# How Can Communications Service Providers Overcome New Competitive Threats? – Think Applications!

## Strategies to enhance end-user experience and achieve sustainable competitive advantage

Communications service providers have some unique advantages when it comes to competing effectively in the new content delivery value chain

This white paper:

- Describes the competitive environment brought about by new and disruptive business models, IP-based services, and new players such as Internet-based portals
- Presents three approaches to achieve competitive advantage in this new marketplace

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## Introduction

Next-generation networks are driving radical changes in the content delivery value chain by spawning disruptive business models and enabling players such as Internet-based portals. The Internet Protocol (IP) has given birth to a number of applications like search engines, voice over IP (VoIP), instant messaging, and information services, as well as the advent of e-commerce. In addition, the migration to IP has led to some weakening of control over end-user data and network access by communications service providers.

These changes in the content delivery value chain represent both an opportunity and a threat to service providers. On the one hand, some service providers have been capturing new revenues from non-traditional applications like mobile TV, push-to-talk, and multimedia messaging, and they are poised to expand their position in the content delivery value chain. On the other hand, there is an increasing risk of forfeiting voice communications revenues and missing out on new revenue streams from advertising and content services due to diminishing control over end-user data and network access.

In the near future, Internet-based portals are expected to pose a critical threat given their brand strength, powerful use of end-user data, disruptive revenue models, and geographic pervasiveness.

The Internet-based portals have built their empires leveraging web applications, while service providers have traditionally focused on operating networks and delivering telephony services. Now that IP convergence is blurring the boundaries between networks and applications, service providers must rethink their position in the content delivery value chain. It is no longer enough to just focus on the network. Service providers have specific assets available that will allow them to compete, or to cooperate, effectively with Internet-based portals.

In the battle for new services and profits, how can communications service providers achieve sustainable competitive advantage when competing with Google, eBay, Yahoo!, MSN and others?

This paper presents strategic options for service providers to strengthen their position in the new market environment. These options all focus on improving the quality of the end-user experience. A framework is introduced to help service providers determine how to best use these options to achieve sustainable competitive advantage.

## The Content Delivery Value Chain Revisited

One tends to think of the content delivery value chain as a series of linear hand-offs between players across the chain. Yet, with the advent of IP convergence, most players entertain multiple relationships and hand-offs with one another (see Figure 1).

As a result, an increasing number of participants in the value chain enjoy direct access to end-users and can leverage this relationship into a competitive advantage. End-users have moved to the center of the value chain, with content providers, aggregators, application and platform providers, and service providers surrounding and serving them. The value chain is no longer linear, but resembles overlapping circles gravitating around end-users.

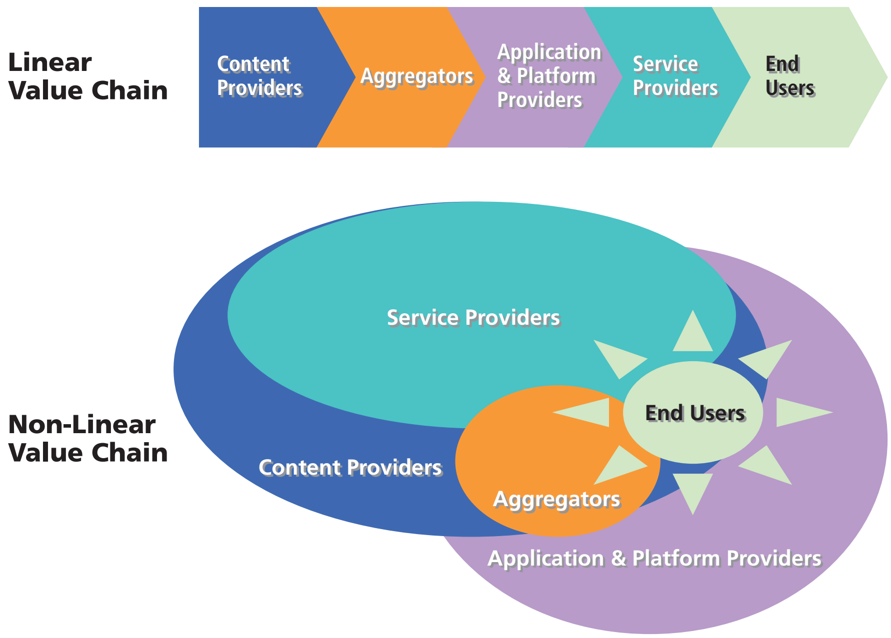


**Figure 1: Simplified Content Delivery Value Chain**

In a linear content delivery value chain, content providers typically extract a large share of the revenue that is created. This share can vary from 35 to over 70 percent of total revenue (see Figure 2), depending on the type of application (e.g., video on demand, ringtone, messaging) and delivery method (e.g., wireless on-portal, wireless off-portal, cable, etc.). We expect content providers to continue to reap a good part of the benefits – "good content" always attracts end-users and is key to every participant in the value chain. As far as service providers are concerned, they have historically influenced the value chain by controlling access to their networks.

| PRESENT—TYPICAL | | | |
|---|---|---|---|
| Current | Content Provider | Application & Platform Provider, Aggregator | Service Provider |
| Wireless (On Portal) | 35 to 45% | 15 to 20% | 40 to 50% |
| Wireless (Off Portal) | 60 to 70% | 5 to 15% | 20 to 30% |
| Wireline (Internet) | 50 to 90% | 10 to 50% | 0% |
| Cable | 50% | — | 50% |
| IPTV | 50 to 60% | — | 40 to 50% |

**Figure 2: Simplified Revenue Distribution Model (Present)**

Migration to IP has led to some weakening of end-user data and network access control. In the wireline space, service providers have been less successful in extracting value from new applications over broadband (e.g., video over DSL, voice over cable high-speed access) other than access fees and selective bandwidth fees.

In the wireless domain, access and applications are increasingly open and decoupled, which will eventually eliminate the "walled gardens" (where service providers used to control which applications were offered over their networks and capture part of the associated revenue). The migration to off-portal mobile content (outside of the walled gardens) may lead to higher overall revenue, but with lower revenue share.

For example, with a full migration to IP, a wireless customer could eventually download voice over IP software (such as Skype) on her handset and place an international call without incurring any international calling charges from her provider. In short, service providers will no longer be able to extract value for just being gatekeepers.

In what could become the worst-case scenario, service providers would extract almost no revenue from applications in the content delivery value chain (see Figure 3). In today's wireline content delivery model, for instance, the "middlemen" – such as web portals – share revenue with content providers (between 50 and 90 percent depending on the application involved, e.g., video, news, etc.) and capture any remaining value for themselves (about 10 to 50 percent).

| WORST-CASE SCENARIO | | | |
|---|---|---|---|
| Future | Content Provider | Application & Platform Provider, Aggregator | Service Provider |
| Worst Case Scenario | 50 to 80% | 10 to 50% | 0 to 10% |

**Figure 3: Simplified Revenue Distribution Model (Worst-Case Scenario)**

Through applications, service providers have an opportunity to strengthen their position in the content delivery value chain and capture a revenue share higher than in the worst-case scenario – or even in the typical scenario. Of course, there will always be carriers that find themselves in specific competitive and regulatory situations and prefer to opt for a strategy of delivering bandwidth, reducing costs, and being a "small player" in the content delivery value chain.

## How Can Service Providers Compete in the New Environment?

Because service providers must now compete on three fronts simultaneously – access, content, and applications – they must focus on extracting more value from applications. It is our view that service providers can best improve their competitive position in the application domain, rather than in the content production or access domains. They already have well-established market strategies in the access domain. In the content domain, the required core competencies represent a stretch for traditional telecom players. Therefore, service providers can realize the largest gains and the largest synergies with their current access strategies by increasing their focus on the application domain.

In the industry, it is common to view the use of content and applications interchangeably. In this paper, we view "application" as the end-user service, which may include content to some degree. For example, mobile TV is an application that leverages some programming content.

To become winners in the application domain, service providers need competencies, or support, in areas such as human factors, content-targeted advertising, youth marketing, e-payment, security, and cross-technology application and platform interoperability. To some providers, this may represent a radical transformation of their business model.

We have identified three levers to implement such transformation and eventually capture a larger share of the revenue opportunity in the content delivery value chain.

## Three Levers for Competitive Advantage

Brand is an important element of the equation, yet it is not sufficient. While successful companies such as Amazon and Google have invested heavily in their brand, they have also maintained the continuous understanding and improvement of the end-user experience as a core value. Strong brands that have failed to provide a satisfactory end-user experience have usually failed to capture value, particularly on the web channel.

So, how can service providers optimize the quality of the end-user experience as a way to achieve sustainable competitive advantage?

In addition to building and nurturing a strong brand, there are three interdependent levers that service providers can push to improve their competitiveness in the application domain. These levers are all related to the quality of an end-user experience with applications.

The key is to look at what influences the quality of the end-user experience. Based on our work with a number of applications, the factors that influence end-user satisfaction the most can be represented as a pyramid (see Figure 4) with the top layers representing the most visible triggers to a positive end-user experience (e.g., speed, image quality) and the bottom layers containing the more invisible aspects (e.g., packet loss, interface with other applications).

Service providers can use this pyramid as a framework to develop actionable strategies and plans for their application business.

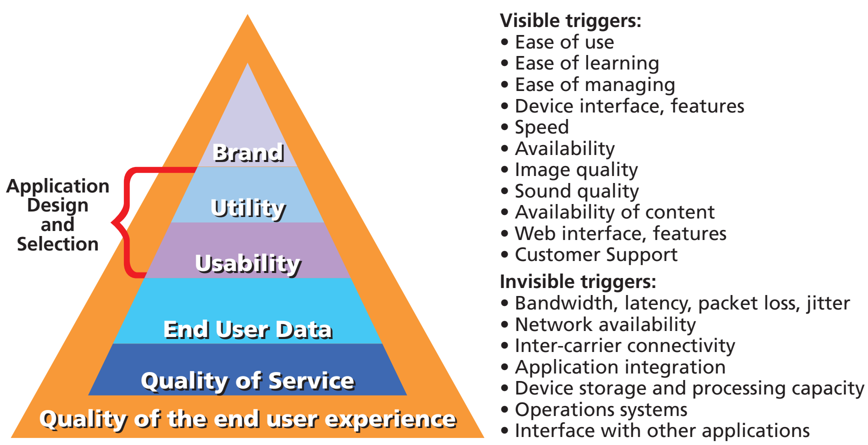


**Figure 4: End-user Quality of Experience Pyramid**

Three specific, interdependent levers allow service providers to create a differentiated position in the content delivery value chain by optimizing the quality of the end-user experience. With these levers, service providers can offer unique value to a broad array of customers – including content providers, Internet-based portals, on-demand application providers, enterprises, and consumers.

The three levers are:

1. **Application-based Quality of Service (QoS)** involving application, service, and network aspects
2. **End-user data control** involving the effective use of end-user data to continuously improve the end-user experience and enhance the value and performance of each application
3. **Application selection and design** involving the choices service providers make about the functionality and deployment strategies of their application(s) for multiple customer segments, with a view to increasing application ease of use, management, and profitability

The greater the value-add that is generated from these three levers, the greater the opportunity to increase the margins from applications. From this perspective, it appears that applications are more than just a vehicle for "content delivery."

#### Lever 1 – Application-based QoS

This first lever involves defining and managing the key attributes and requirements that can impact and enhance the quality of the end-user experience for each class of applications (e.g., messaging, video, "blended lifestyle" applications, etc.).

Of all the many challenges that service providers face in delivering next-generation applications, QoS is the most difficult to manage due to its many facets – there are numerous factors impacting whether or not a user is satisfied with an application.

The key attributes of end-user satisfaction are located in the application layer (e.g., modular code, open APIs) and/or the service layer (e.g., provisioning, billing) and/or the network layer. Service providers have various degrees of control over each layer. For example, at the network layer, different applications have different requirements for delay, jitter, bandwidth, packet loss, and/or availability.

QoS challenges are likely to intensify in the future, particularly with the increasing popularity of video-based applications. Therefore, QoS solutions for the next-generation content environment must move away from the best-effort network-based approaches of the past and provide *service management by application*.

Network owners are in a unique position to provide consistent and differentiated levels of application-based QoS for specific applications (e.g., multiplayer gaming, video conferencing) targeted at specific customer segments, including Internet-based portals and other on-demand application vendors – and even end-users.

### Meeting End-User Expectations

To implement differentiated, application-based QoS for different customer sets and applications, service providers must first understand end-user expectations and intrinsic quality requirements for each application. This allows service providers to define priorities for each customer set and application.

By identifying the key attributes of end-user satisfaction early on, service providers can improve their success rate in launching new applications. Also, they can try to influence the many relevant factors that are often perceived to be outside the control of an application, such as a mobile handset's screen size or battery limitations.

While application-based QoS is the first key step to capture value, our next two levers provide additional needed elements.

## Lever 2 – End-User Data Control

This second lever involves capturing, managing, and extracting value from end-user data – both static data (e.g., age, ethnicity) and dynamic data (e.g., location/presence, transaction history). By managing this lever effectively, service providers can improve the quality of the end-user experience by enabling personalization, context-aware services, and effective interaction across multiple applications and services. This lever also provides ways to support effective *service management by application* as it leverages end-user data from the network, service, and application layers.

Traditionally, service providers have been relying on end-user devices to control end-user data. Applications now give them and their competitors, the opportunity to revolutionize end-user data control and value. For example, when implementing IPTV, service providers can capture high-octane value by collecting data on viewing habits and leveraging this information to tap into the advertising market or offer context-aware services. Additionally, to avoid losing control over end-user data, wireless service providers must determine how to capture and exploit end-user data as the pace of migration to off-portal content increases.

Specifically, service providers can leverage their structural advantage in the network(s) to access certain types of data that are not as easily available to Internet-based competitors, such as location, presence, call patterns, and billing information. In addition, end-user data control can generate incremental revenue by unleashing the potential for advertising and privacy control, and enabling service providers to respond more quickly to end-user needs and application requirements. Finally, service providers can realize operational gains by swiftly responding to changes in network load and traffic based on different application life spans or usage patterns.

### Available Tools and Technologies

There are a number of tools and technologies available today that service providers can acquire and implement to get the most out of end-user data – for example, Lucent's Datagrid (provides a unified view of all user-related data), Vortex (policy management tool), Surepay (billing system), and GUPster (Lucent's prototype of 3GPP GUP metadata manager). Such tools can effectively increase customer satisfaction and retention in a number of ways.

In competing with Internet-based portals, service providers can use Lever 2 to:

- Create an easily tuned environment that allows for proactive control of application-based QoS (Lever 1)
- Enable rapid service delivery of custom applications
- Facilitate the personalization of the end-user experience
- Enhance the user-friendliness of the end-user experience by inviting users to enter data and preferences once, then sharing this information across all devices
- Manage policies involving multiple applications – this is particularly critical as service providers implement Service Delivery Platforms (SDPs) such as IP Multimedia Subsystem (IMS) and launch blended lifestyle applications

End-user data control is a key enabler for defining, applying, and managing application-based QoS and is also essential to maximize the value of the application portfolio.

### Lever 3 – Application Design and Selection

Service providers need to deliver the right content in the right format, at the right time, at the right cost, to maximize the value of their application portfolio for the targeted customer segments. Our third lever addresses the detailed choices a service provider can make about the functionality and deployment of an application and the way end-users interact with this application.

Lever 3 deals with optimizing a portfolio of applications by:

- Assessing and improving each application's ease of use
- Determining the utility of each individual application, as well as the utility of the application portfolio for different groups of end-users
- Selecting applications and implementation strategies to maximize profitability

We challenge the conventional wisdom that says that the value of an application resides solely in the content itself and that service providers need to focus on increasing Average Revenue Per User (ARPU) per application. Instead, service providers should focus on increasing the profitability of an application. This can be done by acting on two key attributes of an application usability and utility.

#### Usability is Tied to Application Design

Applications deliver maximum end-user satisfaction when they are easy to find, use, and manage. When developing and launching a new application, it is critical for service providers to focus on the usability of this application. One key success factor of web applications and text messaging has been ease of use. Usability specialists have now become part of the overall development and deployment process for web applications. As IP convergence progresses, usability assessments must be incorporated into the telecom domain.

Communications applications must be effective and efficient. Effectiveness is measured by how well an application can provide required results. For example, if a mobile application delivers daily weather updates, it is considered to be effective if it provides reliable data on a regular basis. Efficiency is the measure of how well an application utilizes resources – for example, how much time is required for the end-user to perform tasks or recover from errors.

In the telecom domain, service providers have launched several applications using different technologies – such as text messaging, WAP, Brew, TDM, and IP – and multiple application partners. The end result is a complex, tangled spider web that makes it difficult for end-users to find, manage, and use new applications. Therefore, there is room to simplify the usability of each individual application, as well as the usability of the user interface into the overall application portfolio.

There are a number of well-documented examples of the economic benefits of application usability in various industries. In the web domain, for instance, a large retailer was able to achieve 67 percent repeat purchases and an 80 percent traffic increase on its web site by improving the site's usability. A well-known brand of computers and IT products reported 400 percent increase in sales after re-designing its web site based on usability studies. A similar potential is possible in the telecom domain, and Internet-based portals are quickly jumping on the bandwagon.

At a minimum, service providers need to proactively work with application, content, and platform providers to maximize the usability of their application portfolio.

In addition, there are a number of opportunities for service providers to maximize application profitability by formulating application-centric network and technology strategies (e.g., IMS platform selection) that are focused on optimizing asset reuse and deployment methods. Deployment methods (not covered in this paper) include partnering, hosted, or in-house implementation.

### Utility Deals with Application Selection

Service providers should also consider utility – the selection and integration of the right set of applications for any given customer segment.

Optimizing the utility of an application portfolio can provide greater value to end-users than the sum of individual applications. The right mix also involves exploring synergies across applications. In doing so, service providers should identify and take advantage of the assets and capabilities that they have and that their competitors do not have.

What do service providers have that Internet-based portals currently do not have? The answer is location and presence information combined with telephony applications (such as voicemail and yellow pages). When competing with web portals and other web-based applications, service providers have the opportunity to blend traditional and new telecom capabilities to help end-users save time and increase productivity.

The unique edge for service providers in the short run comes from their ability to blend traditional telco applications with non-telco/portal-type applications. For example the service provider can connect voicemail systems to e-mail and the web, or offer a personalized "yellow pages" service in conjunction with location- and presence-based services, allowing users to create an easy-to-manage, personal phone book on a wireless handset.

The application selection process involves multiple techniques, including the creation of a successful environment for application incubation and dynamic modeling. There are a number of dynamic models with which service providers can assess the evolution of performance metrics (e.g., market share, churn, profitability, etc.) for various types of applications and competitors. Such models simulate market behavior based on historic or collected data on willingness to pay, price elasticity, and other micro- and macro-economic variables.

## Competing Successfully in Today's Market

Service providers can improve their competitive position in the new content delivery value chain by implementing application-centric strategies that focus on enhancing the quality of the end-user experience. The pyramid shown on page 6 provides a powerful framework that service providers can use to define and implement levers that will help them optimize the quality of the end-user experience and be successful in today's highly competitive marketplace.

New revenues and larger market share are possible through guaranteeing consistent and differentiated levels of application-based QoS for specific applications to distinct customer segments, such as Internet-based portals and other on-demand application vendors – and even end-users.

Effective and creative management of end-user data control can also generate profitable growth and competitive differentiation by leveraging static and dynamic end-user data to advertise, allow privacy controls, or enable quick operational responses to reflect changes in network load and traffic resulting from different application life spans or usage patterns.

Finally, service providers face a number of options to strengthen their financial performance by maximizing the value and effectiveness of their application portfolio mix.

In the battle for new revenues and profits, communications service providers can therefore compete and/or partner successfully with Internet-based portals by leveraging their unique strengths to impact the quality of the end-user experience – specifically, by providing application-based Quality of Service, extracting value from end-user data, and applying effective application design and selection techniques.

## About the Authors

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Jamaigne started his career as a diplomat in East Berlin, where he served as science attaché. He joined France Telecom in 1992, where he managed research and development for the Enterprise market. With Lucent Technologies since 1999, Jamaigne has occupied various management positions in corporate strategy, business development, and sales. He holds a Master of Science from ENSTB (France) and an MBA from Columbia University.

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## About Lucent

Lucent offers thought leadership and leading edge application consulting, development, optimization, and multi-vendor integration services to support service providers in their effort to design and implement application-based QoS as well as to integrate end-user data management solutions. Lucent also provides a number of lifestyle-based applications and tools, as well as business consulting, marketing and hosting services to assist service providers in maximizing application profitability.



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