Review, Rate and Evaluate … Prioritize the Business Models and Win!

Alcatel-Lucent invites you to enter our contest by evaluating the business models described in the enclosed “Business Transformation: Advanced Business Models” article.

Winners will be selected randomly to receive one of the following prizes:

**Grand Prize:** Apple iPod touch

**Second Prize:** Apple iPod classic

**Third Prize:** Apple iPod nano

**General Terms and Conditions**

Contest open to anyone 18 years or older with exclusions. Employees of Alcatel-Lucent and/or its affiliates, advertising, promotion, and production agencies, and members of their immediate families or those with whom they are domiciled are not eligible. All entries must be received by the September 1, 2008, deadline. All ideas, concepts, and other intellectual property rights associated with an entry will become the property of Alcatel-Lucent.

Log in to www.alcatel-lucent.com/enrich/contest to receive the full contest rules and enter to win. Full terms, conditions, contest rules, and entry forms can also be requested by mail. Entries may be submitted at the following address: Enriching Communications Editor, Alcatel-Lucent, Room 3B-400, 600 Mountain Ave., Murray Hill, NJ 07974-0636 USA. When mailing, please be sure to include your return address.

iPod is a trademark of Apple Inc., registered in the US and other countries.
The spirit of this edition of Enriching Communications is to put a spotlight on these changing market dynamics and to offer thought-provoking insights into what might otherwise go too long unquestioned.

The spirit of this edition of Enriching Communications is to put a spotlight on these changing market dynamics and to offer thought-provoking insights into what might otherwise go too long unquestioned. New entrants are creatively capitalizing on end-user needs with personalized services; new business models are being increasingly employed to compensate for connectivity becoming a commodity. As an example, Alcatel-Lucent estimates that the shift in advertising and “sponsored” spending alone will be $48 billion USD (€31 billion) as brand managers and enterprise marketers move to new online, mobile and other interactive media. Those who effectively break the rules will prosper in the new value chain. The bottom line is that business agility and a proactive approach to meeting evolving customer demands will separate those who thrive from those who will fail to survive.

Personalized services are an imperative. Mass segmentation schemes will no longer sustain a vibrant business. Communications service providers and enterprises alike are uniquely positioned to transform their offerings by mining and carefully analyzing their end-user intelligence—an intangible asset that can be used to tailor offerings, ultimately creating a more compelling customer experience and service value.

At Alcatel-Lucent, we question the status quo every day to help our customers innovate, stay relevant and achieve successful financial results. We hope you’ll find the articles from our experts and customers insightful in highlighting the important trends, strategies and technologies that will help you succeed.

As always, we welcome your feedback and hope we have sparked your thinking in creating your own New Rules.

Sincerely,

John Giere
CMO, Alcatel-Lucent

www.alcatel-lucent.com
Dear Customers,

Rarely, if ever, in our industry has there been a moment such as this. On the one hand, a vista of opportunity and boundless possibility; on the other, a hazy and unsettling sense of technological, regulatory and market uncertainty. At such a time, when the virtues of disruption are sometimes hard to distinguish from the perils of chaos, it’s no wonder that vendors and customers alike are exploring new rules to chart their courses to safety and prosperity.

Our dilemma, of course, is that, as leaders of the telecommunications revolution, we are sorely tempted to say there are no rules. Time and again, we have shown that as soon as one set of rules is proclaimed, we can remake it on the wave of a new technology, a new application or a new business model. Rules, like records, exist only to be broken.

And yet, even as change agents, we recognize certain imperatives. Certain constants, not rules we impose on ourselves – like the rules of a game – but rules we recognize as fundamental, like the dynamics of a market or the laws of physics. We know that customers migrate to value. We know that service providers and enterprises live and die by their abilities to deliver what their customers want – insight, awareness, entertainment, socialization, fulfillment, productivity – at the time and place they want it.

The question is, how are these fundamentals of the communications economy manifested in the shockingly new ecosystem of telecom? How – in the kaleidoscopic interplay of merging platforms and emerging business models – are these underlying imperatives being obscured? How are they being addressed? And who is best positioned to take advantage? How can we, as vendors, help our customers recognize and act on the “new” rules while remaining adaptable to game-changing possibilities just over the horizon?

These are the questions at the heart of this edition of Enriching Communications. Indeed, they are at the heart of what we do at Bell Labs. Our researchers – from mathematicians and network architects to nanotechnologists and human interface scientists – are collaborating across the company and across our client base on efforts that span security, privacy, geofencing, peer-to-peer transactions, identity management, and a host of initiatives that will provide for our customers, the insight and options they need to generate value for theirs.

In the articles that follow, we share a little of that insight, gleaned from Alcatel-Lucent researchers, strategists and customers who grapple every day with the new rules in our industry. We look forward to your feedback.

Sincerely,

Dr. Jeong Kim
President, Bell Labs, Alcatel-Lucent
Learn about companies engaged with “New Rules”.

- Letter from our President of Bell Labs, Dr. Jeong H. Kim ............................................. 1
- Introduction: New Rules in the Communications Economy ............................................. 4
  By J. Marinho, S. Mukerjee
- Trends: Getting to a Segment of One ................................................................. 6
  By J. de Francisco López
  Emerging trends are driving the industry toward “segment of one” marketing rather than relying on traditional market approaches.
- Market Perspective: Escaping the Commodity Trap ......................................................... 10
  By Emily Nagle Green, President & CEO, Yankee Group Research, Inc.
  Smarter pipes hold the answer to restoring competitive differentiation in an increasingly commoditized environment.
- Alltel Sees Promise in Integrating Data Services with Flexible Voice Plans .................. 12
  By S. Searls, Senior Vice President, Supply Management, Alltel Wireless
  In the US wireless marketplace, success means standing out from the crowd. Learn how Alltel uses innovative technology to stay one step ahead.
- Connecting the Future .............................................................................................. 17
  By M. Kaddoura, Vice President for Fixed Access Network Planning and Business Solutions, du
  Cutting-edge communities require advanced business models to satisfy customers profitably. Read how du is future-proofing its business.
- Interactive IPTV: Leveraging Infrastructure to Stay in the Game .................................. 21
  By H. Leopold, Head of Platform and Technology Management, Telekom Austria TA AG
  Telekom Austria is leveraging user-generated content to push IPTV to a new dimension. Read how tomorrow’s TV is available in Austria today.
- Business Transformation: Advanced Business Models for Converged Communications .................................................. 26
  By Dr. E. Pittampalli, M. Nespatti, V. Faudon
  New business models can differentiate and create long-term value for telecom service providers by unlocking the value of their intangible assets.
- Transformation 2.0: Laying the Groundwork for Success in the New Communications Economy ................................................................. 32
  By A. Kowalk
  2.0 technologies are radically changing the competitive landscape. Transformation 2.0 provides a framework to develop effective 2.0 strategies.
- Transforming the Service Provider Revenue Engine ..................................................... 36
  By S. Mukerjee, J. Betjemann
  Service providers need to adopt new business models and strategies for revenue generation to respond to the changing wireless marketplace.
- Breaking the Rules: Finding New AVPU Through Click-throughs .................................. 42
  By J. Giere
  Innovative advertising models can generate fresh revenue streams in the communications industry.
- New Financial Instruments - A New Rule for Transformation ....................................... 47
  By M. Gibbens
  New ways to underwrite next generation infrastructure initiatives.
Mitigating Risk in the New Economy .................................................. 50
By Dr. S. Pastuszka, S. Vergnault, Dr. S. Betgé-Brezetz, Dr. A. Aghasaryan and P. Lopes
Using assets and intelligence across different service platforms is critical to capitalize on end-user trends and new business models.

CIO Perspective: CIOs May Learn to Love the Consumerization of Enterprise IT .................................................. 56
By E. Hackenson
CIOs explore upside of consumer technologies to develop enterprise system strategies.

Technology to Power the New Rules: Delivering on the Video Opportunity Promise .................................................. 58
By P. Wilford, E.Six
Innovative network solutions can address new service demands while maintaining the quality of experience and performance subscribers expect.

Hitting the Target with Television Advertising .................................................. 67
By Dr. S. Acharya
Television service providers can drive higher revenues by leveraging their IPTV infrastructure to deliver targeted ads.

An Integrated Approach to Content Networking .................................................. 69
By V. Hilt, M. Hofmann
Combining traditional content-distribution networks with peer-to-peer technologies creates a new breed of massive data dissemination networks.

Driving Revenue with Content .................................................. 71
By R. de Baracé
A managed and hosted service approach, to successfully launch new content services, monetizes your portal audience in a competitive environment.

Geopepper™ Applications Usher in a New Era of Geographic Messaging Services .................................................. 77
By M. Disbrow
New technology allows service providers to offer geographic-based messaging services.

The Dynamic Enterprise – Leveraging 2.0 Applications .................................................. 79
By X. Martin
The Dynamic Enterprise interconnects its network, people, processes and collective knowledge for continuous and transformative growth.

Eco-Sustainable Innovation Drives Profitable Business Growth .................................................. 84
By O. Baujard
Alcatel-Lucent’s innovation engine explores new ideas and opportunities to address environmental concerns while solving business problems.

Intelligent Sensor Networks Advance Eco-Sustainability .................................................. 89
By H. Viswanathan
Smart sensors and intelligent software empower innovative solutions for eco-sustainability.

Thermal Management Technologies for Telecommunications Equipment .................................................. 90
By A. Lyons
New materials, components and systems are being developed to enable the growth of functional density of equipment while reducing cooling costs.

Regional Spotlight: North America Entering Era of Integrated Business and Technological Innovation .................................................. 92
An interview with Cindy Christy, President of our Americas Region.

Letter from our CMO, John Giere .................................................. 97
The communications industry continues to undergo tremendous change, not only in terms of technology that redefines the user's experience, but also in terms of business models that change the economic, social and competitive global industry dynamic. The impact of players such as Google, Yahoo, YouTube, Facebook and so forth serves to continue the industry's momentum to continually reinvent itself. As in the 19th century with the evolution of the telephone from the telegraph, the industry today is at a crossroads; the next-generation Web, based on social networks, the evolution of the semantic Web, and pervasive visual communications will drive a new set of rules that define the 21st century. Looking forward, it is increasingly important to challenge assumptions about today's subscription-based business models and envision how the rules of the communications economy will change to embrace a variety of non-subscription-based, socially engaging and highly visual service models.

At a recent IBM Business Partner Leadership Conference in Los Angeles, Google CEO Eric Schmidt stated his view that “If it’s not searchable by Google, it’s not open, and open is best for the consumer…. People should be able to move from place to place, and their data is available everywhere…. Social networks are a real phenomenon of people living their lives online, and it has legs. We will have to deal with it as a society.” 1 If we look to the notion of the semantic Web, “The perfect search engine,” says Google

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2 http://www.google.com/corporate/things.html
co-founder Larry Page, “would understand exactly what you mean and give back exactly what you want.” Given the state of search technology today, that’s a far-reaching vision requiring research, development and innovation to realize. Google has said that it is committed to blazing that trail. Though acknowledged as the world’s leading search technology company, Google states that its goal is to “provide a much higher level of service to all those who seek information, whether they’re at a desk in Boston, driving through Bonn or strolling in Bangkok.”

Google and others may simply be the catalysts for changes that have yet to unfold. If we look back in time to predict the future, we readily see how patterns of innovation have driven major shifts in society and the global economy – triggered by new entrants. In Wealth of Nations, Adam Smith quotes leading figures of the Industrial Revolution, stating that “There have been, since the world began,” three great inventions which have principally given stability to political societies, independent of many other inventions which have enriched and adorned them. The first is the invention of writing, which alone gives human nature the power of transmitting, without alteration, its laws, its contracts, its annals, and its discoveries. The second is the invention of money, which binds together all the relations between civilized societies. The third is the Economic Table, the result of the other two, which completes them both by perfecting their object; the great discovery of our age, but of which our posterity will reap the benefit.”

The steam engine, the cotton gin and other innovations would have been irrelevant were it not for the “three great inventions.” Indeed the fourth great invention, completing the three described by Smith and Mirabeau, is today’s IP-enabled network/World Wide Web when we consider its transformative affect on global commerce, social networking, entertainment and almost every aspect of human endeavor.

While today, Google, Yahoo, Facebook and others have had an important role in the industry, they are just the initial actors – as were the steam engine and the cotton gin during the Industrial Revolution. One can say that the industry stands at the very beginning of a tremendous transformation that redefines communications, commerce and perhaps society as we now know it. In the same way that no one could predict that the ARPANET would evolve into the World Wide Web, indeed the ultimate effect of the wireless mobile Web, network convergence, mobile-TV, IPTV, online social networks and the rise of the Millennial segment, virtual reality environments such as Second-Life and others is yet to be fully understood. It is difficult to predict how the new and emerging rules will redefine the communications economy. Nonetheless, in this edition of Enriching Communications we look to explore the possible outcomes and the context of how the “New Rules” will drive business and economic growth, new business models and a new end-user value proposition.

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4 (says a very diligent and respectable author, the Marquis de Mirabeau).
Getting to a Segment of One

Making communications more personal

By J. de Francisco López

Traditional demographics-based segmentation tools alone are not enough and cannot identify critical new and changing end-user behaviors. Understanding these changing behaviors is essential for service providers to develop effective, new business models. Today’s drivers of end-user value are shaped more by use cases, behaviors and relationships with communications technologies than by just age, income or gender.
Introduction

In an environment where customers can readily choose where to take their business — and are savvy enough to want personalized, user-friendly services instead of just taking whatever is offered by a network operator — traditional mass market analyses are no longer sufficient to ensure success.

End users today are demanding personalized services in ways never expressed before (Figure 1). As a technology, IP is the enabler and is at the root of these changes. It has done two things that build on each other:

1. It has enabled new forms of competition and business models to enter the market; and
2. It is empowering subscribers to demand choice and control — key to a new generation of data-centric users — which is now transcending market segments thought to be homogenous until just recently.

At Alcatel-Lucent, we believe that, while demographic-based segmentation variables — such as age, gender and income — may help the industry understand the general direction of the market, these techniques alone will not provide the critical insight needed to address the individualized needs of today’s telecom customer. This is because major market dynamics and individual subscriber behaviors are changing rapidly. As a result, traditional marketing approaches alone will leave service providers out of touch with their customers.

The advent of IP, along with rapidly growing fixed and mobile broadband access, allows customers to communicate in ways that displace traditional telecom services. E-mail, instant messaging and VoIP are now very popular means of communications, and Rich Internet Applications along with new social networking technologies have created higher user expectations for multimedia and immersive experiences. As a result, new forms of value are being defined by end users, for end users.

Based on the Web 2.0 environment, emerging platforms such as Microsoft’s Popfly or Yahoo’s Pipes, and social browsers such as Flock, are enabling exciting user-generated mashups that aggregate and blend content from popular services such as YouTube, Flickr and Facebook. Most content management systems already integrate tagged content, allowing subscribers to search for related items and to be both creators and consumers of communications services.

Figure 1: Example of a customizable Mobile Media Portal, delivering a mashup of location relevant information
In some cases, these changes are weakening their relationships with network operators since many of these new user behaviors involve new business models, not all of which are based on the traditional subscriber-pay model. Instead, the new business models often end up offering subscribers free access to communications services, limiting the revenue potential of operators who stick to the traditional subscription-based way of doing business (see our article in this issue entitled, Business Transformation: Advanced Business Models for Converged Communications).

To keep pace with these fundamental changes in behavior, service providers must change not only what they are doing, but how they are doing things. And since new behaviors are being adopted differently by various subscribers, a one-size-fits-all approach for addressing them in this current context will not be effective.

At Alcatel-Lucent, we believe that understanding the human factors with regard to Quality of Experience (QoE), Quality of Service (QoS) and delivery, as well as adopting a more targeted approach to understanding and identifying end-user behavior patterns and usage contexts, should be a strategic imperative.

The Need to Adopt New Emerging Marketing and Service Delivery Models

These trends have significant implications for service providers as the consumer value proposition shifts from basic connectivity to customization and from verbal communications to shared multimedia experiences. A new generation of services is emerging. These services are aware of the relevant context, the user’s role as well as preferences and usage patterns. To remain competitive, service providers must differentiate themselves by adding value to these services and effectively managing QoE – all well beyond the connectivity platform.

To address this challenge, network operators need to adopt new business models, transcend the boundaries between wireline and wireless services and monetize always-on sessions. Today, the trend is for consumers to be far more engaged with communications technologies and define value well beyond basic voice and data services. Key drivers now include contextual personalization, service customization, collaboration tools, content sharing and community enablement. Service providers’ strategies need to reflect the varying degrees to which people engage with these technologies to connect with other people and communities. In short, new and adaptive business models must be learned and mastered.

Long tail economics is one type of new business model. Amazon.com offers a good example of how this model works. The company does not maximize its long-term sales from just the most popular selling titles but rather from personalized recommendations and subsequent sales of related products that have a specific appeal to individual users. The long tail effect continually feeds niche revenue streams from customers looking for more personalized products that suit their specific tastes. Amazon’s success is dependent upon identifying recommended add-ons for a distinct audience and then ensuring that they connect readers-to-readers and readers-to-books as well as to other associated merchandise. Another interesting example is Blip.tv – an online video service tapping into the fast growth of user-generated content. The company is hosting and supporting content creators, while
taking care of their promotion, advertising and distribution. The goal is to capitalize on quality content and cost efficiencies delivered by the mid-tail, which differentiates their offer from other popular services such as YouTube, while focusing on niche and well-identified communities and from traditional broadcasters whose businesses involve mass markets and much higher production costs.

The ability to personalize communication services is the essence of “segment of one” marketing, which can translate well for network operators, especially those offering services that are perceived to hold high value by end users. This dynamic also comes into play in advertising-driven business models that require an understanding of subscriber needs and preferences in order to deliver targeted messages that will resonate with them.

**Alcatel-Lucent – Enabling Innovation for a Better End-user Experience**

At Alcatel-Lucent, we believe it is necessary for service providers to have insight into behaviors – how their subscribers interact with technology, content and services – if they are going to remain relevant in this fast-changing environment. This behavioral approach will allow service providers to innovate by extending the “segment of one” concept to the broadest possible base of subscribers. This requires tapping into data mining and analytics to harvest key intangible assets that exist within their businesses.

Data analytics is an emerging area of research and a source of competitive advantage. Behavioral patterns can be coupled with a mix of leading and lagging indicators, which would include social networking graphs, bandwidth consumption and traffic patterns, usage of specific applications and branded services to support personalized experiences.

Once these profiles have been established, service providers are able to manage their infrastructure and service delivery assets as well as tailor offerings to meet QoE requirements not just for their end users, but for advertisers and brands who want to reach them. The end-result is to personalize the offers in a way that makes each subscriber feel they are being served uniquely.

Many service providers already use some of these tools and techniques to support traditional market segmentation strategies, but most would acknowledge that they are not yet leveraging them to their fullest potential. The trends in this area can be truly game changing as they enable more intimate customer relationships. These new business models can not only deliver revenue growth, they can also mitigate the risk of service providers losing market share to new media market entrants.

**Alcatel-Lucent’s deep understanding of human factors and networks, can help service providers integrate behavioral targeting into their market research initiatives and create the right mix of services today. Service providers can leverage this expertise and our global research on blended services and packaged offers to effectively capitalize on emerging trends to build a foundation to grow revenues and profits in today’s fierce competitive environment.**

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Have you seen this movie? The scene: A strategy discussion at a network provider. Crumbs from the afternoon snacks are everywhere, and the whiteboards are covered with diagrams. The discussion has touched on the emergence of the IP-based digital network, its exploitation by powerful new players like Google, the rocketing demand for IP video and, of course, the very real potential for regulatory prohibitions that could undermine the network’s return on capital. You can almost set your watch by the time the conversation reaches the point where someone says, “We just don’t want to be a dumb pipe.”

Escaping the Commodity Trap

Emily Nagle Green, President & CEO, Yankee Group Research, Inc.

Meaning, of course, that in the massive transformations underway in the communications sector, the revolution could crown new kings. The prior orchestration provided by the network providers themselves will slip from their hands, their new role relegated to that of stage manager, delivering nothing more than a platform for other firms to exploit for the benefit of their own customers and shareholders.

Are network providers right to be worried about the dumb-pipe scenario? The answer is an indisputable “yes.” As a global research and consulting firm exclusively focused on the emergence and implications of ubiquitous connectivity, Yankee Group has witnessed many episodes of rapid commoditization that could point to this same outcome for today’s network operators. The collapse of dedicated, proprietary consumer online services in the face of the exploding open-access, standards-based Internet may be the best recent example.

Looking more broadly at technology’s inexorable push, it’s clear that commoditization works like termites chewing at a house’s foundation: from the bottom up. As soon as the contents of any technology “box” (PC, peripheral, network or anything else) can be replicated, competitive forces bring market efficiencies to bear on its features, distribution, prices and margins. A part of the market is made more efficient but substantially less attractive to its original leaders. Who would you rather be right now: Dell or Microsoft? Innovation – also known as the quest for differentiation – must move up the stack.

So Don’t be a Dumb Pipe

While there may well be network providers who succumb to this fate – or deliberately choose to focus one part of their business on just being the best dumb pipe out there via the provision of best-in-class wholesale services – it’s not inevitable. Here’s why:

- There’s more to a network than bits. A network can know who and where its users are and provide that context to higher-level services. A network can create varying delivery experiences for differentiated prices. Even as new entrants have replicated traditional proprietary network services such as voice using the open Internet, getting packets from point A to point B is just part of what a network can do.

- The potential for services that take advantage of a smarter pipe is huge. Years ago, our thinking about how to use a computer network was limited to sending output to a shared printer. Now we’re sending movies and X-rays around the world. How far we’ve come! But we’re only at the beginning of a revolution in ways to use a ubiquitous network: that means the future holds not just more users, but more activities and devices per user. Our ability to conceive of the full scope of next-generation applications is still pretty limited, but our children are figuring it out for us.

Providers can escape the commodity trap by building an Anywhere NetworkSM. That’s Yankee Group’s term for a network fabric that is ubiquitous, seamless, high in capacity and, most importantly, highly intelligent. Some characteristics it must have are (see Figure1):

- Policy-driven, horizontally-integrated service controls
- Context-aware service creation, rating and charging
- Open interfaces to third-party content and applications
- Scalable, intelligent IP transport

This Market Perspective does not necessarily present the views of Alcatel-Lucent.
Exploiting a Smarter Network

An Anywhere Network is a set of high-IQ pipes. How can a provider escape commoditization if it builds one?

- **Expand the business models used to create revenue.** One key to creating a differentiated future is certain: providers cannot depend on the traditional billing model. Fortunately, as consumers begin to view their network activities as similar to the other media they use, a transition to economic support from advertising and marketing programs will seem logical to them. With a smarter network’s targeting abilities made available to marketing partners, the resulting experience will be less obtrusive to inappropriate consumers and provide value to those it targets. It could be, in fact, that advertising tied to an Anywhere Network might ultimately command the highest per-consumer revenues of any media.

  Revenues will also come from expanding devices on the network, but Yankee Group believes consumers will broadly resist a traditional subscription-style relationship for each of the connected devices they may use. Bundling the access offering into the device price, as in the Amazon Kindle e-book approach, will be an easier way to expand the demand for those additional devices.

- **Expand the sources of innovation beyond the organization’s own borders.** With a standards-based network and simple points of interface, network providers should be looking to support “mashups” of new service offerings that couple components of the net with elements from outside the network. The cultural legacy, in many provider organizations, of protecting the network from threat will not help. For these programs to succeed, management minds must be as open as the network.

- **Leverage the cost of the network’s assets across multiple owners.**

  As globalization expands network demand and standardization simplifies its physical core, cooperation among owners could help reduce the fundamental waste of duplicative infrastructure, freeing investment for more network IQ. If innovation and differentiation opportunities will be primarily at the top of the stack, why fight over the bottom?

Making it Work

The final ingredients that an Anywhere Network must have are management courage and informed stakeholders.

In the entertainment industry, film studio heads try many things, expecting some to fail. Successful leaders of an Anywhere Network must encourage an extended wave of rapid experimentation. “Fail fast” would be a better mantra inside the organization, for instance, than “Make our one big bet win.”

Informed stakeholders are those who understand the transformations required of the network to maintain or restore leadership, and who are less focused on near-term quarterly dividends and more insistent on progress reports on the transformation, expressed in simple but meaningful metrics that the business media can grasp.

The French have an expression they use to encourage someone in a challenging situation which I think is usually translated as “Hang in there.” But I prefer the original: Bon courage! 😊

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Alltel Sees Promise in Integrating Data Services with Flexible Voice Plans

By S. Searls

Whether it’s a voice mail platform or providing the highest quality radio frequency and switch network or migration to an IP Multimedia Subsystem (IMS) core and then leading the evolution to the next generation network – Alltel builds a large part of its business in partnership with Alcatel-Lucent.
As wireless penetration increases, the wireless industry as a whole is coming under increasing competitive pressure to offer more and more minutes for lower and lower subscription pricing. The United States market in particular is saturated with calling schemes, networks and devices, making it difficult for wireless operators to stand out from the crowd.

Alltel, one of the top five wireless providers in the US – and operator of the nation’s largest network – put more pressure on the industry this year as it offered more options for users seeking flexible calling plans. Even as the company moved in this direction, it also introduced new initiatives to add value – and generate revenues – on both the voice and data services sides of the equation. In so doing, Alltel demonstrated that the need to offer more minutes at less cost can be offset if service providers explore the opportunities that are created when innovative technologies are leveraged – innovative technologies that offer choice, control and convenience.

Network, Device and Service – It All has to Come Together for the Customer

Customers expect ubiquitous coverage and “always-on” availability; just test either one of those variables and you learn how sensitive and demanding customers can be. At the same time, customers expect to be able to make calling-plan choices that fit their lifestyles and needs. Some customers want to carefully manage their usage, whereas others see mobility services as their primary way to communicate and are drawn to plans that support unlimited communications. And the mobile device, the most personal part of the customer experience, is chosen for a wide range of reasons – from utility to fashion to self-expression. Although essential, the device is still only one piece of the total customer-care experience. Last, and perhaps the fastest growing area of opportunity, lifestyle-enabling applications and technologies are providing the most intriguing variable in the equation.

In looking across the new landscape of market opportunity, it became clear to Alltel that sustained long-term customer satisfaction would come from helping the customer discover value and use the products and services that best fit their needs. It’s about adding value to the total customer experience and being able to do that in a way that matches what customers are looking for across the entire spectrum of demand – from the user who wants a mobile phone for emergencies, to the small business owner who requires a mixture of data and voice features, to the young adult who has an almost insatiable need to stay connected to a circle of friends and acquaintances. Creating a platform to seamlessly cater to all of those needs is critical.

Interestingly, our primary user research highlighted a shift in customer attitudes. Whereas, at the start of the mobile phone revolution, users would scramble to get their hands on the latest mobile device with the latest functionality – color screen, polyphonic ringtones and so forth – we are now seeing that, for some customers, what the phone can do is becoming less important than what the user does with the phone. In other words, rather than segmenting our customers by rate plan or device, we believe it is more important to look at how they actually use their phones and analyze the corresponding behavior.
Segment Your Customers and Answer Their Needs

A large proportion of wireless customers simply use their phones to talk – and many of them talk a lot. Many of them simply require the convenience of a phone that accompanies them wherever they go. These customers can be described as voice-centric. The convenience of keeping in touch with family and friends anytime and anywhere is the hallmark of the voice-centric customer.

Additionally, the research clearly revealed a second type of customer – the media-centric customer. In this group, customers actively use a number of applications to maintain connectivity and enable communications. Messaging, whether it’s instant, text, picture or video, is the application they use. But it’s not the application that defines the customer; it’s their “social messaging” behavior and how they use applications to hook up with other platforms – such as YouTube, Facebook, MySpace or the simple ability to communicate without having to talk. For these customers, the device is the access point, and the carrier’s applications become a lifestyle-enabling platform.

Alltel’s approach to customers reflects this new reality. Customers are segmented by usage and behavior instead of by rate plan and device. Rather than trying to sell users services and applications they don’t need, Alltel is defining market services and applications that align with the way each segment behaves.

The strategy that was developed to answer customers’ real-world needs has three main thrusts.

• For voice-centric users, Alltel needed to stand out from the crowd. This was achieved in two ways: by creating a brand image that is accessible, cheeky and fun; and by creating competitive calling plans tailored to keeping in touch with the user’s close community – their family and friends.

• In addition, Alltel developed applications aimed at drawing voice-centric users into the data world, by offering them integrated services that add value to their communications experience in very concrete ways.

• For data-centric users, Alltel offered competitive calling plans and new applications that set it apart from the competition by making the process of accessing data applications simple and easy.

Changing Voice Users into Data Users

While Alltel believes that moves like these are necessary, given that even high-quality voice services are moving in the direction of commoditization, there are significant opportunities to leverage the relationship we have with customers to offer new, value-added data services that improve their lives and increase their usage of data services.

As voice and data become commoditized, it is important to help the customer derive incremental value from additional data products and services. By packaging offerings like My Circle with other data products and services, Alltel demonstrated that it can enhance the perceived value of its service, thereby reducing churn and increasing ARPU.

Alltel is finding that offerings like these have a chain-reaction effect; customers who engage with something they are

Attracting and Retaining the Voice-centric Crowd

This year, Alltel announced a major expansion of its My Circle® calling feature with the introduction of My Circle 5 and My Circle 20. These two new options build on the original My Circle 10, which offers customers unlimited calling to 10 numbers of their choice regardless of what network the numbers are on. New and existing customers on any rate plan over a certain threshold receive My Circle 5 and the ability to choose any five numbers on any network. Customers on higher rate plans will benefit from My Circle 20, which allows unlimited calling to the 20 numbers of their choice.
very familiar with – for example, voice mail – can then be inspired to do something completely new with it when it is converted to text, triggering the use of data services. Alltel is seeing that one valuable service can enable another as customers become more familiar with new applications.

As voice plans migrate toward unlimited packages, offering data-based revenues becomes a critical element of the wireless business model. Inspiring and enabling customers to experiment, innovate and adopt lifestyle-enabling – or enhancing – applications is central to driving new data revenues.

Data Services Access Made Simple
In order to optimize data services to drive new revenues in the mobile communications arena, it is important to make the mobile device more data-friendly. That is why Alltel developed a new technology called Celltop.¹ Launched in early 2007, the award-winning service uses patent-pending technology to offer customers an easier way to access, manage and organize the applications, games, downloads and web sites of their choice. Celltop is a mobile phone interface that gives customers more control and convenience over their wireless experience, using a unique and fully customizable technology that is similar to the desktop people see on their personal computers.

Celltop is free of charge and features 10 cells that come pre-installed. Additional cells may also be purchased from Alltel’s web site. Each cell is a category-specific half-screen comprised of graphics and text that provide shortcuts for wireless users to navigate through information and applications. These include things like call logging, weather, news, baseball, basketball, football, stock prices, text messaging inbox, ringtone downloads and so on.

The concept is similar to widgets on a personal computer. Celltop is open to the developer community and provides unlimited user expandability for new and unique cells.

Wireless carriers have been trying to solve the content discovery and navigation problem for years. Alltel worked closely with a creative consultancy to conceptualize, style and implement the Celltop technology to optimize the user experience across mobile devices. Alltel has also established key partnerships to provide content from established and respected names in the industry. For example:

- The news cell allows users to view top news stories and breaking news from the Associated Press;
- The football, basketball and baseball cells, with information provided by STATS Inc., deliver live scores and stats from the teams and players that are of most importance;
- The stock market cell provides information on stocks that are of interest to the customer.

Additionally, Celltop features an innovative ringtone management cell that allows users to scroll seamlessly through ringtones they’ve already purchased, or browse and buy new tones, all on the same screen. The ringtone cell also provides the ability to toggle through ringtones with a single tap – making it easier than ever for customers to personalize, update or change their mobile phone experience. One of the results is that it increases retail revenues for Alltel.

Alltel has found that, by providing interfaces to make data services accessible and easier to use, customers become actively experimental with more data services and are typically happier. As a result, we are seeing reductions in churn. Higher revenue and reduced churn – that’s a pretty unbeatable package.

¹ Celltop is now owned by Aricent, Inc.
The Numbers Speak for Themselves

In 2007, Alltel achieved record customer growth in the fourth quarter and for the full year. The company added more than one million gross customers for the first time in a single quarter. Alltel also achieved records in total net customer additions and post-pay “net adds” in the fourth quarter. This was boosted by reductions in customer churn for the eighth consecutive quarter.

Competition is heating up in the effort to attract the next generation of mobile phone users. By next generation Alltel isn’t just thinking about new customers, but more importantly is targeting families acquiring second, third and fourth phones as the need to be connected rises. Alltel also looks at e-mail-centric devices and data cards as a significant factor in what happens next.

Offering unlimited calling and a subsidized phone will no longer be enough to create the total customer care environment customers expect. Perhaps it never has. As voice and data services are commoditized and rate plans become similar, Alltel expects to differentiate itself by providing the customer experience platform that enables the choices and convenience that allows each customer to be uniquely serviced.

Those providers that listen to their customers will come to view themselves as platforms for the customer experience. Armed with this perspective to guide the new services and applications they develop, service providers will be able to more effectively address user needs and preferences.

It’s all about servicing the customer.

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Connecting the Future

By M. Kaddoura

The best hotel in the world…
The largest man-made islands in the world … Dubai and the United Arab Emirates are fast becoming one of the world’s most advanced business, financial and resort centers.

In the drive to create one of the most advanced living and working environments on the planet, state-of-the-art communications will form a key part of the infrastructure that will underpin the business transactions and lifestyles of the UAE’s future residents.

The Need to Innovate

du set a target to become the region’s first integrated telecom supplier, serving business and domestic customers with fixed, mobile, data, video and fully managed services from a single source.

This would require an upgrade to our network: a blessing in disguise, because new network deployments could accompany the new civil developments to ensure that high-speed telephone and data services are built into the new residential and business complexes. Fiber-to-the-Home (FTTH) and Fiber-to-the-Premises (FTTP) will be the norm in du’s new network deployments.

However, competition from incumbent fixed and mobile operators as well as from cable/satellite TV broadcasters meant that du could not simply deploy a new network, offer services and hope to increase market share; we would not be able to compete with the incumbent cable TV operators on price, for example, unless our business model changed.

World Travel Awards 2007

Dubai’s Burj-al-Arab hotel
Market forces dictated that du undergo a business transformation, rather than just a network transformation.

We could see that the old models, based on subscriber revenues, would not be enough on their own to sustain our business long-term. We then looked at how deploying the infrastructure and technologies able to support next-generation IPTV services could help us sustain and increase revenues. We are now exploring new business models and customer segments for our IPTV products, to enable us to succeed in this highly competitive market.

Enhancing the IPTV Value Chain

du is targeting specific segments, such as hotels and businesses, to provide IPTV services and channels focused on their individual business and customer communication needs. Our new business model for the hotel industry, for example, will eventually provide these customers with a virtual head-end and a managed infrastructure right to their doorstep.

"Enhancing the IPTV Value Chain"

du is targeting specific segments, such as hotels and businesses, to provide IPTV services and channels focused on their individual business and customer communication needs. Our new business model for the hotel industry, for example, will eventually provide these customers with a virtual head-end and a managed infrastructure right to their doorstep.

Our offer will differ significantly from the established approach. End-customers in the hotel and business communities would traditionally have expected to build a video-on-demand or pay-per-view service using an independent supplier. This approach can be very expensive because it is often built and maintained on a per-hotel basis.

du’s offer, in contrast, will be bundled as a telecom service and therefore be very easy to implement.

We have aggressive plans to build up a premium asset library targeted at the mass market, complete with all the latest blockbusters, bestsellers and regional interest titles, such as Bollywood movies. Since we will acquire the content, hotel management can easily offer a huge selection of movies to customers (branded by the hotel, rather than by du). du will manage the logistics of delivery and billing, which does not require any significant investment, rendering the service extremely competitive.

Our company is also actively engaged with real estate developers and residential communities to offer community-based solutions, such as walled-garden TV portals and customized content for individual communities.

The walled-garden TV portal is simply a window – available to a subscriber via his remote control – to a suite of interactive applications managed by du. Any subscriber can visit these applications without exiting the du environment, which ensures the quality of the subscriber experience. These applications are built on top of a browser, which allows the applications to be ported over from the world of IP/Internet, making it cost-effective to build, maintain or modify the content of the walled garden. In the context of real estate developers and residential communities, what we envisage in the medium-term is a multitude of landlord-to-tenant communications services (information bulletins, security services and so on) and tenant-to-tenant applications (such as chat and gaming) to encourage community development.

du is also engineering new IPTV products and services. This approach has allowed us to target new business areas – for example serving advertising content via dedicated IP streams (TV channels) to power digital signage for shopping malls, retail outlets and real estate agents.

This idea, which we are aiming to roll out in Phase 2 of our deployment, consists of a discrete loop channel for each customer, which will deliver that
du is the latest entrant into the UAE telecoms marketplace: the company has been offering mobile, fixed and IPTV services in the UAE for just seven years. Its mobile network covers 90% of the UAE’s population, with 25% penetration, representing some 1.5 million subscribers. Uniquely in the region, du already has some 30,000 IP telephony subscribers.

As systems integrator, Alcatel-Lucent is responsible for the very specialized job of integrating the IPTV application into our existing telco infrastructure. To do this, it is using the Alcatel-Lucent OBI platform, which links the application to the company’s operational support systems, customer care systems and billing systems. Alcatel-Lucent is also responsible for connecting the IPTV application to the revamped head-end, which du is upgrading in parallel to support MPEG-4 streams and, at a later stage, high-definition television. Video-on-demand and pay-per-view content will be introduced to the platform to provide a differentiated television experience for du’s customers.

With this service mix, a combination of broadcast and unicast flows need to be mapped from the head-end to the application servers and finally to the set-top boxes. All this traffic is delivered as packets over our IP network. The key component to perform this traffic routing reliably is the Alcatel-Lucent 7750 Service Router, which ensures that the various broadcast and unicast streams are prioritized for transport through the IP network.

The benefits of this new platform include improved interactivity with the end user to provide a variety of entertainment...
options and a fully-fledged electronic programming guide. The new platform also provides support for customized subscriber communities, which can be treated differently according to our marketing and business requirements. The end-user experience itself will also be improved through a better user interface.

The Future is Now
Deployment of the next-generation IPTV network to cover 15,000 customer locations will take just six months. du plans to go live with its new services this summer and will migrate existing customers and services to the new network shortly thereafter. Longer-term plans include extending the coverage of our IPTV network beyond the newly-developed areas where FTTH and FTTP will be deployed as standard. du is already investigating the possibility of broadening its footprint, using satellite or WiMAX technologies, or both in parallel, to increase our potential audience.

Conclusion
UAE’s ambitious developments mean new opportunities. When plans were announced to transform the region into a world-class business and residential center, we had to take stock of our existing infrastructure and product offerings in view of the massive changes to come. Not only have the bandwidth and connectivity needs multiplied enormously, new, cutting-edge real estate developments also demand equally cutting-edge services and technologies.

Our mission at du is to lead the industry, not only in the UAE but across the world, with personalized services that meet the needs of our diverse and innovative customers. We look to Alcatel-Lucent, with its years of experience in these and other technologies, to accompany us as we break from traditional models and continue to offer our customers highly personalized and innovative communications solutions.

Mustafa Kaddoura is Vice President for Fixed Access Network Planning and Business Solutions, du.

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Today’s telcos are facing a battle for survival against a background of a large number of new market entrants, focused mainly on voice service and Internet access, that are driving a decline in voice revenues.

Those telcos with the clearest vision of how the industry is changing – driven by competition and by user demand for anytime, anywhere, low-cost broadband – will stand the best chance of survival. They are already examining their assets and realizing that future revenue streams will be derived from monetizing the ubiquity of their existing and planned broadband infrastructures, from developing applications that leverage these unique assets and from creating emotional ties with customers to ensure continued loyalty.

An obvious means of achieving these ambitions is through the development of multimedia applications that engage customers in a way that creates new potential markets and that cannot easily be replicated by new market entrants. This is the approach we have taken at Telekom Austria. Our company invests approximately €40 million ($62 million USD) per year in R&D aimed at migrating our voice, data and multimedia networks to a next-generation platform that will underpin our future success.

Multimedia applications enhance the attractiveness of fixed lines and decrease customer churn. In particular, interactive IPTV that relies heavily on user-generated content offers the opportunity to involve end users emotionally in the services offered, driving a level of involvement and loyalty that rivals the success of free online video sharing services like YouTube.

From the Test Bed to the Real World

We were convinced of the need to develop a unique selling-point for our multimedia services to counter declining voice revenues. Therefore, we decided to test this theory in a real-life environment. This led to the creation, in 2004, of a pilot project called Bunte Fernsehen (Colorful TV).
We chose a small community called Engerwitzdorf, in Upper Austria. Engerwitzdorf is an interesting example of a common recent phenomenon. The village is close to a large city, and many of its 8,000 inhabitants are recent arrivals who commute to the city each day. The mayor was concerned that community cohesion was disappearing fast and was interested in seeing if a sense of community could be rekindled among newcomers who had nothing in common except their place of residence. The scenario was also a perfect test bed for us: if our idea of involving users in content generation and community communication could work here, it could work pretty much anywhere.

In earlier times, the local fountain, marketplace or town hall bulletin would have served as the main information source for local residents. Telekom Austria proposed something new in keeping with the digital age: an IPTV service which offered not only the standard broadcast channels and pay-per-view Hollywood movies, but also programs and channels featuring content created locally.

The feedback before we started was clear: people were interested in community channels and programs but not interested in the “standard” approach of a local website. They wanted something they could watch, contribute to and interact with via their TV sets, not just their PCs. Picture quality and convenience of use were key factors for the TV push.

The main objective of the project is to test the wide range of possibilities offered by broadband technology, as well as to investigate the types of technology and content that will attract and retain users in the future. We are gathering extensive market and technical experience from Buntes Fernsehen that will allow us to shape our strategy going forward, develop business models that accurately answer user demands and add a unique selling point to Telekom Austria’s offer. Media-on-demand is a new concept, and the pilot will help us understand consumer usage and consumption patterns before embarking on huge development projects.
Offering an IPTV service is one possible tactic for a telco. However, unless there is something to differentiate the offer from the competition, users will question why they need to subscribe. After all, they already receive national broadcast channels and may well subscribe to cable TV or satellite services. Why would they want to pay more money for a duplicate service that uses new technology and an extra set-top box? There has to be a unique selling point (USP) – something that represents a compelling emotional reason to sign up for the service.

So we offered the citizens of Engerwitzdorf the chance to participate in generating content for the service, turning them into content producers and aggregators and making them part of an interactive TV channel. The major challenge was to make complex technical content understandable to the average person and to design a pilot project that could measure up to international benchmarks and be regarded as a best practice in comparison to concepts like Current.tv and YouTube (Figure 1).

Creating the Buzz
Telekom Austria provided a DSL-based distribution platform for the content generated by the local community. In addition to technical support, we organized and sponsored training and coaching sessions to teach the citizens of Engerwitzdorf how to make a film, how to choose content that is emotionally and socially relevant to their community, and how to shoot, edit and upload the content via a feedback channel to the distribution platform. Our company also provided the hardware and software to turn video footage into edited programs.

The ubiquity of digital video cameras means that one of the traditional hurdles to viewers generating their own content has now disappeared. There is no longer a need for expensive cameras and lighting rigs to produce basic content.

We took on an enabling and coaching role, to guide citizens through the generation, production, integration and distribution of local content using our broadband infrastructure and extensive expertise. In addition to functioning as a digital and multimedia tutor, we also needed to stimulate the content production process. To do this, our company set up the “Golden Dolphin” awards for the best videos, backed by a major local, national and international publicity campaign.

The campaign was so successful that in the three months leading up to the 2007 awards, some 130 contributions were received. To date, around 500 user-generated films have been developed for Buntes Fernsehen, many of remarkably high quality.

Media coverage of the pilot scheme has been extensive both at home and abroad, with the UK’s BBC News producing a special report on the community’s TV station. The project was also awarded Austria’s State Innovation Prize for Interactive Applications in Digital Broadcasting in 2005.
The Keys to Success
The pilot has been so successful that Telekom Austria now believes user-generated content will be a key factor in the success of tomorrow’s applications. In addition to becoming a USP for telcos that possess the infrastructure to offer such interactive services, it will also represent a significant differentiator from other providers and will drive usage of broadband-based multimedia platforms.

We are convinced that communicating to micro-level audiences with highly personalized, emotionally and socially relevant content will play a crucial role for IPTV and overall profitability going forward. This will change the nature of advertising and will have a disruptive effect on the broadcasting industry as a whole.

The pilot in Engerwitzdorf demonstrated that, in addition to locally relevant content, a robust interactive capability and a good user interface are fundamental elements in developing a successful interactive IPTV service.

Moreover, by addressing local issues and problems, self-generated content provides a good platform for local politics and lobbying: it is proving to be a very effective way to raise awareness, foster discussions and impact the decision-making processes within the community – all of which contribute to engaging more and more customers in the project.

In addition, self-generated content can be used as an effective business tool, especially for subject matter experts, providing local and niche businesses with a unique platform to address highly relevant micro-audiences in a cost-effective way.

The pilot further demonstrated that, for interactive micro-content, DSL is the best mass-market technology of those already deployed, since both cable and satellite communications cannot offer the same degree of interaction, personalization and scalability.

Modeling for the Future
Telekom Austria is already examining possible future business models for interactive IPTV services that rely on local, user-generated content to supply a compelling reason to sign up for the service.

Although research is ongoing, several possible future business models are under consideration. We are still modeling how best to deploy and monetize the system we have created. The pilot has been deployed, essentially free of charge, as a pure test bed. We are now looking at customer usage behaviors to determine the best business models for these types of service.

Applications, services, systems, infrastructure, technology and architectures will be developed based on a user-centric approach. The goal is to enable any user at any location with any device to consume, author and publish his or her own content using a networked A/V system.

The project currently links Engerwitzdorf to communities in Cologne (Germany) and Oslo (Norway). The international element of the project will enable us to gather market research and usage patterns across a wider universe of users, which will indicate both similarities and differences in usage and consumption between different countries and communities.

Wider and Deeper Research
To ensure the reliability of the research data used to formulate future strategies, Telekom Austria has encouraged the involvement of ‘Buntes Fernsehen’ in an international community TV project. Citizen Media is a 30-month EU-level project that aims to enable multiple non-professional users to co-create networked applications and experiences based on their own user-generated content.

This project investigates new, innovative ways of exploiting the huge amount of user-generated content to support people in their daily lives and looks at how technology will allow users to co-create networked applications. This work will introduce new concepts that may modify the role of stakeholders in the classic value chain for content delivery.

Developing a Strategy for Survival
We still have several months of research and analysis ahead of us. At the end of this project, we intend to deliver a range of strategy scenarios that will support our future business.
That's why we're investing so heavily in this real-world test bed, to find out which interactive services people want, how they want them configured and how they will actually use them to enhance their daily lives. If we can find the answer to those questions, we can define the correct business model to ensure that Telekom Austria stays at the competitive edge in future markets.

We are using IPTV middleware and systems integration expertise provided by Alcatel-Lucent, and we are confident that our next-generation IPTV platform has the robustness and scalability to cope with huge future demand for interactive IPTV services that rely heavily on user-generated content.

It's certainly an exciting time for our company. We have found the partners we need to help us meet the challenge of surviving the fierce competition we face today, and we are optimistic about our prospects going forward. The market will certainly never stop changing, and neither will Telekom Austria.

Helmut Leopold is Head of Platform and Technology Management, Telekom Austria TA AG.

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Business Transformation: Advanced Business Models for Converged Communications

By Dr. E. Pittampalli, M. Nespatti, V. Faudon
Introduction

While service providers have traditionally generated their revenue by extracting value from their networks – a tangible asset that offers connectivity capabilities to enterprises and consumers – key trends in today’s marketplace are changing the rules of the game. Indeed, today's business models that extract value from intangible assets – such as user profiles that can be monetized through targeted advertising or mobile and e-commerce initiatives that generate commissions or service fees from transactions – generally outperform models centered exclusively on tangible asset-based connectivity revenues.\(^1\)

As a result, service providers should carefully evaluate their present mode of operation (PMO) and business objectives to examine additional business models that may better suit a future mode of operation (FMO) that supports top-line revenue growth and reduces operational expenses by leveraging a host of intangible assets within their business.

There are global consequences to this transition from PMO to FMO. At Alcatel-Lucent, we believe that new and emerging industry business models will enable service providers to:

- Continue broadband penetration and deliver successful and innovative services over broadband in mature markets and
- Maintain momentum on mobile subscriber growth and enable broadband to become a true mass-market phenomenon that delivers the benefits of information technologies to all citizens in high-growth markets.

The New Consumers Have Grown Up and So Have Their Service Needs

There is a growing realization of the need for fundamental innovation in the communications industry today. As a result, we are seeing service providers move cautiously to embrace business transformation strategies. But these moves are taking place with some trepidation. There is significant concern that too much rapid change can prematurely disrupt business models that currently represent the lion’s share of revenue streams. After all, it is estimated that, on average, 80% of current revenues in the global telecom sector are generated by voice and data subscription services.

However, this traditional model is showing signs of saturation in developed markets and, more seriously, exposes service provider weakness against non-traditional competition. As a result, we at Alcatel-Lucent believe that the time is right to introduce advanced business models that allow service providers to not only tap into new revenue streams but, most importantly, to differentiate themselves from competitors by augmenting their existing subscription-based businesses.

To evaluate current business models and determine future means of differentiation, service providers need to perform a critical assessment of their existing tangible and intangible assets and ask themselves which ones they can monetize. Once these assets are identified, service providers must evaluate what rights they can sell for each of these assets in order to maximize their return on investment. By looking at the business in this context, it will become clear that existing offers can be differentiated by introducing services based on new business models.\(^2\)

A recent example of how new disruptive business models can generate new revenues and create differentiation in the marketplace can be found in the digital music player market. This market has been crowded with manufacturers offering a wide variety of products and services for many years. The traditional manufacturer-led market was solely based on selling the music players – a physical asset. But this market was disrupted by Apple when it introduced iTunes, a new content distribution engine, as a part of its business model for its iPod devices. Apple differentiated its player by giving people an easy way to load music and video (both intangible assets) to their devices and proceeded to quickly capture 80% of the United States digital music player market. This feat was accomplished despite the fact that it was not the lowest-cost provider of music players. This experience offers an object lesson in why businesses in general – and service providers in particular – should look seriously at differentiating themselves from the competition by introducing new business models that leverage the intangible assets they own, in order to generate revenues in new ways.

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2 Contest… Enter to Win!

Enter our contest to win one of three Apple iPods by evaluating the business models in this article. Please see the back cover for more information.
Failure to do so can result in negative consequences – in the form of a negative spiral of growing costs and flattening or decreasing revenues and margins.

To move effectively from the PMO to an FMO, service providers must go through a transition phase, during which operational costs may actually increase because they have to maintain legacy systems while deploying new, IP-based systems. Interestingly, we believe a new business model based on financial assets can be considered to underwrite the transition from legacy to IP platforms. For instance, service providers can use their networks as collateral for bonds issued in the market – offering a relatively simple way to use existing physical assets to fund new business models, without significant impact on the mid-term financial results (see our article in this issue entitled, New Financial Instruments – A New Rule for Transformation). In fact, if the transition to new models is handled effectively, not only will service providers have an opportunity to actually reduce their operating costs, but they will also be able to launch new services more quickly. The key question then becomes: What do the FMO models look like?

Real-world Business Models to Maintain Competitiveness

Broadly speaking, there are eight key business models that service providers should consider as they explore new ways to reduce costs and maintain or increase revenues over the long-term.

- **Wholesaling**: This occurs when a network operator resells an asset – such as excess network capacity – to a retail service provider – such as a Virtual Network Operator (VNO). The VNO then offers services to commercial institutions or consumers. The wholesaler owns and operates the access network and offers connectivity to service providers.

- **Outsourcing**: This involves transferring the management of resources and day-to-day business functions to an external supplier. These business functions range widely, for example, from billing to data storage all the way to supply chain or human resource management. The primary focus of this business model is two-fold: to reduce the total cost of ownership of an existing operation or to improve time-to-market of new services that would otherwise require longer periods to be implemented internally.

- **Asset-sharing**: This model is triggered when two or more service providers that individually own and operate networks share overlapping tangible assets. The benefits of this model include the ability for service providers to realize significant cost-efficiencies by eliminating overlapping infrastructure. This allows them to reduce environmental impact and expand their coverage areas by redeploying displaced infrastructure. Service providers under this kind of an agreement can reduce the total cost of ownership of infrastructure and redirect their savings to differentiate their offers with innovative services and applications.

- **Targeted Advertising**: This refers to the ability to interactively connect individuals with the brands and people they are interested in through multiple screens (mobile, computer, TV and so forth). This has emerged as an important revenue stream opportunity for service providers (see our article in this issue entitled, Breaking the Rules: Finding New AVPU Through Click-throughs). Converging networks and related services are combining with the management of subscriber profiles to offer insights into geographic, demographic and – most importantly – behavior patterns about the subscriber base. Targeted advertising models should be optimized to provide the right message to the right people at the right place at the right time. Brands and advertisers will pay a premium to service providers that can offer these types of targeted advertising services, making significant contributions to top-line revenue growth.

- **Content Aggregation and Brokering**: This involves the coordination of commercial agreements and technologies that support the availability and legal distribution of user-generated content (UGC) and premium content. Examples of premium content include newspaper articles and multimedia files – such as copyrighted music or video. Revenue is generated as individuals directly purchase content (such as via video-on-demand and pay-per-view models) or sign up for subscriptions to premium content. This model can also be integrated with sponsored activities. A critical aspect of content aggregation and brokering is the ability to manage the distribution while ensuring the integrity of content complying with the copyrights of authors and editors by using digital rights management technology. By brokering content from multiple sources, the service provider can offer unique services and contribute to the top line in a revenue share model with content creators.
• **UGC and Communities:** This model calls for the development and deployment of platforms, tools and applications that allow any user to generate and distribute multimedia content. This content can be developed by individuals or in a collaborative environment by multiple users. After content is initially created, it can be modified, commented on or rated by other users after it is published. Common types of UGC include discussion boards, blogs, social net-working sites, news sites, trip planners, products and services review sites, photo sharing sites, as well as game sites and any other web site that offers the opportunity for the consumer to share their knowledge and familiarity with a product, topic or experience. Examples of businesses that are taking advantage of the UGC model include Wikipedia, eBay, Facebook, MySpace, TripAdvisor and YouTube. The broadcast industry has also taken advantage of UGC in a creative way, adding an interesting twist to customer interactivity and stickiness to services. User voting via the Internet or mobile phone has been widely used to influence and decide the outcome of programs and reality shows such as American Idol in the US.

• **Fulfillment:** This model is triggered when service providers leverage their established billing relationship with the end users to complete transactions and deliver services on behalf of third parties. A music label, for instance, can work with a service provider to allow consumers to download music to a multimedia device and then have the cost of the music appear on the telephone bill.

Each of these business models either reduces operational costs or increases the top-line revenue. Either way, they can boost margins. The business models that result in cost savings are outsourcing, wholesaling, asset-sharing and hosted services, while content aggregation and brokering, advertising, user-generated content/communities, fulfillment and m-commerce increase the top-line revenue.

In order to support the new and emerging business models, Alcatel-Lucent believes that service providers and enterprises should start considering non-traditional ways to monetize their intangible assets (Figure 1). Intangible assets – like location, presence, community, billing relationship and so on – can be leveraged to improve customer relationships and trust and control what flows through the network. Service providers can then add other end-user applications and third-party management to further extend the value of their intangible assets. This will be necessary if service providers are to leverage the high-growth opportunities that still exist in the new communications economy of the 21st century.
Opportunities Still Exist for Traditional Subscriber Growth

For instance, mobile penetration has only recently reached 50% of the world’s population, with three billion mobile subscribers. Yet countries with great growth potential such as India – where 8.05 million new mobile subscribers signed up in October 2007 according to that country’s Telecom Regulatory Authority – still have just 230 million subscribers. This represents a 20% penetration of this immense market. Broadband penetration is even worse in many other regions. In Southeast Asia for instance, out of a total population of 580 million, only 80 million people use the Internet (less than 14%), and a paltry 5.6 million (less than 1%) are broadband subscribers.

To achieve true mass-market mobile and broadband penetration, monthly costs must drop below $2 USD (€1.3) for mobile access (as it has in countries like India) and $10 USD (€6.5) for broadband access. This poses challenges in how the services are defined and how they are priced and billed across the entire service delivery chain – from infrastructure to point of sale.

In his book *The Fortune at the Bottom of the Pyramid*, Professor C. K. Prahalad advocates the need for innovation to address the “bottom of the pyramid” market. He contends that two types of innovation must take place to mine this segment of the pyramid:

- **Product Innovation**: such as making ultra-small units of consumption available for purchase or creating novel purchasing schemes that make products and services more affordable without sacrificing quality; and

- **Process Innovation**: such as distribution and service delivery mechanisms in which the entire delivery is reexamined to minimize costs and maximize revenues.

In addition to what Prahalad suggests, New Business Model Innovation such as new business models based on leveraging intangible assets should be examined.

Real-world Business Model Innovations

To enter new high-growth markets, mobile and broadband services must become truly affordable to new and existing users. As a result, there is growing pressure to adopt new business models that allow greater penetration.

- **Sponsored Communications**: A major innovation in this arena revolves around advertising-funded calls. It represents a significant shift away from the subscription model. Users who agree to receive advertising messages pay less for their calls and texts or get additional bonus minutes of air-time. Pioneering this approach is UK-based Blyk, which has launched discounted service offerings to 16- to 24-year-olds if they accept advertising messages. This approach could reduce the consumer access costs by 20 to 50%. Service providers will sell these assets to the advertising industry, highlighting the number of users who can be reached, media impact and cost-savings compared with alternative media.

- **M-banking**: In many countries, a large percentage of the population does not have access to basic banking services. There are several reasons for this. It can be too costly to manage small accounts and transactions using current banking systems, and many banks do not have enough branches to address the entire population – particularly in rural areas. M-banking uses mobile technology to address these issues. Mobile pre-paid payment engines have been developed and optimized to manage millions of small transactions in real-time, using Short Message Service as a very cost-effective customer service interface. Globe Telecom, a leading telecommunications service provider in the Philippines, offers its G-CASH service with an electronic valet feature that allows users to send and receive cash and make payments via texting technologies. Globe had more than 19 million subscribers at the end of September 2007, and close to a half-million active G-CASH users. Al Hammond of the World Resources Institute predicts that mobile banking will bring huge numbers of previously
excluded people into the formal economy quickly, simply because the latent demand for such services is so great, especially among the rural poor. Hammond says, "...I'm predicting that mobile-phone banking will add a billion banking customers to the system in five years. That's how big it is."³

**Broadband Community Centers:** Operators can promote and support Internet access through community centers that offer services such as e-government (registration of vehicles, application forms) or e-agriculture (weather forecasts). Many of these centers are based on private and public partnership business models. In Western Australia, many broadband community centers have become government agents or bank branches. In other words, these broadband communities have become a platform on which several industries and organizations have increased their reach to the population, so that they can serve customers and constituents better and in a more cost-effective manner.

**Hosted Platforms:** Alcatel-Lucent’s hosted mobile data center in Dakar, Senegal, is a good example of this approach. Service providers in four countries in this part of the world are using the data center to offer General Packet Radio Service (GPRS) applications that can be transmitted over links that run at speeds of up to 115 kb/s. This enables service providers to release services very quickly (less than three months) based on an innovative business model where participating service providers pay only when they use the platform. This is a very efficient way to deliver advanced services in countries that do not have sufficient users to justify investment in stand-alone platforms.

### A Consultative Approach to Business Transformation

Alcatel-Lucent can help service providers understand and choose the right strategic direction they should take to innovate for future success. We have developed a structured, consultative framework that identifies the right steps individual customers can take to maximize their potential. The simple process consists of:

1. **Step 1 – Identifying our customer’s PMO.** This requires an inventory of the types of assets that are available to the client (physical, intangible, human, financial) and what rights to these assets are currently being sold (right to own, right to use and right to broker).⁴
2. **Step 2 – Understanding the customer’s top priorities and objectives,** such as determining if they are to augment revenue, reduce operational costs or both.
3. **Step 3 – Identifying the customer’s intended FMO for these assets and their rights,** and then mapping them to one or more business models.
4. **Step 4 – Identifying the appropriate products, services and solutions** that provide the platform required to meet the customer’s FMO needs.

### Conclusion

As the telecom market evolves away from traditional subscription-based business models, a growing number of customers are starting to explore how best to maximize their existing tangible and intangible assets. Armed with this new understanding, service providers can develop new revenue streams and stimulate latent demand in unexplored market segments and underserved populations. Faced with ever-increasing competition from non-traditional market players, innovation in business modeling is the key to developing future revenue streams that will guarantee commercial success in the future. Wide and deep experience in introducing innovative business models for mature and high-growth markets makes Alcatel-Lucent an ideal partner for growth in tomorrow’s competitive marketplace. 

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Transformation 2.0: Laying the Groundwork for Success in the New Communications Economy

By A. Kowalik

Introduction
As the telecom industry wrestles with new competitive and end-user market forces that are changing the industry’s business model, a growing number of service providers are exploring the implications of the so-called “2.0” trends. The “2.0” term is a concept that builds on the dramatic changes that have occurred on the Internet. It is a specific reference to the web’s embrace of new economic models that come from “mashing up” existing services and the rise of new social networking activities that are changing the way businesses and consumers interact with each other.

For service providers who have traditionally plied their trade in the telecom industry, the 2.0 opportunity is about much more than simply “webifying” existing offerings. The emergence of all-IP broadband networks and the convergence of services over this IP infrastructure have set the stage for an entirely new class of applications, user experiences, revenue streams and business models. This change is forcing the communications industry to redirect itself and its relationship with end users.

Defining the Elements of Transformation 2.0
In order to analyze the opportunity for service providers brought by the 2.0 ecosystem and what new market trends offer service providers, Alcatel-Lucent has developed a framework of analysis called Transformation 2.0 (Figure 1). Transformation 2.0 is made up of three key elements:

- **User 2.0** – The industry recognizes that today’s broadband consumers – individuals who use converged IP applications to interact with and express themselves to other people – behave differently with each other and the brands and causes they care about when compared to traditional user segmentation analyses.

- **Telco 2.0** – This reflects a growing awareness that service providers will have to make major changes over the next five to 10 years to address the current broadband incentive conundrum. Service providers must deploy infrastructure to cope with the increasing traffic generated by new Internet applications, while dealing with the fact that average revenue per user (ARPU) from traditional services is declining in countries where broadband is exploding. This raises the important question of who will pay for the necessary capacity.
upgrades. Telco 2.0 organizations also realize that they must begin to compete and cooperate with new digital entrants in the market. This means that they must develop new, more sophisticated ways of defining and selecting new business models, then, make deliberate changes to network assets and service capabilities to realize new revenue streams.

- **Enterprise 2.0** – The implications of these converging trends and increasingly ubiquitous access to broadband services is dramatically changing the way organizations of all sizes behave. The use of emerging social software platforms in companies or between companies and their partners or customers is becoming more common. Social software is enabling people to rendezvous, connect and collaborate through computer-mediated communications, and to form online communities from any place and any time to generate and maintain value for their organizations. According to Alcatel-Lucent, a key success factor for these “dynamic enterprises” (see our article in this issue entitled, *The Dynamic Enterprise – Leveraging 2.0 Applications*) also depends on the ability of enterprises to leverage both their tangible and intangible assets to boost productivity and achieve a competitive advantage.

Thus, the forces behind the 2.0 trend present an opportunity for service providers to transform their networks and their business strategies. The trend is an opportunity to review current cost structures to better compete with new players. It is also an opportunity to integrate an array of platforms to launch the new services demanded by end users, while updating the business models to adapt to this new marketplace.

### Monetizing Core Assets

Because new digital entrants have launched – and in many instances shaped – these paradoxes of demand, the telecom service provider has little choice but to adapt. Part of this adaptation will call for service providers to learn how to diversify revenue streams by monetizing the core intangible assets of their businesses in new ways.

To monetize intangible assets – such as subscriber data, real-time billing, multi-channel interaction and so on – to their fullest potential, service providers must identify key new partners with whom they can collaborate to create value. And to get the proper perspective, the industry as-a-whole will have to shift from a largely vertical approach to understanding its business opportunities and develop horizontal business models across the 2.0 value chain.

Successful development of 2.0 business models will require strong leadership and commitment from the most senior positions within the service provider organization. This is because the internal restructuring of many organizations will probably be quite significant. No particular group within the typical organization currently owns the assets that can be monetized in completely new ways. Unlike current products, services, systems or campaigns that
characterize the way the service providers currently go to market, the core assets described above are spread throughout the organization in separate databases and customer relationship management systems. Bringing these assets together and developing a unified perspective on how to effectively harness them will take a tremendous amount of work and change management. But, the opportunities associated with bringing these elements together are great – and indeed a failure to undergo this type of a transformation will only bring about greater pain later as organizations struggle to survive on waning traditional revenue streams.

That said, it is also important to ensure that Transformation 2.0 initiatives are executed in a way that optimizes current business models for as long as possible. Let’s not forget, that the majority of a service provider’s revenue – for at least the foreseeable future – is predicted to come largely from traditional revenue sources.

The Action Imperative

However, action on new business models is necessary today in order to supplement the ongoing decline in these revenue sources. If service providers do not pay attention to the forces behind key 2.0 trends, serious opportunities will be missed and potential for growth will be strangled as new competitors rush in with new options for consumers and business customers alike.

To prepare for this new 2.0 economy, service providers must begin integrating current offers and future initiatives. They will have to engage in service portfolio diversification and develop new senior executive or C-Level sales engagement strategies that target marketing executives in the enterprise as well as wholesale media providers who can very likely become an important new source of revenue.

New categories of services that can emerge as a result of an active offer-diversification strategy could include:

- **Identity and content management services** – These include identity management services for enterprises such as user repositories, directory services, identity federation, (for example, single sign-on); and content management services, including the ability to store, manage, manipulate, retrieve and disperse content to end users;
- **Advertising** – (see our article in this issue entitled, Breaking the Rules: Finding New AVPU Through Click-throughs);
- **Web services** – This would include services that help enterprises share data with suppliers and partners, while enabling customers to access different applications from different places, networks or devices; and/or
- **E-commerce** – Creating platforms that enable consumer shopping and purchases via cell phones, mobile banking or online payment processing services for enterprises.

Developing 2.0 businesses with these new partners will require a much more collaborative and customized approach to client and partner management than most service providers are used to. However, to retain relevance and increase bargaining power in such collaboration, service providers must enter these discussions by:

- Understanding core competencies of the service provider’s core assets’ value to third parties,
- Developing firm plans for making these core assets available to third parties in a way that is synergistic with their competencies and
- Being knowledgeable about the associated commercial value of these competencies.

One of the biggest challenges associated with commercializing these competencies or assets revolves around making it easy for partners to do business with the new 2.0 service providers. Service providers must become proficient at launching simplified interfaces so that partners can access key services and create joint delivery platforms. This has to be done while ensuring systems and process are secure, auditable and easy to understand.

How Alcatel-Lucent Can Help

Alcatel-Lucent has a thorough understanding of the 2.0 challenges and opportunities that confront both service providers and enterprises. That is why Alcatel-Lucent has a portfolio of targeted 2.0 solutions that are in line with service provider business plans and priorities. We bring to market a set of capabilities that enable operators to make a competitive transformation to 2.0 and work closely with service providers to:

- Restructure capital expenditures (CAPEX) and operational expenditures (OPEX) in a manner that improves margins by creating alternative business models.
- Explore innovative approaches to working with core communication products to retain customers and their spending.
- Facilitate revenue-generating partnerships with application developers through the development of a Service Delivery Environment (see our article in this issue entitled, Mitigating Risk in the New Economy).
• Broaden and increase the sophistication of wholesale and enterprise product offerings, where barriers to entry from competitors are still quite high.

• Diversify into new markets for alternative revenue streams, including: content, advertising, digital home management, banking and content delivery networks.

• Develop new business models beyond the traditional subscription framework.

**Conclusion**

The convergence of IP and broadband networks has created new market dynamics that are eroding the value of revenues from traditional voice and messaging services. However, these trends also provide the opportunity to create new applications, user experiences and revenue streams for service providers. For instance, new digital services are creating larger demand for broadband services. And because the new generation of consumers is more tech-savvy, and willing to adopt new technologies, service providers that can offer converged tools allowing subscribers to create customized communities, services and experiences have much to gain in this new 2.0 economy.

As 2.0 trends continue to establish a foothold in the industry and blur traditional industry lines, it becomes critical to create new business models to successfully compete on the new landscape. New competitors from media, Internet and retailers that are not encumbered with the CAPEX and OPEX challenges related to physical legacy networks are using aggressive strategies to compete for customers and revenues.

For this reason, Alcatel-Lucent is helping service providers develop their own 2.0 opportunities, while providing both technical and intellectual platforms for collaborating with new entrants to define new revenues streams. We believe this is critical. Because when the dust settles, the winners in this marketplace will be those who can improve margins, design communication products to retain customers, facilitate revenue-generating partnerships, increase wholesale and enterprise product offerings to diversify and expand their service footprint, and capture new revenues based on new and emerging business models.

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The wireless marketplace is in a period of transformation, driven by the early 2008 spectrum auctions in the United States and Canada and the impending launch of next-generation technologies. Similar auctions are projected for other parts of the globe in the coming years as well. Even in advance of these auctions (and amid the increased competitive threat posed by potential new entrants into the service provider arena), service providers have been forced to grapple with hard questions about their businesses, as industry forces and market models transform.

Competitive pressures relentlessly demand that service providers invest in network upgrades to the latest and greatest technology. This leaves less room for investment decisions to be driven by broader strategic analysis of how new upgrades will impact revenue growth and enhance margins. As the market evolves into a next-generation world – with wireless networks becoming faster and more open – choosing to follow the current course of the traditional service-provider business model could hasten service provider descent into becoming a dreaded “dumb pipe,” which is a threat today. The service provider revenue engine must be transformed; otherwise revenues and margins will erode.

To date, service providers have countered the dumb pipe syndrome by focusing on new services (whether homegrown or via partnerships) that ride on top of the pipe. Essentially, service providers have attempted to move up the value chain, providing value-added services that get them closer to addressing changing end-user communication behaviors and away from the unglamorous network characteristics of communication access. However, given the obvious strength major players in applications, content and the Internet have in their ability to drive value-added services, this strategy equates to swimming against the tide. Service providers need to focus on their unique
assets (for additional information, see our article in this issue entitled, Business Transformation: Advanced Business Models for Converged Communications).

At Alcatel-Lucent we believe service providers should focus squarely on their network assets and reject the notion that the pipe is dumb. In fact, the pipe is getting smarter and smarter as service providers leverage their intangible network intelligence assets. Furthermore, carriers must challenge themselves to reject certain prevailing strategies, such as on-portal (walled garden) Web 2.0/3.0 application initiatives. They must promote an open networks philosophy that welcomes third-party applications and content providers who are looking to execute independent mobile Internet strategies. Open networks will provide an environment to maximize the monetization of the “smart pipe.”

To effectively drive revenue growth, service providers need to view their networks – and enabling data within the network – as valuable resources optimized for sale to all comers on a retail and wholesale basis.

- In the retail market, focus needs to be on creating new sources of revenue that are paid for by brands and advertisers rather than by end users. That revenue may then be used to subsidize the fees that are charged to end users.

- In the wholesale market, all types of transactions should be welcomed and considered, whether long-term Mobile Virtual Network Operator MVNO relationships or short-term purchases of user information such as location by a third-party application provider. Service providers that offer the most dynamic access to wireless network and data resources will experience the greatest demand for their offerings and have the greatest pricing power.

Recent developments and pressures in the wireless marketplace illustrate the need for a new strategy for revenue generation.

**Evolving Nature of the Wireless Marketplace**

Traditional cellular networks were designed to meet the unique challenges of mobile voice service. Therefore, wireless service providers built their networks and competed for customers based on their ability to best solve voice challenges. Today, despite marketplace attention to growth in mobile Internet and data services, the vast majority of service provider business is still derived from subscription-based voice service. Based on data from Pyramid Research, global service providers derived 81% of ARPU from voice in 2007.¹

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**Figure 1: Millennials’ usage of data applications compared to the average user**

![Millennials mobile service usage (typical day)](Figure1.png)

Source: Based on Pew Internet and American Life Project, 2008

¹ © 2007, Pyramid Research, Global Mobile Data.
Therefore, from an operational standpoint, the primary goal of the operator has been to ensure voice coverage and quality and to avoid circumstances where network resources – both equipment and spectrum – are overtaxed.

With broader deployments of 3G and planned roll-outs of next-generation networks, cellular networks are evolving to look like any other high-speed IP network. This has two major effects on the traditional service provider business model.

• The first is that, at an accelerating pace, voice is becoming a commodity, as evidenced by the industry trend toward flat-rate, all-you-can-eat rate plans.

• The second is that high-speed IP networks, wireless or wired, are very friendly to most popular Internet applications and services; this means service providers can expect their customers to increasingly expect their networks to support all forms of applications available on the Internet. Customers will be dissatisfied with limited on-portal applications presented by service providers. Figure 1 illustrates the thirst the younger generation – the Millennials – has for data-rich applications.

While these effects may be disruptive to service providers in the short-term, the evolution toward high-speed IP networks also brings with it two enormous opportunities (Figure 2).

The opportunity to benefit from anticipated massive demand for high-speed wireless network access can be accomplished by effectively managing network inventory as a scarce resource to maximize profits. In a broadband 3G/4G world, absolute demand for cellular network capacity should exceed supply for the foreseeable future, and certain buyers will pay more than others.

The opportunity to generate revenue by monetizing intangible assets based on access to unique and differentiable data elements (or Data Gems) produced by service provider networks and customer relationships. Data Gems are component parts that can be leveraged within a myriad of native and third-party application services running on the network – making these services better. These Data Gems can be organized and utilized in an aggregate model that does not infringe on end-user privacy or can be tracked on an individual basis in an opt-in model.

Service providers can expect demand for their network capacity to come from both traditional retail consumers they’ve been serving under their brands and from customers seeking wholesale capacity.

Wholesale customers include:

• Regional carriers. Small carriers that wish to offer nationwide packages to their local consumers and need roaming agreements.

• MVNOs. Branded, niche-marketing companies that launch retail wireless service businesses riding over another service provider’s network.

• Enterprises. Companies providing in-house wireless services to employees and partners.

• Consumer electronics manufacturers. Manufacturers that bundle wireless Internet access with their products.

Demand for Data Gems is likely to come from a variety of players looking to enhance the services they deliver via the mobile Internet, including:

• Wholesale customers (identified above),

• Search Providers,

• Advertisers/Ad Servers/Ad Networks,

• Application Developers,

• Content Providers, and

• e/m-Commerce Providers.

In the face of this increased and diversified demand, a service provider’s full portfolio of holdings and network assets must be looked at in a new light. Traditionally, the service provider managed those resources to simply meet voice demand and to offer new on-portal applications and content. They now need to shift their focus to ensure spectrum and network resources are actively applied against revenue and profit-generating demand for network and Data Gem resources.

Consider the following analogy that highlights the change service providers must make as they approach applications and content on their networks.
In the past, service providers could be equated to restaurants that sold full meals to customers. In the future, they need to be seen as grocery stores focused on selling food to third-party restaurants that then serve the customers. This analogy shows how the service provider can optimize the opportunity by reaping a smaller piece of revenue from a larger number of meals, rather than all the revenue from a small number of meals.

Redefining Industry Revenue Metrics
As the industry continues to evolve, the classic revenue metric for retail service provider – ARPU – will need to be broken into two “per-user” components. We define these as User Paid Revenue (UPR) and Non-user Paid Revenue (NUPR) (Figure 3).

UPR represents the voice, data and on-portal applications charges that appear on an end-user bill (or are included in a pre-pay package). Within retail services, NUPR includes revenue that flows to the service provider from either on-portal advertising or the sale of Data Gems to the marketplace (this could be unit sales, revenue shares, affiliate fees and/or transaction fees).

Today, NUPR is very low or zero for service providers.

Retail ARPU is projected to be essentially flat or even declining into the future. Based on data from Pyramid Research, global ARPU is forecasted at ~€15.00 ($23 USD), with a modest decline year-over-year. With UPR currently representing the major component of ARPU, the key to service provider top-line growth will be NUPR. Service providers with the highest NUPR will have the strategic advantage of being able to under-price the competition for consumers, while still achieving market-leading levels of ARPU due to the NUPR subsidy.

To maximize NUPR and thus total ARPU, service providers can focus on ensuring their networks are attractive to both third parties (that can generate NUPR) and wholesale customers (that can drive expansion in profitable business-to-business relationships). The less encumbered the network is with proprietary service provider protocols, partners and applications, the more attractive it is to third-party developers and to wholesale customers.

Service providers need to have a service delivery environment that is based on an open-services architecture providing flexible, consistent and simple access to third-party services, resulting in increased quality of experience for the end user. It should be noted that service providers will not have all the expertise in-house to maximize NUPR and hence will turn to specialized best-of-breed vendors (technology partners) who can offer specialized solutions.

Those service providers first to tailor their networks to open principles could be the early leaders in the growth of retail NUPR and wholesale revenue. They will enable an environment conducive to providing the most “eyeballs” to third parties and will likely be in a position to capture market share and outperform their competitors.

Updating the Service Provider Business Model and Strategy
Given the limited nature of a service provider’s capacity, as well as changing dynamics in the marketplace, it is paramount that Data Gems and pricing and allocation of network capacity be optimized (Figure 4). This should be the overriding mission for transforming the revenue engine, and it cannot be
achieved alone. Service-provider success in this mission is inexorably tied to the success of technology partners in upgrading their business models in unison.

Once the service provider business model is transformed, prices for network usage are set via yield management technologies and methods. Yield management assesses demand at a given moment and analyzes past commitments and future opportunities. To maximize profits, yield management can provide real-time analyses of:

- Demand,
- Underlying actual costs,
- Opportunity costs,
- Usage characteristics and SLA requirements of different user types (retail and wholesale); and
- Available capacity.

Additionally, the service provider must make strategic investment decisions about when and where to expand resources. These investment decisions may include new equipment purchases, spectrum sharing deals with other service providers and the deployment of new technologies such as femtocells that localize access to the wireless network.

For the scenario presented in this article, the breakdown of the service provider business will not be radically different. A typical service provider will still run a consumer-oriented retail service and will host MVNOs and roaming partners with available excess capacity. The most significant difference will be seen in the utilization of yield management to set and adjust pricing plans for the retail business and effectively expand the amount of excess capacity for wholesaling.

By focusing on Data Gems and dynamic terms for transactions, service providers will increase the desirability of their networks to a wider variety of potential wholesale customers. Simply, offers will be better matched to the demand profiles of buyers. As a result, the pricing of capacity and Data Gems will be based on demand at a given moment, as well as an analysis of past commitments and future opportunities.

When looking at the service provider business from a yield management and dynamic pricing perspective, it looks like other industries, such as airlines, hotels and TV broadcasters also have disposable inventory. The differences between wireless network capacity and these industries are that the number of capacity customers is much fewer and the time horizon over which delivery commitments play out is much longer. For instance, the number of potential MVNO customers for wholesale capacity will be relatively few, and the capacity commitments that they need will cover multiple years. Therefore, each transaction and pricing decision made by a service provider carries relatively heavier weight than transactions in other disposable inventory industries.

Conclusion

From a financial and operational standpoint, a large portion of future service provider metrics will focus on profitability per sales unit (as NUPR revenue sources increase over time compared to UPR), the absolute size of saleable network capacity and the penetration of Data Gems into application and content services. While many elements of the transformed model may seem pretty basic, it is important to recognize that the model requires service providers to adopt major changes to recent operating philosophies as well as to their relationships with technology partners.

Optimal service provider performance will be facilitated by partners that provide the best technology and services for managing inventory and the sales process. This means the selection of technology partners is paramount. Traditional relationships between service providers and technology partners have been fairly straightforward, focused on turnkey
product sales and installation and break/fix services. This has led to service providers typically building their networks with equipment, services and software from a few vendors.

To maximize revenue, the service provider must have a more holistic view of network elements and data in order to make optimal sales and network management decisions. A disparate array of equipment and operators can obscure the holistic view. Additionally, capacity can be maximized and Data Gems optimally extracted when new software tools are able to interact directly with every network element in the field. This interaction needs to be at a deeper level than any of the protocols defined in wireless standards like CDMA, GSM, UMTS, WiMAX or LTE; therefore, operational effectiveness again may be impeded if there are too many partners involved.

Alcatel-Lucent supports next-generation service provider strategies by developing new technologies and a service delivery environment focused on delivering a value-added optimization layer that rides above the standards-driven network layer. The optimization layer maximizes network utilization and facilitates the correct pricing of capacity and Data Gem sales to various retail and wholesale customers. Additionally, our focus is on seamlessly bundling the technology and service needs – both traditional and new – to fully realize the promise of the network. Our mission is to effectively meld all of the network technologies and services into one profit-maximizing business solution for the service provider.
Leaders of every stripe – whether in military, political, scientific or even business arenas – have prospered in turbulent times by breaking the traditional rules of engagement that governed the status quo. We find ourselves at such a time today in the communications industry. The industry seeks out new growth that extends beyond traditional revenue streams. We believe, as a result, that service providers must explore business models that focus on leveraging their intangible assets.

This mantra represents a fundamental shift for most service providers and their strategic suppliers, such as Alcatel-Lucent, in terms of how we create value. Together, we must look beyond traditional tangible network assets that deliver us the Average Revenue per User (ARPU) baseline metric. Fundamentally, we must reassess how we can extract new value from our intangible asset base, to drive the new revenue metric – what we refer to as Average Value per User (AVPU).

By looking at their entire business value per customer, a growing number of service providers are discovering a whole new array of largely untapped value assets. The challenge is to create a successful business strategy focused on monetizing these assets. For example, what is the business model to harness new technologies and intelligently mine subscriber profiles to generate new customized service offers and related profitable revenue streams? There is recognition that new approaches to targeted advertising – that is, providing digital marketing platforms that connect buyers and sellers in an intelligent way – can be important part of how the industry answers this question in the future.

Much has been written about how “new media” disruptive entrants into the communications field (like Google, Yahoo, Apple, Skype and so on) are putting downward pressure on incumbent players’ traditional, subscription-based revenue streams. Service providers have an opportunity to challenge the status quo in the “new media” markets by leveraging innovative advertising models to capture new revenue and deliver enhanced customer value. This enables them to penetrate established markets in their own disruptive manner and play a little revenue offense in a marketplace that often places them on the revenue defense. Specifically, service providers offer a new value proposition to advertisers and brand managers with a very targeted and contextual digital marketing platform that surpasses the capabilities of “new media” digital marketing providers.
Service providers intending to take advantage of this potentially lucrative opportunity will focus on reinventing their present relationships with their subscribers. A key aspect will be the need to blaze new trails on how advertising delivers value to consumers and merchants alike. This is especially critical as a new breed of modern consumers takes the stage. This new generation of consumers has forged its buying and decision-making processes in a Web 2.0 environment, behaving very differently from previous users of communications services and traditional advertising demographic segments.

The Modern Consumer
Personalized interaction is the key to dealing with the modern consumer, which we define as one of two groups:

- **The incoming Millennial Generation:** Coming of age in a Google and MySpace era, conditioned to both receive targeted advertising based on the query characteristics of their searches and to volunteer personal information as they set up profiles on social networking sites.

- **An older generation of early technology adopters:** Often parents of Millennials, they appreciate the power of personalization in their own interactions and are pulled to this technology capability via their children.

Both segments are interactive technology users and multitaskers who have integrated collaboration strongly into their lifestyles. Thus, Millennials are a vital target audience for marketers and brand managers. These are the folks who are behind the concept of buzz marketing. These consumers desire to build and develop authentic relationships with friends, communities and brands they care about. When they like a product or a service, they are very likely to spontaneously share their preferences with friends, family and colleagues. Study findings show they have a significant influence on parental technology related purchases. Alcatel-Lucent research shows that this segment of the market accounts for 55% of consumers currently using two or more devices (mobile phone and laptop for instance) on a regular basis.

New Business Model
According to our research, total investments in global advertising will grow from roughly $600 billion USD (€389 billion) a year in 2007 to $800 billion USD (€519 billion) a year in 2011, representing a robust 33% growth. While this market opportunity is expected to raise the tide of the overall market, it will not lift the fortunes of all the players currently in the advertising space today.

Specifically, we expect traditional media outlets – such as newspapers, magazines, TV and radio – will continue to lose a significant share of this spending as brand managers and enterprise marketers shift their focus away from print and broadcast media to the new online, mobility and other interactive marketing opportunities (Figure 1). Mobile, online and IPTV platforms will represent the fastest growth segments for advertising investments. In fact, traditional advertising will only account for 89% of all advertising dollars spent by 2011, down from 95% in 2006. This reduction represents a dramatic $48 billion USD (€31 billion) shift in ad spending to new digital advertising mediums.

The reasons for this shift are simple. The new digital delivery mediums offer marketers and brand managers ways to:

- Deliver marketing messages to the devices of choice in a more targeted manner, enabling digital marketers to customize specific offers to individual needs and personal preferences. This micro-marketing capability translates into an improved cost-per-thousand (CPM) response performance perspective, a better cost-per-acquisition metric and, finally, a better brand experience metric.

- Leverage the power of buzz marketing. This digital phenomenon relates to how customers use social networking platforms to share with peers their preferences, experiences and recommendations about brands, products
and recent purchases in a manner that is more authentic and compelling than traditional marketing and messaging vehicles. Properly managed, this leads to a much higher percent in terms of purchases-per-impression.

- Create cross-media campaigns (mobile, IPTV, web) to nurture and track the development of an individual relationship between buyer and seller. Digital campaigns can enforce a higher level of accountability by tracking the specific responses to every campaign every time, potentially across multiple user access devices. This is important because advertising results have exponential value when exposure (“eyeballs”) and subsequent response rates can be measured at an individual level.

**Consumer Rules**

The relationship between subscriber and communication service provider is one that is built on trust. We have seen through our primary market research that it is critical to address subscriber privacy concerns and implement good stewardship of personal information. According to Alcatel-Lucent research of consumers in the United States, United Kingdom and Germany, the three most important attributes for mobile advertising are privacy, control in starting and stopping advertising, as well as limits on advertising (Figure 2).

If the relationship between service provider and consumer is properly managed, advertisers will see an increasingly compelling case for investing their considerable resources in digital mediums.

**Communication Service Providers Uniquely Positioned**

In this environment, few players are better positioned to play a central role in developing this market opportunity than communication service providers. Service providers have tremendous insight into who each individual consumer is, where that consumer may be present at any given point in time, and preferences based on previously “learned” behavior patterns. This information is extremely valuable to business-to-consumer marketers. It enables lifestyle micro-marketing at home or on the go – which is missing in today’s mass-market advertising models.

We see a growing number of examples where subscribers are willing to share profile information with service providers in exchange for receiving more personalized services.

One good example of a service provider that is leveraging this phenomenon is Virgin Mobile. In 2007, Virgin launched its Sugar Mama service to offer customers new opportunities for earning wireless “airtime in their spare time.”

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**Figure 2:** Most important attributes for mobile advertising as reported by consumers in the US, UK and Germany

<table>
<thead>
<tr>
<th>Importance of mobile advertising attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Privacy is most important to consumers for advertising via mobile channels.</td>
</tr>
<tr>
<td>2. Control in starting and stopping mobile advertising.</td>
</tr>
<tr>
<td>3. Limits on advertising received.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>attribute</th>
<th>US</th>
<th>UK</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privacy</td>
<td>89%</td>
<td>87%</td>
<td>87%</td>
</tr>
<tr>
<td>Privacy</td>
<td>78%</td>
<td>80%</td>
<td>82%</td>
</tr>
<tr>
<td>Limits on advertising received</td>
<td>76%</td>
<td>74%</td>
<td>74%</td>
</tr>
<tr>
<td>Receiving information that is personally relevant to me</td>
<td>69%</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
<td>Well-placed advertising</td>
<td>68%</td>
<td>62%</td>
<td>62%</td>
</tr>
<tr>
<td>Economic or financial rewards</td>
<td>60%</td>
<td>60%</td>
<td>61%</td>
</tr>
<tr>
<td>Minimal delays in receiving information</td>
<td>39%</td>
<td>66%</td>
<td>66%</td>
</tr>
</tbody>
</table>
Brands as varied as Microsoft’s Xbox, Jive Records, Levi Strauss, Sony Pictures and the US Navy are working with Virgin Mobile to underwrite new services geared toward young subscribers. Specifically, they are offering customers the opportunity to opt in to interactive mobile and web-based advertising initiatives in exchange for free airtime on their Virgin Mobile phones. Air credit is earned when customers interact with marketing content from one or more of the sponsors. In the process, advertisers get detailed feedback from target audiences.

The results have been impressive. Within the first year of service, more than 300,000 Virgin Mobile customers signed up to earn 5 million minutes. On average, each Sugar Mama subscriber has earned 16 minutes by signing in to interact 14 times with various offers.

Click-through rates are in the 5.5% range, which is 18 times the industry average of 0.3%. Moreover, Virgin Mobile reports that 33% of the users voluntarily provided additional, psychographic information to enhance their participation in the program.

The Virgin Mobile case illustrates that personal information can, in fact, be acquired and used with the full support of consumers. Consumers increasingly see a positive quid-pro-quo in providing information on certain preferences in order to receive commercial messages that are relevant to the brands, people and products they care about over the medium, device or platform of their choosing.

Looking forward, one of the key value-propositions large service providers can offer to brand managers and advertisers is the ability to integrate the various digital initiatives that marketers want to implement. Today, a company that wants to deliver messages to mobile handset owners, web surfers and to the nascent IPTV viewership must execute these campaigns separately, often with different delivery suppliers. The irony is that in many cases, the exact same infrastructure may be used to carry the transmissions to these three different audience segments. One of the biggest opportunities before service providers is to consolidate and simplify digital media buys so that marketers can better understand, manage, measure and adjust their campaigns real-time to maximum effect. Making this happen will require service providers to break through the conventional rules of today’s operations and integrate both network elements and service management levers to present one face to the advertising customer.

Multi-screen Personalization

Comprehensive integration (sometimes referred to as a three-screen strategy) is the ultimate goal for many marketers, as they seek to have both a presence and a multi-screen relationship with consumers as they interact with their:

- Mobile screens,
- Computer screens,
- TV screens (particularly in an IP environment) and
- Others (portable game players, on-board vehicle screens and so on).

Each of these form factors has different technical and user-experience imperatives. Marketers would like to develop integrated campaigns that seamlessly connect consumers to brands they value across these screens. Service providers are in an ideal position to realize this vision. At Alcatel-Lucent we are working with our customers to introduce the new technologies and management tools that will enable this cross-screen management and link the presentation of content within the context of customer preference information. This not only offers brand managers a way to customize messages across the different screens, but also, more importantly, provides a meaningful way to interact with consumers in a highly personalized and engaging manner.

The Challenge of Successful Execution

Making the ad-sponsored future happen will have its challenges. Executives must run a race in two directions – continue optimizing their current core business (offering connectivity services to enterprises and consumers) – even as they reallocate resources to develop and execute new services addressing entirely new customer categories such as brand managers and advertisers. Consequently, success will mean effectively managing a more diverse portfolio of services, ecosystem partners and customer bases than ever before.

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For instance, measuring results of ad campaigns is an imperative. Service providers will have to become skillful managers of advertising metric data to entice sophisticated brand managers and advertisers, and subsequently ensure they reach their desired consumer ad metrics. This introduces yet another service area where service providers can offer added value: measurement and response rate.

Leading service providers are working to develop these key performance indicators to further accelerate the role of network operators in the advertising domain. At the recent 2008 Mobile World Congress event in Barcelona, the GSM Association announced that five of its members would work together to define common metrics and conventions for mobile advertising. According to a February 2008 report by Ovum’s analysts John Delaney and Vincent Poulbere, Vodafone, T-Mobile, Telefónica/02, Orange/France Telecom and “3” are looking for consistent ways to measure the effectiveness of mobile network advertising. According to Ovum: “The group will conduct a feasibility study with their five UK operators aimed at developing a consistent basis for aggregating operator data into audited cross-operator metrics, for use by media and advertising companies.” This will be invaluable, and indeed essential, to media and advertising companies as they seek to compare “apples-to-apples” in their new digital promotion campaigns.

The Way Forward
It seems clear that service providers are well-positioned to play a key role in delivering the right, relevant messages to the right people at the right time and stimulate the value chain for all stakeholders. Ultimately, identifying and leveraging intangible assets such as customer profiles will be critical to new business model success. Service providers can position themselves to advertisers as the optimal channel to reach individual consumers with very targeted and relevant messages that result in a higher degree of purchase response.

To achieve this optimized state, Alcatel-Lucent believes that service providers must begin now to design and implement a long-term plan that integrates strategy and operational management across applications and delivery platforms. Service providers are uniquely positioned to “make new rules” and capitalize on the opportunity to connect people to the “click” of a brand on their device(s)-of-choice. The result of these new rules will be the generation of higher value AVPU and consequently shareholder value creation.

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Whether carriers operate in mature telecommunications markets or are blazing new trails in emerging economies, it is becoming increasingly important to find new and creative ways to fund new infrastructure development initiatives. In this global context, all service providers are caught between competing trends:

- Investor pressure to control costs and increase profitability
- Market demands for a new generation of services and multimedia offerings
- Increasing capital market pressure

Business and financial leaders are, therefore, looking for new and innovative ways to re-structure capital and operating frameworks to address market demand and fund emerging market growth opportunities.

In the past, increases in networking capabilities involved making large initial capital outlays for new equipment and infrastructure. These investments have typically been associated with significant operational expenses for maintenance and operation of these capital assets to support traditional subscription-based business models. The market risks associated with traditional infrastructure investments for both capital expenditures (CAPEX) and operational expenses (OPEX) have been borne almost exclusively by service providers and their shareholders. At a minimum, it has resulted in a large balance sheet item. To maintain a competitive edge and meet the rising demands of end users for richer, higher quality services, service providers must be capable of rapidly expanding new network-based services, even as they scale back uncompetitive or unprofitable services.

Outsourcing, hosting, managed services and other business-process innovations have softened the risk of investing in new network resources. Nevertheless, all of these activities still show up as additional obligations on balance sheets that
new rules in the communications economy

explore

New Investment Models Emerging

The good news is that there is a consensus in the investment community that the communications industry will be extremely profitable, global and sustainable, thereby alleviating some of the pressure that new infrastructure investments can place on corporate balance sheets. There is growing interest from large institutional investors in identifying opportunities to ride the wave of growth and profits that are expected to flow from this future trend. Analysts at Deloitte LLP point out that “even as their core business continues to erode, opportunities abound for telecommunications (telecom) companies in 2008 – if they can turn their installed networks into money makers by offering new consumer products and services to leverage their pipes in the ground.”

Consequently, investors who have previously played a minor or indirect role in funding the communications industry are emerging as major players in how new infrastructures are financed and deployed. Across the globe, there is an emerging pool of institutional investment funds interested in directly owning key communications infrastructures. It is therefore important for service providers to understand the new impact investors can have on the industry as they:

• Identify existing service providers that appear to be making the commitments necessary to succeed in the new communications economy and share their financial investments and rewards;
• Underwrite start-ups or new entrants with compelling business plans to wrestle market share away from incumbent providers; and/or
• Directly invest in the underlying infrastructures upon which traditional service providers and new entrants will build value-added service offerings.

This last option is creating brand-new investment instruments that will affect the entire service provider community. It is creating what many are calling New Financial Investment (NFI) opportunities. NFI is a concept that is gaining increasing appeal in the communications industry because it provides a way to make direct investments in specific infrastructure initiatives – as opposed to investing in the companies that are involved in the development and deployment process.

Here is how this NFI instrument can work. Instead of having service providers buy or lease new technology elements from infrastructure partners – transactions which show up on balance sheets as obligations against shareholder equity – service providers can reach an agreement with investor groups who see a business case for introducing new capacity in a particular service area. As investors allocate their capital to fund the infrastructure development project, service providers can form agreements in which they can benefit from the new infrastructure capabilities without having the line items impact their balance sheets.

These types of agreements basically consist of a commitment from investors to fund and own the infrastructure build-out so that new services that generate new revenues can be created. The service provider, in return, commits to marketing new services that use the new network infrastructure. The ensuing revenues generated by the new services are then shared by all participating parties.

Many service providers are also exploring opportunities associated with “sale-and-lease-back” arrangements whereby service providers sell networking assets to another service provider to free-up capital resources and then pay a monthly fee to, in essence, “rent” network capacity that they once owned. The main benefit of this approach is that it gives service providers the capital resources needed to fund next-generation infrastructures that will support new business models and revenue streams.

Another potential NFI model that is capturing the interest of the telecommunications industry revolves around leveraging current business models to create new financial instruments. For example, service providers can work with investment bankers and other institutional investors to issue bonds that are backed by revenues from contractual agreements generating recurring annuity revenues, such as aggregate calling plans and MVNO (mobile virtual network operator) agreements.

In these NFI models, service providers can benefit from third parties who underwrite the development and deployment of modern infrastructures – or segments of infrastructures – within their service footprints, with minimal impact on their balance sheets. For this reason, these infrastructure investment models have the potential to significantly accelerate the global rollout of new enabling technologies.
In developed economies, this model could be used by service providers that have a heavy legacy asset load that is still in the process of being depreciated – or by organizations that have been involved in strategic mergers and acquisitions and have taken on new obligations. These situations can be very attractive to investors who believe a market territory that is being well-served with traditional telecom services may have unmet demands for next-generation services – like IPTV, mobile video/TV, m-commerce and others.

In high-growth economies, service providers may simply lack the access to financial resources to introduce voice and data wireless services in under-served markets. In this scenario, investors may find a long-term opportunity to not only roll out technology, but also stimulate the economic development of the region by connecting people and businesses to digital society.

In both scenarios, financial resources remain available to ensure unencumbered support of existing revenue streams. In the case for funding infrastructure projects that generate new revenue streams, the risk of new capital investment in network resources is shared among the financial institution, the network-services provider and any other third party that brings value to the relationship.

NFI offers a way for service providers, institutional investors and venture capitalists to increase revenue and market share while actually reducing their exposure to risk.

- For service providers, NFI offers a way to build out network infrastructures while strategically managing the impact that this has on an organization’s financial picture.
- For large institutional investors, a properly managed telecom infrastructure investment model, in partnership with service providers and infrastructure providers, can generate handsome returns on investment.

**Conclusion**

These new investment models require service providers to reexamine not only what they consider to be their core assets, but also their strategy on how these assets can be best managed in a rapidly changing marketplace. In some cases, service providers who want to realize NFI benefits must be prepared to release their direct ownership and perhaps management of network assets to third-party partners. In other cases, they will have to explore new financial arrangements that may require them to reassess how they manage financial risks. There will always be a group of service providers who will see these new financial models as simply too radical because they view their core value as stemming from the network itself. As a result, they will be very reluctant to relinquish control of operations to investors and, at the same time, miss the opportunity to unleash the value they hold in their tangible and intangible assets.

Nonetheless, many will look to mitigate these concerns by developing and managing robust service-level agreements that also address corporate control. For these players, the NFI arrangements described in this article have the real potential to strategically shift capital and operational expenditures in a way that will allow them to invest more aggressively – and more strategically – in new and emerging business models.

As the need to roll out new services becomes more acute, Alcatel-Lucent is exploring ways that different types of service providers can work with the institutional investment community to identify opportunities that will expand funding resources in the most promising communications markets around the world.

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Mitigating Risk in the New Economy

Addressing changing user needs and market trends

By Dr. S. Pastuszka, S. Vergnault, Dr. S. Betgé-Brezetz, Dr. A. Aghasaryan and P. Lopes

The telecommunications landscape is in transformation, as new technologies change the habits of increasingly demanding end users. In the process, a growing number of opportunities – and risks – are being created. As this new generation of consumers and professionals express its needs and desires, new players are coming and going, causing value chains and business models to rapidly emerge, evolve or go bust.

Companies like Google, Skype, Yahoo! and others are taking advantage of free Internet resources and the widespread availability of broadband access to compete against traditional players by offering new services – often using an incumbent carrier’s own infrastructure. At the same time, digital media is decoupling content from classic distribution methods, placing formerly independent players into the same marketplace. Examples include online video-on-demand services vs. brick-and-mortar video rental shops or VoIP providers vs. fixed telephony companies.

In response to these trends, telecommunications service providers are striving to adapt and take advantage of the opportunities in this new global landscape. They are harnessing numerous assets to deliver new offerings of their own.

For instance, network operators can:

• Expand their revenue sources with enhanced TV services to compete with traditional broadcast media.
• Differentiate themselves from other competitors by offering blended services; and/or
• Bring in new revenues through different business models. For instance, a service may be free to subscribers, yet collect revenues from advertisers via targeted, personalized campaigns that are based on intimate end-user knowledge.

To succeed in this new environment, service providers must focus on knowing their end users much better than ever before. At the same time, they need to embed flexibility into their service delivery capabilities to take advantage of user needs, new trends and developments. Naturally, risk is inherent in almost every possible move, but these risks can be mitigated if they are properly understood and addressed.
Managing Risk
Understanding market dynamics and properly interpreting current trends is a prerequisite to charting a course of action. To successfully execute this new course, a number of elements are crucial to avoiding operational pitfalls. Some of the risks – and the keys to mitigating them – revolve around:

• **Internal barriers to innovation:** These can stem from inflexible processes and systems that can lengthen time-to-market and contribute to high production costs for new services. They also include organizational issues. However, as operators move away from service stovepipes by incorporating innovative service delivery capabilities, they can find ways out of this potential trap.

• **Misunderstanding end-user needs and their evolution:** Intimate knowledge of the subscriber base is critical to providing the proper service mix and experience, and therefore to avoiding user dissatisfaction and churn. However, by employing the right techniques and tools to identify and follow end-user preferences and changing behaviors, service providers can develop compelling offers and generate additional revenue.

Improperly managed risk can result in lost opportunities, spoiled investments, offended shareholders and lost customers. Yet, doing nothing is not an alternative. New and innovative services are needed to serve new end-user needs. Apart from the services themselves, offering the right user experience is a cornerstone for success in today’s environment. From a business perspective, it is critical to have the lowest possible cost structure because the new competitive reality involves players with nimbler infrastructures and simpler operational systems.

Service providers must be able to launch new services flexibly, while reducing the significant costs associated with service creation, deployment, operation and billing. This same flexibility and cost efficiency must also be brought to bear when retiring unsuccessful services. Service providers will need to experiment with different mixes of telephony, web, video and other offers. New market conditions also put pressure on service providers to find non-traditional revenue sources by implementing creative and innovative new business models.

Winning companies will take advantage of the new Web 2.0 and content capabilities that new competitors are using and combine them with their own assets – both tangible and intangible – to develop new revenue streams.

Breaking Barriers to Innovation
In order to do so, service providers must break down barriers between internal service “silos” in order to provide a single, rich, end-user experience. The ability to readily and seamlessly access the assets within each silo becomes critical in responding to end user behavioral trends. Alcatel-Lucent research shows that end users are, in fact, willing to pay more for services that seamlessly blend content and multiple capabilities than for mere connectivity, such as the ability to access all services and content via any device, using a single network-based address book.

Alcatel-Lucent studies demonstrate that more than twice as many enterprises and consumers would be willing to pay more for blended services, as compared to bundles that simply package voice, data and video. What’s more, about 60% of enterprises and consumers are willing to switch providers to get access to personalized and blended services.

The key to successfully creating user-centric services lies in effective collaboration among internal service...
provider departments, as well as with content providers and other service partners.

For instance, since service expectations are no longer bound to dedicated infrastructures, it is important to create and manage services independently. It is important to break down infrastructure silos in order to effectively blend legacy telephony, web, Internet Protocol Multimedia Subsystems (IMS), IPTV, TV and mobile services.

To move away from service stovepipes, a new common framework is required. Specifically, service providers must be able to:

- Create blended, personalized and context-aware services that leverage web, IPTV, IMS, mobile video and legacy infrastructure capabilities independent of each technology-specific Service Delivery Platform (SDP).
- Allow new services to be created by communities of third-party developers and end users. This will be done via Session Initiation Protocol (SIP) and Parlay/Parlay X, or other exposed web services.
- Enable flexible business models and promotions, such as pay-per-feature, multi-screen advertising and others.
- Reduce costs by establishing and re-using common processes (such as automatic provisioning, partner and end user self-care portals) through capabilities and assets in a Service Oriented Architecture (SOA) framework.
- Leverage tangible and intangible assets across technologies. This access includes presence, location and convergent payment capabilities, subscriber data and profiling.

It is important to foster service creation and delivery capabilities that take advantage of current and future assets as well as new players in the value chain. It is also necessary to move away from the current practice of developing each individual service as a stovepipe (Figure 1).

When each and every service is created in isolation – as is typically the case today – it hinders competitiveness at the network and service levels. It duplicates functionalities (raising operating expenditures) and prevents timely creation of services that blend capabilities from multiple domains.

Successful players in the FMO environment will have capabilities built on a vision and framework that enable them to quickly take advantage of new trends, technologies and service requirement opportunities. They will
find ways to generate new revenue rapidly and will have the flexibility to adapt to new business models and user demands. In the process, they will be positioned to tap into communities of users and developers to roll out offerings that monetize user sessions, while reducing time-to-market, operational complexity and costs over time.

The Alcatel-Lucent Service Delivery Environment (SDE) provides a blueprint for ensuring that service operations, service enhancements and federated control can be leveraged across different SDPs. This can result in the development of a Service Factory, where personalized and blended services can be created.

Employing the SDE will assure the flexible and cost-effective creation and delivery of services. Using this framework, service providers can quickly satisfy the evolving expectations of consumers and enterprises, while taking on the new breed of competitors enabled by the rise of IP networks.

The SDE effectively coordinates multiple SDPs that share common functions within a converged IP infrastructure. Each time a new service is created, the SDE uses common resources and processes in an SOA. This reduces the risks and costs of service creation and life cycle management.

Understanding the End User
To embrace new opportunities, service providers must intimately understand the end user so they can offer services that deliver compelling end-user experiences. More than defining the proper service mix, end-user intelligence opens up new ways to generate revenue.

For instance, in the United States, operator Virgin Mobile is offering free minutes to users in exchange for the opportunity to show them targeted advertisements. Instead of paying money, end users are offering personal information in exchange for services. Virgin is then using its subscriber reach to generate revenues from brand managers and marketers.

To effectively monetize their subscriber relationships, it is crucial for service providers to do more than simply provide advertisers with access to users. Service providers must first organize their data with a subscriber data management (SDM) solution to ensure consolidation at the network and service layers and perfect their understanding of user preferences and behavior patterns or profiles.

Simply analyzing market segments and trends using traditional methods is no longer sufficient to make a competitive difference. In order to differentiate service and deliver value to end users, specialized approaches are required to bring deeper and more precise insight. For instance, Deutsche Telekom interviews 2,000 consumers and 500 enterprises each year to better determine their needs. Alcatel-Lucent also supports service providers with specialized end-user research to deliver appropriate user-centric solutions.

New user profiling techniques take this analysis to the next level. They capture knowledge about the end user on a much more frequent basis. Service providers can leverage their existing one-to-one relationships with customers by using profiling techniques to analyze and interpret day-to-day user behavior and data. In this process, providers come to know their customers not just as segments or demographic groups, but also as unique individuals.

A Word About Confidentiality and Privacy
Capturing and maintaining information from individuals is a very sensitive undertaking from a privacy perspective. User profiling and profile data management systems must comply with applicable international and national privacy policies. User acceptance and acknowledgment of data collection activity is imperative. Indeed, each end user balances the desire for privacy protection against the benefits of new, personalized services.

Alcatel-Lucent Bell Labs proposes an approach based on high-level policy settings that allow end users to determine their own privacy parameters based on their confidence and trust in the service provider. For example, an end user can specify the types of service (IPTV, mobile video, web browsing and so on) and traces (watching, interactivity, zapping) that can or cannot be used for profiling. Individuals can also opt out of allowing access to profile data for targeted ads based on specific interests.
Service providers already have data on end-user service consumption trends and are well positioned to accurately infer user preferences, interest domains and behavior patterns. To leverage this information and deliver value-added services, service providers need to employ an efficient profiling tool.

In response to this need, Alcatel-Lucent’s Bell Labs has developed a research prototype “profiling engine” that enables service providers to accurately and automatically learn about end-user preferences and understand consumer behaviors in real time. With this profiling engine, service providers can:

- Measure all end-user usage traces (such as logs, call detail records and user interactivity traces) collected from the various SDPs;
- Define user models representing the viewer’s interests, consumption habits and behaviors according to the user’s context;
- Implement profiling algorithms that aggregate all the usage traces to follow the real-life evolution of the user’s profile;
- Integrate preferences explicitly declared by the end user;
- Offer intelligent interfaces to the user-profile data in order to easily and efficiently personalize diverse applications, such as content recommenders, targeted ads and social networking; and
- Implement individual user – and comply with statutory – privacy requirements.

With the profiling engine (Figure 2), operators will dynamically learn and update the user profile in a rich multimedia service environment. It accurately represents the real-life evolution of the user’s interests and behavior. The profiling approach is fundamentally different from efforts currently based on web and e-commerce technologies. For example, solutions like Google AdWords, AdSense and Amazon Recommender are dedicated to a particular web-based, personalized application.

Turning Risk into Opportunity

End user demands and technologies will continue to evolve, allowing new players to enter the market and inspiring new business models. Service providers must adapt to this new market reality and develop strategies that facilitate the quicker development, launch and retirement of services flexibly, while re-using existing infrastructure and investments.

Successful players in this new environment will build service delivery strategies based on a framework that takes advantage of new trends, new service requirements and new ways to earn revenue, while minimizing operational risk.

An important element in the Alcatel-Lucent approach to risk mitigation is the Service Delivery Environment. It gives service providers the flexibility to adapt to new business models and user demands, while reducing time to
market, operational complexity and costs. It is part of the end-to-end Alcatel-Lucent Transformation Advantage™ Framework for network, services and business transformation. It starts with an architecture blueprint and includes solutions, products and services available today that can be deployed in a modular way according to business priorities. These capabilities are effectively augmented by the Bell Labs Profiling engine, which offers an efficient tool for leveraging subscriber information into new value-added services.

The transforming telecommunications market offers plenty of opportunities. Alcatel-Lucent can help service providers exploit these opportunities, while minimizing operational risk. Indeed, the greatest risk today lies in ignoring the need for transformation, while the competitive landscape changes with increasing speed.

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Generational and cultural forces in the workplace – boosted by better network and processing technology – are challenging the traditional model of enterprise IT management. Corporate CIOs have, for the most part, built their enterprise networks on systems of standardized component hardware and software. There have been good reasons for taking this approach. It has given us management control over system performance and resource allocation. It has also allowed us to keep watch over enterprise IT security and data integrity. Standardized components have helped achieve economies of scale in both the acquisition of new systems as well as in ongoing operations and staffing.

As a result, CIOs have, for years, resisted letting users’ personally-owned devices connect to the enterprise network. And, for years, this response made the most sense from an accountability and cost containment standpoint.

New rules, however, are underway. A new wave of knowledge workers – comprised of the Millennial Generation in their early 20s to post-Baby Boomers – are now accustomed to technology at work as well as at home.

Three major trends underscore the penetration of computing technology into daily lives:

1. The relative price of computers has steadily dropped.
2. The power and reliability of consumer computers has increased.
3. The increasing availability of inexpensive broadband access has made the Internet a key element in both the work and recreational lives of consumers.

These developments are creating a need for CIOs to consider new practices to meet the changing expectations held by today’s workforce. For example, supervisors are learning that 20-somethings are more likely to respond immediately to text messages than they are to e-mails – which are regarded by many new workers as a less urgent form of communication.

Moreover, globalism and the expectation of higher productivity – doing more with less – have given rise to the mobile workforce and employees who are expected to be on call around the clock. To help balance the scales, many enterprises have made significant changes to improve the quality of life for individual employees by supporting mobility and remote access. These organizations realize that giving people a voice in how they work provides a pay-off in terms of increased productivity and employee satisfaction.

Embracing IT Consumerization

Understanding the implications of these trends, and the changes that CIOs may have to make in response, requires some perspective. Ten years ago, CIOs pointed to glaring differences in quality between consumer- and business-grade computing hardware, services and support. These differences were cited as key reasons to own and control all aspects of enterprise technology. CIOs did not want to be responsible for providing help-desk and back-office support to users who were located off-site, using systems and networks that support staff were not trained or authorized to service.

The Web 2.0 Effect

Things are changing, transformed by new technology developments, emerging business models and a major technological shift in society. The Web 2.0
phenomenon – including the use of social networks, blogs, wikis and other relationship building applications – will have a huge impact on corporations. This will not only have an effect on how workers collaborate, but also on how key information resources are accessed. Users who attended college within the last five years are probably used to working with highly collaborative learning tools as a routine part of their coursework. Many contemporary users also read, respond to or even write their own blogs, and of course, participate in social networking sites such as Facebook and MySpace.

At Alcatel-Lucent, we see a growing number of colleagues using Facebook to keep in touch, to solve problems and to exchange ideas about new technologies. Many of these employees are leveraging their knowledge of – and comfort with – social networking technologies to build virtual project teams. In fact, we believe the water cooler discussions are moving to Facebook, given more and more of our employees are part of global teams.

We’re excited as well about other Web 2.0-inspired possibilities. We have seen how the wiki concept has helped companies build and refine corporate knowledge. In many ways, this concept is uncooking knowledge that used to be siloed in specific departments. The cross-fertilization of ideas among different departments scattered across the globe is creating innovative opportunities to explore and pursue.

Web 2.0 and personal productivity devices (like smart phones, PDAs and so on) are playing a major enabling role in our ability to integrate our network, people, processes and collective knowledge and thereby exemplify a “Dynamic Enterprise” (see our article in this issue entitled, The Dynamic Enterprise – Leveraging 2.0 Applications). With the consumerization of IT, we are making the collective knowledge available anywhere and anytime, regardless of end-user device.

An Opportunity to Focus the CIO Mission
The consumerization of enterprise IT infrastructure offers CIOs an opportunity to refocus efforts on building the best network and service provisioning systems. But it will also require a major shift in thinking. As a result, CIOs will have to develop enterprise strategies and policies based on listening to the technology needs of their end users rather than dictating what resources will be made available and how those resources will be used.

One example of this cultural shift may come in the form of supporting end-user devices that are owned by the worker rather than by the enterprise. While this may be a radical idea with serious security, compliance and operational risks, there could be a significant upside to exploring this trend. CIOs may be able to reallocate resources from laborious and expensive activities associated with equipping and supporting dedicated connectivity over a few meters of network infrastructure. This could free up budgets and staff to concentrate on the delivery of innovative IT services. To mitigate security risks, new technologies – such as the Alcatel-Lucent Non-stop Laptop Guardian – can be used to enforce enterprise standards of behavior in an automated fashion from a central facility. This particular technology, for instance, offers a reliable way to protect intellectual property and even erase sensitive information from a remote location if the device is lost or otherwise compromised.

From a technology refreshment perspective, employee-owned equipment could actually reduce cost and keep the enterprise in tune with the latest capabilities offered by the marketplace. Moreover, an employee-owned enterprise desktop/laptop strategy could offer the opportunity to shift help-desk device support activities to the manufacturers of the equipment. This would free corporate support staff to focus on ensuring that enterprise applications are delivering on key performance requirements.

The Big Challenge: Keeping It Corporate
Much of the potential risk can be mitigated by developing appropriate policies and creating a culture of digital responsibility and etiquette that is vigilantly enforced in the organization. In addition to managing their own technical staffs, CIOs will need to coordinate closely with fellow senior managers and executives to develop policies and procedures that ensure social networking, collaborative and communications tools support company operations and objectives.

The Alcatel-Lucent IT team is very excited about the prospects of giving our workforce new ways to collaborate and communicate from anywhere and anytime so that they can develop tomorrow’s telecommunications solutions. And as a company committed to the development of innovative technology, we realize we can’t micromanage the creative process and expect to drive a lot of breakthroughs. Some of the ideas being generated by the consumerization of IT may offer the tools and concepts to optimize creativity while rationalizing the security and performance imperatives of a major multinational company. I believe that by exploring these opportunities, we can make sure our best minds are linked across oceans and time zones to collaborate and share ideas to deliver the results our customers demand.

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Technology to Power the New Rules: Delivering on the Video Opportunity Promise

By P. Wilford, E. Six
Introduction
An increasing number of carriers have arrived at a crossroads in the evolution of their networks. As they consider adding the capability to deliver advanced video services to their customers, and in order to support new business models for the communications economy of the 21st century, there is a need to get more content over the last mile. While many wireline carriers are in a strong position to offer initial services to a segment of their customers, fiber will have to be extended deeper into the access plant to provide uniform services to all their customers. In fact, many service providers today are updating their access plant with fiber-to-the-home. Moreover, core network bandwidths will also need to be expanded to support the scalability of wireline and wireless services across their entire customer base. But as important as increasing network bandwidth, powerful processing elements in the network must be added to handle the rigorous demands of advanced video services. This article highlights several significant opportunities and issues relating to IPTV, and demonstrates particular solutions that Alcatel-Lucent has developed to address these needs.

There is no doubt that the number of IPTV subscribers will grow significantly. Some of this growth will come from enhancements of existing access networks that are currently not able to support video services. Other growth will be the result of advanced video services that attract new subscribers. Further, by addressing some fundamental issues in the delivery of video service, as will be described in this article, IPTV will be more attractive.

Market forecasts predict a rise from an IPTV subscriber base of 13.5 million in 2007 to 72.6 million in 2011 (Figure 1). This represents a compound annual growth rate of 40%.

Corresponding revenue streams from IPTV will grow from $3.7 billion USD (€2.4 billion) in 2007 to $23.2 billion USD (€14.9 billion) in 2011. In addition to providing IPTV over the wireline access network, delivery of video over the wireless cellular network to handsets has become significant in the past two years. This represents not only a change in required technologies and networks, but also a change in the type of content consumers want and will watch and pay for. Trends like viewing shorter clips, interactive viewing, larger screens and smaller mobile screens all create challenges for the video delivery network.

Figure 1: Global IPTV subscriber forecast
Recently, we have seen new network architectures associated with video distribution. One such approach, hybrid satellite and terrestrial wireless systems, offers the advantage of multicast broadband downstream capability (for “conventional” TV watching) while enabling more flexible unicast services as well. Again, these types of networks require innovative solutions to ensure the quality of delivery subscribers expect, particularly if they are paying for the service.

However, the good news for most carriers is that they will be able to leverage much of their existing networks and their current network elements to deliver a new generation of video services. Alcatel-Lucent is working on management systems and video processing elements that can be added to their current equipment. As carriers upgrade their system to increase bandwidth and allow the delivery of advanced video services, they will be in an increasingly better position to make incremental investments, allowing them to cost-effectively take advantage of the growing revenue opportunities.

**Challenges to Overcome**

As carriers explore the opportunities presented by new demands for video services over their networks, there are technical challenges that must be solved to fulfill the promise of the video opportunity. One of the most compelling issues revolves around how to ensure that the network delivers video services – and all the associated video features and services customers have come to expect from this category of services – so that latent demand can be converted into new revenue generating opportunities.

It’s in this area that Bell Labs has developed significant innovative breakthroughs. Video delivery for carriers has proven to be very challenging. Almost all the difficulties relate back to the fundamental fact that the industry has mixed two very successful technologies together to build video systems:

- MPEG video compression and
- IP transport

While these two technologies have been extremely successful in their own rights, they were never intended to be mixed. MPEG, for instance, is a very successful standard for video compression. It was created with a paradigm of supporting long video sequences (such as movies or TV programs) with well-engineered broadcast channels and storage-intensive playback devices (like DVD players). The compression uses a lot of prediction to remove redundancy from the signal and has long-time constants to manage video buffers and other resources. These techniques have resulted in fantastic compression (better than 50 to 1) and picture quality like we are beginning to experience with ultra-HDTV displays and soon-to-come 3D TV, and now extending to multiple screens and many new types of players and recorders (like Blu-ray).

IP networking and transport is also a very successful technology. It allows for all kinds of very different services to be carried over the same network. IP packets travel across the network independent of each other and pack the higher-level services into small segments. This allows
for greater flexibility and the ability to share resources of network equipment, and results in the rise of very low-cost transport and delivery networks.

But when these two technologies (developed independently of each other) are combined and integrated, four key problems emerge that must be addressed before new video services can be successfully brought to market:

- **Reliable Delivery**: Problem is packet delivery can have a profound effect on the picture quality perceived by the customer. Because IP packets arrive at non-predictable and irregular times (and at times out of order or not at all), it poses a serious challenge to an MPEG standard that is time-sensitive and dependent on highly predictive sequencing. The way the signal is received by the subscriber is not the way a traditional MPEG receiver was designed to expect it.

- **Channel Change**: Because of the careful way any MPEG stream is created, both in terms of prediction and buffer control, an instantaneous random switch to a different stream will cause multiple seconds of garbled video until things correct themselves. Solutions must be deployed to alleviate this problem.

- **Advertisement Insertion**: Because of the nature of the MPEG signal, switching from the main program stream to an advertisement often results in “wrong predictions” and other problems in the stream. These must be addressed properly to keep the subscriber from viewing severe artifacts for several seconds at each advertisement boundary. (See our article in this issue, entitled *Hitting the Target with Television Advertising*).

- **Delivery Over Wireless Networks**: To enhance the revenue generating capability of a carrier’s network, there is a desire to send the same content over networks with much lower bandwidths. Therefore, there is a need to take MPEG content and reduce the bandwidth significantly. Solutions are required to be able to do this in the compressed domain.

**Reliable delivery**

To get a feeling for the challenges that must be overcome for these areas, please refer to Figures 2a-d. As will be seen, all four of these issues are related to the properties of the MPEG and IP technology and will share a common set of solutions.

We start with reliable delivery, which is described based on packet transmission shown in Figure 2a. Shown is a series of packets, each containing a successive portion of the video signal. The first and sixth packets are “anchor” frames. These anchor packets contain all the aspects of the video signal needed to display a high quality picture on the subscriber’s screen. The packets in between are “predicted” packets. We show in Figure 2a a situation where an error is made in the transmission of packet number 4. This could be anything from a bit error, all the way up to a lost packet.

The significant issue for IPTV systems is that, in this scenario, not only is the picture corrupted during the time of the

<table>
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<tr>
<th>Time</th>
<th>Video packets – channel A</th>
<th>Video packets – channel B</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Anchor</td>
<td>Anchor</td>
</tr>
<tr>
<td>#2</td>
<td>Predicted</td>
<td>Predicted</td>
</tr>
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<td>#3</td>
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<tr>
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</tr>
<tr>
<td>#9</td>
<td>Predicted</td>
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Figure 2b: Predicted packets result in slow channel change

- **Corruption of displayed picture (until next anchor frame)**
“errored” packet, but also the picture stays corrupted or impaired for all subsequent packets. This is because the prediction is based on something that is itself corrupted. This problem situation persists until another anchor packet is received. In the figure, the red oval represents the time when the picture displayed on the screen has residual corruption. It could last for several seconds. To further illustrate the situation, the figure shows what the TV picture would look like. Note the corruption persisting from the point of the error all the way down until the next anchor frame.

One way to solve the problem of reliable delivery is to ensure that all packets arrive to a customer in the way an MPEG system would like them to arrive. This is an approach that has been tried by early IPTV systems that have been deployed. But it is a very expensive and unrealistic approach, because it is trying to convert the IP network into something that it is inherently not.

Channel change
The root cause of very slow channel changes in IPTV systems is caused by the same fundamental aspects that led to packet transmission problems – specifically the predictive nature of MPEG. Figure 2b shows the same type of packet transmission and prediction. Let’s suppose the subscriber is watching channel A. Then at the packet number 3 timeframe, the subscriber switches to channel B. Since channel B is transmitting “predicted” packets, the resulting picture displayed on the TV screen will be corrupted, because the predicted frames are from the old channel. This situation will again persist until a new anchor frame is received. This situation can result in very slow channel change times; it can take several seconds. With new advanced codecs, such as H.264, this situation is getting worse because there is a longer time between anchor frames.

To address the problem of slow channel change (and also improve the reliable delivery problem), one could make the anchor frames appear a lot more frequently in the bit stream – but this would create higher bandwidth requirements or result in the reduction of overall picture quality.

Advertisement insertion
Local advertisement insertion is an important revenue generating capability of a service provider offering video services. It refers to the capability of network operators to be able to locally...
(small town size geography) insert customized advertisements for that particular locality. However, as we show in Figure 2c, the same nature of MPEG makes ad insertion challenging. Suppose the service provider wants to insert a local advertisement at the time of packet number 3. The original bit stream was very carefully set up using the predictive nature of MPEG. In addition, there are many key parameters in the bit-stream – like buffer levels, timing information and global parameters. The advertisement being spliced into the signal will have parameters that are different. This change of parameters that results when an ad is inserted can lead to a problematic and noncompliant bit-stream, which will result in a corrupted picture, and may even cause reset problems in IPTV set-top boxes (STBs).

The problem of local ad insertion could also be addressed by coding the video in a prescribed manner but, again, it would be at the expense of picture quality.

Transcoding – Delivery over wireless networks
The last issue, transcoding and transrating, presents a slightly different and difficult challenge. Addressing and solving this challenge, however, is significant because if it can be done in a cost-effective and manageable manner – in the IPTV Network – it will open up new revenue streams for service providers as they now have the capability to re-purpose content to many more types of subscribers over many more types of access networks.

A common scenario is as follows. Video to be delivered on an IPTV network will have been prepared and encoded at a certain bit rate and with a certain format, chosen to work with the characteristics of the access network and type of end-user device. A typical example would be 3 Mbps using MPEG2, assuming a DSL network with the most common type of STBs. However, service providers would like to have the ability to take these video streams and deliver them to subscribers using networks that have significantly lower bandwidth and with end-devices that support a different syntax. In Figure 2d we show a “transrating” from 3 Mbps down to 500 Kbps and a “transcoding” from MPEG2 to H.264. These rates would be common of what’s required for video on a wireless network.

The need to transcode and transrate the video could be solved by decoding the video and then re-coding it at a different rate and syntax. But this would be very expensive. Alternatively, multiple bit-streams with different rates and formats could be provided at the access point and a selection made at that point. But this is again expensive and requires more bandwidth and management.

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**Figure 2d: Transcoding and transrating: Reducing video bandwidth and changing video syntax**

![Diagram showing transcoding and transrating](image-url)
Alcatel-Lucent’s Approach

Alcatel-Lucent has developed a unified solution to cost-effectively address all four issues. It involves placing a video processor and server with buffering into the existing network elements. This technology is shared by all the subscribers, and thus it is extremely cost-effective. Further, since the solution is integrated into the existing network elements, it can be managed as part of the existing infrastructure. And for legacy systems, we have architected the solution so that it can be placed in a stand-alone video-processing server.

The key to our solution revolves around placing a powerful video-processing server into our access and edge router equipment. This video-processing server is made of three major components and is shown in Figure 3:

- Video packet processors
- Video content processors
- Video packet buffers

The buffer stores a small segment of each video stream being delivered by the network. This would typically be 100 to 500 TV channels and five to 10 seconds of each channel. The video packet processor manages the video stored in the buffer.

In order to improve Reliable Delivery in this environment, when an error in the bit-stream is received by the STB – which would otherwise result in severe picture impairment – the STB signals the network to resend the packet that has an error. The STB then replaces the bad packet with the good re-sent packet before the picture is decoded and displayed on the TV. There is a one or two second buffer in the STB, which allows time for this technique to work. Thus there are no visible impairments.

Fast Channel Change uses the same basic network functionality. When a subscriber clicks the remote to change channels, a signal is sent to the network to send the new selected TV channel. By using Alcatel-Lucent’s solution, the channel is sent to the subscriber – not from an arbitrary point, which would result in several seconds of delay before a good picture would appear on the TV – but from an appropriate point in the buffer so that the picture can...
immediately be properly seen. The video processor will then “speed up” or “slow down,” by either adding more compression or increasing the transmission rate to bring the buffer back to the normal operating position. This process takes between five to 10 seconds. The buffer re-synchronization occurs without any visual perception by the customer.

**Seamless Ad Insertions** utilize the same network video-processing capability. Our approach allows for the processing of the main TV program and the advertisement to be integrated into the signal so that when the splice is made, the bit-stream is fully compliant, allowing the STB to decode it and display the signal on the screen without any artifacts. The video-processing element we have developed has the capability to match anchor frames with splice points and perform all the required signal processing and manipulation to make the splice seamless.

One of the most powerful aspects of IPTV systems is the ability to deliver truly targeted or personal advertisements to individual subscribers. The techniques described here developed by Bell Labs allow for the seamless delivery of personal advertisements to every individual subscriber without any modifications of existing STBs.

**The Transcoding and Transrating** function requires extensive processing of the video signal. This is where the role of the video processor is critical. The approach we have taken is to process the video while it is still in the compressed domain and reduce the bandwidth and change the coding syntax to adapt to the available access bandwidth and the type of client device that is receiving the signal. We use a variety of techniques to make this happen, including:

- Motion vector sharing,
- Re-quantizing coefficients and
- Reducing the bit rate of select codes.

All three of these techniques can be executed much more efficiently (in terms of required processing power) within the video-processing server than using conventional methods.

Alcatel-Lucent is implementing a product and architecture strategy for adding this video-processing capability into our network equipment. We have developed a common set of algorithms and protocols that all of our products will implement, thus ensuring that when customers deploy large-scale systems, these key aspects of video delivery will work very well.

**Considerations for Implementing Video Strategies**

One of the most important issues associated with deploying technologies that deliver high-quality video and video features customers are demanding is to ensure that the technology implementation is coordinated across all the network elements in the video-delivery system. Fast channel change and reliable delivery require signaling between the STB and the access and edge router equipment. Seamless ad insertion is most effectively accomplished when the routers are coordinated with the access equipment. Transcoding and transrating requirements require knowledge of access bandwidth and performance characteristics, as well as knowledge of the type of end-user devices. And to optimize performance (scalability), to minimize expense and to be able to manage the video subsystem as effectively as possible, an integrated view of the network must be considered.

That said, there are two barriers to deploying this new technology. The first is that there are large-scale existing legacy systems that service providers may want to use for IPTV offerings. The second is that new technology must be deployed in multiple places in the network simultaneously for this new capability to work.
To break through these barriers, Alcatel-Lucent has done two things:

- We have developed this new technology in a highly modular and flexible manner that enables its incorporation into all of our network equipment. This includes the ability to enable customers with legacy equipment to incrementally upgrade their network in a step-by-step fashion until all the new capability is incorporated in the network elements.
- We have tested our common algorithms and protocols in multiple systems test labs. In fact, our different product development teams used common core assets to speed our time-to-market and make testing performance in the field much quicker.

Conclusion

IPTV systems are still at the beginning of their deployment potential. They offer the promise of tremendous value to the end user – blended services, complete interactivity, simplified home networking as well as high-quality, big-screen, entertainment TV. The technology Alcatel-Lucent has developed ensures that nothing detracts from the user experience of watching TV in any format on any device.

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Today’s television advertising, much like its programming, is broadcast, meaning all viewers in a town see the same programming and the same ads. The ultimate quest for television advertising, however, is targeted advertising – delivering different ads to different households for the same ad slot. For example, when the program goes to ad break, the car dealer ideally would like to showcase different car models based on each household’s demographics (such as family, seniors and so forth [Figure 1]). Indeed, targeting is key to the phenomenal growth of Internet advertising. By displaying ads on a web page customized for the user (for example, based on their search query or access history), web portals have been very effective in matching advertisers to their target audience. Consequently, Internet advertising has seen significant growth over the last several years and Alcatel-Lucent analysis projects continued growth of 18% year-over-year through 2011.
With the advent of digital television and IPTV, the television industry now has all the tools required to leapfrog to this ultimate advertising paradigm. The opportunity for targeting is greatest for local ads where, akin to the Internet, regional providers can segment their audience into niche demographics and do so with finer granularity as the targeting infrastructure matures. Analysts believe targeted digital advertising can help to grow network operators’ portion of the local ad market significantly from the $6 billion USD (€3.8 billion) size it is today in the United States.¹ Most importantly, this narrowcast ad delivery model will bring together two critical catalysts for effective advertising – the affecting appeal of television with the efficacy of targeted marketing, making it a truly attractive medium.

However, like any industry in its infancy, telecom vendors and the advertising industry have to overcome issues in their quest for tailored ads. The technology challenges can be broadly classified on two fronts – delivery infrastructure and decision “intelligence.” Today’s linear ad-insertion systems “splice” the program and ad stream in real-time – a serious video-processing effort. With targeting, instead of a single ad during the ad break, the system has to cut the program and create n distinct, protocol-compliant ad streams, assuming n demographics are being targeted. In turn, this creates an n-fold explosion in the scalability and bandwidth complexity of the splicing process – the Alcatel-Lucent Bell Labs technical innovation lies in achieving this cost-effectively. IPTV has a fundamental architectural advantage for targeting because DSL is a dedicated line to the home with a natural fan-out at the Digital Subscriber Line Access Multiplexer (DSLAM). This can mitigate the n-fold bandwidth overhead on the “last-mile” that a broadcast-based system such as cable TV would entail. The other important challenge is the decision intelligence – dynamically matching ads to households without compromising on privacy. Much like the Internet, the differentiator will be a system designed to effectively handle multiple criteria – program content, demographic, Internet and channel-surfing history, and so on, and yet, provide decisions in real-time to create a seamless experience for both the advertiser and the viewer.

Bell Labs is active in this exciting space, creating innovations ranging from scalable ad delivery infrastructure to audience profile mining and discovery tools. The television industry is on the cusp of an advertising revolution, and it is coming to a TV near you! ★

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¹ ©2008, Yankee Group, The High Watermark for Interactive Cable.
The vast majority of network traffic is related to the transmission of content between interested parties. Many content providers such as the BBC, Disney, Netflix and Joost make their content available either through their websites or by using peer-to-peer (P2P) technologies. In addition, applications such as BitTorrent and Azureus enjoy great popularity among users and contribute significantly to the overall network traffic.

Content providers find P2P content distribution attractive because it can significantly reduce the load on their servers. However, network operators are concerned about the significant network burden P2P applications can place on their infrastructure. This burden is a result of many P2P applications being oblivious to the underlying network structure, and often content is randomly fetched from peers without regard for location. This is inefficient and provides suboptimal performance for the application as well as the network operator in that content may be downloaded from very distant peers when the same content is available from a local network peer.

Alcatel-Lucent Bell Labs takes an integrated approach to content networking that addresses the problems of P2P techniques while, at the same time, leverages its unique capabilities for content distribution. This is achieved by approaching this problem from two angles: first, we combine traditional content distribution networks with P2P technologies to improve the efficiency and scalability of the content distribution infrastructure. This approach leverages the endpoints as well as the caching infrastructure capabilities in a way that enables each to contribute optimally. The second goal is to reduce the tensions between P2P applications and the network infrastructure by enabling the network to guide P2P content distribution. In the following, we describe two examples of the benefits and opportunities in peer-assisted content delivery.
It is commonly believed that P2P is naturally suited for handling flash-crowd scenarios, due to its inherent self-scalability. Flash crowds are scenarios in which many users access the same content at the same time, generating a sudden request peak. Bell Labs analysis shows that, in practice, asymmetric access links and the large size of video content make pure P2P less efficient, resulting in poor service quality. A better solution is therefore to carefully combine server and peer contributions to create a solution that provides a superior overall performance for handling sudden load peaks.

An approach to lessen the tensions between P2P content distribution applications and the network is to guide P2P applications toward peers in the local network during the peer-selection process. Bell Labs’ studies show, however, that the current algorithms for local peer selection have a key impact on the content delivery performance, and substantial performance improvement can be achieved through more intelligent peer-selection algorithms.

Summing up, at Bell Labs we believe that future content-distribution networks need to combine approaches from the P2P domain with traditional content-distribution networks. Choosing the right algorithms to combine these two technologies is essential for achieving excellent network and application performance.

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An effective response to current technology, market and regulatory changes requires new directions, new business models and a search for new sources of revenue. That is why, after harvesting substantial profits from voice services over the past few decades, the race is now on to find new ways to generate profits and maintain margins as new technologies and market dynamics drive operator strategies. Content services are an increasingly important source for augmenting current voice-based revenue streams.

A Window of Opportunity
Consider this: European mobile operators are now expecting minimal voice-only subscriber growth, while in the United States, the slowest growth rate in this decade was experienced in 2007 – 9% – for the top four operators. According to Jason Kowal at Analysys, the rate of growth in the US market will decline to as low as 2% per year by 2012. Worse yet, average revenue per user (ARPU) derived from voice services in most major markets will continue to fall over the next three years, as:

- Traditional voice and related applications become increasingly commoditized,
- Price competition becomes more fierce,
- Regulations restrict prices,
- New players enter the market, and
- Subscribers continue to expect new services at the lowest possible cost.

Analysys researchers expect non-voice services to account for 17% of US ARPU in 2008. That figure will grow to nearly 30% of ARPU in 2012. As a result, operators must explore new applications as a way to grow revenue, differentiate services from competitors and encourage customer loyalty. As new services are introduced, content – and related offerings – are expected to play a major role in how new revenues are generated.

According to Alcatel-Lucent analysis, the upside potential of the content and advertising market is enormous. The size of end-user spend on online digital content (defined as spend on fixed or mobile on-net entertainment services, excluding broadcast TV and off-net entertainment such as DVB-H) is expected to grow to €32 billion ($48 billion USD) in 2009.
(representing a 37% compound annual growth rate). Without counting revenues from advertising, this would represent about 10% of total end-user entertainment spending in 2009.

Mobile content distribution, which will represent approximately 27% of this total, can take multiple forms. With mobile data usage – including Internet browsing, ringtones, gaming, video and music streaming and mobile TV – still in its infancy, mobile content distribution is largely an untapped opportunity.

New Challenges

While there is tremendous opportunity to generate revenue with content, supporting content services requires much higher levels of integration of both service delivery platforms and the back office business systems that track customer usage. Stand-alone mobile and wireless networks that deliver dedicated voice and data services cannot fully (or even significantly) deliver on the substantial promise of content-based revenue models. There are significant technical and business hurdles that need to be overcome in order to succeed.

Consumers and businesses alike now take a holistic approach to their communications resources. Voice services should not – in the minds of end users – be completely divorced from the data services they use confluently on a daily basis. The idea of receiving separate bills for different services offered by different operators is viewed with increasing disdain. It represents complexity they can do without.

As music and movies are increasingly digitized, distribution channels are following suit. We are seeing them shift from using business strategies that depend on the sale of physical media (CDs, DVDs) to becoming online distribution players leveraging IPTV, VOD and other download technologies. This is creating new opportunities for the same media to be consumed on a variety of different platforms: TV sets, PCs, iPods, mobile phones and other portable devices.

Digital media distribution is distinctly different from traditional media distribution, as digital content can potentially flow over any kind of network or device. As a result, new relationships and business models that go far beyond delivery of conventional voice and data services must be explored and adapted.

Many organizations, including telecom carriers, are launching Internet portals that leverage the increasing penetration of broadband technologies. As telecom carriers control the link to the digital consumer via the last mile (either fixed side or mobile side) they are in a strong position to establish early positions in the new digital content distribution market.

Moreover, there is end-user interest in building tighter links between the technologies that offer connectivity with the content services – news, m-commerce, social networking and so on – that are accounting for a growing percentage of traffic that flows over today’s networks. Evidence of this interest is illustrated by the impact that new media players (such as Google, Apple and others) are having on the communications industry as major competitors for the hearts and minds of prospective subscribers.

New Technology Requirements

Most industry experts now agree that the key to integrating voice and data networks (both wired and wireless) revolves around taking advantage of the next-generation technologies that bring the functional capabilities of the Internet to the communications network.

This involves much more than simply rolling out new IP infrastructures, Multi Protocol Label Switching (MPLS) capabilities and other key wireless technologies. It requires the creation of a service delivery environment that allows operators to manage and manipulate applications and customer information to rapidly create new services in response to new demands in the marketplace.

Even with a next-generation network, however, actually delivering a sufficient quality of service is not without challenges. Successful delivery of packetized video streams is quite complex (see our article in this issue, entitled Technology to Power the New Rules: Delivering on the Video Opportunity Promise).

Few doubt that – over the long run – operators who make the investments to have these networks in place will succeed in the marketplace. What is less clear is how today’s operators will achieve this future state. In this regard, it seems that most operators have a couple of choices. They can:

- Invest in – and build out – a new generation of integrated content applications and provisioning infrastructures that enables content services to be deployed;
- Leverage the resources of a hosted and/or managed services provider to offer new content-based services to current subscribers on current networks.
Some of the largest global operators are pursuing the first option. Many are working with Alcatel-Lucent to deploy new networks capable of delivering new revenue-generating services. While this makes sense for some operators, it admittedly requires significant investment in new technologies, significant focus from the most talented human resources and a substantial capital investment. Rolling out these new content services will also take time. But for those with the wherewithal to follow through on this type of strategy, the investment – and risk – is well worth it.

For many others, however, the risk, investments, resources and availability of in-house expertise is simply not available. In some markets, operators may also not be able to afford the delays that may be associated with building out content resources on their own.

Integration of the content management platform within the network operator’s environment (network, portal, customer care, billing systems) is a complex undertaking.

Service delivery and orchestration requires a complex integration of many elements (Figure 1):
Managed and Hosted Content Services: A “Business Enabler” Model with Broad Implication

Given the technical complexity of developing a content-delivery platform, managed and hosted services options – such as those offered by Alcatel-Lucent – make a great deal of sense, especially for those who see a compelling need to roll out new services rapidly. This delivery model allows operators to shift their focus from managing core network operations, to developing compelling service bundles and executing successful marketing and sales campaigns.

With this model, operators no longer have to devote significant resources to scaling up or down based on a particular technology. Nor do they have to worry about managing the skills, people and training processes required to take advantage of new technologies. Operators are able to delegate many day-to-day operational activities to solution partners and manage those partners through service-level agreements.

Here are some things you should look for as you develop your own platform or seek a partner to manage and host this for you:

- **Superior Marketing for an Optimal End-user Experience:** User experiences should be personalized based on subscriber preferences and selected profiles, download and purchase history, browser patterns, purchase triggers and response to campaigns. Content delivery platforms should enable key elements of the optimal experience, including:
  - Content storefront portal, including personalized portal layout;
  - Cross-media sales and promotions through mobile (short message service [SMS], and wireless access protocol [WAP]) and Web;

- **Consistent Quality of Experience:** It is imperative that a content-delivery platform consistently deliver an overall improved mobile content end-user service (such as dynamic user-experience modification, cross-media discovery and selling) and provide service level agreements (SLAs).

- **Interconnection of the Content Management Platform** within an operator’s environment (that is network, portal, customer care, billing).

- **Management of Trusted and Un-trusted Content Partner Relationships** to enable the operator to consolidate its content portfolio into a single platform.

At Alcatel-Lucent, we offer mobile operators our Managed Content Services solution, an end-to-end service package that enables our customers to improve time-to-market, lower the risks associated with launching new personalized services to end users and optimize their expenses through a revenue-sharing arrangement. Our service delivery model is structured on a partner ecosystem (Figure 2).

Today, the service is best suited for mobile operators in countries where 2.5G and 3G networks have been or are being deployed, which provides the foundation of an attractive content offer. Managed through a single point of contact known as the Executive Service Delivery Manager, the complete package offers a number of key services.

Alcatel-Lucent provides platform hosting and operations through Data Centers and Network Operating Centers (NOCs) supported by sophisticated day-to-day business operations expertise (Figure 3).

The shift toward managed and hosted services follows an ongoing trend that runs across the entire business spectrum and involves applications related to sales, marketing, human resources, content management, customer relationship management (CRM) and a wide range of other processes.
In addition to enabling low-cost, rapid deployment, these services allow operators to avoid the learning curve associated with implementing and maintaining new technology related to content distribution. Equally important, they allow operators, content owners and media companies to avoid further technical complexity, which has become a critical issue for many. Instead of adding to complexity, managed and hosted services are implemented rapidly and with relative ease.

Although this new model offers operators, content owners and media companies the same set of benefits – to increase content usage and therefore generate revenue directly from the end user – it enables strategic partnerships that share revenue, with the potential of capturing additional revenue through targeted marketing campaigns (Figure 4).
In a sense, the managed and hosted model allows operators to succeed all the way around. Operators can immediately take advantage of new content services and build new revenue streams while remaining focused on their core competencies.

Conclusion
With true partnership and help structured on an application service provider (ASP) model similar to the one presented here, operators can expect faster deployment, offer better services and reduce their operational costs. The managed and hosted service model – and many of the elements that compose it – can benefit content owners, too, especially as they look for new ways to reach consumers at the end-points of fixed or mobile networks. New managed and hosted content services are able to provide a significant competitive advantage by easing the complexity associated with network deployment and operations while reducing time to market for new and innovative content services with an optimized quality of experience. With this business model, operators are able to benefit from expert technical and marketing support and at the same time mitigate and share the risk in this very dynamic marketplace.

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Over the past few years, there has been a tremendous amount of excitement surrounding two new revenue-generation opportunities in the Information and Communications Technology world: advertising and location-specific services. Alcatel-Lucent Bell Labs has developed a unique Geographic Messaging Services Platform (GMSP)\(^1\) that allows customers to successfully participate simultaneously in both of these opportunities with new and innovative end-user services.

Telecom carriers and large facilities – such as malls and sports arenas – can reach mobile users and offer automatic delivery of advertising messages that are relevant to their immediate geographical environment. The very same platform can be used to provide a host of other geo-based services. For example, location-specific social networking services can be offered in which messages are associated with friends when they approach a particular location (“I’m in the rear of the restaurant – come on back.”). Or services can be provided that issue alerts associated with geofencing\(^2\) event triggers – such as when your child passes outside a pre-defined perimeter around his or her school.

Today, there is a variety of first-generation location-based services. For instance, users can look up nearby restaurants, get directions and find other information based on location. However, these are all PULL services that require the user to actively request information from the network. By contrast, the GMS is a PUSH service; it allows the network to proactively send content to users when they enter a geographic zone or a predetermined geofence area.

For example, Sally opts in to a peer-to-peer push service, and Mike – who already belongs to the network – associates some personalized content for his friends with an area in New York City, such as Times Square. When Sally enters that area, a Short Message Service (SMS) or Multimedia Messaging Service (MMS) is automatically delivered to her with Mike’s geo-specific content. We call this location-triggered messaging mechanism GMS.

In order to deploy “push” geolocation services, carriers need a central platform that can:

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1. GMSP is a new platform for delivering location-driven messaging for cell phones. It is a message associated with a geographic region that is delivered to a subscriber when they are in that region. A GMS is a message delivered when a mobile device enters or exits a geofence. See: http://en.wikipedia.org/wiki/Geographic_Messaging_Service.
2. A geofence is a virtual geographic region (such as one mile around a mall or arena).
• Handle each handset’s location requests (potentially thousands in a single area) without bogging down the wireless network; and
• Enable any third-party service to “feed” information to this platform to be pushed to users.

To address these two critical needs, Bell Labs has developed GMS technology that harnesses:
• Predictive Movement – to minimize impact on network infrastructure, air interface, phone battery life; and
• Intelligent Client-Server – to share resources across a portfolio of servers, increase functionality and simplify implementation of new services.

In February 2008, a service using the Geopepper mobile marketing application went live, as a trial, at one of the largest sporting arenas in the United States. The local professional ice hockey team worked with Alcatel-Lucent to showcase the possibilities of the Geopepper mobile marketing application. Hundreds of hockey fans were handed cards and invited to opt in to receive advertising text messages on their mobile phones. The messages were, in essence, digital coupons that could be redeemed for discounts offered by stadium vendors. To obtain the discounts, fans simply had to show the vendors the message and special code that was sent to them exclusively, via their mobile phone, during the event. This sporting arena trial illustrates one of the interesting applications for GMSP. It shows how large facilities can create a mobile marketplace that extends the physical reach of retailers directly to the consumers.

Alcatel-Lucent is also working with telecom service providers to establish a set of geofences that can define discrete mobile areas of commerce – throughout metropolitan as well as suburban and rural areas. The geofences are designed to connect mobile users to retailers in which users have expressed an interest and are co-located within the geofence. This is a major opportunity for service providers to harvest revenues from coffee shops, delis, boutique retailers as well as major chains. For instance, users who have indicated in their profile that they enjoy special-interest bookstores can be notified of a location that is right around the corner.

In addition, capabilities have been developed that will enable retailers or service providers to analyze user data – associate user locations with discrete geofences, allow retailers to send context-relevant messages and provide a suite of other associated functions. Service providers and retailers can use a web portal to create, edit and provision messages. The Geopepper mobile marketing application also offers an optional handset client application for devices that are GPS enabled. For non-GPS enabled devices, the Geopepper mobile marketing application uses the Mobile Location Protocol through a location gateway to access an end-user location. Geopepper sponsors can not only determine end-user location information, but also predict where users will go next, based on their current trajectory and prediction algorithms.

In short, the Geopepper mobile marketing application empowers Alcatel-Lucent customers with a unique and powerful platform to capitalize on the growing importance of geo-based advertising as well as being able to offer a host of other new geo-based services.
The Dynamic Enterprise –
Leveraging 2.0 Applications

Companies look beyond connectivity and see technology as a tool for business transformation

By X. Martin

Introduction
Over the next few months and years, a growing number of mid-market, large and multinational companies will learn that significant gains can be made by integrating tangible and intangible organizational assets\(^1\) – network, people, processes and collective knowledge – to boost productivity and efficiency and achieve a competitive advantage. In doing so, a new type of company will arise: what we at Alcatel-Lucent call a Dynamic Enterprise.

No two Dynamic Enterprises will look alike. Each company’s communications assets are based on the competitive landscape, technological maturity and the CIO’s mandate. Different markets pose unique challenges, and those factors influence an organization’s network infrastructure needs. Technological maturity, and the ability to make sophisticated decisions, involve not only being aware of new technical developments but also understanding how new technologies can be integrated into the enterprise to leverage the four key assets and gain a competitive advantage.

These factors help explain why the role of most CIOs has changed so dramatically over the past five years. Today, most CIOs are part of the management board. Their new responsibilities make it necessary for them to look beyond technology toward enabling business objectives such as attracting customers and supporting key processes. Thus, in Dynamic Enterprises, CIOs must carefully tailor their portfolio of projects with an eye to realizing a comprehensive business transformation over a period of time.

These new types of companies do share one thing in common: in order to become a Dynamic Enterprise, it is not enough to simply throw new technology at a challenge. At Alcatel-Lucent, we believe that success depends on the nuanced ability for companies to assess their own business objectives, assets and requirements and plan for a gradual migration (Figure 1). Put differently, the Dynamic Enterprise is more of a journey than it is a destination.

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Tapping Structured Data and Tacit Knowledge

Inefficient business processes can be traced to an organization’s inability to deliver the right information to the right people at the right time. And knowledge management specialists agree that explicit company knowledge (structured information maintained in databases, for instance) accounts for as little as one-fifth of all information that can potentially be used by organizations to make good decisions. Tacit knowledge (unstructured because it exists mainly in the minds of individuals and in private areas such as hard disks) represents the majority of the information.

Dynamic Enterprises understand the need to unleash “connected knowledge” by making the collective knowledge accessible in real-time – anywhere, anytime, on any device – to the business community, thereby unleashing the value of the intangible asset associated with connected knowledge. Until recently, there were few solutions available to address this requirement. However, the rise of social networks and Web 2.0 services in the consumer arena offer enterprises critical insight into how the problem can be solved.

Technologies such as Wi-Fi, broadband and smart devices are entering the enterprise. The rapid introduction of these technologies is being driven by a new generation of users who are willing to use the most convenient tools to achieve their jobs, regardless of the corporate solutions developed by IT.

We fully expect the enterprise to turn to users to play a big role in influencing which technologies are deployed and how they are used as new collaborative applications based on Web 2.0 are imported into the enterprise arena.

Dynamic Enterprises Leverage Enterprise 2.0 Applications

This fusion of Web 2.0 with corporate usages results in what is now referred to as Enterprise 2.0 solutions. These new solutions can provide access to the collective knowledge within companies. And if a company integrates this collective knowledge with real-time communications, it can have a significant business advantage by linking the right people at the right moment on the right device. It allows Dynamic Enterprises to integrate real-time communications solutions (applications, devices and network infrastructure) with Enterprise 2.0 services such as corporate wikis, blogs and other “profsocial” networks used by employees, partners, suppliers and customers.

They establish the foundation for connecting knowledge in a way that drives broader convergence between the network, IT and business processes to better achieve mission-critical objectives.

A Different Paradigm

This represents a new paradigm in managing technology. Today, open standards and open-source capabilities are driving new technology developments so that a wide range of devices and applications can be integrated. Open and flexible solutions are a must in order to build end-to-end networks that link both the enterprise and carrier worlds; standards-based technologies such as IP are essential if companies are to migrate successfully and anticipate future communications advances.

Ten years ago, single-vendor, proprietary solutions for voice, data and early mobility were viewed as tools for helping companies using those unique solutions to differentiate themselves. The emergence of the Internet as a business tool, however, illustrates how far we’ve come in the evolution of open systems.

As soon as the network becomes standards-based, it can no longer be considered a sufficient framework for competitive differentiation. Everybody can have IT at a total cost of ownership that breaks the entry barriers and transforms the market, both technologically and from a business perspective. In this process, differentiation is flattened.

Although enterprises (particularly those with multiple locations) saw cost control as the first visible benefit of IP deployment, it soon became clear that the real value of IP rests in its ability to integrate voice and data in a converged way to support a new breed of applications that can bridge the network and IT worlds.
The unified communications market, which emerged five years ago, promised to improve users’ efficiency and productivity. This created a shift away from the network and technology dimension to the user dimension. This shift acknowledged users as an important company asset and businesses shifted, focusing on equipping users with the right solutions to support their roles and functions.

The evolution of communications investment continues today. Once the right solutions have been deployed for the right users, some companies are looking for communications solutions to reduce business latency, ensuring that the right person has the right information at the right moment. Meeting this requirement requires the ability to integrate business applications – or their attached processes – with real-time communications. This is the key to enabling business-driven and context-rich notifications on any device. It also allows for the triggering of instance-related automatic outbound calls in the context of customer service for companies that integrate their contact center operations into a broader customer service chain.

Technologies at the Center of Dynamic Enterprise Enablement

A number of technologies must be well understood and managed if companies are going to progress on their paths to becoming Dynamic Enterprises (Figure 2).

- Mobility – and all of the technologies that enable people to access the resources they need from any place and at any time – has been a key force driving enterprise transformation. As people become increasingly mobile, there is also greater pressure to boost their productivity and their ability to positively influence any business situation. As a result, the enterprise network infrastructure needs to be able to support mobility.
There are many technologies that can get this done. The rapid adoption of Personal Area Network (PAN), LAN, WLAN and Wide Area Networks (WANs) – in conjunction with mobile applications such as push mail systems, unified communications, ubiquitous Internet Protocol (IP) calls that can be made from almost any type of terminal or device – are changing actual business strategies. The types of information that these technologies can exchange encompasses a wide range, originally stored into corporate databases and applications (such as supply chain, CRM, human resources or any other business-critical application – industry-specific or not).

Since it is unlikely that each of a company’s employees will use the same communication end-points, mobile operating systems and desktop applications, it is then essential to use standards-based architectures that are application, location and device-neutral from a federation perspective.

- A second technology that has a key role to play in the Dynamic Enterprise is Web Services. There are two reasons for this. First of all, in order to integrate corporate applications, organizations need secure Web Services capabilities that enable a dialog between these applications and real-time communications solutions. Second, Web Services enable integration between Enterprise 2.0 and real-time communications solutions to transform collective knowledge into connected knowledge.

- Security technologies are also critical. While a tremendous amount of progress has been made on the standards and technology development fronts associated with security, trends like mobility and social networking have introduced new risks and threats. The role and scope of security has changed dramatically over the last couple of years and now must also support the challenges posed by mobility and platform computing.

For instance, three years ago the main security challenges involved data protection and intrusion prevention.

More recently, the focus has shifted to protecting applications and assets – what is often referred to by Alcatel-Lucent as user-centric security. The aim is to deliver enterprise security solutions that provide finer control over what users can access on the network and to deliver proactive security that can prevent misuse of resources and limit potential liability. Specifically, the purpose of new security measures in this much more dynamic environment is to:

- Protect sensitive information from misuse;
- Allow sensitive data to be accessible when and where it’s needed;
- Ensure information is compliant with information privacy legislation;
- Secure information flow when sharing with third-party organizations including partners and suppliers; and
- Enable efficient demonstration of regulatory compliance.

Bottom line, companies must enable secure information flows throughout processes and across Enterprise 2.0 services, which can also ultimately be considered a process.

Solving these security issues involves delivering:

- Run-time access policy enforcement, which ensures information access and change control;
- Consolidated audit logs that demonstrate compliance; and
- Single identity, which ensures corporate-wide consistent policy.

How Key Technologies Support the Mission

Using a search engine based on tags, Enterprise 2.0 applications point people to the right information and then provide immediate access to the information they need regardless of the time of day or device they use. This allows organizations to gain access to the collective unstructured knowledge, which so far has been inaccessible.

Wikis, contributions to blogs and social bookmarking services offer access to new, reliable and up-to-date sources of information in a dynamic fashion. And the good news is that these services can complement existing Intranets and other corporate IT investments.

By integrating Enterprise 2.0 with real-time communications solutions, users will know how to quickly contact those who have information. In the process, they will lower human latency and increase business efficiency.

The key to success for Dynamic Enterprises is to move beyond focusing on how information interacts with systems and turn every interaction into a business opportunity by offering different types of workers within an organization the ability to access, interact with and manage the information they need in a secure and appropriate manner. This requires technology professionals to have a solid understanding of the different types of users that exist within an organization and provide them with the right solutions to enable empowerment and productivity.
Alcatel-Lucent’s Approach to Dynamic Enterprise Solutions

In recent years, Alcatel-Lucent has conducted extensive research to categorize roles within organizations. We have segmented the basic types of users into five key roles:

• Executives
• Mobile professionals
• Team workers
• Office workers and
• On-site roamers

In addressing these five different profiles, we have built user profile packages that embed networking technologies, communications applications and devices. Each package is based on the profile of users that enterprises want to address. The end-result is a series of off-the-shelf solutions that accurately address each employee’s individual needs (Figure 3).

Moreover, Alcatel-Lucent has integrated business processes and Enterprise 2.0 services into key solutions to more closely tie together communications solutions and business purposes. Our implementation of a web-based architecture supporting Web Services (such as Service-oriented Architecture [SOA]) enables communications with these applications or services.

Alcatel-Lucent enables the Dynamic Enterprise with the Dynamic Communications Framework of solutions, an evolutionary model for how to invest in communications infrastructure, aligning with business objectives at the appropriate pace, while protecting past investments. These state-of-the-art solutions include:

• Hybrid (or IP-ready) voice communication servers;
• End-to-end IP networking;
• Network and applications management and supervision solutions;
• User-centric security portfolio;
• Mobility and collaboration solutions (part of a complete Unified Communications suite);
• Customer service (contact centers, self-service platforms);
• Solutions for convergence (data and voice, fixed and mobile, enterprise and carrier networks); and
• Web Services and support for SOA.

Finally, we have developed a unique program for integrating our solutions with those of third-party providers, including more than 50 Alcatel-Lucent Applications Partners and/or Alliance Partners such as IBM, Nokia and Microsoft, to deliver vertical applications or address specific customer needs. This partner ecosystem is complemented by strong relationships with all major carriers worldwide, either to partner around Managed Communications Services offerings or to deliver on the promise of end-to-end IP networks, which are the foundation for the enterprise of the future.

We fully expect that Dynamic Enterprises will represent a major source of demand for communications services in the months and years to come. Their communications and IT processing needs will be extremely sophisticated. That is why Alcatel-Lucent works every day to innovate and to invent the communications technologies, platforms and business models of the future.

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Environmental concerns are not a new focus for Alcatel-Lucent. Our heritage in ecological innovation can be traced back to the invention of photovoltaic technology developed by Bell Labs more than 50 years ago. This allowed the industry to convert light into electricity and enhanced energy management for communications networks. This early example of our work on eco-sustainable innovation illustrates a mindset and corporate culture that continues to drive our thinking and technology development initiatives to this day.

Eco-sustainability is gaining an increasing amount of attention, and as we contemplate many of the choices once accepted as self-evident truths, we realize they perhaps need to be reconsidered.

- You can’t offer high levels of service if you want to hold down costs.
- You can’t operate an open network if you want to protect data integrity and privacy.
- You can’t run an ecologically sustainable business without sacrificing profits.

All of these statements are now considered myths by a growing number of innovative and financially successful organizations.

Operators are Well-positioned to Enable Eco-sustainable Profits

Environmental consciousness is, in fact, one of the new rules that a growing segment of consumers and businesses are asking the industry to play by.

As we see it, true eco-sustainability has nothing to do with adopting superficial changes to look good while continuing to do business as usual. Nor does it mean making changes that undercut business viability.

We believe that eco-sustainability can be achieved cost-effectively, and it can also drive growth and profitability. As a growing number of enterprises build eco-sustainability into their purchasing criteria, service providers offering eco-sustainable products and services can differentiate themselves from the competition, leading to increased market share and revenue growth. They can increasingly make the case, for instance, that reducing carbon emissions is directly associated with improving energy efficiency, which ultimately helps the
environment while lowering operating costs – and contributes to the bottom line.

There is also growing evidence that an eco-sustainability strategy can offer top line benefits. One of the most dramatic examples of an organization that is achieving substantial revenue gains as a result of a well-developed eco-sustainability strategy is United States-based General Electric Corporation. The company stated in its 2007 Annual Report that it now expects to achieve $25 billion USD (€16 billion) in eco-related sales by 2010 (a $5 billion USD [€3.2 billion] increase from their previous target). This is a result of its well-recognized “ecomagination” program.

At Alcatel-Lucent, we believe that operators are well-positioned to be seen in similar eco-sustainable terms by both consumers and businesses. There are growing opportunities for service providers to maximize revenue opportunities by positioning new communications services – such as unified communications and virtual collaboration – as a way to help end users reduce their environmental impact.

In fact, in our industry, and in particular through Alcatel-Lucent innovation, we have already made significant strides in this area. One of the most impactful is the migration from classical circuit-switched networks to IP networks and the inherent energy efficiency improvements (exceeding 90% energy reduction in power per unit of bandwidth).

Intertwining Challenges
A new study from the American Council for an Energy-Efficient Economy (ACEEE) found that implementation of a whole array of new technologies leads to a dramatic increase in energy efficiency and is actually a net saver of energy by a 10:1 ratio across the economy. Researchers found a direct correlation between gains in energy productivity and investments in information and communications technology (ICT).

The ACEEE found that, today, it takes less than half the energy to produce a dollar of economic output than it did in 1970, and that energy-efficiency gains have increased significantly since 1996.

One prime example of the alignment of eco-sustainability with business objectives can be found in how data centers today are being managed to reduce costs and improve carbon emission efficiencies. There is a general consensus that technology-related power consumption improvements can reduce CO2 emissions significantly. A growing body of evidence suggests that spending on data center power to cool hardware accounts for a large and growing portion of IT infrastructure investments.

At Alcatel-Lucent, we are tackling this challenge and have recently unveiled our world-class data center in Marcoussis, France. The facility is equipped with our latest generation equipment (such as OmniSwitch) and features an innovative cooling system that can deliver 30% reductions in equipment power consumption and produces 20% savings in air conditioning.

Similar concerns need to be addressed in locating, planning, building and maintaining mobile base stations and other telecommunications facilities.

Broadband and Eco-sustainability
While the demands from technology-based operations can be great, there is another side to this story. According to recent work performed jointly by the World Wildlife Fund (WWF) and the European Telecommunications Network Operators Association (ETNO), CO2 reductions can be garnered by using current and emerging telecom services (Figure 1). For example, increased adoption of audio conferences as a travel replacement can save 2,646,000 tonnes of CO2. Furthermore, existing flexi-work initiatives – programs that allow employees to work from home or avoid peak rush hour commuting – has been calculated to save more than 57 million tonnes of CO2 with 50 million flexi-workers.

These outcomes also contribute to improved productivity and operational efficiency, especially as a growing percentage of the workforce becomes more mobile and new ways of working, such as flexi-work, are increasing.

What is eco-sustainability?
For Alcatel-Lucent, eco-sustainability means conducting business in a manner that generates exceptional value for its customers, shareholders and employees while providing equitable care and respect for the natural environment and the people and communities within.
Alcatel-Lucent is continuously developing the key technologies to enable this new way to communicate. For example, as a result of Alcatel-Lucent’s leadership in developing broadband access technologies (ADSL, VDSL, 3G/EVDO) as well as virtual contact center solutions for fixed and mobile communications, we are enabling flexi-working and rich multimedia communications (such as video conferencing) as an efficient and effective alternative to “being there.”

Alcatel-Lucent Recommends a Proactive Approach

Regardless of the many elements that enter into the picture, one thing is clear. It is best to incorporate eco-sustainability considerations – such as power consumption, the use of alternative forms of energy and other environmental concerns – as an integral part of the overall planning and design process, rather than retrofit “eco initiatives” after the fact.

Changes made later in the process, though certainly still worthwhile and important, have less impact.

The business of eco-sustainability requires more than good ideas and new projects. It demands a new mind-set, a new discipline and a different way of planning. Eco-sustainability should inform key decisions in the initial design of business processes, products and services, covering the entire range of business functions and customer solutions.

This means that, when developing new devices, networks, applications and services, we need to ask ourselves:

- Are we designing solutions that require less energy to function?
- Can they use or promote the use of renewable or alternative energy?
- Are we using nontoxic materials that have a low impact on the environment?
- Will our solutions last so they can be replaced less frequently, reducing the impact of producing replacements?
- What is the afterlife? Can our products be recycled or reused?
- And, more globally, do we enable and facilitate new ways of life and work, which are less energy-intensive?

The good news is that, if you have made investments in Alcatel-Lucent solutions, you have already taken important steps toward profitable eco-sustainability.

We believe that eco-sustainable gains are inevitable outcomes of innovative initiatives that enhance the quality and performance of key technologies. Alcatel-Lucent is defined by innovation and recently signed the United Nations Global Compact “Caring for Climate” initiative to further strengthen our commitment to increase energy-efficiency and reduce the carbon footprint of our activities. We are also listed in the Dow Jones Sustainability World Index, placing us among the top 10% of the leading sustainable companies out of the largest 2,500 companies in the world. We have further been awarded the prestigious 2008 SAM Silver Sustainability Recognition in acknowledgement of our long-standing

Figure 1: Potential CO₂ savings for telecom services

<table>
<thead>
<tr>
<th>Number of calls (million)</th>
<th>CO₂ savings according to the audioconference calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>441,000</td>
</tr>
<tr>
<td>40</td>
<td>882,000</td>
</tr>
<tr>
<td>60</td>
<td>1,323,000</td>
</tr>
<tr>
<td>80</td>
<td>1,764,000</td>
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<td>120</td>
<td>2,646,000</td>
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</tbody>
</table>

Source: Saving the climate @ the speed of light, © Dennis Pamlin – WWF; Katalin Szomolányi – Magyar Telekom, ETNO

Figure 2: Annual CO₂ savings by flexiworkers

<table>
<thead>
<tr>
<th>Number of flexiworkers (million)</th>
<th>CO₂ savings (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>11,485,200</td>
</tr>
<tr>
<td>20</td>
<td>22,970,400</td>
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<td>50</td>
<td>57,426,000</td>
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</tbody>
</table>

Source: Saving the climate @ the speed of light, © Dennis Pamlin – WWF; Katalin Szomolányi – Magyar Telekom, ETNO

Figure 3: Potential CO₂ savings for telecom services
commitment regarding sustainable development. As a leader in this important area, we look forward to working with our customers to develop solutions that will help them meet both their business and eco-sustainability objectives.

Here are a few examples of eco-sustainable solutions we have provided for our customers. Alcatel-Lucent is:

- **Reducing broadband equipment power consumption** – State-of-the-art advancements have yielded significant power consumption reductions (23%) in our most recent Very High Speed Digital Subscriber Line (VDSL) products.

- **Cutting wireless base station energy consumption** – To conserve energy in Global System for Mobile communications (GSM), Worldwide Interoperability for Microwave Access (WiMAX) and Code Division Multiple Access (CDMA) systems, we increased our level of hardware integration to reduce the power consumption of the radio modules for given radio coverage and traffic handling performances. We also introduced both passive-cooling capabilities at low ambient temperatures and fresh air fan cooling without air conditioning in high ambient temperature environments. These cooling technologies enable organizations to avoid traditional air conditioning systems that often consume even more power than the actual telecom equipment uses to provide core services. Finally, we are developing software features that enable service providers to adapt the power consumption to the actual traffic on the network. (These innovations are being used to support our broadband terrestrial infrastructures as well as our wireless networks.)

All of these improvements are particularly compelling when you consider that power consumption can contribute up to 35% of a radio site's total costs when the power supply equipment and the power bill are jointly calculated. T-Mobile, a leading mobile service provider in Germany, completed a total GSM network renovation with Alcatel-Lucent's equipment that yielded energy savings of up to 40% compared to previous equipment. The company used its OPEX savings to help finance its network evolution in a fiercely competitive market.

- **Reducing the number of network radio cell sites** – Another way to conserve power in wireless networks is to maximize coverage per cell through more efficient network designs. “Beamforming” technology in our WiMAX solution has led to a 40% decrease in the number of base station sites required to cover a given area. As a result, the overall network power consumption is significantly reduced. Alcatel-Lucent's Twin TRX transceivers dramatically expand the network coverage of each GSM site, enabling service providers to reduce the number of network cells and resulting power needs required to offer service by between 30% and 50% depending on the network configuration.

- **Offering eco-sustainable energy alternatives** – Beginning in 2008, Alcatel-Lucent celebrates the deployment of its 200th solar-powered GSM base station. This milestone is being reached as we expand a network in Senegal, where 40 new solar-powered base station sites are being deployed this year. Self-contained energy solutions such as solar (photovoltaic) panels allow new radio sites to be established affordably in regions that are not connected to public electricity grids. This is just a sampling of solutions that can help operators – and by extension end users – reduce energy consumption and minimize impact on the environment.

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1 Improvement was made from release R2.2 to release R3.3.
Conclusion

We find ourselves today at an interesting point in history. After a century and one-half in which economic development and technological progress has been seen by many as coming at the expense of environmental protection, Alcatel-Lucent believes that today the opposite is true. The best-run service providers and enterprises of the foreseeable future will not only be more responsive to market forces and operationally efficient, they will be major beneficiaries of eco-sustainable profitability.

That is why it is so important that we, as an industry, work to integrate the role of eco-sustainability into our infrastructure development and go-to-market initiatives.

The challenges we face remain complex when it comes to fulfilling the promise of eco-sustainable profitability. But at Alcatel-Lucent it is clear that there are hard and tangible business benefits to be gained by embracing eco-sustainable imperatives. It will thus continue to be an increasingly important dimension of the business strategy and an integral component of conversations we have with the industry in general and our clients in particular. Eco-sustainability will continue to be a major factor fueling Alcatel-Lucent's innovation engine as we explore new ideas and opportunities to address environmental concerns while solving business problems.

Olivier Baujard
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Welcome to the eco-friendly home of the future. As you approach the residence, your presence is detected as your mobile device interacts with the public and home networks to alert your home computer, broadband connections and other appliances, of your imminent arrival. Systems that were shut down to save power are appropriately turned on so that they are ready for use as you arrive. The home is warm and comfortable despite your unusual arrival time because you used your cell phone to turn on the heat earlier. Lights turn on and off automatically as you walk from room to room, and your favorite music plays softly… and only in the rooms that you occupy.

Sensor networks can play a significant role in maximizing your use of key technologies while minimizing energy consumption in places where we live and work. While traditional sensor-based, power-saving techniques have revolved around using motion detection devices, emerging sensor and actuation networks offer a plethora of possibilities for minimizing use of energy.

Humans are creatures of habit. As a result, it is not only possible to trigger device activation by physical presence or movement, but also to anticipate behavior patterns by correlating information collected from different sensors in order to activate key technologies automatically as they are imminently needed – and then deactivate and power down when they are not.

Information gathered from daily activation and deactivation times of key systems – such as home alarms, time-of-day-based thermostat settings and motion-sensing devices – can be used to accurately predict when residents are away from home. This information can then power down various equipment such as home gateways, home computers, water heaters and air-conditioning systems. With the deployment of femtocells – cellular base stations for homes and offices – additional behavior patterns can be gathered by detecting the presence of cell phones. Smart home networks, coupled with smart utility applications, can make significant progress to minimize overall energy consumption through demand-side load balancing.

These examples demonstrate how residential energy efficiency is achieved when sensors are used to monitor usage and optimally operate appliances and other home systems. In institutional environments – such as office buildings and hotels – sensors are being deployed for “people tracking” to dim all under-utilized hallway lights, only activating them as people approach.

Bell Labs is currently engaged in efforts to develop technology enablers such as intelligent middleware and service aggregation that will help service providers and enterprises to deploy new services using standards-based sensor technology.

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Heat is the enemy of electronics. Yet, it is an omnipresent byproduct of the electronic devices that use high-speed processors, high-voltage line drivers and so forth. Just as heat affects the engines in our cars (consider the consequences of driving without a cooling system), high temperatures shorten the life of electronic devices. Ironically, moving heat away from equipment takes energy – in some cases, just as much energy as it takes to power the equipment itself. Consider the challenge presented by an advanced telecom equipment cabinet that dissipates 15,000 W (15 kW) of heat in approximately four square feet (600mm x 600mm) of floor space and where many components must be kept below 185 degrees Fahrenheit (85 C) to ensure reliable operation.

At Alcatel-Lucent Bell Labs, we are conducting research to identify new techniques to improve thermal management performance while reducing the energy required to cool our equipment. We are developing innovative materials and components including:

- Thermal interface materials to conduct heat,
- Vapor chambers to spread heat and
- Heat sinks to dissipate heat into the air stream.

We are exploiting advanced manufacturing technologies to control material properties on the micro- and nano-scale to enhance thermal contacts and optimize airflow patterns. Additionally, increased use of photonics in components is resulting in decreased heat generation.

With the aid of these sophisticated thermal “tools,” we are constructing a new generation of cabinets to house equipment that will deliver additional functionality to users of communications technology (which theoretically generates more heat) while reducing the energy required to cool these same systems.
Instead of dispersing waste heat into the central office, we are developing technologies that transfer waste heat to fluids that are pumped outside the building. This waste heat can be used for heating other parts of the building, or in northern climates, melting snow and ice on walkways. These approaches can replace the blowers, air handlers, chillers and compressors that are typically used indoors to move air and cool equipment. Additional benefits can be gained from reducing intake of dust and other contaminants that can compromise equipment reliability.

We are also investigating new amplifier designs that incorporate high-efficiency gallium nitride transistors. These transistors would operate at temperatures high enough to enable thermoelectric modules to efficiently convert waste heat into electricity – further increasing the overall efficiency of the amplifier. ❧

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North America Entering Era of Integrated Business and Technological Innovation
The North American communications market is undergoing significant transformation as technologies converge toward bundled voice, Internet and TV offerings, and as new business models are introduced. In addition, the decline of landline revenues in the United States will continue due to increasing competition from mobile providers and new technologies. Meanwhile, in Canada, the rapid deployment of advanced broadband and mobile services experienced during the early part of the decade has, in more recent years, slowed. John Giere, Editor-in-Chief for Enriching Communications and Chief Marketing Officer at Alcatel-Lucent, asked Cindy Christy, President of the Alcatel-Lucent Americas Region, to discuss the dynamics of this market.

**John Giere:** As traditional revenue streams reach their peak, where do you see the growth opportunities for the communications value chain over the next five to seven years?

**Cindy Christy:** First let’s recognize that while new subscriber growth in North America may be under pressure, we are still adding 60,000 new mobile subscribers per day – and nearly double that in Central and Latin America. As part of that, we are seeing a huge rise in consumer demand for personalized, always-on communications – such as interactive video and web-enabled solutions – that keep people continuously connected over multiple devices. Last year alone, more than 100 million consumer electronic devices were sold in North America.

Also in North America we’re seeing the highest broadband penetration, thanks to demand for user-generated content through social networking media (think YouTube and MySpace, to name a few). And the opportunity is real: Alcatel-Lucent’s market research shows that 18% of North American consumers are willing to pay a premium for composite services that remove barriers between communications and digital video features on any device. That spells new revenue for service providers as they intertwine voice, video and data in just these two services.

In line with these trends, service providers are shifting both mobile and wireline assets to IP to provide multimedia services at a lower cost.

Underneath that, Alcatel-Lucent is bringing technological advances in areas like deep packet inspection, web applications and high-bandwidth, low-latency wireless technology to help service providers ultimately connect more people over more devices. And we are facilitating entirely new business models to help service providers create new sources of revenue. For example, multimedia broadband entertainment via IPTV and mobile video are where many service providers are looking to expand beyond subscription-based communications services to generate new revenue streams.

Advertising-based services represent another business model that is growing tremendously in our broadband-connected world – we’re projecting that this market will grow from $25.7 billion USD (€16.6 billion) this year to $38.5 billion USD (€24.8 billion) by 2011 (Figure 1).

Looking at the growth of these business models, service providers have the opportunity to capture new revenues by making the most of their subscriber data and billing relationships. This is done by analyzing and using subscriber information, such as user context (presence, location

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**Figure 1:** **US advertising spending – digital channels ($billions USD)**

Source: Based on Alcatel-Lucent Analysis
and availability), preferences and behaviors. This allows providers like Verizon to collect revenue by:

- Aggregating information about their subscriber base before a “consumption of service” occurs;
- Providing the connectivity and control to enable the fulfillment of the service; and
- Providing billing, payment and e-commerce related services, after the engagement, for both the user and supplier of the application.

JG: What impact do you see large non-traditional players – like Google, eBay, Apple and so forth – having on the competitive dynamics of the North American communications sector?

CC: Clearly, these players have had a tremendous impact on our traditional customers by riding “over the top” of the access and transport infrastructures. Their use of the latest IT technologies in application development and the lack of “legacy” network OPEX allow these players to focus on innovation and time-to-market for new applications.

They are making major advances into the world of entertainment and social networking services and have largely built their businesses using the advertising business model. However, the fact that many new players lack assets in the form of the networks on which they “ride” is a major limiting factor. All of their services are subject to “best effort” delivery.

This is where facilities-based providers have a significant opportunity. A service provider’s ability to manage quality of service through routing choices, bandwidth and latency management puts them at a great advantage. Alcatel-Lucent research shows that US end users are willing to wait no more than eight seconds for advertising content to arrive on their phones. A network that does not have proper latency and bandwidth management could force end users to wait far longer than that and prompt the potential customer to flee the ad. In this scenario, the service provider will not be compensated by the advertiser. So I believe brands will gravitate toward the network that provides the best user experience.

We also know from our research that Quality of Experience is a major concern for brand managers when it comes to promoting their products over a service provider’s network. The fact is, while Internet-based application service providers are competing with the facilities-based provider for core revenues – in essence “biting the hand that feeds them” – a symbiotic relationship is emerging.

New “application” providers and traditional “service” providers recognize that together they can enable new business models, provide higher quality services and capitalize on end-user demand. For that reason, Alcatel-Lucent is broadening its partnerships in the Americas to include entertainment companies, device makers, content developers and advertisers, so we can smooth the way for service providers to offer personalized new services in ways our industry had not considered before.
JG: These radical changes in business models are imposing new demands on the communications industry. How are organizations responding to these changes, and how is it impacting the way they go to market?

CC: Ten years ago, service providers were more focused on technology and what the network could deliver. This included connectivity, hosting services like call centers or some very rudimentary applications.

Today, however, it’s a more services-led industry as consumers want information at any time, wherever they are, and they’re demanding mobility in all that they do. And in many cases, these users want to create the content. In the US alone, there are 70 million social networking users and 64% of online teenagers are content creators. What’s more, this trend is not limited to the North American market. For example in Europe, Google, YouTube and eBay are leading the way for web-centric applications where more than 50% of the younger population is showing interest. (Source: ©2007, Strategy Analytics, Figure 2).

As a result of these trends, service providers are moving away from technology and process silos, as they look to reduce overlaps in their organizations and create a structure that better reflects the needs of their customers – breaking down barriers between wireless, wireline and enterprise businesses. In addition, they are looking for opportunities to outsource some of their operations, such as Customer Relationship Management or billing. We are also seeing non-organic growth strategies, as illustrated by the merging of BellSouth, Cingular Wireless and AT&T. This is the “transformation” that is happening today and it’s happening at the network, services and business levels.

JG: How do organizations rationalize these decisions? In other words, how do they decide where to put their limited financial resources to advance their mission-critical objectives? Can you offer some examples of what you have seen?

CC: Our customers realize they need to look at both the top line – new revenues – and the bottom line – higher margins. This means making investment decisions that have cross-organizational and cross-portfolio impact.

For instance, the decision to move to all-IP networks requires strategic investments, such as those made to enable entertainment services. Verizon’s roll out of FiOS, AT&T’s implementation of U-Verse, Telefónica’s Imagenio and Telmex’s new WiMAX deployments in Latin America are all real-world examples. They are very calculated investments executed on a massive scale, which is why we are placing our bets in developing technologies like fourth-generation wireless standards, Passive Optical Networking and IMS – to help support any mix of broadband services while protecting the operator’s embedded base. We also started to exploit the use of femtocells for Enhanced Residential and Services Gateways which will create true fixed/mobile convergence. This translates into high-quality delivery of content to the home and among devices in multi-screen distribution.

Offering super-high-bandwidth wireless data services is the next big strategic investment for some of our customers. This allows them to capitalize on users’ willingness to pay for the untethered, always-on experience.

Traditional service providers are also forming strategic relationships with Internet players – like Yahoo – for portal services, and with consumer electronic manufacturers – like Apple – for device innovations such as the iPhone. These relationships are driven and guided by consumer demand for services. Further, these relationships can be monetized differently as indicated by Vodafone’s public projections of revenue for its MySpace partnership (Figure 3).

Today, technology is being harnessed to enable new business models as well as to grow the subscriber base. As these new business models often involve areas that are not part of a traditional service provider’s core competencies, early phases of investment may require partnerships or outsourcing. Mobile video is a good example of this – most of the Tier 1 wireless providers in the Americas region are using either MobiTV or Qualcomm’s MediaFLO hosted solutions to enter the mobile video market to assess market uptake. Alcatel-Lucent recently teamed up with ICO Global Communications to demo North America’s first video broadcast based on the new digital video broadcasting standard, as they plan to deploy a fully-integrated MobiTV network in North America. So there is no shortage of possibilities.
Dear Customers,

A prominent Harvard University evolutionary biologist, Stephen Jay Gould, was once quoted as saying “The most erroneous stories are those we think we know best – and therefore never scrutinize or question.” We can all, at times, find ourselves continuing on our current path of success without recognizing that the environment in which we do business is changing. Market dynamics can creep up on us gradually and stealthily. It may not be readily apparent that a major shift is about to disrupt our status quo. By stepping back from time to time and examining where we are, we gain a new perspective and fresh competitive insights. Alexander Graham Bell, founder and father of Bell Labs, said it well: “Leave the beaten track occasionally and dive into the woods. Every time you do so you will be certain to find something that you have never seen before ... All really big discoveries are the results of thought.” If we only focus on today’s reality that voice and data subscription services generate 80% of current global telecom revenue, it would be easy to miss that our communications economic value chain is in the midst of a major disruption.

The spirit of this edition of Enriching Communications is to put a spotlight on these changing market dynamics and to offer thought-provoking insights into what might otherwise go too long unquestioned. New entrants are creatively capitalizing on end-user needs with personalized services; new business models are being increasingly employed to compensate for connectivity becoming a commodity. As an example, Alcatel-Lucent estimates that the shift in advertising and “sponsored” spending alone will be $48 billion USD (€31 billion) as brand managers and enterprise marketers move to new online, mobile and other interactive media. Those who effectively break the rules will prosper in the new value chain. The bottom line is that business agility and a proactive approach to meeting evolving customer demands will separate those who thrive from those who will fail to survive.

Personalized services are an imperative. Mass segmentation schemes will no longer sustain a vibrant business. Communications service providers and enterprises alike are uniquely positioned to transform their offerings by mining and carefully analyzing their end-user intelligence – an intangible asset that can be used to tailor offerings, ultimately creating a more compelling customer experience and service value.

At Alcatel-Lucent, we question the status quo every day to help our customers innovate, stay relevant and achieve successful financial results. We hope you’ll find the articles from our experts and customers insightful in highlighting the important trends, strategies and technologies that will help you succeed.

As always, we welcome your feedback and hope we have sparked your thinking in creating your own New Rules.

Sincerely,

John Giere
CMO, Alcatel-Lucent

www.alcatel-lucent.com
Review, Rate and Evaluate … Prioritize the Business Models and Win!

Alcatel-Lucent invites you to enter our contest by evaluating the business models described in the enclosed “Business Transformation: Advanced Business Models” article.

Winners will be selected randomly to receive one of the following prizes:

**Grand Prize:** Apple iPod touch
**Second Prize:** Apple iPod classic
**Third Prize:** Apple iPod nano

General Terms and Conditions
Contest open to anyone 18 years or older with exclusions. Employees of Alcatel-Lucent and/or its affiliates, advertising, promotion, and production agencies, and members of their immediate families or those with whom they are domiciled are not eligible. All entries must be received by the September 1, 2008, deadline. All ideas, concepts, and other intellectual property rights associated with an entry will become the property of Alcatel-Lucent.

Log in to [www.alcatel-lucent.com/enrich/contest](http://www.alcatel-lucent.com/enrich/contest) to receive the full contest rules and enter to win. Full terms, conditions, contest rules, and entry forms can also be requested by mail. Entries may be submitted at the following address: Enriching Communications Editor, Alcatel-Lucent, Room 3B-400, 600 Mountain Ave., Murray Hill, NJ 07974-0636 USA. When mailing, please be sure to include your return address.

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