Next Generation Telco Service Providers: Telco 2.0 and Beyond

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***Abstract* — This paper analyses some trends among operators in their attempts to tame the "Internet innovator's dilemma" that looms behind the ineluctable Telco and Internet convergence.**

While the latter is often well accepted, the resulting strategies and business models of many operators are often weak or not playing that well into the operators' strengths. From these analyses, we derive some recommendations and identify new promising approaches and options for operators.

Keywords-component: *Telco 2.0, Web 2.0, SDP, SDF, Innovator's Dilemma, Convergence, Cloud Computing, Telco Business Models, Exposure to third party, VAS,Policy, Advertisement, OSS, BSS, OSE.*

I. INTRODUCTION

While it's well established that convergence is the future of Telecommunications, the exact scope and implications are often less clear. In fact the term convergence itself is used to denote many trends and meanings ranging from network technologies (from circuit switched to packet technologies and IP including the dreams of new IP networks like IMS that would be Telco wall garden and where Internet competitors would be kept at bay), to next generation flexible billing and OSS/BSS systems, to new communication applications continued across networks [4], to new application mixing communications and Web / Internet technologies, features or services and to new business models and approaches where operators want to offers services that compete or complement with Internet services. However, it is more rarely as well understood that convergence is instead dramatically altering the landscape of the Telco market, threatening traditional Telco service providers' business models.

II. THE INNOVATOR DILEMMA

The innovator's dilemma was introduced in [6] as an explanation for all disruptions that have taken place in manufacturing, software and services. The high level model goes as follows. Imagine a particular technology in its main market. As time passes by, any measure of value of the technology is in a growing curve. In the absence of the introduction of other technologies, the company or companies that master the technology and therefore dominate the market will be most apt at innovating, improving and competing. They will drive any improvement solely competing among each others in the "gorilla game" [7]. In such a market disruption does not exist, only competition between incumbents and relevant players. Disruption instead comes from the introduction of a new technology used in other market or for other purposes but also able to be an alternative technology for the existing market, albeit poorly. This is essential; otherwise it would be heavily pursued by the incumbents and they would maintain market dominance among themselves. Instead, with disruption, the technology does not pass the threshold of suitability for the market or at least for the traditional customers of the incumbents. So traditional players ignore it or at least maintain focus on their traditional technologies. Doing so and listening to their customers is their demise... Indeed, as time goes by both traditional and new technologies are on similar growing curves; and at some point, the new technology crosses the threshold of suitability. This is when disruption occurs: the new technology is now good enough and the extra value (and therefore extra cost) of the traditional technology is no desired anymore; the customers switch to. With the new technology, new players take over and dominate the new market and traditional players don't have credibility or investment to react fast enough to compete and they stumble. It is by then too late to switch and play. Even if they have also invested in the new technology, their customers and natural strategy to not cannibalize their own sources of revenues have prevented them to now compete seriously. Only players, who are on the disruptive curve or have identified the risk and accepted to compete with disruptive offerings against even their traditional offerings, can successfully, negotiate the disruption...

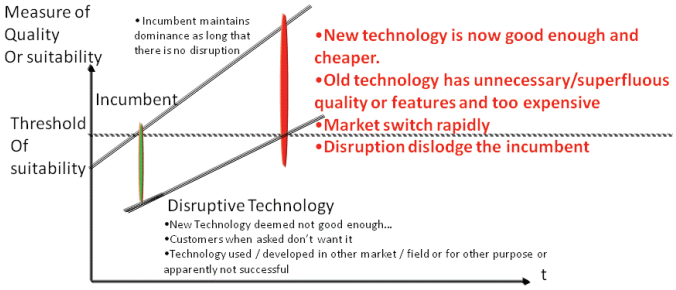

Figure 1 – Illustration of the Innovator's dilemma principles from [6]

III. CONVERGENCE AND TELCOS, AN INNOVATOR'S DILEMMA?

Could the "convergence", discussed above, rather be a major technology disruption for Telco business models, technologies and services?

While the evolution to IP is widely accepted by Telco players as the future for network technology, that aspect may not be the most important disruption... Indeed, one could argue that because it is well understood and not questioned, this is rather a technology evolution that will remain dominated by the incumbents, albeit possibly with opportunities for new entrants who build smaller disruption around the evolution. The actual disruption may rather be at the level of the service layer... And not resulting from just the evolution to packet networks but rather from the reality that as a result today there is no Telco service that is not available also the Internet (Think about Skype and VoIP vs. Voice services (PSTN or IMS), Web streaming and WebTV vs. IPTV, Internet "IM" and contextual services vs. all the IMS Multimedia services, etc) [3, 4] nor any new business model or service that does not already exist for a while on the Internet... And more and more their usage can be ubiquitous without involving traditional Telco network providers or just using them as bit pipe...

And still most of the time, the view of the Telco industry is that these services are "lacking"... A telling sign of "innovator's dilemma", especially if we look at how fast that assessment becomes obsolete or quite subjective; especially considering the customers' understanding and acceptance of Internet performances and business or customer relationship management approaches. One may argue where the

industry is we respect to the threshold of acceptability... But we certainly are not that far...

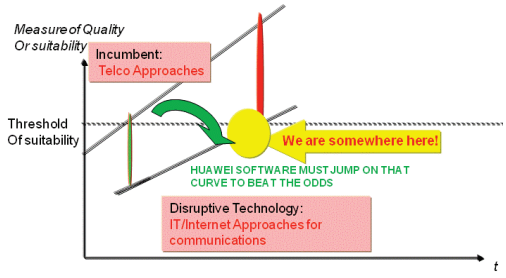

Figure 2 – Telcos and the Innovator's Dilemma…

IV. ARE TELCO OPERATORS READY TO SUCCESSFULLY NEGOTIATE THE DISRUPTION?

One should expect that many Telco players have devised strategies to negotiate the disruption. But are they really?

Consider the following few observations that illustrate how the advent of the Internet and web has affected the Telco market or customers expectations:

- No service (or even access) can be well controlled by operators without strong competition and as a result revenue drop
- Service already used and known (with similar services) dictate user expectation and reluctance to switch
- Many services are rather of an ephemeral nature. There are few killer applications and there not to stay long:
  - Hot services are rapidly no more hot or rapidly free (or with different business models like subsidized by advertisements)
  - Those who stay, result from first mover advantage or clever innovation to win highly competitive alternatives (e.g. look at Facebook as social network)
  - 12 to 18 months to deliver a new service means that Telcos are almost always too late before even starting to compete…
  - Success is based on trials and errors; something that is hardly compatible with 12 to 18 months TTM cycles.
  - To be profitable services must be built efficiently, fast and at low cost…
- No service strategy can assume superiority from being provided by a Telco Operators:
  - Providing the same kind of services without attractive differentiators proves rarely attractive to users
  - Limiting services to a wall garden is always a losing proposition.
- From a service point of view, bandwidth for a service is infinite in the long term …
  - Sure this is not true from a network point of view, but the bandwidth arguments have little impact on service strategy and are not congruent to users' expectations based on what they can have on the internet.
- There is no Telco service that does not already exist for a while over the internet and it is often free or very cheap and unregulated!
- Internet services providers offer services to users and many strive to optimize experience based on some understanding of the user (e.g. analytics, BI, user profile etc) and they do this for any users instead of just subscribers as handled by Telcos.
  - Unfortunately most of the premises of Telco consist into making business with addresses or phone numbers instead of the user…
  - Telco rarely collect well, use or monetize the information about their subscribers that they are the only ones to be able to collect today…
- Many services and business models are entirely or partially funded by Advertisement
  - Telco Operators must have equivalent alternatives to profitably match prices or business models
- Etc …

Users have gotten used to most of these and now rather expect them. Many are actually practices that present quasi insurmountable challenges to Telco service providers who still operate "traditionally".

It seems clear that Telco operators are rarely today on the disruptive curve... And as the innovator's dilemma teaches us, they risk suffering when the disruption occurs... But how can they be better positioned?

V. A HARSH REALITY

Of course, many other challenges affect Telco operators. For example:

- Existing Service infrastructures are reaching end of life (SCP) and new networks deployments are lagging.
- Existing Service infrastructure is not future proof and can't be repurposed or adapted across networks or for new services
- Proprietary and Silo service Solutions are not efficient, flexible or cost effective
- Customized services and "best of breed" increase long term TCO
- Even more inefficiencies come when productizing or managing service with OSS and BSS…
- Telco operators' internal organizations are preventing competing at internet speed: Organization changes are needed!
- Telcos strategy is driven daily by the need to redirect its "ABC Curves" to keep business viable as explained in Figure 3. Curves A should be raised while curve C (depending on B) is to be lowered as much as possible

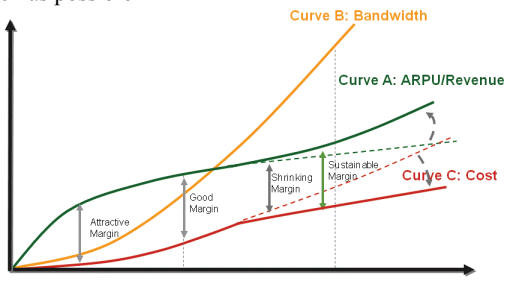

Figure 3 – ABC Curves. Curve A: Traffic growth outpaces revenue increase and so how to enhance revenue? Curve B: Fast evolution of technologies and networks and so how to establish advantages in bandwidth? Curve C: Costs of telecom industry do not follow Moore's Law and so how to restrain cost hikes?

VI. THE NEED FOR TRANSFORMATION

Following the lessons of the innovator's dilemma, it seems clear that operators in order to better compete against the "Internet SPs", they must themselves become Internet SPs: they must change from Telcos to SoftCos. Operators need to transform their business model and that requires organization changes. The rest of this paper discusses some trends to do so.

A. Separating Network from Service Businesses

Many organization changes can be recommended. A key one encompasses moving from their current structure to support different businesses:

- Network service provider
  - Infrastructure
  - Transport
- Softcos
  - Focused on services offered to users

- Internet like approaches

Becoming SoftCos is not only to become more efficient but to ensure more successful competition by

- Avoiding for examples the hurdles of extra regulations in posed on traditional Telco providers but not Internet Service Providers.
- Matching the ABC curves of Internet Service Providers (new business models, more efficient development, independence from bandwidth)

Once understanding that the success of the businesses will come from their own distinguished strategies, operators can determine how to best structure themselves across the entities driving these different businesses. Note that we have not said that synergies do not exist between network service providers and SoftCos businesses. They do exist, but they can be maintained with right business agreement across businesses. On the other hand confusing the objectives and strategies across services and network transport often leads to the challenges we discussed above and frankly often prevents Telco operator to have a fair chance.

There exist many strategies to correct the curves for network providers (e.g. by improving network technologies to increase bandwidth at reduced cost and increase demand etc). Network provider strategies should be the object of a different discussion. We will instead focus on the story for SoftCos: how to tame the innovator's dilemma for SoftCos and redirect the ABC curves within the service layer...

B. Organization changes

To become SoftCos or alike to Internet Service Provider means not only be able to define a SoftCos business but also offer the same kind of services as efficiently as other internet players and rely on related technologies but they must also reorganize themselves.

For example, it is essential to optimize end to end business processes like concept to cash, trouble to resolve etc. Indeed, for example cycles of 12 to 18 months cycles to bring a new product to market does not work. By the time services are ready, the market has moved on to other hot services and / or with many competing alternatives and the operator is confronted with a reduced or even already disappeared window to generate revenues.

This can only take place by having all constituents of the organization able to closely interact (something rarely seen today within most Telco operators) and ability to design integration and automation of business processes across NW, IT/ services, OSS and BSS departments. Today successfully achieving such changes require the presence of a strong management support and (CTO) functions spanning all these departments. It may also require upgrades of legacy systems like the OSS or BSS.

The gain in efficiency is also essential to favorably adapt the ABC curves when competing on services.

C. Business model changes

To increase ARPU, options include:

- Providing more efficient or new and richer communication, collaboration and multimedia services
- Providing digital supermarket to target sale and upscale of multimedia content
- Relying on third parties to generate innovation and share business risks
- Monetizing assets like network, OSS or BSS capabilities
- Targeting new customers
- Creating new businesses

In general to compete efficiently, operators should differentiate based on their strength. Telco operators can sustain differentiation and viable value propositions if in addition it:

- Utilizes assets, e.g.
  - Network / "communications" specific functions / capabilities
  - OSS/BSS (exposed features or on-demand)
- Exploits Carrier relationship to subscribers, e.g. :
  - Charging/Billing (e.g. access to bill of customer)
  - Subscriber information
- Takes differentiating advantage of Networks aspects, e.g. :
  - Transport / Access
  - QoS/Bandwith/Quality
  - Security

Without these differentiators, Telco SPs compete on par with other SPs and therefore must behave like them (organization, practices, Infrastructures)

- Customers do not rely any more on Telco SPs just because they are "Telcos"…
- In fact unless there are differentiators that address market needs, Telcos rather face uphill battles…

VII. SERVICE DELIVERY PLATFORMS (SDPS)

Many Telcos are relying on SDPs to address the problems of building new and / or more efficient businesses and compete or cooperate with existing Internet Service Providers.

In the absence of an industry accepted definition of SDP, we proposed to define a SDP as IT SOA middleware with Telco / communications features, capabilities and performances (see Figure 2) [5]. A good blueprint of how it should be implemented is provided by the OSE (OMA Service Environment) and related OMA and ITU work and specifications [2].

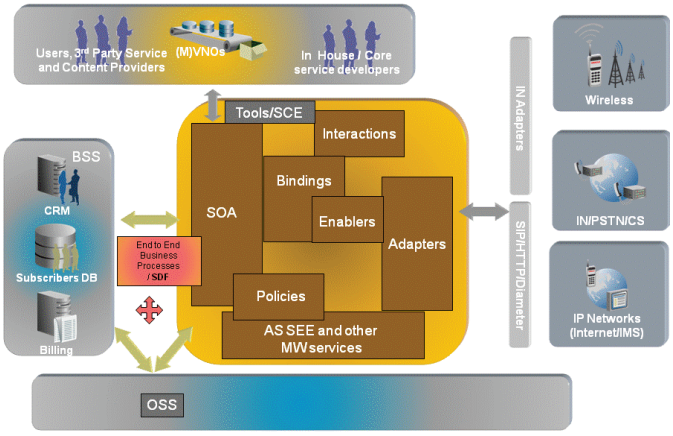

Figure 4 – Blueprint and positioning in a Telco Environment (or generic Service provider environment) of a SDP as Middleware + Telco (in fact communications as this works also on internet for ISPs) functions, capabilities and performances [5].

Accordingly, the SDP IT middleware provides communication functions (e.g. enablers and SEE/SCE like SIP AS) in a SOA IT middleware. The underlying network capabilities are exposed as enablers and controlled by these enablers through adapters that abstract them from the underlying network technologies. Applications, in house or developed by third parties are implemented by composition of enablers and / or within the SEE/SCE. This way, applications can be network technology and equipment vendor independent, future proof and convergence, continuity and FMC services are trivial to implement [4]. Enablers can also be used to expose (Telco) backend applications like BSS (Business Support

Systems) like CRM, Billing Systems and BI and OSS (Operating Support Systems) like network and system management, activation, provisioning. In this paper, in the context of a SDP and according tour SDP recommendation and blueprint [2, 4, 5], resources denote the system exposed and controlled via enablers or SEE/SCE (e.g. network elements like location server, SMSC, SIP router, IN call control, HSS, HLR, media servers, IVR/Voice servers etc…, or OSS, BSS functions).

SDPs are also integrated with OSS and BSS via end to end SOA business processes as described in [5].
With a SDP, Telcos (operators) can:

- Repurpose, increase, improve or rapidly and efficiently develop, with IT software practices, current and next generation core services as well as new communications services across Telco and Internet Networks.
  - It enables operators to more easily maintain and offer their core services across many networks and for many different business purposes.
  - It also enable operators to better ensure that their investment in core / communication services are future proof
- Develop many content delivery services that allows operators to play new roles in the Internet value chain by becoming reseller, content aggregators, content distributors or even content providers towards their users.
  - It can include in particular capitalizing on the user generated content by facilitating it's dissemination to the users, especially beyond the Telco SP network. This is certainly an easy way to play a key role in many of Web 2.0 and social network value chains.
  - The concept of digital super market has been around for a while; but since there is continuously growing more supported relevant content type, content and user acceptance. In a digital super market, operator can offer various content aggregated from different content providers, including its own or UGC (User Generated Content). Then adding analytics of the user behavior the operator can provide recommendations and cross sale or up sale. Being the gateway to multiple access channels, Telco operators have differentiating advantages as they can provide services through many channel and play the card of immediacy. Furthermore, their knowledge of their user across access channels or across / no matter the services, can give them unique business intelligence and insights in their recommendations.
    - Applications stores are particular cases where the content client-side applications. Today Telcos risk being dis-intermediated by device manufacturers who sell directly to the customer. However, cross devices or access channel are efficient and differentiated ways to compete, albeit to create attractive economies of scales for the user these may require cross operators' alliances.
    - Service stores can extend the concepts beyond client download to actually include prepaid or postpaid "subscriptions" management or pay per use purchases.
- Asset exposure (to third party)
  - Following the OSE blueprint [2], SDP can be used to expose through interfaces of enablers the operator's assets and capabilities, like features from the operator's network, OSS or BSS to applications, especially to third party applications. The interfaces typically accommodate web services (e.g. SOAP) and web 2.0 bindings (e.g. REST) and the SDP ensures that the exposure is "controlled" by enforcing policies and SLAs on all requests and responses to and from the enablers and containers.
  - This enables operators to create "two sided businesses". Conventionally this was for consumer services, but recently two sided businesses have proven also very successful to increase the role, and revenues, of operators with enterprises. Indeed, it allows service providers to resell third party services to enterprises bundled with their own communications services, therefore increasing revenue opportunities for operators and facilitating the distribution for third parties.
  - Both for consumer or enterprise markets, policy controlled exposure and two sided business models can enable new sources of revenue for operator where they can for example:
    - Monetize their assets
    - Share revenue with third party application / service providers
    - Create businesses for other third party to sell "enablers" (I.e. Not necessarily Telco/communications enablers but rather reusable capabilities or functions like search) through the service providers to others (e.g. third party application providers or enterprises) who use them in their applications.
    - The model can be revenue sharing or reselling agreement etc
  - With enterprises, the approach allows also operators
    - to insert themselves in the enterprise value chain
    - And doing so to build a relationship equivalent to the one they have with their consumer subscribers.
    - And now being able to bundle their own and third party services to enterprises, again evolving towards up sales and cross sales in ways many other players cannot achieve due to their lack of a few communication portfolio.

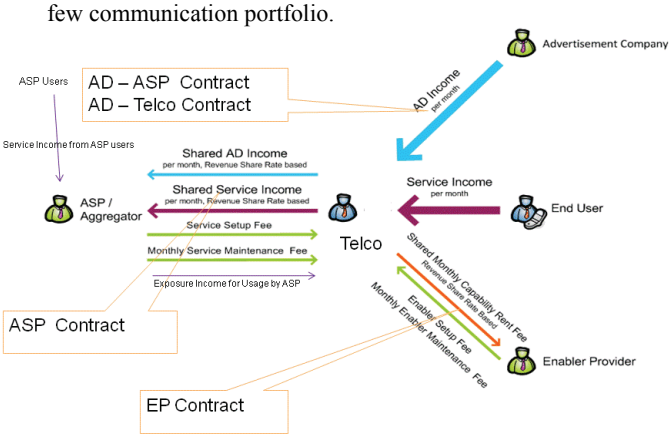

Figure 5 – Examples of revenue streams with two sided business models with 3rd party application providers as well as enabler providers as enabled by a SDP.

- Enablers expose relevant function ranging from communications functions like call control, media control, multimedia messaging, contextual functions like location, presence, OSS functions like device management or system provisioning or BSS functions like user or subscriber profile management, subscription management or account management, payment etc... They may also denote reusable functions (SOA) or MW exposed services.
  - Some enablers open the possibility of new businesses for operators like for example:
    - Payment and account management can enable operators to allow third party to bill services against the bill (pre or post-paid) and therefore provides alternatives to services like pay pal.
    - Profile information or derived recommendations or business intelligence can be communicated (possibly filtered to respect privacy, preferences or regulation)
- Policy enforcement. A SDP provides advanced policy decision capabilities. The can be used to provide ease of control of many other assets like:
  - Policy based differentiated traffic QoS
  - Converged charging as policy enforcement
  - Traffic control based on policy enforcement
  - Etc

- Anything else: as an open platform, operators can use the service creation and execution of the SDP middleware for any other need that they have, thereby enabling them to develop new services on par with the IT and internet players.
  - E.g. Developing recommendations, “ad insertion” and “ad warehousing” solutions that can be used to:
    - Subsidize services to better compete against the Internet "free" services that are similarly subsidized but differentiated with the addressable channels, applications that can support ad insertions and accurate ad targeting.
    - Maintain or create relationships with advertiser instead of giving them up to Internet advertisement warehouse like Google, Yahoo etc.

With the above, operators are able to offer more efficiently services and better compete or partner with other IT/ Internet Service Providers.

Operators can also create new businesses away from traditional Telco SoftCos businesses. For example:

- Providers of financial services like mobile banking, payments
- Providers of hosted platforms for third party services
- Aggregators or federation of web 2.0 and social network services, e.g. motivated by the need to facilitate interactions to multiple social networks from the operators multiple access and the value to relate the user contextual, profile and collaboration capabilities to the social network services.

These new services and some of the other services described above might be considered to be offered to "Internet users" instead of just the current Telco subscribers... This might truly perfect the transition of the Telco SP to SoftCos (I.e. Telco service providers looking better like Internet Service Providers).

With the above, operators are able to offer more efficiently services and better partner with other IT/ Internet Service Providers. Is this however sufficient?

VIII. Relationship between SDP and Cloud Computing

To jump on the disruptive curve, Telco operators can also create new businesses away from traditional Telco SoftCos businesses like:

- Providers of financial services like mobile banking
- Providers of computing capabilities [8] with efficient hosted models like the cloud computing IaaS (Infrastructure as a Service) and PaaS (Platform as a Service).
  - As this is an emerging space, Telcos have a unique opportunity to position themselves as providers in this new space relying for example on
    - Their expertise to offer reliable infrastructure
    - Bundling supporting capabilities from their own businesses like network QoS, Prepackaged OSS, BSS and end to end business processes to allow operators to off "business as a service" where ... [add]
  - Cloud Computing may be a key way to increase the efficiency (and reduce the cost curve) for SDP and services by allowing to reduce significantly both CAPEX and OPEX required.
- Broker / resellers of cloud computing SaaS possibly bundled with their own offerings
- Aggregators or federation of web 2.0 and social network services (e.g. Motivated by the need to facilitate interactions to multiple social networks from the operators multiple access and the value to relate the user contextual, profile and collaboration capabilities to the social network services.

These new services and some of the other services described above might be considered to be offered to "Internet users" instead of just the current Telco subscribers... This might truly perfect the transition of the Telco SP to Softco...

IX. Conclusions and Recommendations

We have illustrated the importance for Telco to evolve for their service part to become more like SoftCos, I.e. (Communications) intent service providers.

The following are some closing recommendations collected throughout the analysis of the market trends:

- Don’t bet against internet and IT technology, embrace them:
  - Practices, Capabilities, infrastructure and tools
  - Exploit the same Economies of Scales
- Operate at internet speed:
  - Service dev and productized fast and at low cost (including core services)
  - Be able to experiment with new services or new business models, reduce TTM / cost and can accept failures…
  - Reduce time to market by order of magnitude.
- Don’t bet on keeping competitors away: Compete and cooperate with them!
  - Rely on partners and different models
  - Build strategy based on successful differentiators that can be sustained and profitable
- Consider “organization changes” if needed:
  - Become IT / Internet SP like while keeping your differentiators
  - Today many delays result not just from service development but more importantly from lack of integration of OSS/BSS/SDP and automation of end to end business processes
- Target new business models
  - Rely on IT / SOA SDPs
  - Consider two sided business models
  - Consider Cloud Computing initiatives
  - …

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