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WHITE PAPER

Communication service providers in the next decade

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Introduction

What a difference a decade has made for communication service providers (CSPs). The original flagships of the industry are gone—AT&T, MCI, BellSouth and Qwest. What governments didn't manage to do through legislation, deregulation and the destruction of monopolies, IP technology has done by turning what were once high-margin services into commodity applications—essentially democratizing the industry while at the same time eroding margins.

The high barriers to entry in the former elite telecom industry have been torn down, leaving a brutally competitive market, where over-the-top (OTT) providers like Vonage, Skype, Netflix and others, with no desire to own a network, provide offerings that ride on top of CSP networks. The huge support system silos that telecoms have to support their massive infrastructures are outdated; the new application-based playing field relies on agility and creativity, and the sky is the limit.

With high margins on voice and messaging under attack, CSPs are looking for the next cash cow. The field is reminiscent of a three-way chess match. Which one of the players—traditional CSPs, cable CSPs or non-traditional competitors—will win? Will the status quo continue? This paper examines the playing field, market dynamics and strategy options open for the remaining players.

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IP everywhere and the age of competition

Internet protocol (IP) technology changed the telecom business; voice call distance, for example, is no longer proportional to voice call cost. With the massive adoption of Skype—today's largest carrier of long distance traffic[1]—traditional CSPs are finding it a challenge to be cost competitive due to their complex legacy environment.

New providers like Vonage and Skype don't have an expensive network to maintain, yet they can still provide services based on a "bring your own broadband" (BYOB) model. The concept of OTT applications riding on top of a customer's BYOB is popular in entertainment as well, where companies like Netflix, Hulu, Amazon and others are delivering applications directly to the customer. Messaging—a very lucrative and high margin service for CSPs—is also under multiple attacks from OTT social media products and offerings like Whatsapp.

The large operation and business support system (OSS/BSS) environments of large CSPs, with their multiple and overlapping systems, were built to introduce new

[1] "International Call Traffic Growth Slows as Skype's Volumes Soar," TeleGeography, January 9, 2012.

offerings and were once assets. However, they quickly turned from assets into liabilities, as new competition developed innovative and agile systems, reduced costs, and decreased time to market. Maintaining an ability to compete proved to be a significant challenge for traditional CSPs burdened with duplication in their OSS/BSS environments and a huge portfolio of often overlapping products and services. In addition, their ability to compete was impeded by different customer care systems with fragmented databases of record, multiple billing systems, and silo-based activation systems, resulting in a lack of visibility, high costs and order fallout.

This trend towards OTT applications has been accelerated by changing service expectations. If a Skype audio or video call fails, the customer doesn't expect any support—after all, the call is either free or very low cost and the quality is "best effort." However, if a carrier call fails, chances are the customer will contact customer service. The erosion of carrier traffic by Skype clearly illustrates what customers prefer. Premium, yet free, Skype services accelerate user acceptance even if user experience varies due to the quality of service.

Another case in point: a consumer can buy a TiVo box in a retail store and then expand the storage with an external drive. If the same TiVo box comes from a cable provider, the provider will make it impossible to attach an external device because it can't troubleshoot potential problems resulting from customers customizing their set-ups with additional hardware.

To provide customers this option, traditional CSPs would have to improve their ability to gather information from the attached device to help debug customer problems, which would increase their costs and pricing. Thus, given customer expectations of premier service, CSPs are keeping customer options more limited. Another obstacle for CSPs may be content rights.

Traditional CSPs inherited expectations for higher quality in addition to the higher costs they were already experiencing compared to new providers like Skype. So, it's both the complexity of traditional CSP service structures and higher quality expectations from consumers that are making it more difficult for traditional CSPs to compete with new entrants, especially when it comes to overlapping offerings.

Traditional CSPs that decide to become full service providers are faced with tough questions. How can they effectively compete with Google, Skype and new entrants? And, how do they achieve more agility? The simple answer is to change their OSS/BSS environment so that their only constraint is creativity. But what exactly does that mean?

Striking the right balance between CSP internal cost savings and OSS/BSS modernization is a significant challenge for traditional CSPs in the current environment. They are not only experiencing revenue erosion from both voice and

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messaging, but also application revenue bypass through Apple and Google or other OTT providers. At the same time, they are facing rising costs with OSS/BSS consolidation and IP multimedia subsystem and wireless upgrades.

An equally important role in achieving greater agility is the simplification of the existing product portfolio, which may have grown unchecked for many years. Do CSPs need all of the existing products that have accumulated over the years? How profitable are they? How many are redundant? Would product pruning offer an opportunity to retire systems and decrease costs?

Yet even though most CSPs will likely find an opportunity to rationalize their traditional telecom portfolio, the CSPs that aspire to become full service providers will want to expand their offerings portfolio into new areas such as the cloud, machine-to-machine (M2M), etc. This underlines the importance of both legacy portfolio consolidation and OSS/BSS flexibility. The next generation "agile" OSS/BSS environment needs to support both legacy and new offerings, which often branch well beyond pure telecom.

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Wireless CSPs have to upgrade their networks in faster cycles. To monetize the rollout of long-term evolution (LTE) networks, they have to put more emphasis on up-selling data services. This dilemma was summed up by René Obermann, CEO of Deutsche Telekom AG:

> "Our voice revenues are declining and they will continue to be under pressure, and the commoditization of our traditional services has begun. It is a question of balancing commoditized services on one side of the equation with making an effort to innovate and embrace new business models on the other—and that's a very difficult balance."

The European Telecommunications Network Operators' Association (ETNO) is the trade association of for European telecom operators. Its annual report published in November 2012 noted that European CSP revenues of €274.7B fell for the third year in a row, and over the past six years, Europe's share of the global telecom market decreased from 31% to 25%. Without a "game changer," the trend in decreasing revenue is forecasted to continue.

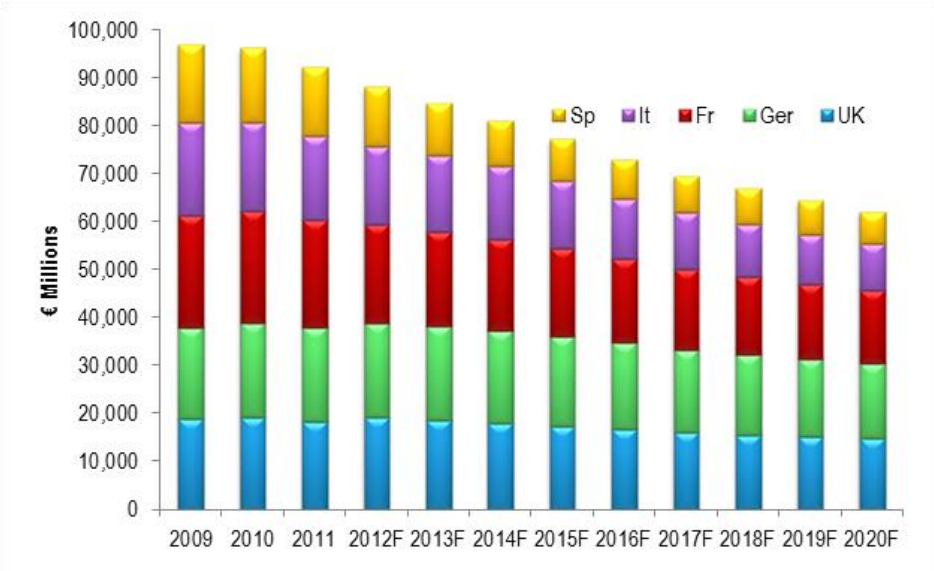

Figure 1: EU revenue trends in five major countries
(Source: European regulators, Mobile operators, Barclays Capital, STL Partners assumptions and analysis)

The competition landscape has changed from one of minimal competition, where traditional CSPs had a monopoly in designated functional and geographical areas, to one of heavy competition where traditional CSPs are competing against one another and against a multitude of new, agile CSPs.

The same IP technology that made it possible for cable CSPs to provide VoIP has enabled traditional CSPs to get into the entertainment space through IP television (IPTV). However, the IP revolution didn't stop at VoIP and IPTV. Phone manufacturers realized the power of applications and the importance of getting developers on their side. Those who realized this—Apple, Google and their Android partners—thrived. The industry giants in the past decades that were slow off the mark either disappeared (Palm) or have been struggling (Nokia, RIM).

The age of "co-opetition" has started. Microsoft is collaborating with traditional CSPs on IPTV while, at the same time, eroding CSP voice revenues through Microsoft Lync and the acquisition of Skype. Apple collaborates with CSPs to maximize iPhone and iPad sales, causing application revenue to bypass through the App Store—a convenient one-stop shop for hundreds of thousands of applications. Seventy-two percent of Apple's revenues are from products that didn't even exist five years ago. The race is on for many traditional CSPs with a large number of duplicated systems. However, it may feel like trying to compete in a steeplechase with a boat anchor tied to their foot.

At the crossroads

The competition landscape has changed from one of minimal competition, where traditional CSPs had a monopoly in designated functional and geographical areas, to one of heavy competition where traditional CSPs are competing against one another and against a multitude of new, agile CSPs. These new CSPs are

competing without the historical baggage of overlapping and hard-to-modify legacy OSS/BSS environments, along with thousands of products with significant overlaps.

Competition has become global; most consumers don't care in which country a service provider resides. The focus on agility, creativity and low cost of ownership is becoming critical in an age where a competitive offering is just a mouse click away for a user. It is no longer possible for traditional CSPs to become successful by cost cutting alone.

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All of this leaves traditional CSPs with a stark choice—expand the footprint and replace lost revenue through revenue enhancements (i.e., new offerings), or shrink and retreat to the pipe provider model and focus on broadband. Both options have significant challenges.

Expanding core competencies produces risks, increased costs and new competition with established players. Restructuring to provide connectivity only forces CSPs to downsize significantly and rely solely on lower-margin networking. The biggest risk of all, however, is to do nothing—that guarantees obsolescence. To paraphrase Charles Darwin, it's not the strongest CSPs that will survive, nor the most intelligent; it's the ones that are most adaptable to change.

What should a traditional CSP wanting to remodel its offerings do, given its silo-based legacy environment, multiple systems and intense competition? What is needed to transform traditional CSPs from the silo "bellheads" legacy telecom mentality where new offerings take a long time to rollout to the agile "googleheads" world?

Into the future

ORGANIZATION AND STRATEGY

Triple and quadruple play has become more of a norm than an exception. While many traditional CSP systems are still silo based, the transition needs to happen organizationally, functionally and technically. Barriers between organizational silos need to disappear to reflect marketing position and how consumers view the CSP.

TRANSITION

STRATEGY CHALLENGES

Despite the difficulties, long-term strategic planning is a prerequisite for success—although not a guarantee. Figure 2 below shows a view of different transition phases. While the phases are somewhat intuitive, putting the phases in the proper sequence is often difficult for CSPs.

Subject matter experts (SMEs) are often brought in to work with CSP business leaders for business strategic planning. However, SME expertise is often silo based, given the many years that silo structures have been in place. It can be challenging to understand something other than silos, let alone provide vision for an agile, convergent OSS/BSS landscape and combine it with revenue enhancement ideas.

Due to these constraints, it's often tempting to start with the enterprise architecture phase, or even the solution development phase, where the level of comfort is higher. That, however, is a trap; the key vision and derived requirements from business and strategic planning would be missing, the horizon of change would be too limited and revenue enhancements could be limited as well.

Choosing an upgrade strategy without a thoroughly agreed upon business and IT strategy is often followed by disillusionment as new requirements appear and often make the newly implemented solution suboptimal. In most cases, such requirements would have been likely discovered if the team had started with business strategic planning, assuming the correct expertise was available.

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At worst, this OSS/BSS refresh cycle is repeated, resulting in a cycle of lengthy and expensive refreshes, draining the CSP's resources and impacting its competitiveness. In cases where the consolidation and remodeling approach in Figure 2 failed, the most frequent reason given for the failure was that the team started in the middle, i.e., with remodeling the enterprise architecture or developing new solutions.

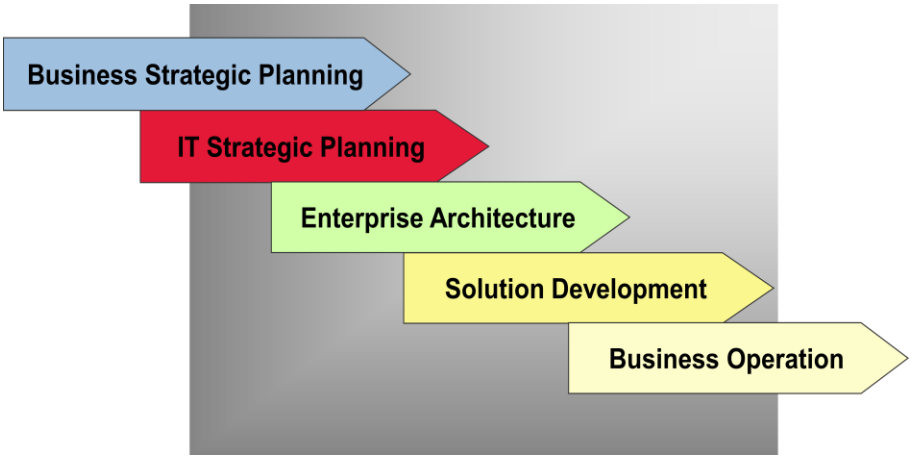

Figure 2: Consolidation and revenue generation approach

Discipline is often a challenge. While it's possible to overlap the phases in Figure 2 somewhat, trying to perform IT and business strategic planning while remodeling the enterprise architecture at the same time is a recipe for disaster.

Another challenge is the availability of key players who are "too busy" to participate in such strategic planning, even though the success of the enterprise is dependent

on their contribution. Can a CSP succeed when firefighting consumes 100% of its key players' bandwidth? The workaround may be to enlist external help with both firefighting and strategy creation. However, another mistake is trying to make up for the lack of key CSP resources and subcontract all of the business strategic planning with no contribution from key internal resources.

While it's a good idea to get expertise from outside the company to supplement this cycle, going to the other extreme and assuming that external organizations can completely plot CSP strategy is risky and unrealistic. It leaves different types of "blind spots" and often creates significant headwinds in terms of new strategy acceptance. While the right external experts can add significant value, there is no substitute for a close collaboration of two teams—CSP senior management and strategists collaborating closely with external industry experts.

IT strategic planning and enterprise architecture development must include system consolidation. In the current environment, CSPs typically have multiple provisioning, service activation, billing and CRM systems, as well as multiple databases of record.

BUSINESS STRATEGIC PLANNING RECOMMENDATIONS

Business strategic planning requires CSPs to create out-of-the-box ideas for medium- and long-term strategies, focusing on both cost optimization and revenue enhancement ideas. It's also where measurement criteria should be finalized, enabling CSPs to adjust their strategy as the market situation changes. Creating a mixed team of key internal players and external players from a trusted partner usually creates the best mix of ideas. A strategic planning partner not only can critically examine revenue and cost assumptions, but also add ideas about new areas where the CSP could succeed from a revenue enhancement perspective. An ideal strategic planning team consists of key CSP players combined with external experts to maximize creativity.

Assuming this works well, such collaboration may be extended to other phases such as IT strategic planning and enterprise architecture development, where the CSP lays the foundation for its ultimate goal—an agile OSS/BSS environment with fast time to market and low operating costs. Part of this collaboration should include identifying critical areas that should remain inside the CSP enterprise, as well as what should be outsourced and what would make sense to consume from the cloud.

IT strategic planning and enterprise architecture development must include system consolidation. In the current environment, CSPs typically have multiple provisioning, service activation, billing, and CRM systems, as well as multiple databases of record. Further, most of these systems have embedded product catalogs, requiring the manual creation a new offering using a "swivel chair" approach where the SME must be able to remember the capabilities of different CRM, billing, provisioning, service activation and order orchestration.

The SME must then figure out if a particular offering is feasible based on the functional footprint of various systems. Given the fast pace of industry evolution, the goal is to standardize across a domain and upgrade to a system of choice per

functional area. The first step in system consolidation is the analysis and cleanup of the existing product offerings, which have often been left unchecked to grow and may contain offerings with marginal profitability and a limited number of customers. Getting rid of redundant and obsolete products also reduces complexity. Doing this work first may ease the burden of legacy system retirement and consolidation.

System consolidation is difficult and time consuming given the number of systems involved, yet it's time sensitive because it enables cost reduction. Rather than taking a "big bang" approach, providers often push gradual migration, while accelerating the "external" move to full convergence. Examples include: (i) ensuring a consolidated database of record exists in the functional domain, either in an existing or a new system; (ii) implementing an order orchestration layer that can interface with legacy and new systems and ensure convergent order orchestration prior to completing consolidation; and (iii) looking at single billing system alternatives, e.g., by installing an adjunct rater or following a rebiller strategy.

Consolidating systems reduces costs but not enough to make CSPs successful in launching new offerings that lead to revenue enhancements.

Adjunct raters enhance the capabilities of an existing system to perform real-time sophisticated rating. The rebiller approach sets the framework for the convergent system by interfacing both with real-time mediation feeds and with legacy billing systems in batch mode. The rebiller produces convergent bills rather than just "bill stapling." This mitigation strategy may not save costs because consolidation will still need to be done; however, it accelerates the move to full convergence from the customer viewpoint, and thus increases CSP competitiveness.

When it comes to the solution development phase in Figure 2, the prior phases should all feed into the solution requirements. It's important to ensure not only that current issues are solved, but that new solutions will successfully cover existing functionality and the new strategic business and IT direction. Consolidating systems reduces costs but not enough to make CSPs successful in launching new offerings that lead to revenue enhancements.

What should a CSP think about when determining which solution to choose? The easy part of this phase is mandating standards (e.g., TM Forum and SOA). A much harder aspect is selecting a system that is future proof. Typical RFP requirements creation and system selection can take in excess of a year—implementation and system consolidation years after that. New requirements are almost certain to arise during this period of time. What should a CSP look at to ensure the deployed system is future proof? This is especially important in the age of mergers and acquisitions (M&As), where the suppliers of these solutions were limited by their existing architecture and tried to solve the problem by simply acquiring another solution.

Paradoxically, product supplier M&As may only compound the CSP problem. If a supplier acquired another solution to integrate with its original one, in reality there are now different systems, developed by separate companies with different

architectures that are often written in different languages. Even if such systems are provided by the same vendor, consolidation might take years to accomplish and require significant investments. While it's easy to create convergence on paper, in practice, inserting convergence into disparate systems is a different matter, as convergence needs to be built from the ground up.

Product supplier M&As have three possible results: (i) zero or negligible positive impact on the acquiring supplier's product (the supplier's main benefit is the acquisition of the client base); (ii) wallpapering over the cracks, i.e., integrating two disparate systems using middleware (this integrates them but doesn't make them convergent); or (iii) the acquiring company re-writes one of the two systems to match the "master" architecture. It is important for CSPs to understand which of these M&A strategies the product supplier adopts.

Scalability is another key requirement. Massive amounts of data often need to be processed. Some product providers point to billions of call detail records (CDRs) and IP data records (IPDRs) rated and proudly talk about scalability, leaving unanswered the question of how. If the volume increases twofold, will the hardware requirements increase by the same ratio? Does the system scale horizontally and vertically? While CSPs can throw hardware at the problem, in this age of lean budgets, a linearly scalable system can save significant costs.

A similar issue needs to be examined regarding direct access storage devices (DASDs). Does the system have a fixed size per record, rather than being able to flexibly adjust? In the former case, the size is likely to be rather generous to avoid the need for software upgrades due inadequate record size. However, while having a large record size of, for example, 4 kb when a typical rated event only needs 1 kb doesn't sound like a big issue, leaving 75% of DASD unused quickly inflates costs as billons of records are rated and three-way or four-way mirroring is introduced.

Choosing a single-supplier solution versus a number of "best-in-class" solutions is often debated. Does a CSP really have to choose either/or—and why? Should a CSP risk the goals from Figure 2 and compromise implementation just because of a pre-integrated software suite often acquired from various companies through M&As? Why should the selection process be different? Integration costs may be cited as the reason for this choice. However, that argument leads to the issue of starting in the middle of the process in Figure 2, which was already discussed as contributing to increased costs and delays.

If we take the early phases in Figure 2 into consideration and define a best-in-class solution as able to meet the requirements resulting from business planning, IT planning and architecture development, this definition should stand regardless of whether the resulting system is pre-integrated or not. Compromising requirements and choosing the second best solution because it's pre-integrated will likely limit the ability of a CSP to compete. Is it really cheaper to compromise on key

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competitiveness requirements than to integrate another truly best-in-class system into the OSS/BSS environment of a CSP?
If modularity is an issue in this dynamic market, does it make sense to pay to be locked into a specific product? Who can guarantee that the vendor chosen today will still be the best solution in five years given this fast-paced market? The cost of an OSS/BSS replacement is high, the modifications are complex and the landscape changes quickly. The ability to upgrade or replace different OSS/BSS modules quickly and at low cost is likely to be a key competitiveness factor.

Another issue to look at is agility—how business logic is created. Is the business logic separate from the code so that an SME with no programming knowledge can implement it using GUIs? Is the business logic backward compatible? If so, agility will be high and the upgrade costs low. Such a system typically provides the agility needed to compete in this market, where traditional CSPs are competing with new CSPs whose environment isn't burdened by massive legacy systems. New CSPs have the good fortune of being able to experiment with different products that can be introduced to the market quickly, enabling them to easily react to competitive pressures. Creativity in a CSP, rather than the OSS/BSS environment, should be the only limiting factor.

One could argue that this flexibility is the most important aspect—features can be added and business logic created. In contrast, where business logic creation requires coding, not only will the deployment cycle be slow and expensive, but so will the upgrades, as we have seen in many billing and CRM systems. Product suppliers may show pictorially the separation of business logic from code but forget to mention how to create such business logic (code, scripting, or GUIs for SMEs), and whether there is any backward compatibility.

The bar has been raised. As competition increases due to expanding service overlap among all CSPs and due to potential overlap among CSP products embracing the cloud, the ability to introduce competitive products is key.

Conclusion

The bar has been raised for all CSPs. As competition increases due to expanding service overlap among all CSPs and due to potential overlap among CSP products embracing the cloud, the ability to introduce competitive products is key. The journey has just begun, and the transition from traditional legacy telecom providers to agile CSPs providing next generation services has ramifications in all phases of the transformation. Each phase is impacted by the current competitive environment, and CSPs and their partners need to take this into account.

We live in an age where the only constant is change, and the only guarantee for success is innovation. We have seen the giants of the telecom industry disappear or move from market leaders to companies fighting for survival. The approach outlined above is likely to force traditional CSPs out of their comfort zone. However, in this age, this is a prerequisite for success.

No single company can meet every customer’s expectation alone—even the largest providers. Focusing on strengths and choosing the right partner with the right expertise, motivation and trust is paramount for success.

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