by a South Korean CSP Provides Lessons for the Consumer Industry"

"New Television Meets Context-Aware Computing"

"A Scenario for the Future of Television in the Cloud"

Mobile-Learning Low-Range/Midrange Handsets

Analysis By: Jan-Martin Lowendahl; Nick Jones

Definition: Mobile-learning (m-learning) or learning administration applications use basic and enhanced phones. Such handsets range from ultra-low-cost devices capable only of voice and SMS, selling for under $20, to more capable handsets supporting Web browsing and Java Platform, Micro Edition (Java ME), retailing at up to $150.

We separate m-learning on basic and enhanced handsets from m-learning on high-end smartphones, such as iPhones, because these will tend to be used in different ways, by different students and in different markets.

Position and Adoption Speed Justification: M-learning encompasses a very broad range of applications, including, but not limited to, media delivery (for example, audio and video), exploratory learning using augmented reality, educational games, collaboration and project work, e-books, surveys, tests, data gathering, real-time feedback, and simulations.

Technologically, low-end handsets can deliver m-learning in several ways. For example, this could be by using: (1) very simple technologies, such as SMS — for example, for health education; (2) server-side technologies — for example, the mobile Web or, in some cases, using the handset just as a voice channel to listen to lessons broadcast from a server; (3) more-capable handsets that support stored media, such as podcasts or video; (4) native m-learning applications specially developed for low-end handsets and preloaded by the manufacturer — for example, Nokia's Life Tools; and (5) simple applications developed using widely available tools, such as Java ME. One of the challenges that determines m-learning application architecture in emerging markets is that data communications to a handset are often weak (for example, general packet radio service [GPRS] or SMS) and sometimes unavailable.

Examples of low-end m-learning deployed include simple tests and exams (for example, vocabulary tests for students learning a new language) and health education. Some low-end m-learning is delivered as a service predominantly for markets in the developing countries — for example, Nokia's Life Tools in India and China, and Urban Planet Mobile's ring-tone-based language learning in Indonesia. There are increasingly examples of services for more-mature markets, such as the U.S., where more-innovative companies have developed SMS-based SAT prep as a subscription service exploiting the ubiquity of SMS functionality. Recently, Livemocha teamed up with Urban

Planet Mobile and Slooce Technology to extend its capability to deliver English learning over an SMS solution to its 13 million users of the social language learning site.

Some K-12 institutions prefer low-end devices, as they provide access to learning objects, while minimizing the exposure to the "full-featured" Internet that smartphones offer. However, the latter point might not hold up as Moore's Law will benefit low-end m-learning during the next five years, and the handset capability available at a given price point will continue to rise, enabling low-end and midrange handsets to deliver more-sophisticated m-learning. Larger screens and the falling price of color screens will particularly benefit low-end m-learning.

Low-end m-learning is quickly maturing and finding real learning applications in the education ecosystem. Altogether, this merits a jump on the Hype Cycle to the other side of the Peak of Inflated Expectations and, possibly, a quick run through the Trough of Disillusionment due to the rather more-focused applications and more-defined markets. We expect the time to the Plateau of Productivity to be closer to five years than 10 years at this point.

User Advice: A real change to a curriculum must be based on a near 100% availability of a tool for the students. Educational organizations in which students own primarily low-end and midrange handsets should experiment with m-learning technologies and systems that match these devices. M-learning on lower-capability devices will be particularly important in emerging markets but can also be a steppingstone in developed markets as there is not yet 100% penetration of smartphones.

Business Impact: Organizations such as network operators and handset manufacturers in emerging markets, where still relatively few devices are smartphones, should explore the potential of educational services and applications delivered on low-range to midrange handsets. Organizations such as agricultural cooperatives that need to distribute information to large numbers of individuals owning low-end handsets should also explore m-learning techniques. Subscription m-learning services are a potentially interesting model for network operators and others in emerging markets, because the low price points are outweighed by the large potential number of learners. The latest examples show that mobile learning companies can use low-end m-learning as a disruptive innovation to establish themselves and make inroads even in more mature markets.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Sample Vendors: Bharti Airtel; McGraw-Hill; Nokia; Urban Planet Mobile

Recommended Reading: "M-Learning Opportunities and Applications"

"Cool Vendors in Education, 2011"

"Cool Vendors in Collaboration, 2009"

Social Gaming

Analysis By: Neha Gupta; Brian Blau

Definition: Social games allow users to play digital games with and against social network friends and have the following characteristics:

- They contain at least one game feature that utilizes a player's social graph.
- They facilitate and encourage social interaction and communication using online social communities.
- They are accessed via PCs, game consoles and mobile and portable devices and are usually played online.

Digital games that offer an immersive gaming experience with no connection to social graphs are excluded from the social gaming category.

Position and Adoption Speed Justification: Multiplayer and socially connected video games have been popular for decades, but the more specific genre of social network gaming emerged only when consumer social networks became established. Social games are a way to leverage engaged users of social networking sites. Facebook is considered the first and leading social games platform and its APIs have earned industry standard status.

Due to its objective of creating "sticky" social networking users, social games are usually casual in nature and the dominant models used are advertisement-led, "freemiums" or support for in-game transactions on virtual goods. Other main business models include offers (for example, Groupon and LivingSocial) and the direct purchasing of game credits.

This market is beginning to mature, as seen by more consolidation and evolving business models and partnerships, but it still has great potential, as evidenced by the many new and traditional games, developers and publishers that have entered this market recently. For example, Electronic Arts recently acquired Popcap, complementing its earlier acquisition of Playfish.

Additionally, Playdom purchased eight companies in as many months, before being acquired by Disney. The most active social gaming publisher, Zynga launched Zynga Platform for publishing games built by external publishers and developers. It has also launched Zynga.com, where users can play its social games without going to Facebook.

However, Zynga's alliance with Facebook remains strong, as it continues to use Facebook "credits" as the underlying virtual goods payment system for Zynga.com users. In the future, this move gives it a platform to earn revenue from other virtual goods payment systems. Our view is that Zynga.com has the long-term potential for building a community of casual gamers.

The market is also experiencing increased monetization of social games on smartphones. More titles are being introduced by console gaming companies and pure social gaming developers alike for smartphone users. Social gaming will continue to face the challenge of sustained user

engagement, as reflected in Zynga's performance, which saw a fall in monthly active users in 4Q11 to 225 million from 266 million in 3Q11.

User Advice: The social gaming industry is facing the challenges of sustaining previous growth levels, maintaining steady business models and following social networks as they transition from a PC-centric user interface to mobile devices.

The test for traditional game developers and publishers entering the social gaming market is to make money from the social games they introduce. Social gaming publishers will need several games in their portfolios to provide a steady run rate (specifically, a fixed number of players on a regular basis), with the bulk of their games used for further social and gaming development. New content to keep users engaged is also critical to future success.

In the long run, Facebook will not be the only social gaming platform, as publishers will hedge their risks by supporting alternative regional and mobile social gaming platforms. Once there are multiple social gaming platforms of comparable scale, the success of social gaming companies will be judged on innovation, in both game development and distribution.

Business Impact: Social games are likely to be relevant as a core game genre and business model for decades to come. Most video games that become popular over the next 10 years will include some level of social gaming features.

The social gaming population will increase from 715 million in 2012 to 1.3 billion in 2016, representing a compound annual growth rate of 17% that will provide a larger base for game monetization. Due to the rise in social gaming, there is now a new crop of tools and technologies to support game developers and publishers.

New platforms for social games will surface to challenge traditional social networks (such as Facebook) and game developers/publishers will have alternative hosting platforms and social networking touchpoints available to them.

Social gaming will continue to lead the games and social networking industries with innovative user interfaces and user engagement models. Future consumer and IT services will get added value from social games as derivative user interfaces and engagement techniques emerge.

Enhanced monetization platforms by game developers will evolve: for example, GREE introduced PayPal and prepaid cards as payment systems, first in Japan and now for further global expansion. This broader range of payment methods will be more convenient for users.

Larger game developers will start to operate open platforms for third-party game developers, for example, Zynga Platform.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Sample Vendors: Disney; Electronic Arts; Facebook; RockYou; Wooga; Zynga

Recommended Reading: "Market Trends: Worldwide, Social Gaming, 2011"

Mobile Health Monitoring

Analysis By: Barry Runyon; Jessica Ekholm

Definition: Mobile health monitoring is the use of IT and mobile communications to remotely monitor the health of patients, and to help ensure that appropriate action is taken. Patients are provided devices that measure vital signs such as blood pressure, blood glucose and heart rate, and the data is sent to clinicians through mobility services. This profile does not include the use of mobile communications specifically while at home, as Gartner considers that "home health monitoring."

Position and Adoption Speed Justification: Advances in mobile communication technologies and medical devices have removed many of the technical barriers to mobile health monitoring, as exemplified by the Continua Health Alliance, as well as the healthcare activities of the ZigBee Alliance and the Bluetooth Special Interest Group. Although the typical communication vehicle today is Bluetooth-enabled mobile phones, there is an increasing trend to communicate data via health monitoring devices that do not contain a voice element. In mobile health monitoring, as with home health monitoring, it is essential that the devices send the data to an intelligent system that can issue alerts for abnormal ranges. This also implies the existence of a team of clinicians who are trained to take appropriate action after receiving the alerts, such as telephoning the patient to schedule a clinic appointment or to offer advice, and notifying other clinicians or family members.

We have seen an increased interest in mobile health monitoring over the past three years. This is the result of several factors:

- The increased burden of chronic disease in emerging markets, many of which have poor landline coverage and good mobile coverage, is generating interest from healthcare delivery organizations (HDOs) and government healthcare agencies in deploying mobile versions of home health monitoring devices.
- There is a growing interest among HDOs in developed and emerging markets in using mobility to overcome the limitation of home health monitoring technologies: location dependence. The use of portable or wearable devices opens the possibility not only of monitoring patients who are active and mobile, but also of continual real-time monitoring. This is appropriate, in certain cases, for some cardiac conditions and some diabetic patients. However, for most remotely monitored conditions, it appears that periodic monitoring is sufficient. Moreover, there is a good reason why most remote monitoring today is limited to homebound patients. Those patients are more expensive to manage than patients who are able to travel, and, therefore, there is a clear business reason to remotely monitor homebound patients.
- The emergence of personal health record (PHR) platforms is enabling healthcare consumers to create Web-based healthcare data repositories that are able to accept data from health and fitness monitoring devices.

- The widespread adoption of smartphones with low-cost applications that enable mobile health monitoring is leading to growing interest from healthcare consumers in self-monitoring.
- In February 2012, a company named Telcare (see "Cool Vendors in Healthcare Providers, 2012") began shipping U.S. Food and Drug Administration (FDA)-cleared glucometers that automatically connect to a cellular data network and integrate with Telcare's own website, payer call centers and the EHRs of healthcare providers. There is no requirement for the user to sign up or to connect to a Wi-Fi network initially or after each reading. This is the same technology that made the book reader Kindle popular. The connected glucometer is no more difficult to use than an unconnected glucometer, and far easier than those that use Bluetooth or cords to connect the device to an intermediate PC.

Despite growing interest, most deployments of mobile health monitoring are pilot projects. HDOs have not yet shown the organizational commitment needed to develop sustainable services on a large scale. The ease of deployment of products such as Telecare will help move some pilots to larger-scale, operational programs.

During the next few years, as mobile health monitoring evolves and its clinical uses become more clearly defined, it will most likely fragment into certain submarkets focused on particular clinical areas, such as diabetes and cardiac care.

User Advice: HDOs should not rush to throw out home health monitoring in favor of mobile health monitoring. Mobile monitoring will supplement home monitoring, but will not replace it in the near term.

HDOs must focus on the process and business issues raised by mobile health monitoring. It is essential to develop the ability to manage large numbers of devices and patients, to change processes to handle a huge increase in data, and to orchestrate time-critical interventions for patients.

Mobile health monitoring vendors and, to a lesser extent, mobile carriers should work with nongovernmental organizations and governments to promote sustainable programs that demonstrate not only the technical viability, but also the economic impact of mobile health monitoring. This will help accelerate the maturation of this market.

Mobile carriers should consider working with mobile health monitoring vendors and solution providers in order to tap into future additional mobile revenue streams, coming from mobile-to-mobile connections or data generated through increased usage of SMS and cellular data access. However, they should carefully consider the extent of their investment and err on the side of caution.

Whether mobile health monitoring pilots evolve into operational deployments depends on the ability of HDOs to overcome multiple obstacles, including legal and licensing restrictions, inconsistent reimbursement by healthcare payers, and the fact that mobile health monitoring requires new protocols for dealing with large volumes of information and new ways of staffing and information sharing — particularly concerning care coordination. Much depends on whether governments create the regulatory and financial incentives to help promote care coordination. In this respect, the

emergence of accountable care organizations and "meaningful use" incentives in the U.S. market are especially positive developments.

Business Impact: If deployed appropriately, mobile health monitoring will enable closer monitoring and faster intervention in the care of certain groups of patients.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Abbott Diabetes Care; Aerotel Medical Systems; Ideal Life; Johnson & Johnson; Medic4all; Medtronic; OBS Medical; Ringful Health; Roche; Tunstall Healthcare Group

Recommended Reading: "Cool Vendors in Healthcare Providers, 2012"

"As the Mobility Movement Gains Momentum, Healthcare Delivery Organizations Must Prepare to Adapt"

Mobile VoIP

Analysis By: Charlotte Patrick

Definition: Mobile voice over Internet Protocol (mVoIP) offers packet-switched voice communications over a radio access network. It can be integrated with other services or into websites, and the most usual implementation today is within a mobile unified communications (MUC) client — alongside instant messaging and video products.

Position and Adoption Speed Justification: mVoIP is moving down the curve as mVoIP clients become more readily available to developed-market customers, due to the increasing penetration of smartphones — with a good number of high functionality products available. The number of new users continues to grow strongly with the growth in smartphone usage, and the ability for over-the-top (OTT) providers to offer high call quality as networks are upgraded to Long Term Evolution (LTE) will remove one of the significant barriers to usage in the next few years.

As communications service providers (CSPs) move over to voice over LTE (VoLTE) and decommission their older networks, all calls will ultimately become mVoIP and the question will be: Who will win the battle for mVoIP traffic, the CSPs or the OTT providers? The following will help determine a winner:

A key consideration is whether a sustainable OTT business model can be created. Providers primarily attract customers by exploiting the price arbitrage in international and roaming markets. These opportunities are currently limited by the cost of using mobile data while abroad, and will in future be limited by CSPs' moves to include international calls in their bundles.

As the retail price of domestic minutes reduces to close to zero, the battle will center around good user experience and other functionality around the mVoIP product. The inclusion of mVoIP inside

full MUC clients — or some of the lighter consumer variants of MUCs — will be one of the battle grounds. The market for light consumer clients has low barriers to entry and we have seen several brand names rising rapidly, such as WhatsApp. Question marks again hang over the long-term ability of these providers to generate money from subscriber charging or advertising — and, today, some of the larger providers such as WhatsApp have yet to put mVoIP into their product set. This is presumably because the main market for mVoIP remains those who travel regularly (which is not yet a specific target market for them) rather than their core youth markets.

Lastly, the in-factory uploading of clients by device manufacturers is also driving this market. To date, some manufacturers have gone head-to-head with CSPs and installed clients, while others have chosen not to.

User Advice: Mobile CSPs should monitor the usage of mVoIP clients via deep packet inspection or other functionality in order to build up a picture of consumer preferences and reactions to their price changes. They need to know how price sensitive their customers are. This will help them with pricing decisions and selection of their own future functionality.

They should also look at having their own consumer MUC offering — to enable them to keep their brand known for providing good quality communications services.

Business Impact: The main impact of mVoIP on consumers is much the same as seen in the fixed VoIP market — inexpensive or free calls to otherwise expensive destinations. mVoIP products are also having an impact on high-margin CSP mobile voice revenue, such as those from international calls and roaming; in parallel with regulatory moves to bring down international interconnect charges.

Over the past year, the seriousness of the threat from MUC applications has created a sudden renewed interest from CSPs in either rolling out their own application or looking at Rich Communication Suite. However, again, the impact is mostly felt in their revenue from messaging than that from domestic voice.

The full impact of mVoIP on both consumers and CSPs will not be felt until call quality improves as networks are upgraded. At this stage, it looks likely that there will be a global oligopoly of providers focused on international mVoIP users, as well as a group of MUC providers that have chosen to enhance their suite of services with voice and that are more focused on taking domestic traffic. Revenue looks set to come from advertising and charging for off-net calls (as per the SkypeOut service). This will not provide these players with bountiful revenue, but it will at least provide them with a workable business model.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Microsoft; Rebtel; Skype; Viber; Yahoo

Recommended Reading: "Emerging Technology Analysis: Mobile Portal VoIP, Global Consumer Communications Services"

"Market Insight: Over-the-Top mVoIP Poses Threat to Traditional CSP Mobile Voice"

"Competitive Landscape: Mobile VoIP for Consumers"

Rich Communication Suite

Analysis By: Deborah Kish

Definition: Rich Communication Suite (RCS/RCSe) is a Global System for Mobile Communications Association (GSMA) initiative, aiming to develop specifications for Rich Communication Services. These include "enhanced" instant messaging, video calling and the ability to share documents and photos simultaneously during calls and service discovery. All services can be accessed from a subscriber's contact list. RCS services will be available across any network and any device. Specifications have been defined and developed to date in five phases and/or releases.

Position and Adoption Speed Justification: The initiative has still not gone live and communications service provider (CSP) participation varies from region to region, as will version deployments. For example, RCSe is supported by Deutsche Telecom, Orange, Telecom Italia, SKT, Telefonica and Vodafone that have decided to move forward with RCSe later in 2012. North American CSPs, have not yet announced launch dates, but are expected to launch version 5 in 2013.

Many technology and software vendors continue to be involved in RCS, and some have decided to develop RCS as an enterprise software package to reach critical mass, while others have simply developed downloadable clients that will work in a closed environment (i.e., subscribers will need to have the same client in order for the service to work). Due to the length of time since the inception of RCS and sporadic launches, coupled with a non-worldwide adoption, the position of RCS has advanced on the Hype Cycle and is now close to the Trough of Disillusionment.

User Advice: Equipment and technology vendors and software developers should focus on creating case studies. The value of the RCS platform needs to be proved by real-world examples. They should work toward developing applications that differentiate them from the competition, either organically or by working with software vendors, such as IBM and Oracle.

CSPs should use RCS to support IMS as a service delivery platform and consider offering software suites either as cloud or hosted services to enterprise customers. They should mitigate risk by continuing to invest in other service initiatives and/or equipment, such as Mobile 2.0 (as over-the-top and cloud-based providers [such as Skyfire] have), next-generation service delivery platforms, application stores and inter-CSP initiatives, such as joint innovation labs. They should be aggressive with making trials reality. The farther out RCS is pushed, the more likely it is that it will fail to take off. Alternatives exist that are less costly yet don't provide the same level of QoS and QOE but could be utilized while building out supporting infrastructures such as IMS. For more information please see the Emerging Technology Analysis mentioned in the recommended reading section.

Business Impact: It is hard to forecast the likely success of RCS as there are unknown factors concerning user experience, such as whether consumers will find the intelligent address book features very attractive on devices with smaller screens or whether the mass market will be interested in the more complex RCS functionality. It is also unclear whether the road map for this initiative is moving at sufficient speed to ensure commercial success. RCS also lacks a clear business case in relation to capitalization, besides protecting existing infrastructure deployments and protecting the subscriber base.

The possible benefits that will drive trials and deployments among CSPs include:

- Consumers' ability to see the status of friends, which could trigger additional or simultaneous communication sessions, such as picture sharing with voice, which would not have taken place previously. It could also encourage them to use more niche functionality, such as video. By having these functionalities, consumers are likely to increase their general use of mobile data and voice services, thereby increasing the average revenue per unit.
- The functionality may increase subscriber stickiness.

Ownership of this type of functionality allows the operator, device manufacturer or over-the-top player to have a degree of influence over consumers' choice of communication service and to act as a portal to their social contacts (rather than allowing entities such as social network sites to own the relationship completely).

It will be important that CSPs looking to launch RCS or RCS-e ensure a better-than-Skype quality to provide a better user experience with mobile video. With the proper QoS in place, CSPs can at least test out price points here and find potential new revenue streams, as enhanced video may be a service that subscribers are willing to pay for as part of a bundle or tiered service. The main driver for IMS (and beyond, RCS) is Long Term Evolution (LTE) and the fact that voice over LTE (VoLTE) is likely to happen on the heels of LTE and that VoLTE needs IMS.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Alcatel-Lucent; Critical Path; Ericsson; Huawei; Metaswitch Networks; Motorola; Nokia Siemens Networks; Sony Ericsson

Recommended Reading: "Emerging Technology Analysis: What Exactly Do Rich Communications Offer Communications Service Providers?"

"User Survey Analysis: Consumer Services and Mobile Applications, Worldwide, 2011"

"Dataquest Insight: The Future for Telecommunications Operators in Social Networking"

"Market Trends: The Personal Cloud From Consumers' Perspective"

"Dataquest Insight: Carriers Can Keep Control of LTE With IMS"

"Network Operators Should Strive to Be Community Owners, Not Technology Providers"

Mobile-Learning Smartphones

Analysis By: Jan-Martin Lowendahl; Nick Jones

Definition: We address mobile-learning (m-learning) or a learning administration application using smartphones (that is, handsets with an identifiable OS capable of supporting installable applications). M-learning encompasses a very broad range of applications, including, but not limited to, media delivery (for example, audio and video), exploratory learning using augmented reality, educational games, collaboration and project work, e-books, surveys, tests, data gathering, real-time feedback, and simulations.

Position and Adoption Speed Justification: By year-end 2012, Gartner forecasts smartphones to constitute 34% of devices sold in 2012. Smartphones are expected to grow to 41%, 47% and 52% of total devices sold for each of the next three years, and reach a range of 60% to 80% in mature markets, such as Western Europe, in 2013. Advanced smartphones, such as the iPhone, have already been used for educational purposes. As smartphones become more capable and more numerous, their ubiquity, sophisticated features and flexibility will make them preferred m-learning tools in mature markets, even if media tablets in different formats are gaining ground. There is a form factor versus function competition that will segment the m-learning market in the near future. For example, some K-12 teachers simply reject smaller screen size phones for reading, while other institutions embrace smartphones as replacements for "clickers" (classroom response systems) just because of their size.

Although a wide range of m-learning applications has been demonstrated, the domain is still the subject of pilot testing — to understand what type of education is best delivered on mobile devices and how to integrate m-learning with traditional education. Through 2013, emerging smartphone applications, such as augmented reality viewers, smartphone e-book reader applications and scriptable mapping tools, will offer new delivery platforms for educational content. In the long term, technologies such as flexible screens will enable a wider range of portable m-learning devices.

Inhibitors in 2012 still include the immaturity of the domain, smartphone cost, device limitations, development of m-learning course materials, lack of skills and the wide diversity of mobile devices. Educause student data from 2011 indicates that, although 99% of students had a mobile phone in the developed countries, only about 55% had a smartphone (a modest increase of 5% over 2010). A major inhibitor for any large curriculum changes and programs looking at leveraging smartphones is that schools still have to include a strategy for providing smartphones to students.

Through 2014, we expect that platform differences will impact m-learning delivery technologies on smartphones. Technology-neutral content delivery tools, such as HTML5, may not have matured enough, for example. Certain types of innovative applications may evolve more quickly on more-open platforms, such as Android, which impose fewer technical and commercial restrictions on developers.

Higher education system providers for administrative and learning systems are increasingly offering mobile applications, which is evidence of a financial commitment from these providers to meet the requirements of end users in higher education institutions. Android, iPhone and iPad applications from higher education providers are increasingly expected to be the norm.

Altogether, the lack of full ubiquity among students and increasing understanding of the problems of supporting a diversity of OSs, together with different form factors, lead Gartner to position m-learning on smartphones on a steady trajectory toward the Trough of Disillusionment and to retain a five- to 10-year time to the Plateau of Productivity.

User Advice: Many educational institutions have experimented successfully with some form of m-learning. Educators should look for simple applications that can deliver educational materials or assist staff and students with administrative tasks, such as sending assignment reminders and booking resources. Educational institutions have the opportunity to increase the accessibility of learning content that not only better supports problem-based pedagogy, but also leads to better usage of "dead time" (for example, while commuting). The latter convenience is greatly appreciated by part-time learners, which tends to increase students' satisfaction and retention.

The growing body of experiences has shown that, in some cases, the m-learning experiment initiatives have not been properly structured to truly assess the impact of such devices. Failing to structure the experiments in m-learning leaves open the questions regarding the value and effectiveness of specific approaches to m-learning. Any institution attempting to experiment with m-learning should, therefore, carefully design the assessment phase to confirm or disprove the assumed advantages to specific applications of m-learning.

Business Impact: Corporations and governments should explore the potential of m-learning for just-in-time training. Organizations and educational institutions creating or selling training and reference materials should explore the potential of mobile devices as delivery channels.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Apple; Blackboard; OutStart; Tribal Software

Recommended Reading: "M-Learning Opportunities and Applications"

"Market Insight: Worldwide Opportunities for Consumer Mobile Applications in Education and Learning"

"Forecast: Mobile Devices, Worldwide, 2009-2016, 2Q12 Update"

"Best Practices for Mobile Device Learning Initiatives in Higher Education"

Mobile Money Transfer

Analysis By: Sandy Shen

Definition: Mobile money transfer (MMT) enables the transfer of money between accounts and between people. It can be used for domestic and international money transfers, retail purchases (when transferring money to a merchant's account), bill payment, and salary payout. Payment accounts can be stored-value accounts or bank accounts, and they can apply to both individuals and businesses.

Position and Adoption Speed Justification: MMT represents an immediate opportunity in developing markets by targeting the unbanked and underbanked population that need a secure and efficient way to transfer money. It is among the top use cases of mobile payment services in emerging markets, and many service providers use MMT as the anchoring service for their launch. The transferring pattern varies by country because some countries (such as Kenya) see mainly domestic transfers between urban and rural markets, while others (such as Middle Eastern countries) see more international remittance.

The service is also starting to catch on in developed markets for banked users to transfer funds between bank accounts. Barclays' Pingit money transfer application had good market reception, with the application being downloaded 400,000 times in the first eight weeks of launch. This application offers free money transfer among all banked users in the U.K. People not only use it to transfer money between bank accounts, but also for eBay purchases and business payments. If the service is adopted by the mass market, it can become a new alternative payment method.

User Advice:

- Communications service providers (CSPs) should extend the distribution network by working with retail chains and local communities since the distribution network is a key success factor in MMT. They should also provide sufficient training and management of agencies to ensure they are motivated to grow the business.
- Financial institutions in emerging markets should partner with CSPs to make use of CSPs' brands and distribution networks. They should aim to reach people in the unbanked population, get them acquainted with the basic banking services, and move them to more-sophisticated banking products in the future.
- Service providers in developed markets can target the immigrant population with an MMT service, and they should create networks for cash-out and/or purchases in the recipient countries to make the service appealing to recipients.

Service providers should provide a tariff structure that is clear to understand and competitive against other channels, such as money transfer agencies and bank transfers.

Business Impact: CSPs can use MMT to generate extra revenue and to reduce churn. Financial institutions can use MMT to reach more users in emerging markets. In developed markets, financial institutions can attract users from competitors and cross-sell other bank products using the MMT application as the launch bed.

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Barclays; Comviva; eServGlobal; Fundamo; G-Xchange; Monitise; PayPal; Sybase; Utiba; Western Union

Recommended Reading: "Forecast: Mobile Payment, Worldwide, 2009-2016"

"Market Trends: Mobile Payment, Worldwide, 2012"

LBA/LBM

Analysis By: Annette Zimmermann; Charlotte Patrick

Definition: Location-based advertising (LBA) — Refers to advertisements that appear on a mobile device, including banner or text ads on a mobile Internet site or mobile application, including maps.

Location-based marketing (LBM) — Addresses the user directly. Usually, the consumer receives a message on their mobile device containing a call to action (such as enter a competition, visit a website or order a product) and an incentive, such as a coupon.

Position and Adoption Speed Justification: Although the market is still young and underpenetrated we are seeing a big push this year, especially from the retail industry which wants to save its challenged business: the physical store. We have identified several drivers for growth; that is, critical success factors for vendors in this market such as the ability to offer clear incentive models to consumers, an established connection with consumers and expertise/contacts in the retail business (see "Competitive Landscape: Location-Based Advertising and Marketing"). There are four main types of providers:

- Large players with a substantial customer base, including Google, Facebook and Nokia
- Startups such as foursquare
- White-label technology providers
- Mobile communications service providers (CSPs)

We believe that white-label solutions coupled with cloud-based coupons and loyalty schemes will generate early successes, as evidenced by several U.S. and U.K. implementations where CSPs, retailers and white-label providers are involved. Geofencing is a key technique in this context, which technology providers and retailers leverage to deliver targeted LBA or LBM to consumers. Moreover, events such as sports games, sightseeing attractions and theme parks are also good opportunities for LBM/LBA; successful examples have been seen in Japan.

It is crucial for brands and retailers of consumer goods to gain access to the data analytics essential to providing more targeted offers, and to show measurable results. We therefore believe that data and analytics are key competitive assets in this (currently) very competitive market. In such a

complex competitive ecosystem, it cannot currently be determined which will be the dominant vendor; we are seeing several players that have successfully implemented their solutions in a certain geographic region, and may therefore see different winners in different markets.

From a demand point of view, Gartner sees growing interest in location-based offerings as long as they are linked to a direct benefit for the user — as several primary studies have shown.

Inhibitors to market development include:

- The concern of users and regulators regarding location privacy may become a providers' concern when the privacy settings and data usage is not sufficiently transparent to the user. Even though most mobile users (especially those in generation Y) are increasingly open to such new services — and less suspicious about their data privacy — service providers should not underestimate the backlash that can arise after a prominent data breach.
- Consumer brands that are still too reluctant to invest in new mobile technology and would rather stick to traditional marketing tools such as paper coupons.

User Advice:

- Lead with fast-ROI services while LBA/LBM is maturing. Coupons, for example, appeal to consumers' desire for bargains; their uptake is easy to measure and they fit well into the retail industry — which is the most important adopter of LBM.
- Technology providers should work with retailers using geofencing techniques, and define business models around this.

For small LBA/LBM providers:

Get to market quickly. Focus on the user experience and reporting capabilities to attract advertisers and potential acquisition offers from larger providers looking to enter the market.

Business Impact: We see the strongest impact of LBM and LBA in the retail industry, counting most initiatives in the U.S. and Western Europe.

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: foursquare; Facebook; Google; Intersec; Point Inside

Recommended Reading: "Competitive Landscape: Location-Based Advertising and Marketing"

"Survey Analysis: Big Advertisers Overcome Digital Aversions"

Indoor Positioning

Analysis By: Annette Zimmermann

Definition: Indoor positioning uses information about the indoor location of mobile devices — derived from cellular networks, Wi-Fi access points (APs) or other technologies — to deliver a service.

Position and Adoption Speed Justification: Indoor positioning has gained traction in enterprise environments for locating (employee) equipment and parts and goods. Although there are many use cases for indoor positioning on mobile devices in the consumer market, uptake has been very limited until now, with few test runs and even fewer commercial launches. The trade-offs between accuracy, costs and coverage of the different positioning technologies have been the main challenges to the uptake of indoor positioning in the consumer space. In addition, as with outdoor location-based services, marketers need to be convinced that there is user acceptance and demand (as evident from various Gartner user surveys) for location-based advertising.

Consumer location services have been focused mainly on outside areas. However, there are plenty of use cases inside buildings, such as when a user wants to walk from A to B (rather than driving) and, before leaving his or her current location, sets up the navigation tool or checks on interesting places that are close to destination B. Other scenarios that are even more interesting are shopping malls, airports, train stations, museums, exhibitions, conferences, night clubs and other large crowded places where people need to find their way around or there is the possibility of providing them with a service. Brands, retailers and marketers could use indoor positioning as a tool to present context-enriched offerings, information and services to users.

The ultimate solution will be a combination of several technologies to provide indoor and outdoor positioning. Wi-Fi is most likely to emerge as the mainstream indoor positioning technology in the consumer space, due to its high accuracy and the ubiquity of Wi-Fi APs. Wi-Fi chips are incorporated mainly in smartphones, but devices with open OSs are moving quickly into lower price segments. In 2013, 792 million smartphones will be purchased, accounting for more than a third of all mobile devices sold.

The main indoor positioning technologies available include Bluetooth, RFID, Cell ID, Wi-Fi, Uplink Time Difference of Arrival (U-TDOA), and GPS repeater extended with algorithms such as dead reckoning. We have described their advantages and disadvantages and how they work in specific reports (see, for example, "Location Technologies: Sensors, Tags, Beacons and More" and "Location Technologies: Wi-Fi, Satellite and Cellular").

Innovation is driven by a number of larger players, as well as by startups. Gartner has identified over 40 different companies offering indoor positioning technology that are competing in this market. In 1Q11, Navteq (a wholly owned subsidiary of Nokia) announced its own indoor map product, called Destination Maps (using Point Inside maps). Qualcomm and Cisco have also raised their profile by testing their own indoor technology at Mobile World Congress this year. Also, Google has created indoor maps of larger venues such as shopping malls and airports, adding imaging of the shops' interiors where possible. In trying to find a solution for issues with precise positioning, the vendor recently launched an app — venue owners who have uploaded their floor plans to Google's

mapping service use this app to provide Google with feedback about how accurate its predictions are for their locations.

Startup companies Point Inside and Micello have been building up a database of indoor maps of all major malls and airports in the U.S., which can be licensed to airlines and retailers that want to develop their own customer experience on top. A large U.S. retailer, Meijer, is using Point Inside's technology to let its customers search for and find the location of products, receive detailed product information, find out about sales and location-based promotions, and download highly personalized discounts and coupons.

The market has become even more competitive over the past year, with players such as Walkbase, Sensewhere and Pole Star intending to license their proprietary solutions. Pole Star brought its first commercial product to market in 2009 and has since expanded to several continents, providing both consumer-facing and enterprise solutions. Apps based on this solution, such as My Way Aeroport de Paris, can be downloaded from Google Play. Once the solutions are installed on the mobile device a connection to a server is not necessary, as the position is calculated directly on the device. This means very low overhead costs for the user as no data is required and enables real-time positioning without any latency due to server connection.

We have moved this technology forward slightly on the Hype Cycle. We have seen more companies entering the space, some launching commercial products and some have increased their revenue. However, given that we are not seeing any stable business models yet, nor any larger player taking over the whole space, we have not yet moved the profile to post-trough.

Barriers to adoption:

- We are currently seeing a highly fragmented market with different vendors trying to find partnerships with larger brands, real estate owners, airports and retailers to commercialize their solutions and to drive adoption. That creates a patchwork of services and applications that are currently bound to certain locations, making them hard to scale and thus limiting user uptake.
- Clearly, not everyone can win this race for scalable services as the technology of some of the vendors in this space is hard to scale to begin with. This is related to the fact that some of the vendors have built up large databases of Wi-Fi access points or created maps that are necessary for the mobile positioning to work. This data is expensive to collect and maintain but quickly becomes a commodity.
- With the release of iOS5, Apple has made the function for searching for available Wi-Fi networks in the surrounding area a private API, and so developers developing for this platform need to find work-arounds in order to comply with Apple's developer rules. A few Wi-Fi-scanning applications have already been removed from the App Store by Apple, as they were found to be using its private API.

User Advice: Device vendors should monitor developments in indoor positioning technology and recognize that it will make your existing location products much more compelling when the move indoors can be made.

Read Gartner's user survey results ("User Survey Analysis: Enhancing the Effectiveness of Communications Service Providers' Advertising Initiatives"), which clearly show users' interest in location advertising, information and coupons.

Business Impact: The largest impact will be in the consumer space. As context services have become a key differentiator, the use of those services indoors will close an important gap in the current service landscape. Many key applications such as friend finder/social networks and location search should be able to be used just as well inside as outside. Addressing this point will make a solution much more attractive to users as, in the end, it will create opportunities for more frequent use.

There will also be a large impact on the retail industry. Technology providers that can provide solutions with targeted offers and analytical data about the consumer at a low cost will make early wins in this industry. There are solutions, such as the one from shopkick, that provide a relatively low-cost solution for individual retailers with very targeted offers.

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Sample Vendors: Micello; Nokia; Point Inside; Polaris Wireless; Pole Star; Sensewhere; Skyhook

Recommended Reading: "Cool Vendors in Consumer Services, 2012"

Addressable TV Advertising

Analysis By: Andrew Frank

Definition: Addressable TV advertising technologies enable advertisers to selectively segment TV audiences and serve different ads or ad pods (groups of ads) within a common program or navigation screen. Segmentation can occur at geographic, demographic, behavioral and (in some cases) self-selected individual household levels, through cable, satellite and Internet Protocol television (IPTV) delivery systems and set-top boxes (STBs).

Position and Adoption Speed Justification: Addressable TV advertising has the potential to bring the power of context-aware computing technologies to the optimization of TV advertising. By applying data about audience and situation (including such diverse factors as local weather, device being used, or what just happened in a sporting event being viewed) to the selection of which TV ad appears on a given screen, ads can be made more relevant and engaging, and their effects can be tracked and optimized on an individual level.

Addressability was long envisioned as part of television's long-term evolutionary road map, but the competitive threat from online video (which is inherently addressable) added urgency to TV service providers' efforts, while highlighting the challenges inherent in their legacy infrastructures. Addressability approaches are closely tied to service providers' underlying technology infrastructure, so that the efforts of cable companies, satellite providers, telco providers, and hybrid

approaches combining over-the-air (OTA) broadcast and Internet are progressing at varying rates in different regions. As a result, not one of the efforts has achieved enough scale to make much of an impact, and some efforts have been plagued by high-profile failures. For example, Canoe was formed in 2008 as a joint venture among the six largest U.S. cable companies to provide a nationwide solution for addressability over cable TV, but it abandoned that goal in 2009. (It subsequently abandoned its second goal, to provide interactive TV ads, in 2012, and decided to focus exclusively on video on demand dynamic ad insertion.)

Scale is a critical factor for addressable TV. Because addressability is for segmenting audiences, the underlying audience that can be addressed by a given solution must be large enough to produce segments large enough to be of interest to advertisers. This factor has limited interest in the technology outside of the largest broadcasting markets, such as the U.S. and the U.K. (As Nielsen Research has noted, advertiser goals for addressability can be divided into "reach" strategy, whose main objective is to cover a broad target segment with a message to generate brand awareness, and "effectiveness" strategy, whose main objective is to engage a more limited target segment that is likely to respond to a specific call to action. In either case, scale is essential, although effectiveness places greater emphasis on the depth and quality of the targeting data.)

In the U.S., where cable serves about 60% of the 115 million television households, a few cable operators have achieved regional addressability (such as Cablevision, using Visible World's Connect product to deliver addressable ads to about 3 million households in mid-Atlantic states), but technical issues of legacy set-top boxes and headend systems continue to impede broader efforts. Digital broadcast satellite (DBS) providers are further along, and are in the process of rolling out addressability solutions based on DVR-based local storage of addressable ads. Telco providers, with the smallest footprint, offer zone-based addressability.

Outside the U.S., providers such as Sky are deploying addressable platforms in regions such as the U.K. (Sky AdSmart, expected to launch in 2013), but such deployments remain the exception in most regions. However, as a new generation of hybrid STBs gains traction and developing countries leap-frog legacy technology, achievement of addressability through Internet Protocol will likely become less of a hurdle. Additionally, second-screen TV applications that are able to sync with TV broadcast signals will deliver the capability to add addressable interactive extensions to televised ads that can appear on companion screen apps on tablets and mobile devices, such as personalized or localized special offers and coupons.

At least as significant as technology and scale issues, however, are business issues affecting the adoption of addressable TV advertising. There are several to consider:

- General inertia and recalcitrance of the TV advertising market, for which addressability represents a disruption to entrenched business practices
- Fragmentation of audiences, which represents a large jump in the complexity of media packaging and sales processes:
- Uncertainty as to how much additional value advertisers will attach to targeting (especially in high-ad-spending, low-consideration sectors, such as consumer packaged goods), and whether this additional value will be sufficient to offset costs

- Significant privacy concerns associated with household billing, and demographic and viewing data
- Issues regarding the allocation of revenue and control over addressable ads among broadcasters, distributors and third parties

At this point, it appears likely that addressable advertising on TV is likely to require greater levels of convergence between Internet and multichannel distribution services, through the diffusion of smart TVs, hybrid STBs and compliant ACR second-screen apps, so that IP technologies can provide addressability in a standard way. This still won't resolve all of the issues, but it will allow the incorporation of technologies that are proven, scalable, global and interoperable across systems. Once this tipping point is reached, the efficiency and accountability benefits of TV addressability will drive advertiser demand and accelerate its adoption, forcing the resolution of business issues.

User Advice:

- Agencies must offer multichannel campaign management services that include support for various emerging segmentation and targeting capabilities in media. They must also invest in data analytics to gain the ability to use emerging targeting techniques effectively.
- Broadcasters must ensure that they preserve their direct relationships with advertisers and don't get intermediated by platforms over which they have little control. They must bargain aggressively to minimize intermediary revenue splits and may play competitive factions against one another to prevent lock-in to any single-provider solution.
- Internet portals, OTT services and ad networks can continue to exploit delays in TV addressability by engaging more with traditional video-oriented advertising agencies and advertisers to develop online targeting and segmentation strategies and capabilities. They should also press for interoperability of TV standards with Internet and mobile channels, and challenge proprietary service provider data, such as customer addresses, being used for ad-targeting purposes without informed consent.
- Multichannel video programming distributors (MVPDs) must re-evaluate how various Internet advertising technologies might present opportunities to offer advanced advertising capabilities alongside in-band approaches and be wary of platform-specific solutions that require extensive alignment among fragmented operators.

Business Impact: Addressable TV advertising technologies affect advertisers, advertising agencies, MVPDs, TV networks, CE manufacturers, marketing data providers, television regulators and privacy advocates. These technologies also affect marketing technologists considering the CRM implications of new targeting capabilities. Addressable TV advertising represents an opportunity for mainstream advertisers and broadcasters to benefit from the scourge of audience fragmentation — thus, turning a big problem into a benefit.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Sample Vendors: Alcatel-Lucent; Arris; Google; Invidi; Microsoft; NDS; OpenTV; Packet Vision; Visible World

Recommended Reading: "New Television Meets Context-Aware Computing"

"A Scenario for the Future of Television in the Cloud"

2D Bar Code Marketing

Analysis By: Sandy Shen

Definition: 2D bar codes can be used to encode URLs, business cards and product information. 2D bar code marketing enables people to download content onto mobile phones. For example, companies can print bar codes on advertisements, posters, brochures and product packages; users can then scan these bar codes with a phone camera to get the associated information.

Position and Adoption Speed Justification: Brand-name companies can use 2D bar codes to manage content dynamically on printed materials they have distributed. They can also use them to track usage in order to gauge the effectiveness of advertising campaigns. 2D bar codes appeal most strongly to newspapers and magazines, for which they generate much-needed revenue via printed advertisements. Broadcasters and advertisers have also started to include bar codes in TV shows and commercials to enable interaction and access to more information and promotional elements such as coupons. Local businesses, including retailers, are using bar codes on posters and flyers to increase footfall and extend their loyalty programs with in-store promotions and posters. Some online retailers are using bar codes to direct people to their online stores.

Mobile bar code technology is used by less than 10% of mobile device users worldwide, but usage is increasing thanks to the pre-installation of bar code readers on mobile devices, the availability of many bar code readers from app stores, and marketing campaigns designed to increase user awareness. According to comScore, 14 million users scanned a bar code in August 2011 in the U.S., or 6.2% of the U.S. mobile user base. The reason for consumers to scan bar codes is to gain easy access to content, such as URLs, business cards and video, and to deals, such as coupons.

Advertisers increasingly view bar codes as an important marketing technology with which to reach users. A Gartner survey conducted in August 2011 found that over half (53%) of the advertisers and agencies in the U.S. and U.K. already included quick response (QR) codes in their marketing, and an additional 30% were somewhat or very likely to include them in the next 24 months. This makes bar codes the No. 3 "emerging technology" in a long list that includes Facebook fan pages (No. 1) and dual-screen TV app platforms (No. 17); in this list bar codes also beat mobile search advertisements, branded apps for media tablets, viral videos and promoted tweets on Twitter.

2D bar codes can be a simple technology to implement, compared with Near Field Communication (NFC), and involve fewer ecosystem players. This can enable shorter implementation times and lower costs for marketers. However, 2D bar codes face competition from SMS, and to a lesser extent Bluetooth, in the short term. They will also face a challenge from NFC when this technology matures and becomes widely available.

User Advice: Mobile platform providers should include bar code scanning as a standard capability in their operating systems to provide a consistent scanning experience for users.

Brand-name companies should consider 2D bar code marketing for campaigns and promotions, but be fully aware of the different coding schemes and the low level of penetration of compatible devices. They should work with device vendors and mobile carriers to encourage preinstallation of bar code readers and downloading by users.

Print publishers should encourage advertisers to include 2D bar codes in advertisements to improve the fill rate and reduce the pressure to discount.

Business Impact: Brand-name companies can cut paper, printing and mailing costs by employing bar code marketing. Doing this can also improve customer loyalty.

Print media companies can position themselves as more effective channels for advertisers by enabling brand-name companies to track the effectiveness of advertising campaigns, if they have reporting mechanisms in place.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: 3GVision; Ecrio; Mobile Tag; Mobiqa; NeoMedia Technologies; Neustar; Scanbuy

Recommended Reading: "Survey Analysis: Big Advertisers Overcome Digital Aversions"

"Mobile Check-In for Airlines: Lessons From a South American Airline"

"Dataquest Insight: Music Festival and Amusement Park Show Potential of Mobile Ticketing"

Mobile OTA Payment

Analysis By: Sandy Shen

Definition: Over the air (OTA) payment refers to remote payment as opposed to proximity-based payment using technologies such as Near Field Communication (NFC). OTA payment often uses SMS, Unstructured Supplementary Service Data, Wireless Application Protocol or downloadable client, but not NFC. Gartner defines mobile payments as transactions conducted using a mobile phone and payment instruments, such as bank accounts, bank cards or prepaid accounts.

Position and Adoption Speed Justification: Mobile OTA payment can be used for money transfers, bill payments, merchandise purchases and so forth. It is used in emerging markets where mobile payment services have been launched to target the unbanked and underbanked population. Money transfer, bill payment and mobile account top-up are the top three use cases in emerging markets. For example, we expect the three use cases to account for 92.5% of the transaction volume in Africa in 2012.

Despite the success of M-Pesa in Kenya, not all services in emerging markets have been a success. Nokia recently decided to withdraw its mobile money service from India due to difficulties in ramping up the scale. This, along with many other not-so-successful services, highlights the challenges in developing a mobile payment ecosystem that works for local markets, and there is no standard formula that can be applied to all markets.

In developed markets, mobile OTA payment is often related to online shopping and mobile banking transactions. We expect online shopping via mobile phone to experience accelerating growth, driven by services from electronic commerce (e-commerce) providers, banks, communications service providers (CSPs) and alternative payment providers, such as PayPal. These many services will help increase user awareness and make users feel more comfortable using mobile devices to make payments. At the same time, there are new initiatives led by banks that could potentially be disruptive to card-based payments. In May 2011, three U.S. banks announced a service called "clearXchange," which allows anyone with a bank account to send money to another person using the recipient's mobile phone number or email address. The service will launch in mid-2012. In February 2012, Barclays launched a money transfer application called "Pingit" that allows banked users to transfer money for free to any bank account in the U.K., using the recipient's mobile phone number. These services can become new alternative methods for online shopping and business payments among small or midsize businesses.

User Advice:

- Banks in emerging markets should consider working with CSPs to make use of their brand and distribution networks to reach out to new customers. Banks in developed markets should monitor the progress of clearXchange and Pingit, and they should consider launching competing offers.
- CSPs should focus on the top use cases for OTA payment and partner with related companies to enrich the service offering.

Business Impact: CSPs can expect to see increased revenue and reduced churn from mobile OTA payment. Banks have the potential to reach more users, attract users from competitors and cross-sell more bank products.

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Barclays; Comviva; Fundamo; Gemalto; mChek; Monitise; Obopay; Sybase; Utiba

Recommended Reading: "Forecast: Mobile Payment, Worldwide, 2009-2016"

"Market Trends: Mobile Payment, Worldwide, 2012"

"New Barclays Mobile Payment App May Upset Bank/Telco Status Quo"

Climbing the Slope

E-Coupons

Analysis By: Gale Daikoku

Definition: Electronic coupons are the digital form of a paper coupon or voucher (also known as an "offer"), and can encompass several formats, including mobile and social coupons. An e-coupon can be part of a single-party process, where a retailer issues a coupon via its campaign management system for redemption in its stores, or it can be a multiparty process, such as digitized brand manufacturer coupons that are distributed in a variety of ways, such as redeemed in stores or processed by clearinghouses.

Position and Adoption Speed Justification: Although e-coupons have been around for many years, they represent only a small fraction of the overall coupons — less than 2% of all coupons currently redeemed in physical stores. E-coupons, which include mobile and social coupons, are highlighted as separate technologies on the retail Hype Cycle to reflect their relative maturity, given the hype of all forms of e-coupons in the market. The movement of the category of e-coupons to the current position of post-trough 20% reflects a gradual maturing of the technology category and the influence of the emerging forms of e-coupons — mobile and social — on consumer adoption. The greatest barriers impacting retailer adoption are the retailers' ability to accept these types of coupons, verifying whether they are legitimate to process, and financial settlement.

For customers, key challenges include the ability to redeem coupons, easily keep track of e-coupons when saved to card, or to remember to print out an e-coupon in-store or at home to bring to a store. However, mobile phones and the practice of integrating a coupon's discount automatically onto a loyalty card are expected to continue to advance consumer use during the next few years. Online and in other direct sales channels, the use of e-coupons or promotional codes is common.

User Advice: Recognize that e-coupons can come from a large number of sources, ranging from manufacturer sites and portal sites to retailer sites, group buying sites, and retailer's CRM systems. Choose a technology or technology partner that will be able to validate and redeem e-coupons (originating from any source) across channels. Evaluate store-based technologies and processes to ensure you can accept and process coupons in stores. Retailers with loyalty programs will also want to be able to "embed" the coupon onto consumers' loyalty accounts so that printed coupons, or even mobile coupons, won't need to be carried around if consumers have their loyalty cards.

Business Impact: The benefits of e-coupons center on increasing the frequency of visits and transaction value. Sales, margins and customer loyalty are all targeted to increase as a result.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Sample Vendors: Cellfire; Coupons.com; SavingStar; You Technology; Zavers

Recommended Reading: "Consumer Survey Shows What's Ahead for Retail Coupon Management"

"Real-Time Customer Offer Engine Vendor Landscape for Retail"

Phone Bar Code Reader

Analysis By: Sandy Shen

Definition: A phone bar code reader is a software client that works with a phone's camera to capture and decode bar codes.

Position and Adoption Speed Justification: Bar code readers are used to decipher data so that users can quickly access content and eliminate the need for text input. Bar codes can be used to encode URLs, business cards, product information and marketing campaigns. For example, a company can put bar codes on printed advertisements, billboards, posters, brochures and product packages, and users can scan the bar codes with a phone's camera to obtain the corresponding information. There is no specific camera phone requirement for this technology, and a basic Video Graphics Array camera will work.

Bar codes can be one-dimensional (1D), two-dimensional (2D) or 3D (using color to create the third dimension). However, 3D bar codes need server support to decode the data effectively, and require a live data connection from a phone, which currently limits market penetration. The 2D bar code is the code used most often by mobile phones, and there are about a dozen 2D bar code codecs with different data capacities. Quick response code (QR code) and Data Matrix are used most often and can be read by most readers, while less used codes may require a special reader. QR code is the most often used code for marketing, while others can be used for more specialized purposes, such as manufacturing, retail, logistics and ticketing. The 1D bar code is often used in warehousing, logistics and retail for internal tracking, rather than for customer interaction. The 3D bar code is the least seen in the market, and requires dedicated readers.

Bar code readers can be downloaded from most app stores, although performance varies. A number of phone manufacturers also preinstall the reader. Penetration of the installed mobile phone base is still low, on average, less than 10% globally, and mostly on smartphones. Lack of user awareness, the need to download readers and unfamiliarity with the technology all deter more frequent use. However, more companies with recognizable brands have started to include bar codes in their marketing campaigns and materials. This will help increase user awareness.

User Advice: Organizations can include bar codes in their marketing materials and product manuals to offer more and interactive information. Companies should look for vendors that offer solutions to manage the content remotely and dynamically, and that provide reporting and analytics.

Business Impact: Companies can use bar codes for interactive marketing, and to offer more useful information. Communication service providers (CSPs) can expect higher data traffic, content downloads and advertising revenue if they have a hosting service.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: 3GVision; CodeZ QR; ColorZip Media; Microsoft; NeoMedia Technologies; Nokia; QuickMark; Scanbuy; Semacode

Recommended Reading: "Mobile Check-In for Airlines: Lessons From a South American Airline"

"Dataquest Insight: Music Festival and Amusement Park Show Potential of Mobile Ticketing"

Mobile Advertising

Analysis By: Andrew Frank

Definition: Mobile advertising is advertising or other paid placement on mobile device screens, most notably smartphones and media tablets. Mobile ad formats include search-, Web-, app-, stream- and message-based placements.

Position and Adoption Speed Justification: Despite continuing economic pressure, 2011 proved to be a breakout year for mobile advertising, with growth exceeding most forecasts (including Gartner's). Driven by accelerating consumer adoption and usage of smartphones and tablets to access information and entertainment content, mobile advertising revenue more than doubled in most regions, growing 147% year over year in the U.S. to $1.6 billion, according to the Interactive Advertising Bureau. Mobile app usage, led by the gaming, social and utility categories, provided a surplus of mobile ad inventory, driving down prices and challenging advertisers to keep up with rapidly changing consumer behaviors.

Although low prices are spurring overall growth, they're also making the picture considerably less rosy for mobile developers and publishers looking to monetize mobile content with advertising. Ads on mobile are currently selling at an average rate that's about five times lower than desktop Internet ads, and some of the most popular mobile categories, such as games and navigation, are monetizing at even lower rates. Google has cited growth in mobile advertising as a reason for declining cost-per-click rates, which are constraining revenue growth, while Facebook has also implicated mobile as a challenge to sustained high growth rates for its advertising. Apple, as well, has been forced to accommodate pricing challenges in its much-hyped iAds mobile ad network.

Still, although impediments remain, mobile advertising has nowhere to go but up. It still represents only 5% of interactive ad spending, and less than 1% of ad spending overall. The growth of mobile advertising is being streamlined by the many lessons learned through the 10-year emergence of Internet advertising, as many of the business models and practices, such as ad networks and exchanges, automation platforms and context-aware interactive design techniques, are being replicated and refined for the mobile channel. The addition of location awareness, for example, has strong potential for the retail category, although privacy concerns continue to hold this back. At the same time, the growing use of media tablets in the evening hours to consume rich content on high-

resolution displays is attracting brand advertisers more accustomed to the quality and impact of television.

Advertisers and content providers are also discovering the utility of using a mobile device in concert with other media, including television (in so-called "second screen" applications), radio, print and out-of-home signage. The key to these applications is the use of microphones and cameras as input devices for automatic content recognition techniques, such as audio fingerprints and watermarks (to synchronize with TV and radio) or quick response (QR) codes and image recognition (to extend messaging from print ads and signage).

In the relatively fast-growing Brazil, Russia, India, and China (BRIC) economies, mobile Internet access is leapfrogging the desktop and creating new advertising opportunities as consumer goods and services companies look to grow these markets. In India, for example, mobile Internet traffic surpassed desktop traffic for the first time in April, 2012 according to StatCounter. As a result, many advertising conglomerates are making their largest investments in mobile advertising capabilities within these regions (including other high-population countries such as Indonesia).

Add to these benefits projected growth in mobile payments (enabling ad-based transactions) and mobile wallets (enabling ad-based distribution of coupons and loyalty incentives), and mobile becomes an even more attractive promotional and transactional platform for advertisers, especially in retail sectors and other businesses that rely on direct response marketing, such as financial services, which is currently the fastest-growing sector of mobile advertisers according to mobile ad network Millennial Media.

Despite these positive signs, some significant challenges do remain. For example:

- **Formats and standards —** Existing ad standards from organizations such as the Mobile Marketing Association (MMA) and the Interactive Advertising Bureau (IAB) are widely considered to trail the capabilities of more-advanced smartphones and media tablets, leading to the fragmentation of device-specific platforms, which is driving up production costs for rich interactive ads. Fragmentation is affecting both in-app ads — especially on the Android platform — as well as mobile Web ads where variations among mobile browser capabilities are now reminiscent of the Web in the late 1990s, when browser testing was a major headache for Web designers.
- **Metrics and measurement —** The mobile metrics picture, considered by many advertisers and agencies to be a baseline requirement for any major media investment, remains hampered by technical and organizational complexities. Although metrics providers such as Nielsen and ComScore offer mobile media metrics, there are significant variations in methodologies and perceived quality among regions. Clearly. more work is necessary to satisfy the demands of publishers and marketers.
- **Privacy and targeting —** Although mobile devices contain a wealth of targeting data, privacy concerns have blocked significant uptake of these capabilities, particularly on iOS devices on which Apple's Safari Web browser is set by default to reject third-party cookies (an essential component in the currently widespread practice of Web targeting). Apple recently deprecated the use of its unique identifier (UDID), which many apps had previously been using to track

users. As a result, most mobile advertising remains untargeted, putting significant downward pressure on ad yields and fill rates.

In summary, although many fundamental issues remain to be resolved, Gartner expects overall strong growth rates for mobile advertising over the coming years as the format ascends the plateau to become a fully productive marketing tool.

User Advice: Marketers considering mobile advertising must evaluate a number of variables to determine how best to reach their target audience:

- Brands and agencies must develop methods of evaluating the effectiveness of mobile campaigns across various mobile channels to optimize the use of mobile media in the marketing mix. This is likely to vary considerably by product category, audience profile and region. In particular, brands and agencies must consider ways to use mobile channels as a response mechanism in concert with other noninteractive formats, such as print and TV, and not only as a stand-alone channel.
- Local advertisers, in particular, must understand how to leverage the medium's ability to deliver nearby traffic to their offline stores and venues in a privacy-friendly way.
- Advertisers and agencies must continue to refine privacy policies and practices to address new and potentially controversial targeting capabilities of mobile devices and systematically assess regional variations and partner practices. This is particularly an issue in the EU, where the ePrivacy Directive is set to disrupt many of the common tracking practices of websites.
- Content providers, developers and publishers need to understand how to incorporate elements, such as social features, maps and video, into applications that will attract users and advertisers.
- Communications service providers (CSPs) and manufacturers need to be decisive about their intended roles in mobile advertising and acknowledge that, with few exceptions, success will require strong partnerships and strategic acquisitions to quickly establish key roles in end-to-end solutions that can deliver efficiency and scale to advertisers.
- CSPs and advertisers should not overlook handset telephony capabilities for contextual click-to-call and save-contact features in ads.
- For developing markets, SMS will remain a good way to distribute marketing messages to mass audiences, and it may provide enough economic value to subsidize the expansion of access to more-advanced handsets and service plans.

Business Impact: Mobile advertising will continue to siphon most of its revenue from print and outdoor categories, although improvements in efficiency and effectiveness will prevent overall spending from being a zero-sum game. Mobile's short-term impact on television will be minimal, although the overall effect of mobile will be to emphasize direct, targeted, pull-style interactions that may accompany a long-term reduction in the share of marketing resources directed at general media advertising.

Since smartphones and media tablets are increasingly used to access Web content (much of which is not yet optimized for display on these devices), as well as broadcast content (TV and radio), the status of advertising within these cross-platform content formats becomes ambiguous. To reduce

ambiguity, we consider mobile advertising to apply only to formats that are specifically optimized for wireless Internet delivery to a mobile device, but overlap with other formats will continue to produce confusion when assessing spending shifts.

Mobile advertising has arguably conferred its biggest benefits on Google, which has successfully exploited the channel and leads the world in mobile ad sales. A handful of new companies, such as Millennial Media and Velti, along with their investors, also appear to be significant beneficiaries, based largely on impeccable timing. Apple's much-hyped iAds platform has not fared as well, and is expected to be adjusted to better align with market needs. Publishers, content providers and application developers appear to have a similar problem on mobile that has challenged their efforts online, namely the "long tail" fragmentation of audiences and usage that makes it difficult for all but a few providers to achieve the scale necessary to attract substantial ad revenue. A few CSPs have succeeded in building momentum around mobile advertising efforts, although the majority find themselves marginalized by reliance on their flagging portals. Manufacturers other than Apple have also found difficulty gaining a foothold in the ad platform market. Nokia and Microsoft bear close scrutiny as they mount a worldwide effort to establish a viable alternative for content and apps.

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: Apple; Google; Greystripe; Jumptap; Microsoft; Millennial Media; Velti; Yahoo

Recommended Reading: "Forecast: Mobile Advertising, Worldwide, 2008-2015"

"Competitive Landscape: Location-Based Advertising and Marketing"

IPTV

Analysis By: Ian Keene; Fernando Elizalde

Definition: IPTV refers to the network architecture, equipment and technologies, middleware and software platforms used to deliver standard or high-definition TV (HDTV) signals, and other video content services, in real time and on demand: over a communications service provider's (CSP's) managed Internet Protocol (IP) broadband access network to an end user's TV set via a set-top box (STB), with picture quality at least equivalent to existing pay-TV and free-to-air services.

Position and Adoption Speed Justification: IPTV services are a TV delivery solution for wireline CSPs over either DSL or fiber to the home access networks. IPTV delivery systems increasingly employ advanced video compression technologies, such as Moving Picture Experts Group Layer 4 (MPEG-4) or VC-1 (video codec standard), whereas early implementations of IPTV used MPEG-2. Cable operators are increasingly deploying IP technologies to complement and improve their video delivery services, but this generally does not fall within Gartner's definition of IPTV. IPTV should be contrasted to over-the-top (OTT) Web streaming video, or Internet TV, with no quality of service issues such as buffering delays.

IPTV constitutes the CSP's response to competition from cable and satellite operators and the threat of OTT TV and video services. It is a major area in the field of next-generation telecom architecture and services, with the potential to be a transformational enabler for CSPs and for those end users that have not been able to receive interactive TV. However, factors that hold back the rapid and widespread adoption of IPTV are numerous and include the following:

- Mature pay-TV markets in some countries and competitive bundled offerings from, for example, cable competitors. However, these issues can be overcome. For example, in the U.S. IPTV is doing very well, with people switching from the cable operators to Verizon's FiOS and AT&T's U-verse.
- Technological issues, because the required end-to-end solution is complex. Provsion of IPTV means that CSPs need to manage complex server farms, home devices and networks. Not all copper loops can offer enough noise-free bandwidth for standard-definition video and HDTV and poor customer experience can be an issue.
- The inability of some CSPs to procure different and compelling content — or even content similar to current content deals.
- The inertia of consumers when it comes to changing service providers.

Consumers are not universally convinced about the benefits of premium content, and the market for OTT video on the Internet is growing fast. In most areas, CSPs cannot engage in effective advertising and marketing campaigns.

Some satellite operators are partnering with wireline CSPs, to deliver an expanded selection of on-demand and interactive TV — alongside linear broadcast TV and Internet services — through hybrid IPTV/pay-TV STBs.

Global subscribers to IPTV services delivered by wireline CSPs reached nearly 41 million in 2010 and are estimated to have shown 25% growth during 2011. By the end of 2015, 94 million subscribers are forecast worldwide. While this is a small number in terms of household penetration (less than 2% worldwide in 2010, and forecast only to reach 4.5% in 2015), not all households are considered part of the target market for IPTV. Currently, the main activity is in China, followed by Western Europe (aggregated countries), the U.S. and South Korea.

It is becoming clear that IPTV is not a quick and easy answer to new revenue generation. Rather, it's a value-added service to complete the offering to the household and reduce churn. Some CSPs have started to think about IPTV as a service delivery platform. They are experimenting with, for example, digital advertising and marketing solutions — in addition to the "three-screen strategy" of providing their customers with content and content-related services on TVs, PCs and mobile screens.

User Advice: Keys to success will be:

- Avoiding "me too" offerings
- Gaining access to compelling content
- Bundling IPTV with other services at favorable prices

- Ensuring that the network can deliver the bandwidth needed for reliable, high-quality viewing

If CSPs are to drive customer uptake in mature markets, they need to come to market with services that are either equal to those of their competitors at a lower price, or superior to existing video services in terms of content, convenience, ease of use and, importantly, customer service to improve the overall customer experience. Cable operators across geographies have been notorious for their poor customer service.

CSPs will need to evolve new applications, usage and user behaviors to differentiate themselves from the established broadcast alternatives. In less-saturated markets, they will need to use the best combination of price, technology and content (as well as bundling with non-entertainment services) to bring new customers into the pay-TV market. Expect market development to vary by region and by country. The complexity of delivery means that integrated solutions will probably be the fastest and most cost-efficient way of deploying the necessary architecture. Increased video content in networks will drive capacity upgrades.

The upside for service providers is still largely speculative, and contingent on the ability to differentiate services and price aggressively — especially in regions with significant satellite and cable deployment. The most positive immediate effects for CSPs are loss of churn and the ability to sell more broadband to users. CSPs need to embrace OTT video to complement their offerings and facilitate the search of OTT content. They should consider signing partnerships with premium OTT service providers to expose their subscribers to OTT and create a win-win scenario, protecting their subscriber base and increasing the user experience and content available.

Business Impact:

- The effect of IPTV will be felt primarily in the residential market. CSPs promised to deliver a new viewing experience compared with cable or satellite TV. However, most cable and satellite offerings have been upgraded to deliver what IPTV originally promised to differentiate on.
- There is the potential for virtually unlimited programming, thanks to the "switched" nature of the network architecture. In addition, more cross-platform integration between entertainment, communications and information services is coming into play. This can be achieved between PCs, TVs, smartphones and tablet devices.
- Other potential benefits include more integrated search and navigation among broadcast/linear programming, on-demand, OTT and personal content such as stored music, photos and videos.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Alcatel-Lucent; Cisco; Ericsson; Motorola; Nokia Siemens Networks; Technicolor

Recommended Reading: "Forecast: IPTV Subscriptions and Revenue, Worldwide, 2008-2015"

"Leading IPTV Carriers and Their Technology Vendors, Worldwide, 1Q12 Update"

"Market Definitions and Methodology Guide: IPTV Service Forecast and Business Models, Worldwide"

Mobile Banking

Analysis By: Sandy Shen

Definition: Mobile banking enables people to conduct banking services from a mobile device. Common features include balance inquiry, account history, automated teller machine (ATM)/branch locator, fund transfer and bill payment.

Position and Adoption Speed Justification: In developed markets, many banks are rolling out mobile banking services due to competitive pressures, and it has become an expectation from the customers for their banks to offer such services. Besides the basic features such as balance inquiry, account history and fund transfer, banks are enabling new features such as bill payment, check deposit, fund transfer using mobile numbers and investment. These will increase the service appeal to customers and attract more users to the service. Security is one key issue that has kept some users from using the service.

In developing markets, mobile banking lags behind the development of mobile payment because it is most often targeting the banking population, which is a smaller percentage of the total population. For the unbanked users, the limited presence of bank branches, stringent requirements for signing up for a bank account, and the often need to maintain a minimum balance are hurdles to them using the service. In addition, some banks charge a fee for basic services such as balance inquiry and statement, which further deters the users from using mobile banking. Until banks do away with additional charges on the mobile channel, mobile banking usage will remain low in developing markets.

User Advice:

- Communications service providers (CSPs) should address security concerns by educating users on the measures they have put in place.
- Technology providers should work with banks and CSPs to select the features that have a good fit with the mobile use case such as bill payment, check ATM locations and so forth to take advantage of the mobility feature.

Business Impact:

- In developing markets, mobile banking can help achieve financial inclusion of unbanked population, and increase their quality of living.
- In developed markets, mobile banking is a hygiene factor, and many banks are doing this as part of banks' multichannel initiatives. The market has good growth potential because still less than 20% of the banking customers are using mobile banking.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Sample Vendors: ClairMail; Comviva; Fundamo; Intelligent Environments; M-Com; Monitise; Sybase

Recommended Reading: "Monitise-Clairmail Deal Stresses Need for Alliances in Mobile Banking"

Mobile Social Networks

Analysis By: Monica Basso; Brian Blau

Definition: Mobile social-networking services enable individuals to connect to their social communities using a mobile device, through one or more available mobile channels. Members share experiences, interests, presence information and personal content either via social network apps or through socially-enabled mobile apps. Mobile adds new capabilities to social networking, such as location-related services (e.g., check-in) or visualization mechanisms (e.g., augmented reality which overlays contextual information).

Position and Adoption Speed Justification: Mobile social networks and activity streams are proliferating in consumer and enterprise markets. The business opportunity today is, with 4.6 billion mobile users worldwide, to offer context-aware services for social interaction and collaboration through devices such as feature phones, smartphones and tablets. These are the tools predominantly used by people to stay in touch with their real communities. Providers include a variety of startup players, but acquisitions from larger IT players are ongoing and further consolidation is expected in this fast-moving mobile landscape that is quickly redefining the mobile social experience. For example:

- Enterprise-focused social networks, such as Yammer, Socialcast and Socialspring, are used as real-time collaboration tools to support the mobile workforce. For example, they enable salespeople to access, collect and share geolocated customers information on devices. VMware acquired Socialcast two years ago, and recently Microsoft announced the acquisition of Yammer.
- Pure play mobile social networks, as well as those based on the ability to check-in, such as GyPSii, MocoSpace, foursquare and Path, some of which originated the mobile social revolution, forced companies like Facebook and Twitter to roll out check-in services of their own. Instagram's $1 billion acquisition by Facebook redefined the mobile social landscape but achieving what no other was able to accomplish: successful launch and exit of a pure-play mobile social network. It has reset business parameters in the marketplace by placing a premium on the value of mobile social users.
- Leading social networks such as Facebook, Twitter, Google+ and Zynga, are accessible through optimized clients for most mobile platforms. The same applies to community-oriented services such as YouTube, Flickr, LinkedIn and Tumblr. Facebook acquired the picture-focused

mobile social network Instagram and location-based social networking service Gowalla in an apparent talent acquisition to help bolster their mobile development efforts.

- Mobile players federated with Web-based social networks like Facebook include myGamma, Mobimii, Bluepulse, Funambol, Mobikade and Crush or Flush. They offer some blend of services in this area.
- Megaplayers in the Internet and mobile industry launched different initiatives to enable social-networking experiences on mobile devices. For example, Google with Google+, Yahoo with IntoNow, and Skype with their mobile client on many devices. Apple offers community-based experience with applications such as Ping (a social music network) and Game Center (Apple's game network), accessible on iPhones and iPads.
- Carrier players: Some providers partner with mobile carriers to give access to their mobile communities to the carrier's subscribers through a link on the default page of mobile phone browsers (for example, Jumbuck Entertainment and airG).

With such a crowded market, consolidation was inevitable, and the Instagram and Yammer acquisitions will spark more interest. Startup companies will fight to gain brand recognition and grow subscribers (perhaps through partnerships with bigger players), mostly on a regional basis. Through 2015, the pure-play, mobile social-networking market will consolidate to around five players or less. Social-networking companies will target a multichannel audience with context-oriented services. Internet companies will consolidate multichannel social-networking services.

Today's biggest social network, Facebook, claims that more than 45% of its 900 million active users currently access their services through mobile devices. Adoption of social networks is expected to grow rapidly among mobile users and by 2016 the number of mobile social-network users will reach 1.5 billion.

User Advice: Organizations should explore mobile social networks to find opportunities for innovating their communication styles with employees, clients, partners and markets (for example, to enable salespeople to collect and share geolocated information about customers in real time). Mobile social networks also represent great opportunities to engage with end customers and establish new forms of marketing and advertisement. However, organizations need to evaluate emerging risks in the areas of IT security threats, legal liabilities and reputation.

Business Impact: Mobile social networking is likely to affect many vertical sectors, particularly where organizations deal with large client or user communities (such as the retail, education, healthcare and government sectors), or have larger distributed workforces in sales or other client-facing activities (such as the pharmaceutical, transportation and utility sectors).

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: bliin; Facebook; Funambol; GyPSii; Instagram; MocoSpace; Myspace; Twitter; Yammer; Zyb

Recommended Reading: "Yammer to Give Microsoft Needed Dynamism in Enterprise Social Networking"

"The Emerging Market of Mobile Social Networks Offers New Business Opportunities"

"Social Trends Are Influencing the Adoption of Mobile and Web Technology"

"Gartner's Top Predictions for IT Organizations and Users, 2010 and Beyond: A New Balance"

"SWOT: Facebook, Worldwide"

"SWOT: Twitter, Worldwide"

"Forecast: Social Media Revenue, Worldwide, 2011-2016"

"Market Insight: How Consumers Socialize On the Go, The Rise of Portable Social Networks"

Network DVR

Analysis By: Fernando Elizalde; Mike McGuire

Definition: Network digital video recorders (network DVRs), also known as network personal video recorders (network PVRs), have a similar function to their stand-alone DVR/PVR counterparts, enabling consumers to record, store and play back content with DVD-like functions. The main difference is that a stand-alone DVR stores content on a hard drive within the set-top box (STB), while content for a network DVR is stored on the service provider's network. For larger operators, the required network storage will grow to be dozens of petabytes.

Position and Adoption Speed Justification: Network DVRs have evolved into two main versions:

- In one, consumers make predetermined decisions as to what they will record.
- In the other, the service provider records all video content (or that agreed on with the content providers), or selects broadcast channels which are then available to consumers for a set number of days.

There are also hybrids, where users may have a combination of both network DVR versions, and implementations of combined network and STB-based DVRs.

Network DVRs can benefit pay-TV operators in several ways:

- As a customer retention mechanism, by providing additional value-added services as a service differentiator.
- As a generator of incremental revenue, where the pay-TV operator can charge for the feature as well as setting up different levels of network DVR recording capacity at different price levels.
- Reducing the need to send a technician to the customer site to deliver an STB with hard drives when recording features are requested by customers.

- Reducing costs by reducing the types of STBs held in inventories and also the management of the device installed base.

To date, most network DVRs deployed worldwide provide access to programs (already broadcast) for a set number of days. Copyright issues are generally agreed beforehand with the broadcast and/or content owners that make a selection of programs available to TV service providers to distribute on their networks. In other cases, such as On TV in Greece, service providers ask subscribers to authorize them to record shows on their behalf to be stored for a limited time on the operators' servers.

Within this type of service, the features most widely deployed are selected time-shifted capabilities, network DVR for selected shows and, to a lesser degree, start-over capabilities. Some or all of these features have become standard in most European pay-TV operators — both IPTV and cable ones. In the U.S., the five major cable operators, as well as Verizon FiOS and AT&T U-Verse, have introduced different versions of this type of network DVR. In China, several cable and IPTV operators offer most channels on demand after the real-time broadcast.

Network DVRs that allow consumers to decide what to record on the operators' servers have seen limited deployment worldwide. The complexity, storage capacity and stress on the network — together with copyright issues and the cost of storage — have pushed large operators away from network DVR platforms toward successful deployments of premium STB-based DVRs. This type of consumer-driven network DVR is implemented most often in small IPTV deployments: for example, Teo's Gala TV in Lithuania, Invitel and Wist in Poland, Iskon in Croatia, Amis in Slovenia and Minsk TV in Belarus. Most recently, KPN in the Netherlands has started providing a network-based service and is probably the largest IPTV operator offering such a feature. Cablevision (in the U.S.) launched a network DVR service in 2011 after a U.S. Supreme Court ruling left network DVRs equal to STB-based ones.

As consumers move to accessing video from multiple screens, pay-TV operators are moving toward a "TV everywhere" model. This new scenario will push operators and content owners to sort out copyright and digital rights management issues, and more network-based DVR services to emerge — whenever the in-country regulatory environment allows it.

User Advice:

- Regional implementations will vary because of copyright laws and their interpretation; carriers must be prepared to address these discrepancies with different strategies and innovations.
- A network DVR can offer significant benefits over STB-based DVR. For example, a network DVR can handle the treatment of advertisements: from preventing viewers from skipping ads, to enabling advertisers to update and replace old ads with more targeted ones. It is also well positioned to be part of the personal cloud and enable a fuller TV-everywhere experience within (and outside) the home.
- For large operators, however, STB-based DVRs are better positioned to address consumers' recording decisions; this solution avoids the issues that surround service provider network capacity and copyright.

Business Impact: Network DVRs will affect most, if not all, of the players in the consumer pay-TV value chain. For consumers, the positioning of network DVRs facilitates greater time shifting and the move to an on-demand environment. Cable and telecom companies will benefit from lower capital and operating expenditures, but satellite operators will lose out if they fail to emulate network DVR services (by providing hard drives in STBs) to compensate for the lack of a return path in their offerings.

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: Alcatel-Lucent; C-Cor; Cisco-Scientific Atlanta; Ericsson Television; Espial Group; Microsoft

Recommended Reading: "Emerging Technology Analysis: Internet TV, Global Consumer Communications Services"

"Forecast: IPTV Subscribers and Service Revenue, Worldwide, 2007-2013"

"Dataquest Insight: Worldwide IPTV Growth to Remain Steady, but not Spectacular"

"Leading IPTV Carriers and Their Technology Vendors, Worldwide, 2Q09 Update"

Embedded Cellular Data

Analysis By: Hugues J. De La Vergne

Definition: Embedded cellular data implementations are focused on notebooks, as well as on media tablets and other small-form-factor devices. The cellular or wireless WAN technology embedded in media tablets and notebooks is typically High-Speed Packet Access (HSPA) or Long Term Evolution (LTE) in the regions where it is widely deployed, such as the U.S. Some modules, primarily in emerging markets, also support older cellular data standards.

Position and Adoption Speed Justification: The embedded cellular technology market has historically been limited due to expensive data plans in many regions, lack of compelling devices, and an overall lacking user experience due to slower-speed technologies that made embedded cellular data impractical for broad deployment. However, cellular data has enjoyed growth in the past 12 months because of the launch of high-speed technologies, such as LTE and HSPA, which greatly improves the Web-browsing experience. Compelling devices such as media tablets have given hardware producers the confidence to embed cellular connectivity into more consumer electronics (CE) devices. Also, LTE should see a life cycle of at least the next 24 to 36 months, which is key since many embedded CE devices have a 24- to 36-month life cycle. European communications service providers (CSPs) have been well ahead of CSPs in other mature markets, such as the U.S. European CSPs have had success with daily or monthly pay-as-you-go service

plans with a daily/monthly roaming cap that can reduce costs, and we are finally seeing U.S.-based CSPs offer similar plans.

Embedded cellular data will be driven by end users who need to have their CE devices and laptops connected to the Internet. Although we have seen European CSPs become more aggressive with rate plans, high-rate plans remain the largest impediment to growth in many regions, including the U.S. Many end users are paying for wired broadband at home and have a smartphone data plan and view potentially $30 to $50 per month for each additional device to be too expensive. Growth will expand much more quickly once operators move toward a multidevice data plan for individuals that they can allocate between their devices, similar to voice family plans that give users the ability to share minutes between all mobile devices on their plans. With Verizon Wireless' announcement that it will move to multidevice data plans in 2012, we expect the market to start seeing strong growth in the next year as more consumers will see a value of always-on connectivity that cellular will provide. Gartner expects these changes to expand rapidly in the coming 12 months as embedded modems grow from 124.6 million units in 2012 to surpass removable modems in 2013 with sales of 186.1 million units. Growth of embedded cellular modems will continue, driven by products such as media tablets and Ultrabooks, to reach 379 million units in 2016.

User Advice: Consider embedded cellular data technologies for vertical applications that have predictable use patterns and a clear ROI case. Also consider embedded cellular data technologies for targeted segments of the horizontal user population as the life cycle of embedded cellular modems becomes more closely aligned with laptop and media tablet replacement cycles, as technologies for upgrading modules improve, and as multidevice data service plans align closer with specific user requirements.

Business Impact: Embedded cellular data technology will affect telecom strategies and economics for mobile users with notebook computers, media tablets and other connected form factors as organizations choose from a variety of wireless communications options. This move will have sourcing implications because some notebooks and media tablets with embedded cellular data are being subsidized by mobile operators. Devices with bundled communications, such as e-book readers, personal navigation devices, digital photo frames and entertainment devices, offer business opportunities as well.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Sample Vendors: Apple; Dell; Fujitsu Technology Solutions; HP; Lenovo; Samsung Electronics

Recommended Reading: "Multidevice Data Rate Plans Will Disrupt the U.S. Mobile Services Market"

Entering the Plateau

Mobile IM

Analysis By: Monica Basso

Definition: Mobile IM refers to the use of an online IM application, including presence and buddy lists, on a mobile device and a wireless network.

Position and Adoption Speed Justification: The adoption of mobile IM has progressed in different regions. Standards such as the IM and Presence Service (IMPS) protocols from the Open Mobile Alliance initiative and Cisco Jabber on the Internet are driving interoperability, despite the variety of IM approaches and products means fragmentation.

Most smartphones ship with preloaded clients to connect to selected Internet IM services — either proprietary or public instant messaging services. A variety of mobile apps are also available for selected platforms on respective appstores. Apple's devices are equipped with iMessage, Research In Motion's (RIM's) BlackBerry devices with BlackBerry Messenger (BBM), and Windows Phone devices with a Windows Live client. Android devices have a range of messenger apps options including BeeJive and imo.

Alternatively, users can download mobile IM clients to connect smartphones with a variety of Internet IM services, such as Windows Live, Yahoo, Google Talk, AOL Instant Messenger (AIM) and ICQ. Mobile IM clients are also available to connect smartphones with private collaboration platforms, such as Microsoft's Lync (previously called Office Communications Server [OCS]) and IBM's Sametime. Particularly in younger generations, BlackBerry Messenger is increasingly used as a substitute for SMS, to avoid SMS charges. WhatsApp Messenger is another messaging application for smart devices, where presence is not such an important element, but is always on within the phone. Skype is also successful as a mobile IM application.

Mobile operators offer subscribers the mobile IM services built on proprietary infrastructures or integrated with Internet IM systems through specialized platforms. Examples include Cingular with Microsoft Network (MSN), and NTT Docomo i-mode with MSN and Yahoo, as well as Telefonica O2 with ICQ in Germany. Mobile carriers have been concerned that mobile IM adoption might affect their lucrative SMS businesses by providing an alternative for personal messaging. This has limited their commitment to this technology; however, mobile IM represents a complementary tool to SMS and voice for mobile personal communications and may drive further consumption of any services, as shown by some deployments. Younger people's increasing tendencies to use mobile IM with social networks will progressively put demand on carriers to support open mobile IM services. Key mobile operators — such as China Mobile, TeliaSonera, T-Mobile, Telefonica, Telecom Italia Mobile (TIM) and Vodafone — are exploring this approach.

While mobile IM services originated in the consumer space, they are now progressively expanding into the enterprise market. In addition to public services, enterprises increasingly deploy corporate IM and presence on smartphones — particularly through the mobilization of Microsoft Lync through mobile communicator clients.

Social networks like Facebook and microblogging sites like Twitter are recording increased usage on mobile devices, and are set to become hubs for mobile personal communications. In the long term, this trend will affect mobile IM and will allow it to be superseded by mobile social networks before it reaches 30% market penetration.

User Advice: Carriers should pursue integration with established Internet IM systems, enhancing it with SMS for converged messaging experience, to face the growing competition of device-native IM services and the disruption brought to the SMS business. Internet IM providers should make carrier-independent mobile interfaces available to their IM services to enable their subscribers to access the service with mobile devices, as well as computers. They also need to make sure their mobile IM services integrate with email and social networking.

Enterprises should leverage the presence of mobile IM capabilities on devices that consumers own and are using for work to enable new forms of real-time collaboration for their mobile workforce.

Business Impact: There will be a broad impact on organizations with large mobile workforces, because mobile IM is an enabler for enhancing real-time collaboration. For cloud service providers (CSPs), mobile IM is an opportunity to deliver a comprehensive offering around personal messaging in addition to SMS and multimedia messaging service (MMS). However, it is also increasingly a threat as applications such as WhatsApp Messenger and BBM continue to cannibalize the SMS revenue stream.

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Mature mainstream

Sample Vendors: Apple; Comverse; IBM; Microsoft; Palringo; Research In Motion; Tekelec; WebMessenger

Recommended Reading: "Market Trends: Worldwide, The Evolution of Mobile Communication Beyond SMS, 2012"

"Mobile Carriers Should Embrace Internet-Based Instant Messaging Services"

"Findings: Mobile Messaging Becomes Part of Unified Communications and Collaboration"

"Wide Array of Communications Overwhelms Users"

Mobile Search

Analysis By: Sandy Shen

Definition: Mobile search lets people search for information on mobile devices, and uses a number of techniques to make the result relevant to the user's context. These techniques include location, image, voice, audio, time of the day and user preferences to provide personalized results. In addition to Web search, in-app search is another area where mobile search plays a role. It is

customized for the app — for the specific content and formats — and is usually limited to the service provider's content library.

Position and Adoption Speed Justification: Generic keyword search has evolved to a level where it is now good enough on the mobile device that the result can rival that of online search. However, there is room for improvement, such as more mobile content and better indexing, and increased availability of full browsers on mobile phones has helped to enhance the experience — because searches can return Web pages when mobile content is not available.

Contextual search integrating a user's contextual information is still developing — combining the data acquisition capabilities of mobile devices with the potential of online processing power offers infinite possibilities. For example, image search enables users to get information about products and places; local guide apps return results based on the user location; some shopping apps not only integrate GPS feeds, but also indoor location capabilities such as bar code scans and audio signal location; augmented reality delivers layered information based on the camera view; some mobile advertising apps can recognize the audio the user is listening to, and offer related information; and voice-based search technology is mature, though examples with artificial intelligence — such as Apple's Speech Interpretation and Recognition Interface (Siri) — are very few. These services only scratch the surface of contextual search, but represent how things can evolve in the future.

Challenges remain for image search of the picture taken, real object and face recognition. Most products are still in the lab, with no commercial-grade product coming soon.

User Advice: Companies should:

- Incorporate technologies that can drive user interaction and deliver more relevant information. Examples include the use of bar codes on product posters to drive users to your online sites, and the use of location data to deliver geofenced offers.
- Explore new technologies that may give you the cutting edge such as image/face recognition, audio recognition and augmented reality.
- Protect user privacy by employing opt-in and opt-out mechanisms, and by strictly monitoring how user data is used and shared with business partners.

Business Impact: Companies can use mobile search to increase traffic to their websites. Communications service providers (CSPs) can expect higher levels of network traffic and more content purchases if users are using a CSP-sponsored search service, and may also share advertising revenue with search providers. Some vertical industries are more suited than others to exploit search-based advertising, such as restaurants, hotels and retailers.

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Mature mainstream

Sample Vendors: Amazon; Apple; Baidu; ChaCha; Google; Microsoft; Nuance; Shazam; V-Enable; Yahoo

Recommended Reading: "SWOT: foursquare, Location-Based Social Networking, Worldwide"

Next-Generation Voice

Analysis By: Deborah Kish

Definition: Next-generation voice refers to the network architecture, equipment and protocols needed to replace the traditional time division multiplexing public switched telephone network (PSTN) with voice over Internet Protocol (VoIP), and to provide enhanced voice functions and applications in both fixed and mobile networks. In mobile networks, next-generation voice includes an IP Multimedia Subsystem (IMS) core, as well as the GSMA's voice over Long Term Evolution (LTE) — VoLTE — initiative.

Position and Adoption Speed Justification: Approaches to next-generation voice are helping communications service providers (CSPs) to reduce the cost of delivering telephony services. Although, because of their low ROI, voice services don't lead to revenue growth, they do provide a steady income stream, so CSPs have to reduce the cost of delivering them, while simultaneously innovating toward provisioning new voice-enabled service bundles, particularly in fixed networks. The cost to provide mobile voice is relatively low, but the ROI is considerably higher, so it is an important revenue stream for future infrastructure investments. IMS in the core will complement LTE when mobile next-generation voice becomes available. CSPs are under pressure to maintain good-quality voice services, so are working toward achieving high-definition voice services. Vendors and CSPs should participate in initiatives such as Rich Communication Suite and should work with software and handset vendors to improve interoperability and accelerate time to market.

User Advice: Continue to investigate and take advantage of the benefits of open and standardized technology architectures with interoperable interfaces, such as Session Initiation Protocol. Investigate the benefits of telephony emulation, using VoIP rather than IMS architecture for multiservice delivery. Users should evaluate advanced features accurately, ignoring technology hype while acknowledging true added value and understanding the key benefits.

Fixed voice revenue still running on the PSTN will continue to be the "cash cow" that will help pay for investments in advanced technology and the applications that will help differentiate CSPs, so waiting out the long life cycles of traditional equipment in select parts of the networks may be a good short-term solution (no longer than two years).

Business Impact: The impact of next-generation voice will affect CSPs, their corporate customers and residential users, and vendors of next-generation voice technology. VoIP and VoLTE will increase competition between service providers, and should encourage the appearance of a wide range of new Web application providers, such as Google and Skype, as well as cable operators offering voice services. Lower price points due to increasing competition and lower production costs will encourage residential users and enterprises to adopt services at an increased rate. Government initiatives will encourage service providers to increase their reach and upgrade their networks.

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

Sample Vendors: Alcatel-Lucent; BroadSoft; Cisco; Ericsson; Genband; Huawei; Italtel; Metaswitch Networks; NEC; Nokia Siemens Networks; ZTE

Recommended Reading: "Magic Quadrant for Softswitch Architecture"

"Forecast: Carrier Network Infrastructure, Worldwide, 2008-2015, 2Q11 Update"

"Forecast Analysis: Carrier Network Infrastructure, Worldwide, 2008-2015, 2Q11 Update"

"Magic Quadrant for LTE Network Infrastructure"

Mobile Music Streaming

Analysis By: Mike McGuire

Definition: Mobile music streaming is accessing music that is streamed from a service provider to a user's connected device via a browser app or dedicated application, or streamed from a cloud locker provider that hosts the user's music library. Streaming service providers license content directly from rightsholders, while cloud lockers (such as those from Apple, Amazon and Google) are designed to allow consumers to upload their personal libraries and access them via a connected device. Both types enable users to cache tracks for offline listening.

Position and Adoption Speed Justification: For this year, we have upped the benefit rating for mobile music streaming to "high" from "moderate." There are two reasons for this increase. First, in 2011, online music subscription services that have streaming capabilities grew their user bases — both free and paid subscribers — significantly. Subscription services increased their revenue contribution to the music industry in 2011 as they added paying subscribers, including Spotify, which claims to have 3 million paying subscribers. In the U.S., subscription revenue grew by 13% to $240 million, according to the Recording Industry Association of America (RIAA).

While download-to-own online stores, particularly Apple's iTunes, continue to dominate both units sold and revenue contributions to the industry, streaming services are growing in popularity. Music labels, service providers and consumers are showing increased interest in streaming, either as the primary mode of consumption or as a rich discovery and sampling of music. This interest is enabled by the evolution of mobile wireless from third generation (3G) to fourth generation (4G)/Long Term Evolution (LTE) technologies, as well as the maturation of Wi-Fi. That said, some artists have been complaining about the relatively low monthly payouts they receive from the streaming services — both wired and mobile. Gartner does not ignore those concerns about artist payouts, but we note that, by and large, that problem lies with the artists, their managers and the music labels, and had no direct relation to the technology itself.

As noted in 2011's Hype Cycle, the recent popularity of mobile music streaming is driven by increased adoption of smartphones by consumers and, in particular, the availability of music applications, which, in many instances, are extensions of existing PC-based online services, such as Rdio, Rhapsody or Spotify. One of the key benefits of these apps — for consumers, rightsholders and artists — is the offline usage mode that allows a consumer to cache a large amount of albums/songs on their devices, limited only by the storage capacity of the mobile phone or media tablet they are using.

In general, mobile music streaming comes as a subscription-based service. To justify billing for music when consumers have multiple options for getting music for free, service providers must continue — as most are — to experiment with different features, including those coming from social networks and third-party application providers. An alternative business model offers a free service supported by advertising, in a similar way to broadcast radio, and is being embraced by Clear Channel with its iHeartRadio smartphone applications.

User Advice: Technology and service providers offering mobile music streaming should:

- Target consumers who are focused on the benefits of streaming services as a discovery tool
- Use application stores as channels for distributing streaming services as downloadable applications — such as iOS, Android and Windows Mobile — also develop HTML5 alternatives for browser-based offerings
- Integrate the streaming service with other media-related features and services, such as links to download stores, playlist creation and publishing, and other cross-selling opportunities, such as linking to live concert databases and ticket sellers

Business Impact: Mobile carriers are keen to derive revenue from value-added services, such as music, to augment their wireless data revenue opportunities. The trend is to partner with music solution providers, as Orange has done with Deezer.

Music streaming application providers are, in most instances, relying on advertising revenue. They can also drive revenue from subscriptions to their PC-based service, when mobile access is only an extension of the initial PC offering.

Other participants in the music industry are looking at ways to compensate for the decline in sales of physical-format recordings.

Mobile streaming services allow access to a wide range of music without requiring the user to manage the device's memory (unless they're caching content for offline usage), but force consumers to consider how usage impacts their wireless data plans.

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: Deezer; Kkbox; Mog; Rdio; Rhapsody; Spotify

Recommended Reading: "Media IAS Online Music Forecast, 2011-2015: Social Media, Subscriptions and the Cloud"

Mobile TV Streaming

Analysis By: Shalini Verma

Definition: Mobile TV streaming refers chiefly to the delivery of TV content via streaming or progressive download technology over HTTP to smartphones and media tablets, which provide access to this content from cellular or Wi-Fi networks through a mobile app or mobile browser. Content may include both live TV and catch-up TV.

Position and Adoption Speed Justification: The growing adoption of smartphones is prompting pay-TV operators and Internet TV providers to offer a wider choice of content via smartphones and media tablets. The following types of mobile TV service and app have emerged:

- Mobile versions of Internet TV — Providers such as Netflix and Hulu offer mobile versions of their Internet TV services as part of a multiscreen strategy.
- Companion apps — These apps for smartphones and tablets offer some TV content and features such as remote control, check-in, social sharing and program guides.
- Pay-TV operators have continued to enhance companion apps and extended them to multiple platforms, while Internet TV providers have tried to enhance the viewing experience. Mobile TV streaming is increasingly becoming a part of a multiscreen experience. Key developments of the past year include:
- A consortium called the Digital Entertainment Content Ecosystem launching UltraViolet, a digital rights management (DRM) and cloud-based licensing system. This gives users options to watch movies and TV shows on a variety of devices, including smartphones and tablets. It resolves the DRM constraints on accessing TV content within personal clouds.
- Apple enhancing AirPlay for iOS 5, which lets users wirelessly mirror the screen of an iPad 2 or the new high-definition (HD) iPad on an HDTV set, so offering more flexibility to Apple users.
- Aereo launching a Web-based TV service in New York City, which attracted lawsuits from traditional broadcasters. It uses tiny antennas in its data center to broadcast TV channels via the Web to connected devices. Although its fate remains unclear, this initiative shows that technology alternatives will try to bridge the worlds of the Internet, mobile telecommunications and cable TV.
- nimbleTV acting as payment intermediary for traditional TV channels for cloud-based delivery.

User Advice: Internet TV providers, pay-TV operators and broadcasters should focus on optimizing the multiscreen experience through ease of personalization and seamless switching between connected devices.

Providers of mobile TV streaming should partner with communications service providers (CSPs), with the aim of getting prioritized traffic and higher visibility on phone menus and mobile portals, in return for a revenue-sharing or fixed-fee arrangement with the CSPs.

Business Impact: Mobile TV streaming is now part of a multiscreen experience and has extended to subscribers of large-format TV services. The delivery of mobile TV will evolve as part of a personal cloud experience, in which the content delivery experience becomes more important than the platform and the format or length of the content.

Although people will still watch streamed mobile TV mainly via Wi-Fi, its delivery over cellular networks will continue to impact mobile data traffic usage and revenue, especially during major sporting events.

TV service providers will continue to enhance their apps and services on mobile platforms to retain customers. However, apps will remain limited in their geographic reach, and monetization of mobile TV streaming in isolation will be limited.

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

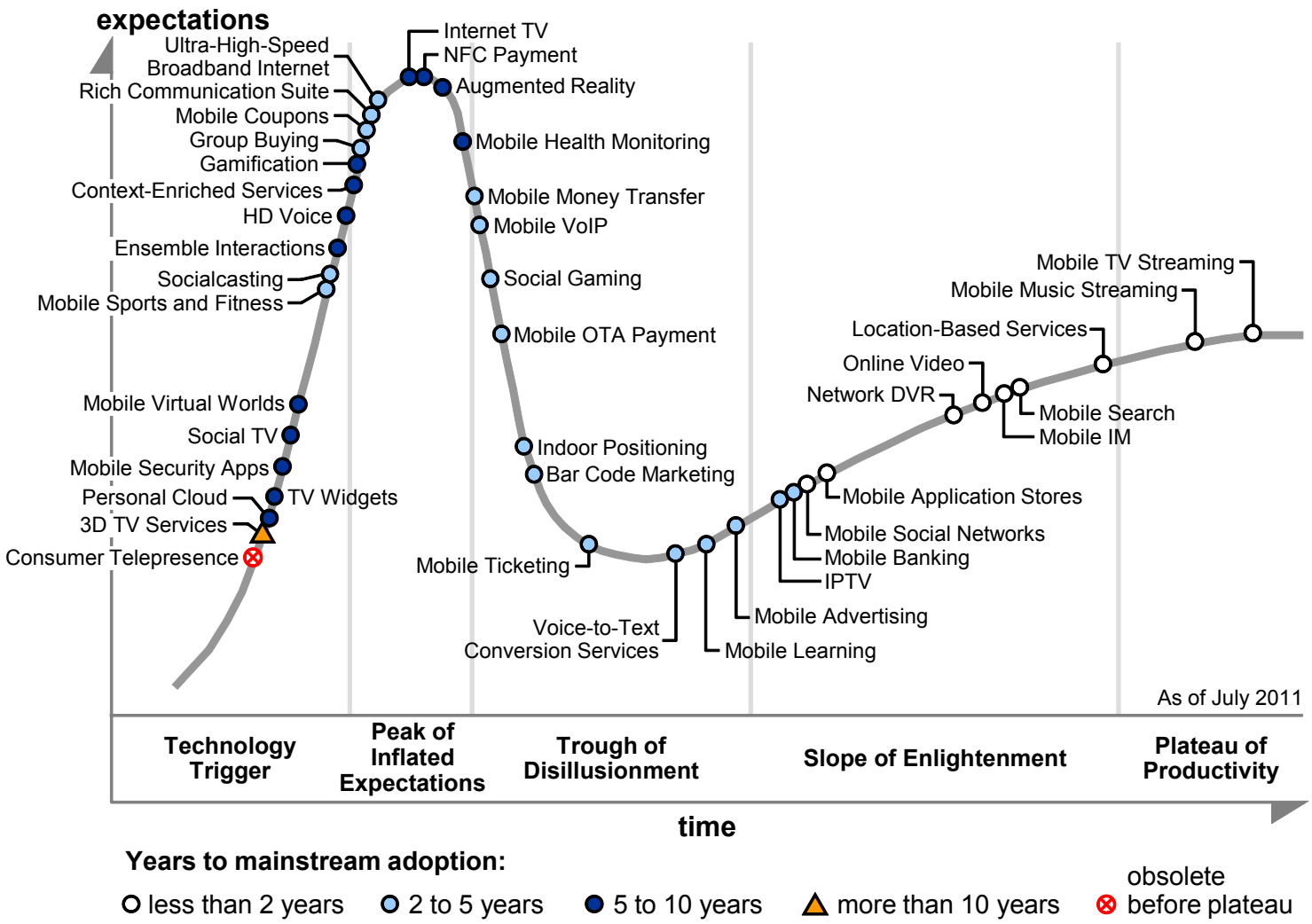
Maturity: Early mainstream

Sample Vendors: BBC; Comcast; HBO; MobiTV; Netflix; YouTube

Recommended Reading: "Market Trends: Worldwide, the State of Mobile Video, 2012"

Appendixes

Figure 3. Hype Cycle for Consumer Services and Mobile Applications, 2011



Source: Gartner (July 2011)

Hype Cycle Phases, Benefit Ratings and Maturity Levels

Table 1. Hype Cycle Phases

Phase	Definition
Technology Trigger	A breakthrough, public demonstration, product launch or other event generates significant press and industry interest.
Peak of Inflated Expectations	During this phase of overenthusiasm and unrealistic projections, a flurry of well-publicized activity by technology leaders results in some successes, but more failures, as the technology is pushed to its limits. The only enterprises making money are conference organizers and magazine publishers.
Trough of Disillusionment	Because the technology does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales.
Slope of Enlightenment	Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the technology's applicability, risks and benefits. Commercial off-the-shelf methodologies and tools ease the development process.
Plateau of Productivity	The real-world benefits of the technology are demonstrated and accepted. Tools and methodologies are increasingly stable as they enter their second and third generations. Growing numbers of organizations feel comfortable with the reduced level of risk; the rapid growth phase of adoption begins. Approximately 20% of the technology's target audience has adopted or is adopting the technology as it enters this phase.
Years to Mainstream Adoption	The time required for the technology to reach the Plateau of Productivity.

Source: Gartner (July 2012)

Table 2. Benefit Ratings

Benefit Rating	Definition
Transformational	Enables new ways of doing business across industries that will result in major shifts in industry dynamics
High	Enables new ways of performing horizontal or vertical processes that will result in significantly increased revenue or cost savings for an enterprise
Moderate	Provides incremental improvements to established processes that will result in increased revenue or cost savings for an enterprise
Low	Slightly improves processes (for example, improved user experience) that will be difficult to translate into increased revenue or cost savings

Source: Gartner (July 2012)

Table 3. Maturity Levels

Maturity Level	Status	Products/Vendors
Embryonic	▪ In labs	▪ None
Emerging	▪ Commercialization by vendors Pilots and deployments by industry leaders	▪ First generation High price Much customization
Adolescent	▪ Maturing technology capabilities and process understanding Uptake beyond early adopters	▪ Second generation Less customization
Early mainstream	▪ Proven technology Vendors, technology and adoption rapidly evolving	▪ Third generation More out of box Methodologies
Mature mainstream	▪ Robust technology Not much evolution in vendors or technology	▪ Several dominant vendors
Legacy	▪ Not appropriate for new developments Cost of migration constrains replacement	▪ Maintenance revenue focus
Obsolete	▪ Rarely used	▪ Used/resale market only

Source: Gartner (July 2012)

Recommended Reading

Some documents may not be available as part of your current Gartner subscription.

"Understanding Gartner's Hype Cycles, 2012"

"Market Insight: Ten Consumer Mobile Applications to Watch in 2012"

"User Survey Analysis: Consumer Services and Mobile Applications, Worldwide, 2011"

"Predicts 2012: Personal Cloud Will Reshape the Consumer Services and Applications Landscape"

"Agenda for Consumer Services and Applications, 2012"

"Cool Vendors in Consumer Mobile Applications, 2012"

"Cool Vendors in Consumer Services, 2012"

This is part of a set of related research. See the following for an overview:

- Gartner's Hype Cycle Special Report for 2012

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