



Trends in telecommunications services – does the traditional operator have the advantage?

George Salisbury

Given that humans communicate via the 5 senses (visual, aural, olfactory, taste, and tactile) it comes as no surprise that the telecommunications services are focused on those senses which lend themselves to “long-distance” communication e.g. sight and sound. But even here the communication is limited to non-stereoscopic images, and mono-aural sound. Stereo-sound is possible, whilst stereoscopic or 3D image projection is still in its infancy. It is interesting to note that there are initial attempts being made at tactile telecommunications, especially using force-feedback techniques (e.g. remote control of a surgical robot). There are even attempts being made at handling the olfactory sense (smell).

The multi-faceted developments within telecommunications are leading to an increasing number of players entering the market who intend to use these developments to attack the traditional providers’ market share with new business models. It is with the backdrop of this increased competition that this article attempts to assess the traditional telecommunications service providers’ chances and to identify ways in which the telcos of the future can hold on to their position at the front of the field.

Increasing bandwidths, improving quality

From the invention of the telephone, up until the development of frequency modulated radio signal, telecommunications was primarily concerned with the transport of mono-aural, limited bandwidth, audio frequencies (300 Hz to 3.4 kHz). The FM radio of the late 1930s improved the quality (bandwidth), and in the late 1950s was the basis for stereo-sound. The “cable” networks have been used for standard quality video/sound broadcast transport for many years. Stereo sound and high bandwidth mono-sound were not addressed by the point-to-point mass market networks (wired or wireless) until the arrival of the packet based IP networks.

Until recently sending (point-to-point or broadcast) information has required that the transport network be “tailored” to support the information being carried. For example: To improve on the analogue PSTN quality, and to support a higher bandwidth, the ISDN was developed. Many TV companies used ATM networks to transport the high bandwidth TV signals between studios and transmitter stations. The “cable” networks were or are being upgraded to HFC (Hybrid Fiber Coax) and then to digital transmission to support high definition TV.

IP networks are the standard today

The creation of the current generation of packet based IP networks has proved to be a “double-sided sword” for the net-

work operators. They have found that it is possible, and economical, to deliver multiple services that require different transport capabilities over a common (IP) transport infrastructure.

The problem, at least for the network operators, is that end-users have discovered this too.

End-users have found that the Internet is capable of transporting interactive voice and interactive video and of delivering real time multi-media streams, without requiring any service support from the Internet operator beyond simple packet transport.

Whilst the quality of the communications may be inconsistent, third party service providers are rushing to provide

Customer demands are on the rise

end-users with such services without needing to directly invest in the underlying transport infrastructure.

Are network operators going to be „degraded” to data transportation?

From the view point of the telecommunications network operators the Internet has become the enabler for many revenue streams, but the networks operators' share of this revenue is potentially limited to simple bit-transport. At least in the PSTN the network operator could provide value added network services such as the non-geographical numbers and revenue collection services for the content provider, but in the Internet the network operator is almost (except for bit-transport) superfluous.

To assess the carriers' present position in the market Detecon examined which services they can provide and which criteria these offers must fulfill. A total of more than 220 different telecommunications services were analyzed.

For example: If users only want Web surfing of static Web pages (no sound or graphic animation) then 64 kb/s access might be good enough. If users want real-time/live high definition TV then the transport network needs excellent bandwidth and possible multicast capabilities. If the users want time-shifted

high definition TV then the transport network is high-bandwidth but without the complications of multi-cast.

This is summarized in the table below.

Network operators master transmission quality

An initial analysis showed that complex services were constructed from a limited set of core services that were then subject to bundling and/or packaging. For example:

- Public broadcast TV, Public Broadcast High-Definition TV and Closed User Group broadcast TV are all essentially the same sort of uni-directional audio-visual point-to-multi-point data streams as far as the transport network is concerned.
- Game download portals, music download portals and Video-clip/film download portals are all essentially based on Web shops with a non-time critical file transfer program.

The services were then examined to identify whether they had relevance to selected characteristics. The following is an example of some of the selected characteristics and their use for an audio download service (such as i-Tunes).

Tab.: Different service requirement profiles

	Bandwidth requirements	Needed Quality (QoS)
<i>Web surfing</i>	Low or better	Low or better
<i>Real time multi-media</i>	High	High
<i>Time shifted multi-media</i>	High	Low

➤ Dependence on QoS	No
➤ Dependence on the PSTN	No
➤ Dependence on Web shop/portal	Yes
➤ Dependence on presence information	No
➤ Opportunities for a 3rd party provider	Yes

operator's advantage over third party service providers, due to ownership of the networks and thus control over a major part of the QoS, will diminish.

- Shift from broadcast multi-media entertainment (TV, radio) towards download and delayed viewing
- Migration of real-time broadcast TV to mobile/wireless (e.g. DVB-T)
- High-revenue one-off video on demand will use download and delayed viewing technologies

The analysis of the results shows that approximately 23 percent of the examined services depend on QoS and thus network operators have an advantage over third party suppliers here, as they have control over the network quality (QoS). One of the key questions is whether this advantage will be maintained, and the extent to which it can be used.

➤ Natural evolution of higher and higher bandwidth core and access networks at lower effective costs per transported bit. This is a complex issue, but basically QoS is used to manage access to network resources under the assumption that the resource is limited. If the resource is not limited then QoS is not an issue.

QoS is less relevant

Based on the following assumptions the author concludes that the network

Most of the services which are dependent on the PSTN are derived from the recognized ITU-T guideline E.164, which defines the components and

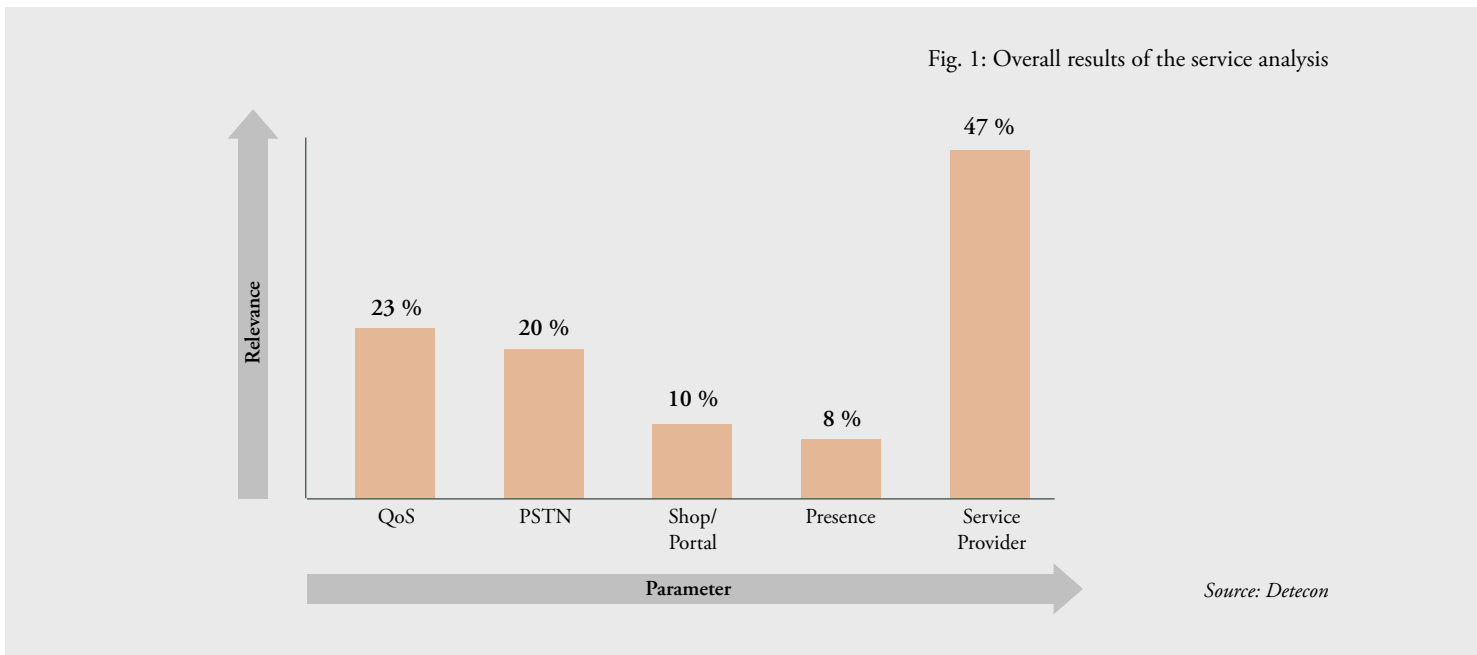


Fig. 1: Overall results of the service analysis

Source: Detecon



length of a telephone number, supported by an Intelligent Network. AT&T, Vonage, Skype and others have shown that PSTN type services can be delivered over someone else's IP network. It is thus to be expected that, unless third party VoIP type services are actively degraded within a network, the network operators' advantage for PSTN type service delivery will vanish. The only substantial leverage that the network operator has, at the moment, is the possibility of providing its own PSTN type services with QoS mechanisms. But given the diminishing market price for fixed network PSTN services, it is probably better to avoid quality voice services on the IP fixed network and thus encourage the voice services to migrate to the mobile network where prices and margins are better. A direct consequence of this reasoning is to keep the GSM/UMTS voice services separate from the Internet!

Third parties can supply PSTN-like services too

The issue of interactive voice services is complex, the analysis simply shows that the PSTN type services represent about 20% of the total service portfolio, and that QoS is of diminishing relevance. These two indicators suggest that PSTN services will not remain in the domain of the network operator!

The analysis revealed that of the 220+ services only 10% are dependent on an internet shop or portal. That is to say that 10% of the services are provided via a Web page on-demand. This must be considered carefully. Any service that is controlled via end-user software, e.g. VoIP via a soft-client, or broadcast TV, does not need a specific per-use Web shop/portal as this is simply inconvenient for the end-user. However, ad-hoc

service usage is best supported via a Web shop/portal rather than customised end-user software. In general, Web shops are used to close-the-deal whilst Web portals are used to interact with subscribed services. The network operator should have no fundamental advantage or disadvantage compared with a third party service provider concerning Web shop/portal since the skills needed are fundamentally IT, not communications.

There is a form of presence where the service provider knows about the service availability state of an end-user. This information is sometimes made available to selected end-users. In the analysis presence was concerned with the service provider letting one end-user know about the service availability state of another end-user. Presence is used in services where end-users interact with one another. These account for about 8% of the analysed services.

It is interesting to note that GSM/UMTS networks can derive a form of presence information from whether the end-device is connected to the network or not. Such presence information is limited for service purposes since it applies to any services (incoming and outgoing) that the end-device supports. The equivalent presence information in the fixed network arena is whether the access circuit is logged-in or not. This presence information is virtually unusable for services since it carries no indication of the actual identity of the user(s) at the end-user's premises.

Whilst it appears that the network operators have an advantage over third party providers in services using presence information, the reality is less positive and is expected to diminish.

Is there any difference between service providers and network providers?

The analysis revealed that almost half of the services could be equally well provided by a third party provider as by the network operator. This figure can be regarded as an overview of the other characteristics.

The superset created by combining the services that are dependent on QoS, PSTN and network presence a service group that is primarily the domain of the network operator. However the analysis of the QoS, PSTN and network presence characteristics shows the overall trend is that such characteristics are of decreasing relevance.

Thus the overall trend is that more and more services will be equally deliverable by a third party provider and by the network operator.

A network operator can respond to this in various ways, for example:

- Bit-Pipe: Focussing on the transport business, not on the content or service.
- Protected Tiered: Offering standard handling to third party data streams, and premium handling to own data streams
- Shared Tiered: As Protected Tiered but allowing a third party service provider to “buy-in” to premium handling
- Open Competition: Same treatment of all data streams, competition at a service level.
- Interference: Delaying, or corrupting, data packets belonging to unwanted data streams
- Censored: Discarding data packets belonging to unwanted data streams

Before following one of the above possible courses of action an operator is advised to consider:

- How the regulator will respond

- How the user will respond
- How the competition will respond.

A qualified analysis of the network operator’s specific situation and skills is necessary in order to answer these questions.



George Salisbury is a Managing Consultant for Detecon and is in charge of the “Technology Strategy” Group. His main consulting subjects are Next Generation Networks (NGN) and the development of technology strategies for international telecommunications companies. Before joining Detecon he held a management function in an international telecommunications company, where he gathered more than four years of business and strategy experience. Prior to this George worked for international telecommunications equipment producers with an emphasis on the design and development of voice, IP and data communications networks for public and private customers. In total he has over 27 years of experience in the telecommunication industry and has been closely involved in the development of NGN concepts since 1995.

George.Salisbury@detecon.com

