

WHITE PAPER

Seizing the Brass Ring: Challenges and Opportunities Offered by Mobilizing Content

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EXECUTIVE SUMMARY

Because of the blistering speed of wireless innovation and a subscriber market that has proven to be highly receptive to mobilized content and entertainment, the wireless industry has moved, in just over 1,000 days, from wondering "will data and content ever happen?" to "how do we get ahead of the curve?" Simple "narrowband" content such as ringtones and games were the breakout applications that moved wireless users beyond basic voice and text messaging. But the staggering growth of these simpler forms of content has severely strained the operational support systems of wireless providers. At the same time, the advent of 3G networks and handsets is rapidly moving the industry toward a wireless "broadband" market ideally suited for mobilized content such as entertainment and sports videos, repackaged TV programming, real-time multi-player games, music track downloading, rich messaging, and enterprise LAN document access. However, the enormous opportunities posed by wireless broadband content pose even more complex content management challenges for wireless service providers.

To maximize growth and revenue opportunities in the burgeoning wireless content space, wireless service providers need to implement end-to-end content management solutions. Such solutions are needed to ensure cost-effective and scalable content management capabilities, and to provide best-of-class content experiences by users which, in turn, drive further content adoption and usage. A comprehensive content management solution must address core issues such as acquiring, managing, and releasing high volumes of timely, accurate, and desired content to specific end users. Additional issues such as content organization, storage, retrieval, security, and DRM must also be supported. And the only cost-effective way to address such complex and inter-related issues, even in the medium-term, is through end-to-end solutions that are integrated, automated, flexible, and fully scalable.

INTRODUCTION

Management of content acquired from Media, Entertainment, News or other content distributors will be core to the wireless service providers' success in broadband content markets specifically, and more generally in the broader wireless market. As voice and even messaging become commoditized products, mobilized content holds the promise of filling the broadband "pipe" of 3G networks with higher revenue growth opportunities.

But mobilizing content occurs in a new ecosystem and poses new challenges. For instance, wireless service providers must interface with new players in the value chain, such as thousands of content providers and dozens of content aggregators. Individual wireless users have different devices and different content needs and usage patterns. Content management systems need to address content lifecycle processes such as ingestion, rendering, tagging, packaging, reviewing, publishing, and archiving. The complexity of the total mobilized content ecosystem requires a new operational management approach that can address both today's needs and tomorrow's unknowns. It also needs an end-to-end, long-term approach to allow the market to grow as fast as possible.

Mobile Content Overview

Wireless subscribers want more mobilized content. The enormous growth of narrowband content, such as games, ringtones, e-mail access, and PIM, has already shown that wireless users prize mobilized content. The success of more complex second-generation offerings such as Vodafone *live!* and Sprint PCS Vision—and even the uptake of laptop access via WLAN and WAN aircards—are leading indicators of market receptivity to such broadband content as full music tracks, sports highlight videos, LAN document access, and rich messaging. Paralleling user acceptance for more content, there is greatly expanded interest from content providers and aggregators who possess and distribute content, and who are "eager" to pursue opportunities within the mobile marketplace.

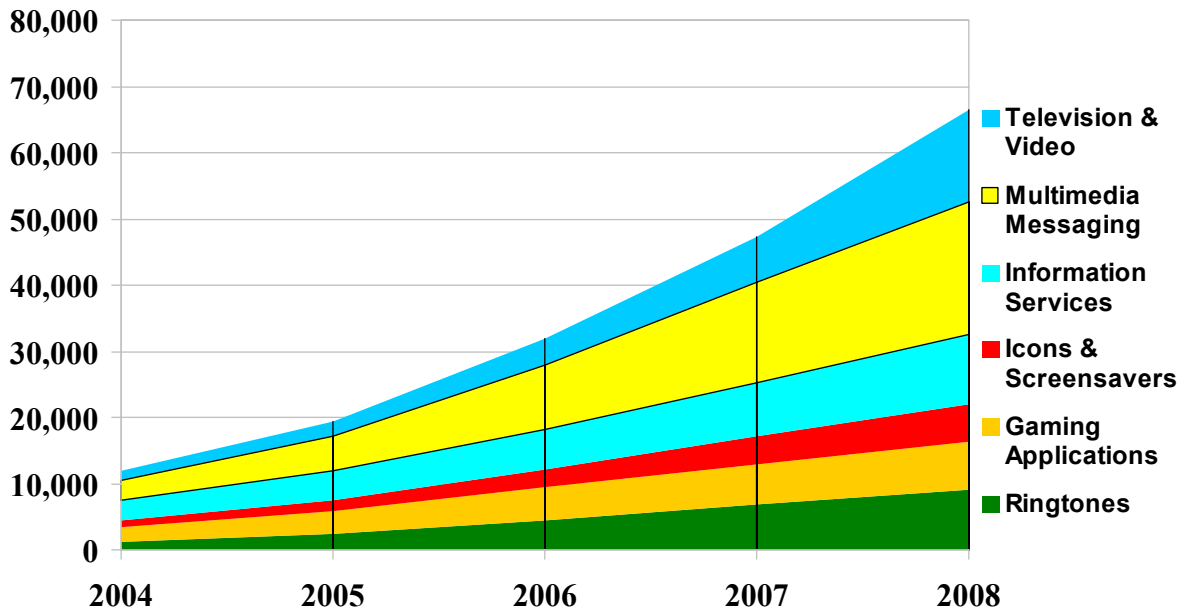
But the market success of narrowband content has also highlighted the core issue of content management. The delivery of mobilized narrowband content today is often a hodge-podge of application-specific solutions, legacies of speed-to-market decisions in a capital-constrained market where broad market receptivity was uncertain. This proverbial "making sausage" approach simply cannot effectively support mobilization of broadband content in the medium term, much less meet long-term needs.

The ecosystem demands are different when mobilizing broadband content. Owners of the most prized content won't release it into a wireless content management world that looks radically different from the wireline counterpart which works so smoothly. Scalability and automation become key in dealing with rapidly increasing volumes and reducing costs throughout the value chain—especially for wireless service providers. Content organization, storage, and retrieval become more important for wireless service providers, their subscribers, and the content source providers. And the quality of the end-user experience becomes paramount to ensuring adoption of new services, purchasing of content, and broad-based market growth.

Mobilized content plays an even more important financial and competitive role for wireless service providers—as an ARPU driver (see Figure 1). While narrowband content has paved the way for broadband content, narrowband content such as messaging and screensavers has simply replaced declining voice ARPU. Mobilizing more content—especially broadband content—holds the promise of actually increasing ARPU and total revenues for wireless service providers. And, if done really effectively, AMPU (Average "Margin" Per User) could increase as well.

FIGURE 1

Global Content Growth



Source: IDC, 2005

OPTIMIZING MOBILE CONTENT OPPORTUNITIES

End-User Needs

High-quality experiences with mobilized content are critically important to wireless users in order to drive both broad-range adoption and increased content usage on an individual level. This is already apparent in the data metrics being reported by wireless providers. Those providers with better organized and integrated narrowband content offerings are typically doing better in terms of driving data ARPU than carriers with a more fragmented approach. Therefore, end-to-end content management solutions play an important role in assuring quality wireless end-user experiences by providing a number of key capabilities, including:

- ☒ **Ease of content discovery and exploration** with good content organization, sophisticated content tagging, logical content links, and individual user profiles that, in turn, can support search and recommendation engines.
- ☒ **Optimized content performance** with thorough multi-device transcoding specific to the user's wireless access devices—which may change in the space of a day when a user changes from a business device to a personal one.

- ☒ **Integrated storage and retrieval functions** that allow end-users to retain use content over time, move content on- and off-device, and organize their content in a manner that will optimize their own content experience

Wireless Service Provider Needs

Service providers have even greater needs that go beyond optimizing content experiences for their customers. Service providers must ensure that meeting the challenges of delivering mobilized content are translated into opportunities to lower their own costs via automation into the content handling process, and to build solutions that address both current and future needs, and can be integrated into legacy systems. A robust content management solution should not only be end-to-end, it should also meet wireless service provider needs to support the following:

- ☒ **Integration with existing systems**, including billing, customer service, and other OSS support systems
- ☒ **Rapid subscriber growth**, which is likely given the market receptivity to even some of the simplest forms of content, such as ringtones and e-mail access
- ☒ **Usage growth**--many new forms of mobilized content will be used more frequently, such as sports highlights that are downloaded throughout the day
- ☒ **Evolution of new usage patterns** for content formats such as a promotional video for a movie intended to be shared for free among wireless users
- ☒ **Growing amount of content**, for example, a library of 100,000 downloadable music tracks
- ☒ **Evolving content types**, such as repackaged TV programming, personal videos, m-greetings, and corporate forms and documents
- ☒ **Storage**, and the "location" of storage, for ever-increasing quantities and types of content, such as daily news stories. Storage needs to accommodate immediate availability, or archival for further searching
- ☒ **Security** against a growing array of potential threats to both systems and content integrity, ranging from hacking, to viruses, worms, spam, and rogue content
- ☒ **Digital Rights Management**--to ensure that revenue for both wireless service providers and content providers is adequately protected

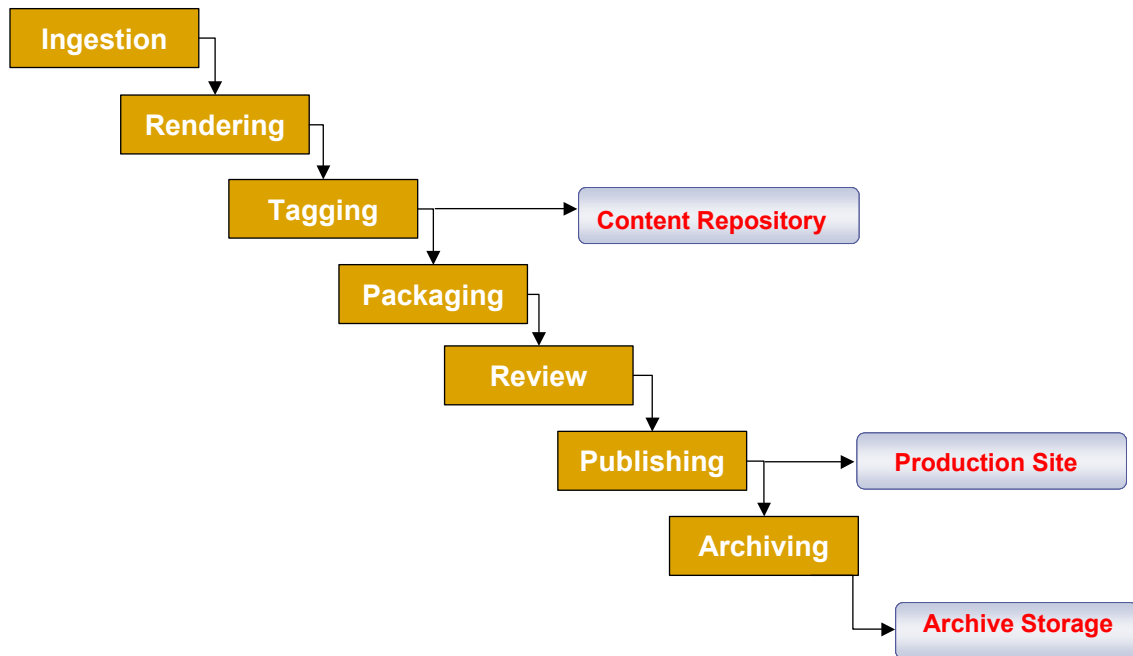
Integrated Content Management Solutions

Since integrated, end-to-end content management solutions offer the best opportunity to get ahead of the content demand curve and maximize the full revenue potential of 3G networks, it is important to understand what components need to be integrated and what "end-to-end" actually means for content management.

Although content types can vary from a simple text-based message to a TV program video clip, most forms of content share a common lifecycle (see Figure 2).

FIGURE 2

Content Life Cycle Management Process



Source: IDC, 2005

The content life cycle includes the following stages and process:

- ☒ **Ingestion** is the stage at which new content enters the wireless provider's content management system--for instance, when a ringtone is released by its developer or a TV clip is sent by a TV studio.
- ☒ **Rendering** is the stage at which the content is transcoded and formatted for different devices and different uses, such as a game that will be offered in both free-trial and full-use formats across a range of devices.
- ☒ **Tagging** is when management information is attached to the content, which may be the content type, DRM rules, pricing information, and storage rules, such as a weather update that is available for only four hours and then automatically deletes, or a World Series video clip that will be archived permanently.
- ☒ **Packaging** is the stage at which the content is finalized into the form experienced by the end-user --for instance, with additional content links attached or service provider menu bars displayed.

- ☒ **Review** is the stage at which content undergoes automated or manual final reviews, such as tests for proper content functioning, and for ensuring content links are active, and content tags are complete and interfacing correctly with service provider systems.
- ☒ **Publishing** is when content becomes available to customers, such as a ringtone that is available at precisely 5:00 p.m. on a particular day to coincide with an album's release.
- ☒ **Archiving** is the stage when content is no longer in sufficient demand to warrant storing on servers that provide immediate content availability, but nevertheless is worth retaining for searching and retrieval.

From a wireless service provider perspective, robust content management solutions must address the following key requirements:

- ☒ **Content community** interfaces, which include dozens of major aggregators, movie studios, record label companies, and up to thousands of sources of additional content, such as individual developers and local media outlets.
- ☒ **Integration with legacy OSS**, such as billing, customer care, and finance.
- ☒ **Integration with internal organizations**, such as customer care staff, product development, and marketing.
- ☒ **Storage**, which will need to address short- and long-term content storage needs of the service provider and its end-user customers.
- ☒ **Retrieval** of content that may be stored differently, such as purchased content that is stored off-device for a subscriber and immediately available, versus a music video clip that must be searched for among archived content files.
- ☒ **Moving** of content among different environments and locations, as between an end-user's device and their off-device storage vault, and within the carrier's storage systems—such as a song that is popular again from being in a hit movie.
- ☒ **Sharing** of content to drive the viral adoption that has proven so critical to rapid narrowband content, while supporting applicable DRM. Examples include an m-greeting card that one user sends to another but is forward-locked, or a promotional video clip that is intended to be shared freely among wireless users.
- ☒ **Transfer** of content among an end-user's devices, such as a purchased ringtone from a business handset to a personal handset, or a music track from a PC to a wireless device.
- ☒ **Security** that not only enhances DRM but also pro-actively guards against threats such as viruses, worms, corrupted or rogue content, spam, and, of course, hackers.

Predicating a wireless content management solution on a comprehensive policy-based approach is also a key issue to consider. For instance, the policy can allow a

high degree of automation and a reduction in exceptions requiring human intervention and review. Content policies can reduce the effort spent in content transcoding and testing when content originates from a provider that has a strong record of high-quality transcoding, or, conversely, can ensure more thorough scrubbing of content that originates from a less-experienced provider. Rules can also automatically screen out adult-oriented content for manual human review for appropriateness, but allow other forms of content that are clearly appropriate for anyone to be published automatically.

Flexible infrastructures and systems are fundamental to ensuring that wireless content—ranging from ringtones to m-greetings to broadband TV programming—can be supported by the same solution. Core issues to consider are that content itself comes in many forms with different characteristics—such as "static" content like a screensaver that does not change once published, as opposed to an evening news clip that needs to be refreshed every half hour. Even video itself has different characteristics. A music video is typically a larger file because of the action that is captured, whereas a simple news read of headlines is generally a smaller content file. A flexible solution needs to account for these differences, and also address the growing opportunity of user-created content, such as mBlogs and video messaging that may be used in place of camcorders within the next few years.

And, finally, scalability of content management solutions is an issue with a unique impact to wireless providers. Today, wireless providers are justly proud of having reached key content milestones in just over three years, such as the availability of over 500 applications to their customers. However, wireless providers must rapidly prepare for a 3G wireless broadband environment in which they must efficiently manage *billions* of content objects. The only way to make that leap efficiently and cost-effectively is through solutions that are fully scalable to address medium- to long-term needs.

Partnering With a Content Management Solutions Provider

Wireless content offers both enormous opportunities as well as new challenges. Therefore, a decision to partner with a content management solutions provider is a critical decision for wireless carriers. Key criteria when evaluating a content management partner include:

- ☒ **Experience:** The provider's experience in delivering content management solutions is perhaps the first consideration. Experience factors include named customer deployments, the focus and scale of any such deployments, and industry sectors with whom the provider has worked, such as recent wireless carrier trials and deployments.
- ☒ **Customer Base:** If a solutions provider has customers that are leaders in their respective fields, it generally denotes a high degree of competency. Industry-leading companies often look to best-of-class solutions providers to maintain and enhance their own competitive position, and have the means to leave if dissatisfied.

- ☒ **Customer References:** Satisfied customers are often willing to talk to other potential customers to share their experiences with a solutions provider. A solutions provider with many satisfied customers should be able to provide a number of references for a prospective client to contact and talk about their experiences.
- ☒ **End-To-End Approach:** Comprehensive end-to-end approaches are critically important for wireless content management. An end-to-end approach is one of the best ways to ensure compatibility of solutions components, and the ability to control, and even lower, costs over time.
- ☒ **Flexibility:** Flexibility of the content management solution is also a key decision factor. Content is one of the most dynamic areas of communications, and countless types of content and applications must be supported in order to fully realize the promise of 3G network and device investments.
- ☒ **Scalability:** Scalability of a solutions package has unique implications for wireless content management. Within the space of the next few years, wireless service providers must scale from managing hundreds of applications, to billions of content objects—and do so while efficiently managing cost metrics.
- ☒ **Provider Partnerships:** A content management solutions provider's partnerships are especially important given the complexity of the content management ecosystem. No one company could have every needed strength and proficiency. Best-in-class solutions providers are typically allied with partners that are best-in-class in their respective areas, together offering comprehensive solutions for their customers.

CONCLUSION

To fully realize the enormous growth and revenue opportunities in the exploding wireless content space, wireless service providers need to implement comprehensive end-to-end content management solutions. The staggering growth of simple forms of content, such as ringtones and games, is already severely straining the operational support systems of wireless carriers. At the same time, the advent of 3G networks and handsets is rapidly moving the industry toward a wireless "broadband" market ideally suited for mobilized content of nearly limitless types and volumes.

The opportunities posed by wireless broadband content pose complex content management challenges for wireless service providers that require a comprehensive, flexible, and scalable solutions approach. A comprehensive content management solution must address core issues such as acquiring, managing, and releasing high volumes of timely, accurate, and desired content to specific end users, and provide efficient interfaces with the growing content development community. Additional issues, such as content organization, storage, retrieval, security, and DRM, must also be supported, along with integration with legacy systems, OSS, and functional groups like marketing. The only cost-effective way to address such complex and inter-related issues, even in the medium-term, is through end-to-end solutions that are integrated, automated, flexible, and fully scalable.

The wireless service providers that embrace the full potential of wireless content, while pro-actively implementing a new mobile content management approach, will be well positioned for success. Such providers have the opportunity to reduce costs, provide richer content experiences, and ultimately differentiate themselves as best-of-breed service providers. And, as markets around the world are beginning to show, the best-of-breed providers are the ones most attractive to innovative content providers and, most importantly, to wireless customers.

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