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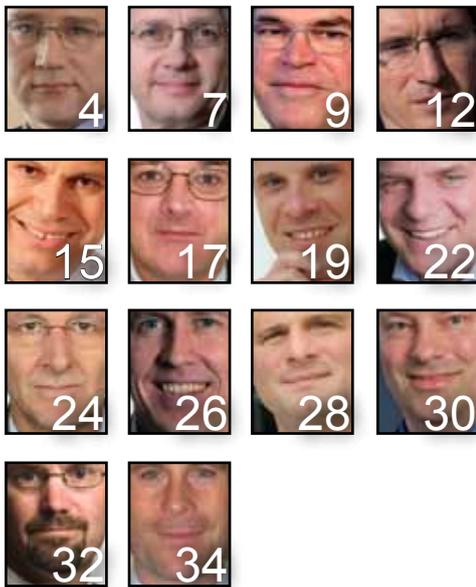


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Connections



It is rare to find two industries with so many parallels as the Travel and the Communications industries. Both have transformed everyday life beyond recognition in the past few decades. Both have been 'democratised' with greater affordability, moving from the occasional luxury to a necessary amenity. These two industries impact and disrupt each other and drive progress in each other. Thus, the need for ubiquitous connectivity grows with frequent global travelling.

The travel industry was disrupted by web technology but emerged as an entirely new digital environment. It now delivers online planning, booking, paying and ticketing, with travel decisions made on the spot from anywhere. The air travel industry is incorporating mobile facilities for not only informing passengers of departure changes, but for co-ordinating crews and passengers when 'irregularities' (major disruptions) occur.

The modern lifestyle is characterised by both mobility and connectivity. It has been coined as 'SoLoMo', merging Social networks, Local services and Mobile smart devices. It is associated with greater productivity, enhanced by the ability to carry your office in your pocket. Conversely, it is also enhanced by communication negating the reason for travel; for example, using conferencing as a travel-substitute solution that allows virtual meetings to take place without moving from the chair.

Free connectivity in Estonian cities, which has been achieved through business collaboration, is now regarded there as a civil right. It has considerably enhanced Estonia's image with tourists, contributing to the country's economy. Connectivity of smart devices, tablets in particular, in the global hospitality business is now considered a decisive factor in appealing to customers. High-earning guests demand support for video-streaming devices, often more than one device, and the hotel's reputation depends on it.

Such users are willing to pay a premium price for connectivity, but the high cost of roaming data is still an issue with many travellers. The notorious Bill Shock effect on users has been to switch off mobiles altogether. Where local operators complied with the EU directive to cap and reduce roaming charges, they were rewarded by rising revenues from mobile Internet. If subscribers can manage their accounts and share data plans across devices, they will gain confidence and usage will increase. Even with limited ARPU, some MVNOs manage to prosper, offering low-cost home calling to immigrant communities. Another way is to partner with local network providers who enable seamless handover to local pre-paid SIM cards via remote re-configuration.

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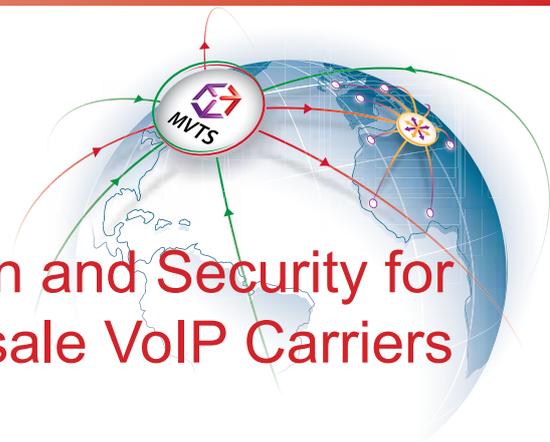
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Profit Protection and Security for Wholesale VoIP Carriers

The VoIP wholesale market is developing fast and has expanded in size greatly over the last years. ALOE Systems is a VoIP network software vendor that has been in the market for over 10 years. How is ALOE Systems different from other vendors? The company has rich experience of customizing products to meet the needs of a particular carrier; however, the key advantage of ALOE Systems is the company's unique know-how - Profit Protection. With this feature carriers can route traffic literally in any way they want, assuring set profit margins.

MVTS II is a four-in-one platform for running VoIP wholesale business, combining switching, routing, billing, and border-control functionality. 2011 saw a significant increase in performance of MVTS II - the concurrent calls' rate rose to 150 000, along with the CPS rate. The system fully meets the demands of large-scale carriers, being capable of routing large amounts of traffic.

MVTS II is one of the most efficient softswitches in the market: the concurrent calls rate is 150 000.

MVTS II Key Features

- The Profit Protection feature allows the carrier to create a set of routing algorithms for customers with different needs in traffic handling/transit. The carrier can set routing algorithms-based on
 - » Route cost (LCR)
 - » Route quality (ASR, ACD, ABR, PDD)
 - » Time (time of day, month, year, day of the week)
 - » Gateway load
 - » Local Number Portability (LNP)
- Maximum difference between incoming and outgoing calls is established to assure profit margins
- Powerful switching: MVTS II is a tool for effective protocol interworking (SIP-H.323 two-way conversion) and transcoding with a wide range of codecs supported
- Partitioning capabilities allow creation of hosted softswitches within the main platform. With partitions being fully

independent, carriers can benefit from renting the switch to other providers. For start-ups, MVTS II is a cost-effective way to enter the VoIP wholesale market

- Route quality control - if route quality falls below a certain point, the route can be blocked and reconfigured to guarantee SLA parameters to end clients
- Distributed modular architecture of the system allows easy scalability of the system and its overall flexibility along with high levels of fault tolerance and network redundancy
- Integrated prepaid/postpaid billing helps the carriers manage finances more efficiently

ALOE Systems' other products are ALOE Transit SBC and MVTS Pro.

ALOE Transit SBC is a session border controller that combines security, media management, and transcoding services in a single, highly scalable software platform.

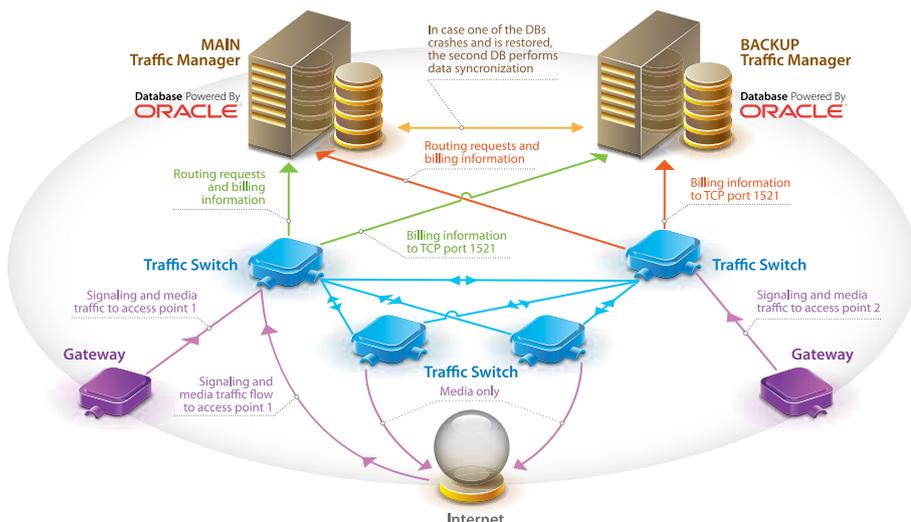
The product can be easily deployed in complex network structures and features network topology hiding and distributed architecture, which makes the network less vulnerable to malicious attacks.

ALOE Transit SBC Key Features

- Secure entry point into the carrier's VoIP network
 - » Call authorization by IP addresses/usernames from system configuration data
 - » Control of incoming CPS/RPS value
 - » Privacy support (presentation/screening indicators, RFC3325/RFC4497/Cisco Remote-Party-id)
- Network topology hiding
- Centralized media traffic management
- Media anchoring
- Protocol interworking
- Transcoding

MVTS Pro is a high-performance class 4 softswitch featuring high capacity, support of a variety of VoIP protocols, and RADIUS for interaction with external billing systems.

Learn more at www.aloe-systems.com.



I communicate, therefore I am

by Juhan Parts, Estonian Minister of Economic Affairs and Communications

Estonia is gearing up to attract tourists, and tourists want the Internet. Local city authorities brought together businesses and encouraged them to invest in common Internet access infrastructure, delivering free WiFi everywhere, which is managed centrally. Mobile Internet in roaming is far too expensive, but responding to the EU directives, Estonian operators reduced charges considerably, resulting in rising revenues. In fact, Mobile Internet revenues have surpassed those from numerous mobile apps that rarely survive 30 days. To encourage tourism further, Estonia is also urging local organisations to embrace consumer online booking, where decisions are made on-the-spot, and address social media with enticing tourists' packages.



Juhan Parts is the Minister of Economic Affairs and Communications. Mr Parts has been leading the ministry since April 2007, when the government coalition between the Reform Party and the Pro Patria and Res Publica Union was formed. In 2003 and from 2005 to 2007 Mr Parts was a member of the 10th and 11th Riigikogus. Juhan led the government of Estonia as Prime Minister from 2003 to 2005. From 2002 to 2005 he was the Chairman of the Res Publica party. From 1998 to 2002, Mr Parts worked as the Auditor General. From 1992 to 1998 he was the Deputy Secretary General of the Ministry of Justice.

Juhan Parts is a qualified lawyer, he graduated from the University of Tartu cum laude in 1991.

Paraphrasing the Descartes' old statement cogito, ergo sum (I think, therefore I am), we can safely say nowadays: I communicate, therefore I am.

The world is becoming smaller and our communication opportunities are becoming increasingly wider. Most of us can be, very probably, contacted 24/7, and we feel rather helpless when we cannot browse the news quickly or exchange thoughts with people we need when we are away from home. When we travel outside Estonia, we find it rather irritating to have to put up with the substandard services of local mobile operators or Internet service providers. Unlike a decade ago, in Estonia we now consider the mobile phone and the Wi-Fi networks, which cover the whole country, something like a human right.

The triumph of mobile Internet

According to forecasts (Morgan and Stanley), the use of mobile Internet will already have exceeded the volume of Internet use with desktop computers already in 2015. Tourists first of all need an opportunity to record what they see and share their emotions with their friends and family.

Tourists in a foreign country need information about transport, sights, events and people that prove interesting to them. In the 21st century, a tourist carries the basic means of communication - a computer, a tablet or a mobile phone - but how to connect these devices to a network in a foreign country? Roaming services for mobile voice and data communication are difficult and expensive, and consequently tourists prefer making Voice over Internet Protocol (VoIP) calls and instant messaging.

Estonia makes a great effort for tourism promotion, and the development of free Wi-Fi in tourism areas is part of this work. The required infrastructure is created in cooperation with businesses and local government. In Estonia, the Tartu City has been one of the most efficient developers of the Internet network by making a consolidated investment and installing centrally administered Wi-Fi transmitters for the city businesses under an agreement with them to share the common Internet connection. Tourists like to stay where access to fast and free Internet is ensured in almost all businesses, which provide services to tourists in the city: in cafes, restaurants, guest houses and hotels. The service is maintained by businesses that need Internet in their daily work. Businesses and tourists share network resources of the centrally administered

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Wi-Fi. Through the Wi-Fi gateways, the businesses and the city provide information to tourists about themselves and tourists spread that information further when they exchange messages through Wi-Fi and communicate to others.

Mobile Internet is preferred to mobile applications

It is remarkable that more than 300,000 different mobile applications have been developed for tourism in the course of the last three years. However, every fourth application used in a mobile phone is downloaded for one-time use only and will never be used again. The average lifetime of a mobile application is said to be only 30 days. Mobile Internet has more users than different mobile applications and is more durable. Developing mobile Internet in Estonia benefits from the high Internet coverage. We can also boast low roaming fees. This creates good pre-conditions for mobile Internet to become a marketing channel that provides location-based services and up-to-date information. This is an important advantage for the small Estonia in comparison with larger countries where the Internet coverage area is so fragmented and expensive that development of mobile Internet is unreasonable.

There is a growing demand for mobile Internet when travelling. People increasingly wish to stay online and use abroad their smartphones that they are using at home. They want to keep an eye on their emails, the local news, and even look at the weather forecast. For a long time, mobile Internet abroad was very expensive, and people could get shocking invoices when they came home. We appreciate the efforts of the European Union in capping and lowering fees. In Estonia, several operators have done much more than the mandatory lowering of fees. Since May last year, the clients of the leading Estonian mobile operator can be confident: the daily limits for mobile Internet, which have been introduced as a new technical solution, provide the assurance that the daily use does not exceed a specific amount. Currently, these daily limits apply in the EU countries but it is intended to apply them also in the rest of the world. The volumes of use of mobile Internet increased hundreds of times after establishing the daily limits - which proved once again that the need to use mobile Internet when travelling existed but the price kept it back.

The Mobile-ID service developed in Estonia by EMT makes it possible to log-in to online banks and give digital signatures securely,

even when in foreign countries. The ID card can be used for the same purpose but it requires a card reader and special software in the computer - which most computers in Internet cafes outside Estonia do not have.

Internet favours independent decision-making

People often travel individually, as opposed to in groups, nowadays, taking weekend trips and short trips. There is a growing trend of tourists coming to Estonia or going from Estonia for just a short trip that needs to be supported by web communication and online channels. The main emphasis in the travel industry has shifted to online channels, unlike the earlier long-term planning through travel agencies, visits to fairs, accessing publications and other traditional channels.

The role of online channels is extremely important in making travel decisions - it has exceeded 60 per cent already according to a survey conducted in 2009 and has considerably increased since. In order to attract tourists and related investment to the country, solutions to support this trend should be developed.

Visitors make decisions on trips on the basis of website content, getting inspiration from the website content: getting inspiration from this content, as well as planning and booking the trip on its basis. All is done online, on-the-spot. This means that technologies, websites and software solutions must allow people to acquire important information within seconds and to plan and book a trip there and then. Otherwise visitors will just go to the next website and make their travel decision or purchase there.

Social media

Most communication in social media channels takes place online and most organisations engaged in tourism marketing already spend the lion's share of their marketing budgets on solutions related to social media. Marketing and communication in social media does not mean just Facebook - actually, channels of social media channels vary with countries. Most solutions are intended for the provision of location-based information - i.e. a visitor has to get specific information and offers related to his or her location.

Summary

The aim of the European Union is to ensure equal opportunities for the consumption of

goods and services for citizens of all of its Member States. The same has to apply to the area of communication and it is quite clear that both common rules and cooperation between different Member States, mobile operators, telecommunication companies and service providers are required for finding solutions.

We communicate in order to exist and to do it better than ever before. ●



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From video-communication to machine-to-machine - life on the move

by Stefano Pileri, CEO, Italtel

Being connected at any time is now essential, while travelling is taking increasingly more of our time. Communication applications bring great improvement to productivity and convenience during travelling, or even help to avoid travel altogether. For example, conferencing telepresence enables remote meetings, eliminating travel dead time. Desktop sharing provides another way of collaborating remotely. A great help for the traveller is the ability to access data safely from anywhere, with Cloud services. Machine-To-Machine technologies bring new advancements in the automotive industry, finding a car parking space, alerting to road conditions and more. Communications is at the heart of the enhancements to the life of the traveller.



Stefano Pileri is CEO of Italtel. Stefano Pileri was born in Rome in 1955. He graduated in Rome in Electronic Engineering in 1980 and he achieved the Master in Applied Electromagnetism in 1981. He has been in SIP (Italian Telecom Operator) since 1982 where he has assumed increasing responsibilities in the Network Management Systems Department. In 1993/94 he was responsible for the Network Development and Operations in the Emilia-Romagna region, and in 1997 he became Responsible for Network Planning, Engineering and Marketing in the Network Division of Telecom Italia. In March 1998 he became Responsible of the Telecom Italia Wireline Network and in June 2005 he was also appointed CTO of Telecom Italia Group, directly reporting to the President, with the responsibility to drive and coordinate the fixed-mobile integration and the overall technological network development. He joined Italtel as CEO in September 2010.

From video-communication to Machine-to-Machine-communication, technology is changing the way we travel, providing new real time, easy-to-access services-based on mobility and collaboration.

The world is going mobile: people are always connected, regardless of whether they are travelling or working at the office or at home. It is not only a way to keep in touch. Being connected at any time is becoming an essential collaborative requirement, enabling a mobile workforce to act autonomously but on behalf of the corporation 24/7. The massive spread of mobile phones allows our professional and private lives to travel with us.

According to recent Nielsen Group research, 77 per cent of frequent business travellers and 67 per cent of travellers overall bring their Internet-enabled mobile devices with them. This is driving 73 per cent of airports to invest in mobile-based services and 56 per cent of airlines to anticipate an increase in IT spending.

Mobile technology drives towards a paradigm shift in business travel interactions. A mobile-enabled workforce requires instant access to ever more information as well as greater ability for self-service and personalized communication. As a consequence, the demand for new, more efficient mobile services is steadily growing. Nowadays, video and social media are considered as key collaboration tools for business trips and are changing the way we communicate and interact.

Conferencing

It is not surprising that 2010 registered a balance between the use of virtual meetings and face-to-face meetings. Even the travel industry has started considering video applications as a complementary alternative for business travellers rather than a threat to cope with. Carlson Wagonlit Travel (CWT) represents a perfect case in point. CWT is a leading corporation in the business travel management sector that decided to launch an enhanced video service offer designed to help

clients seamlessly integrate telepresence into their managed travel program. CWT clients can take part in video-conferences around the world, accessing the Service Provider public network. In an economic environment that requires companies to look for ways to reduce costs, clients now have an additional solution for effectively managing their travel and meeting expenditures while realizing their business objectives.

It has to be taken into account that the majority of business travellers are executives who tend to have high travel costs but very little time to dedicate to corporate meetings. Video services, such as video-conferences, are the perfect tool to turn travel downtime into an opportunity to dramatically increase productivity, allowing executives to participate in far more meetings. Collaboration with colleagues who are thousands of miles apart, located in dozens of different countries around the world, allows one to take faster, better decisions, and unifies team members. In addition, to reduce travel costs, video services help business travellers

take part in scheduled events even in the case of any unpredictable occurrence, such as the recent volcanic ash cloud, or heavy traffic jams.

Service Providers play a key role in making communications in travel around the world easier and more efficient, taking advantage of real time services. In particular, they can add value to video-conferencing delivery due to knowledge and experience of the following:

- enabling video-conferencing interoperability by allowing different video-conferencing technologies - including Over the Top and Internet Providers' services - to interoperate providing the best user experience;
- ensuring that the requested Quality of Service is delivered via marking and prioritizing video-conferencing traffic;
- managing multiple SLAs among different networks and negotiating codec capability among the different video endpoints.

In order to address the new challenges, at the Mobile World Congress 2012 in Barcelona some of the most important European service providers and Telco device manufacturers, Italtel included, announced an open industry initiative to define standards and reference architectures for HD video communications over open service infrastructures. The interoperability among different platforms which belong to independent domains, allows operators to introduce new HD video services and serve numerous potential users who nowadays take advantage of the mass penetration of the latest, smartest, lower-cost smartphones.

Cloud

Cloud-based Computing and Software as a Service (*SaaS*) are two further concrete examples of how a business traveller can take advantage of the Service Provider's infrastructure to dramatically increase the collaboration experience. With the convenience of the Cloud, business travellers can access data across any platform or device in real time. Moreover, work done online is saved on the Cloud and quickly synchronised with desktop machines back in the office. Most cloud-based applications are much faster and less expensive to scale, and hence follow a freemium model of a free basic limited application (*app*) with more features on a subscription basis. This helps the applications to increase their subscriber base much faster too.

The potential productivity and financial benefits for the business traveller of using Cloud-based services in combination with mobile devices are substantial. The combination of increasingly powerful mobile devices and the availability of software solutions via the Cloud will completely

change the way that business travellers think about and experience travel technology. Gartner estimates that up to 35 per cent of the implementation costs associated with on-premises application development is for integration. In comparison, Cloud Computing makes it easier to integrate and extend legacy environments as well as connecting to other Cloud services - making the process much faster and more scalable.

One of the greatest nightmares for the business traveller, the loss or theft of a laptop full of data that has not been recently backed up, is no longer an issue. Thanks to the Cloud, data is safe and automatically backed up for quick access from anywhere. The apparent downside risks to data security through having data stored on the Cloud, and most notably the constant need to access the Internet, do not seem to be hampering the growth of the Cloud.

Desktop sharing

Another effective collaboration tool available is the desktop sharing. Desktop sharing software is an application through which one can share computer screen content live over the web with others. It might sound trivial, but it is a powerful tool, applicable in various business occasions such as online meetings, web conferencing, web presentations, online training and remote support. In a time of globalization, businesses and services take place anytime and anywhere. Desktop sharing solutions improve the efficiency and effectiveness of cross-office collaboration, online product demonstrations, employee trainings and customer services at little or no cost. With it, small businesses can save a substantial amount of time and money and achieve greater success.

Machine-To-Machine

The travel industry and communications providers can find common ground to establish profitable collaboration thanks to the explosion and wide adoption of Machine-to-Machine (*M2M*) communications. In the *M2M* field - also referred to as 'The Internet of Things' - embedded elements such as sensors, actuators and communications devices become an integral part of information systems that enable operational and business processes to automatically adapt and react to changes in their environment. These so-called 'smart' assets can make these processes more efficient and responsive, give products new capabilities, and most certainly will engender new business models. Communication is at the heart of all *M2M* solutions, while the success factor is represented by the ability of the Communication Service Provider to act as enabler of a single value chain, facilitating the interaction among the

different and various partners of the ecosystem.

The travel industry can benefit and play a role in the *M2M* business, by providing a number of cases where *M2M* communications can simplify operations and reduce costs or deliver a better, more contextualized and personalized service. Thanks to a pervasive and dense network of sensors and short-range communications technologies, such as Radio Frequency IDentification (*RFID*), Near Field Communications (*NFC*), railway and aeroplane passengers can be directed to the right train platform or check-in desk and the boarding gate afterwards. In a similar way, check-in operations and ticket verification procedures could be automated, reducing costs and efforts on the business side, and wasted time and frustration on the passenger side.

Besides travel-driven opportunities, *M2M* finds a natural field of application in the Automotive sector, where some progress has already been achieved with the integration of sensors, for vehicle check-up and monitoring, and with the availability of integrated satellite global navigation systems (*GPS*), even in low end cars. The next generation of cars will integrate an *M2M* device that will enable and simplify the following cases:

- fleet management, with identified, tracked and monitored cars; for instance, car rentals could benefit from this application, implementing an effective tracking and assistance service, in case of damage;
- safety and emergency, with *M2M*-enabled cars able to make emergency calls as soon as the emergency or accident has occurred;
- alerting and avoiding traffic jams/bad weather conditions, thanks to a network of sensors, located along the transportation infrastructure and vehicles; risky and unsafe situations, such as unexpected traffic jams or snowy and icy roads could be identified in advance; the driver could be promptly advised with a set of alternatives, to get him or her out of the unsafe situation;
- Assisted Park Search, using sensors placed in public and private car parking; travellers looking for a car park are directed to the closest available car parking space, improving traveller's quality of life and overall environment.

Summary

As for the Video Communications solution, besides acting as value chain enablers and facilitators, Service Providers could bring value to the *M2M* ecosystem, providing not only their solid expertise in end-to-end solutions management, but also their competences and technology for end-to-end quality assurance. ●

Video-centric devices drive change in communications for travellers

by David W. Garrison, CEO, iBAHN

Video-centric tablets, iPad in particular, have swept the market with their unprecedented growth. They are a particular favourite with travellers, including the over 65 and non-computer-literate users. This puts pressure on the hospitality industry to respond to the demand and avoid bad experiences. Streaming videos generates far more traffic volumes than even smartphones. The iPad reception capability is lower than that of PCs, straining the WiFi access further. Mobile carriers, who see falling Voice revenues, now rely on rising revenues from video traffic on 4G mobile broadband, but hotel guests prefer sharing access across several devices and paying for WiFi access instead of 'burning out' mobile quotas. This is an opportunity for the hospitality industry to attract these high-earning guests by enhancing their WiFi facilities and fine-tuning the way that they are charged.



David W. Garrison is CEO of iBAHN. Mr Garrison joined iBAHN in October 2002, bringing with him more than 20 years of experience in leading telecommunications and technology services companies in the wireless and Internet industries. Mr Garrison previously served as chairman and CEO of Netcom, a pioneering Internet service provider. At Netcom, he successfully led NASDAQ financings, using the proceeds to expand geographically within the US, to build one of the first Internet networks. Additionally, he expanded the operations internationally to create a top-rated Internet company in the UK and Canada. He has served as an independent director on several boards of private and public companies, including chair of the independent directors committee at Ameritrade.

New kinds of handheld communications devices, new web applications and the proliferation of WiFi are accelerating a technological and behavioural evolution. Pictures and text are supplanting - if not outright replacing - voice communications. New devices are driving that evolution and none more clearly than the tablet computer, particularly the iPad.

To understand the potential impact of the iPad, consider that three million iPads were

sold in the first 80 days of its availability - equating to more than 37,000 per day. By the time of the iPad 2 launch in March 2011 (less than a year after the iPad 1 release), more than 15 million iPads had been sold - selling more than all other tablet PCs combined since the first iPad release. The iPad 3 release, which occurred in March 2012, was even more dramatic - three million were sold during just the first weekend. Gartner Group predicts 100 million iPads will be sold globally by the

end of 2012. That's only the Apple tablet format - there are more than five dozen other tablet computers currently available from various global competitors.

What makes iPad different?

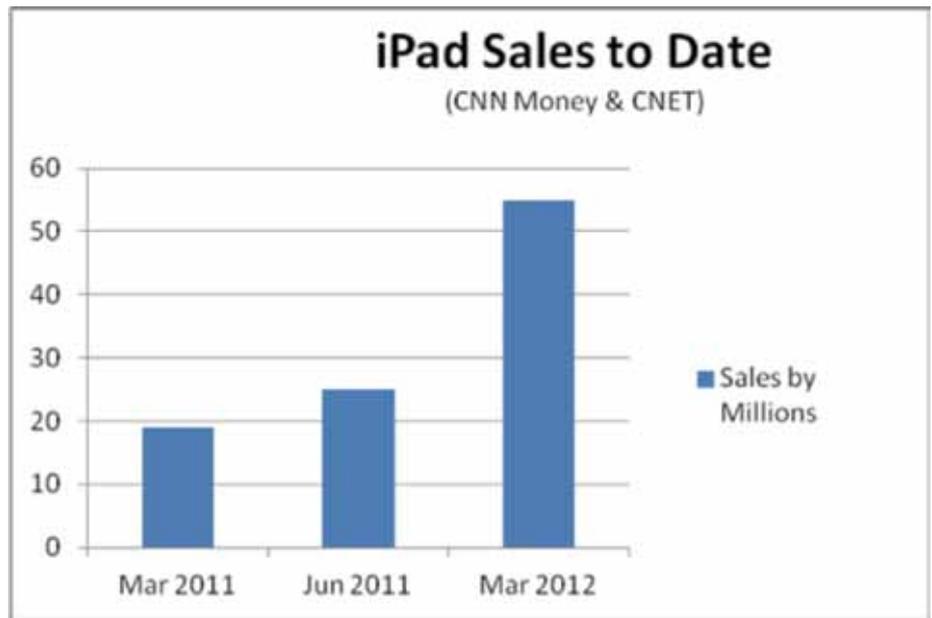
The answer to this question paints a clear picture of what the future holds in hospitality connectivity requirements. There are several characteristics of the iPad that make it different from other

devices currently carried by travellers, like laptops and smartphones - which mean that hoteliers, in particular, now have a new set of requirements in order to support travellers' activities:

- The iPad is the first truly video-centric guest Internet device (along with other tablet computers now on offer to consumers). Remember, video-streaming and sharing burns bandwidth much faster than voice, text and email. In fact, Cisco estimates that video-streaming can be as much as 600,000 times more data-intensive than text/email.
- It is the fastest selling consumer electronics device in history.
- It is driven by a highly intuitive user interface requiring no significant existing computer skills. New users are up and running with an iPad in an average of one hour. This easy interface means that it's not only a device for the computer savvy. A major chip manufacturer reports that the iPad is the fastest growing device among adults older than 65!
- All iPads are fitted with WiFi capability. Of the total number of iPads sold, some 75 per cent are equipped with both WiFi and 3G capability - so it's easy to understand why these devices are already creating hotel network/bandwidth problems - especially when coupled with the high video needs of iPad users.
- iPads place huge demands on WiFi systems, consuming 400 per cent more WiFi data on a monthly basis than the average iPhone, iPod or Android device, according to a recent report from Meraki.

There is another fact about iPads: the antenna reception on iPads is significantly lower than other devices, particularly laptops, creating a setting for negative guest experiences. The chart below shows that mobile devices like the iPad are (on average) about 30 per cent worse than laptops in terms of signal reception.

Based on network data, iBAHN estimates that approximately 25 per cent of the devices on the iBAHN network are now Apple devices. Considering the fact that these devices have been specifically designed to allow users access to their own content as well as Cloud-based content, and that video-streaming requires more bandwidth for an acceptable experience, it is easy to understand the coming challenge for hotels and other hospitality-based venues. In fact, the average iPad user downloads three to four times more data than they would on a smartphone, directly due to video download and streaming



demands. The antenna reception of the iPad 2 is worse than the iPad 1, not better. Data for iPad 3 antenna reception will be available soon - and our prediction is that the new iPad will not have improved receptivity.

What's the impact on the mobile carriers?

Mobile carriers, suffering from a continuing decline in their revenues from voice and text services, are looking to data plans to increase the subscriber base and maintain revenues. At an average cost of £15 for a standard two gigabits per month scheme, the mobile carriers are justifiably excited to see the rapid acceptance of video-centric devices like the iPad - particularly those carriers with LTE networks on which the quality of streaming is extremely good. "Every month in the UK the average mobile phone subscriber will talk for 240 minutes, send 300 texts, and use 133Mb of data. The voice calls, somewhat surprisingly, are still slightly on the rise, but texting is up nearly 50 per cent on a year ago and data use has more than doubled" (BBC.co.uk - April 11, 2011).

Data from the US paints a similar picture: "As data use grows, people are talking on their phones less. The average subscriber used just 638 voice minutes per month in 2011, down from 720 minutes in 2010. Customers are cutting back their voice plans, sending carriers' average revenue per smartphone user down to \$83 per month last year. That's a drop from \$86 in 2010 and \$93 from 2009. LTE offers download speeds of between five and 12 megabits per second - about the same or faster than the typical home broadband connection. In many ways,

the 4G technology is capable of displacing WiFi, although the industry's spectrum limits and usage caps by mobile carriers make WiFi necessary for data-intensive operations like streaming video" (CNN Money, March 25, 2011).

The picture is not quite so rosy for the travelling public. The ease in which all of one's monthly data on a 4G/LTE network is used up in just a few hours makes using mobile networks for video-streaming unsustainable for travellers. This means, of course, that travellers are looking for ways to continue to use their iPads and other devices on WiFi networks instead of mobile carrier networks. In other words, they want to use WiFi instead of their 3G, 4G or LTE subscriptions, where their streaming capacity is quite limited.

What's the relevance to the hospitality industry?

Fast-forward now to a business or leisure traveller checking into their chosen hotel. Even if the establishment charges a fee for Internet access, it is a significant benefit to have the ability to use their video-centric devices without using their own mobile data plan. In some cases, they can connect more than one device to the hotel's network, that is, smartphone, laptop and tablet. A late 2011 USA Today survey showed that nearly 25 per cent of travellers are carrying three devices. So the hotel WiFi network has become a better way for travellers to be able to use their video-centric device to access their chosen content, without burning through their monthly mobile data plan.

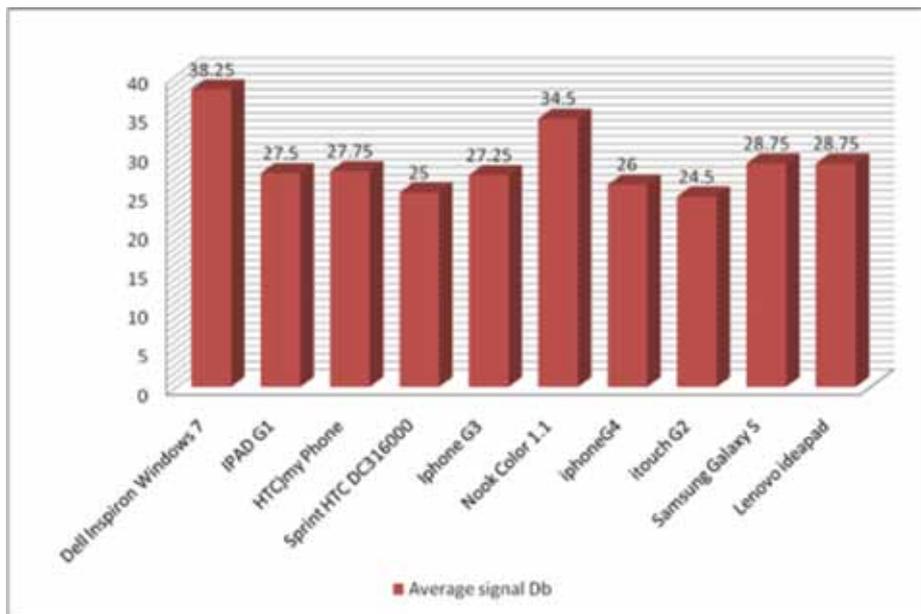
Travellers are changing their usage habits as well. According to a 2011 YPartnership survey, 40 per cent of European business travellers have incomes well above the norm in developed countries, thus providing higher disposable income. Further, they are likely to spend it disproportionately on new technologies like the iPad. The same study indicated that nearly 30 per cent of respondents say they are likely to carry only a tablet device like the iPad when on future business trips. Then, consider that more than 55 million iPads have already been sold and the message becomes clear: the hospitality industry must move quickly to be able to support these devices.

Why should the hospitality industry care?

The average hotel's WiFi system is already overloaded. Some 60 per cent of surveyed travellers in America, Europe and Australia indicate that they already have had a poor downloading experience in a hotel because the system was too slow. The advent of the iPad can only increase the number of unhappy guests. A key driver of future success for hotels will be the ability to provide guests with the same level of technology capabilities they have in their homes and offices. With 67 per cent of guests stating they will not return to a hotel where they have had a poor technology experience, the ability to provide good experiences in using the same devices at home while they are travelling is now an imperative.

So what?

If a hotel or other hospitality venue has a WiFi system that was designed and installed prior to 2010 - which means the design was built around laptop antenna reception - iPad-carrying travellers have a much higher likelihood of having an unacceptable Internet experience. We see the numbers of travellers having bad experiences rising as use of these video-centric devices continues to filter into all global markets. Data versus voice traffic growth is another indicator of guest behaviour changes in hotels - much like the way that mobile phones have changed the telephony picture in the hospitality industry. In looking at the iBAHN network usage chart below, while there is continued incremental growth in voice traffic, the geometric growth for data (read: video) traffic will change the requirements for hoteliers.



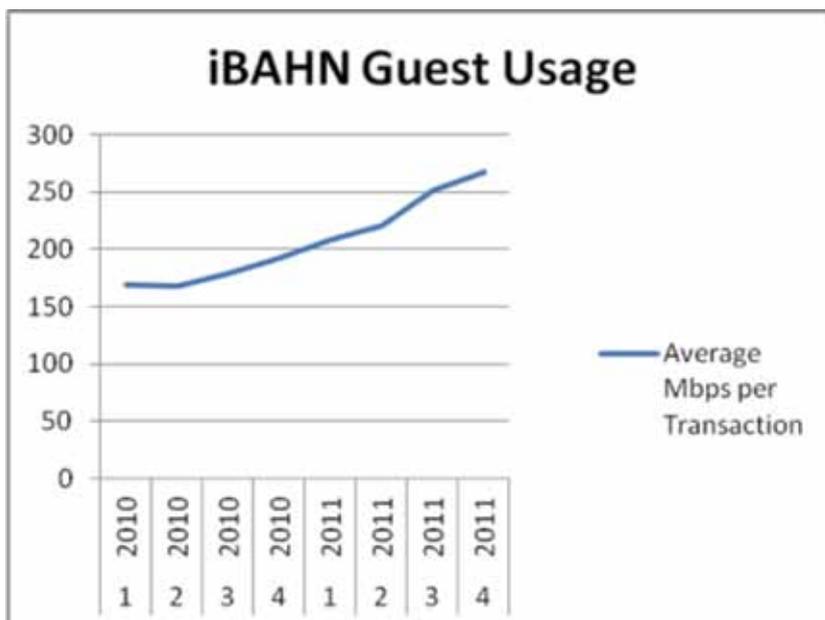
So what's the takeaway?

Thought leaders in the hospitality industry now need to prepare to support guests carrying iPads, and should expect their numbers to continue to grow rapidly. Among those preparations, players in the hospitality industry should consider these two key points:

- Any WiFi system in hotel, restaurant or convention centre that was designed and put in place before 2010 is likely to need to be reconfigured to support the video demand arising from new devices like the iPad, and to take into account the lower antenna reception of tablet computers.

- Unlimited free WiFi may no longer make sense in this new environment of increasing video-streaming, unless venues have unlimited bandwidth, along with unlimited budget to continue adding bandwidth capacity.

In short, the advent of the iPad has created both a challenge and an opportunity for the hospitality industry - this device has already begun to show its power to change how travellers work and play while on the road for business or pleasure. Thus, the global hospitality industry has a unique opportunity to show the world's travellers that it is in synch with their needs, now and in the future. ●



MVNOs create big opportunities in previously untapped markets

by Arkadi Panitch, founder and CEO, Effortel

MVNOs exploit opportunities in niche markets, especially in 'single dimension' subscriber segments. One such segment is the ethnic MVNO that addresses travelling nationals or immigrants in a foreign country by offering services in their own language, but most of all by offering the lowest prices for calling home. A particularly successful model is the retailer MVNO with their regular customer base, distribution channels and trusted brands. The secret to MVNO success is in identifying tightly packaged services for 'discovered' markets, which more often than not address low ARPU subscribers, needing little maintenance, where simplicity is key.



Arkadi Panitch is the founder and CEO of Effortel. Mr Panitch previously worked for Mobistar (Orange Group), Boston Consulting Group and IBM.

Arkadi Panitch holds a PhD in High Energy Physics from the Université Libre de Bruxelles and founded Effortel in 2005.

Non-telecom brands, predominantly retailers, are becoming increasingly aware of both the marketing and revenue opportunities they can access by launching their own mobile virtual networks. The MVNE (mobile virtual network enabler) platform has also been deployed by operators looking to serve niche markets, such as ethnic communities abroad wishing to stay in touch with families and friends at home, or low ARPU customers with very basic connectivity needs. This article discusses the MVNO market that is growing rapidly, as both new and established brands capitalise on tailored mobile services to build and extend relationships with their customers.

An irresistible opportunity

The MVNO sector is vibrant, active and growing significantly. To date, initiatives within the sector have been led by retail

brands such as Carrefour. These brands have effectively pioneered a new business model, now serving as a beacon for many operators, showing that they can capture markets which are often ignored by major mobile operators. The attraction of developing in this sector is based on the potential commercial rewards as well as the ease and relatively low-cost of entry.

When these factors are combined with not uncommon lead times of twelve months having now tumbled to twelve weeks (and sometimes less), the feasibility of accessing incremental revenue streams through an extremely agile manoeuvre becomes not only self-evident but also positively compelling.

At the heart of the Carrefour Mobile value proposition is simplicity at all levels: from simple pricing, to easy off-the-shelf access

to the service. The simplicity attracted high numbers of users quickly, through a strategy of offering a 'Pick Up & Pay' starter kit containing everything a customer needs - except a mobile phone which, as a 'switcher', the customer already has. Launched through Carrefour's stores in Belgium, the platform now provides an on-going communication medium for the retailer itself, serving as a tool through which loyalty-driving initiatives, and promotions, can be delivered at an extremely low-cost.

Through its widespread store universe, offering daily contact with large numbers of potential users, Carrefour had ready access to its target audience: a common characteristic amongst high-volume retailers. Efficient distribution is the cornerstone of any successful MVNO business. Whereas Carrefour has been able to publicise its

service in-store, other operators are yet to find ways of alerting users to their services. In Italy, BLADNA (a subsidiary of Vodafone Egypt) wished to access an audience not so conveniently gathered together in large numbers in limited locations such as stores. To overcome the problem, BLADNA provided the means for retailers and local shops to activate SIM cards for smartphones - an innovation which enabled it to reach its target market, and steal a competitive edge.

The definition of simplicity

That numerous clear market motivators exist is evidenced by the success of many operators now identifying basic needs amongst defined user groups, and targeting tightly defined services to address them. While such a statement may almost qualify as a definition of marketing, raising the question, "So what's new?" the key to its focus lies in the word 'basic'. Many of the emergent user groups buck the trend of today's often intensely techno-savvy mobile user, someone who connects in through mobile usage to his or her second life - whether it be a densely populated universe of friends, or an extended work environment. Users falling into such a profile are enthusiastic adopters of mobile apps, unable to contemplate the concept of life-without-a-phone. A device that was once essential to their lifestyles has now become integral to them.

For mobile operators this is a major money consumer segment, so their services and efforts are single-mindedly driven by the need to protect, develop and grow the sector. Small wonder that these are high ARPU (*average revenue per user*) customers requiring high maintenance - they simply cannot, at any time, be ignored since they tend to be comfortable in the mobile operator space, shopping around for better deals and richer experiences, if their current arrangements appear to fall short on either front. Low ARPU customers are easier to service and can be considered 'one-dimensional' in the expectations they have of what their mobile phone can do for them. For MVNOs, this is where the opportunity lies.

Specialist ethnic MVNOs

One case in point is the ethnic community living away from home. For example, Italy has a community of Chinese people numbering 500,000. Daily Telecom is an ethnic MVNO dedicated to this community. Mobile calls to China and Hong Kong are offered at the price that is lower than a price

of a local call. The customer experience - from website and sign-up to IVR and voicemail - is delivered in Mandarin.

Another example is BLADNA, a new Arabic MVNO hosted by a local network in Italy and dedicated to the North African ethnic community. This defined user group comprises mainly Egyptian, Moroccan and North African nationals and is one of the largest foreign immigrant communities living in Italy. Planning, implementation and launch of the MVNO was achieved in the space of two months. It offers tailored services for Arabs including an Arabic-speaking call centre hosted in Egypt, tailored products and services and the lowest rates for calling back home, through a high-quality service.

The Facebook generation

The speed, ease and low-cost of deployment of the MVNO support its growth as a valuable marketing tool for retailers and as a platform generating considerable success amongst ethnic communities. It should be considered, however, that the opportunities do not exist in these two areas alone. In the months to come, creative and forward-thinking companies and organisations will explore the low ARPU customer and find considerable lifetime value potential in the segment. Opportunities will be identified amongst grandparents, for example, who want nothing more than basic voice and messaging services, or younger target audiences with unsophisticated needs and limited budgets.

FreeM, launched by Polish MVNO, InMobile, addresses this latter audience. It is designed for the target demographic of 15-25 year-olds who are universally active on social networks, but who may not have access to the disposable income required for regular data access. It is believed to be the first subscription-free, advertising-funded mobile service to provide consumers with free data access. FreeM initially presents users accessing a social network site on their mobiles with short, full-screen advertisements. In return, their accounts are credited with a half-megabyte data traffic allowance, equivalent to approximately 30 reloads of the mobile version of Facebook. Access is available even when the user's account balance is zero and no compulsory top-ups are required. At launch the free access applies to a range of social networking, web and messaging platforms including Facebook, Twitter, Wikipedia, Windows Live Messenger and Google Talk.

The FreeM service is being marketed via Facebook and is available on any phone with a web browser and the ability to transfer data. Telephone calls, text messages and data access outside of the ad-funded service are subject to top-up fees as part of a standard 'pay as you go' (*PAYG*) package.

MVNOs create a single market proposition

Forward-thinking retail brands, and other operators around the world, are now recognising the value of owning the mobile relationship. The case is strong for retail-led MVNOs, especially given the opportunity for market differentiation through close alignment between a retailer's MVNO and its core business. This approach creates a stronger link between retail and telecom products, and promotions, in the mind of the customer. Using this model, subscribers can receive free voice minutes, or free access to mobile broadband and data services in return for buying groceries or other consumer goods.

The MVNO acts as an extension of the retailer's marketing effort, increasing sales and building loyalty. As a result of this cross-marketing and promotional strategy the MVNO becomes an attractive prospect to consumers, particularly with regular shoppers of a retail chain. The technology is now available that allows retail brands to take full advantage of a mobile division attached to their core business: discounts, offers and loyalty card schemes can all be focused on a single SIM card. Targeted promotions and loyalty points can all be sent directly to a mobile device via SMS or other forms of mobile technology. Retail brands will eventually be able to integrate mobile payments and location-based services into their business strategy through closer MVNO integration.

However, organisations, both retailers and others, are still faced with the challenge of developing a working and balanced business model (based on a single P&L) to facilitate a single market proposition, making it easier to balance out costs and measure benefits.

This can be achieved by working with an MVNO partner that can successfully integrate its resources and functionality with the existing retail business. Through closer alignment the MVNO is able to provide greater value to an organisation's business than just additional revenue. ●

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Roaming in a multi-network environment

by Shlomo Wolfman, co-founder and COO, Starhome

The new lifestyle of 'SoLoMo' merges Social networks, Local services (e.g. shopping) and Mobile (smart devices including tablets), and is coupled with an insatiable demand to stay connected wherever you are. This requirement is not made easy by the great many networks that provide services to the devices - 3G, LTE and WiFi. When roaming, users want to access the same services but they can be hit by high bills - the famous bill shock. The solution is to empower users to control their own spending with complete transparency, using policy-based packages that ensure consistent and predictable charging.



Shlomo Wolfman is Co-founder and COO of Starhome. As co-founder, COO and former CTO of Starhome, Mr Wolfman leverages his extensive knowledge of telephony and IP technologies with over 25 years' experience in real time telecommunications systems.

Mr Wolfman has led product development, R&D, marketing and business development teams at leading technology companies such as Comverse Technology, Inc. (NASDAQ:CMVT), VDOnet Inc. and Tadiran Telecom Ltd.

Shlomo Wolfman holds an MBA and B.Sc in Electronic Engineering.

In the beginning

Not so long ago, there was a time when we sat glued to our PCs for hours on end, enjoying what we thought was the freedom of high-speed Internet. Today, with the advancement of technology, high-speed Internet is available wherever you are and wherever you go and can be accessed from pretty much every high-end mobile device. Even though most people still have various sources of online access at home, recent figures suggest that the majority of subscribers are now accessing the Internet through their mobile devices.

Social networks are being accessed on the move. Nearly half of Facebook's 845 million users are accessing the site via their mobile devices. It is, after all, the simplistic ease of bringing all our Facebook friends together

on one mobile device that has contributed to this massive phenomenon. Following closely behind are the 55 per cent of Twitter lovers who are accessing the site via smartphones.

Local mobile searches are growing at a rapid rate, with users seeking local information and services, such as location-based daily coupons, as well as local and national maps. A huge number of shoppers are also using their mobile devices to gain instant access in real time to local data sources to look for availability of specific items in stores or to compare prices. Their mobile devices instantly place them in the fast lane for purchasing goods - without standing in line at the stores.

Mobile growth is also soaring to stratospheric heights - from about nine billion wireless devices in 2011 to an estimated 24 billion in

2020, while, in 2011, tablet and smartphone deliveries already surpassed sales of PCs.

The merging of Social, Local and Mobile (*SoLoMo*) is shaping a new mobile lifestyle, which instils subscribers with an insatiable need to stay connected. Together with this exciting world of information at our fingertips, comes our heightened dependence on our mobile devices.

SoLoMo - meets the multi-network environment

The merging of Social, Local and Mobile has had a direct effect on mobile networks and their capacity to cope with higher data rates, wider coverage and improved mobility. Whatever way we look at the industry today, one thing is for certain: the mobile landscape is changing, and a multi-network environment is emerging.

This complex, heterogeneous network comprises multiple network domains, layers and technologies which include 3G, WiFi and islands of LTE within a growing number of networks. One of the main obstacles for operators will be to provide seamless network mobility to subscribers, which will require compatibility with new technologies and devices. Operators will need to re-examine their key strategies and solutions for supporting their subscribers' mobile usage.

The first line of approach will be for operators to establish themselves in this new environment. Being first to launch into new areas and improve the user experience will not only gain subscriber loyalty, but also ensure undercutting rival operators vying for customers.

Network challenge

It goes without saying that the mobile industry is fiercely competitive, and operators have faced many tough challenges. While most of them successfully rode out the impact of the global financial slowdown, they are still facing a head-on battle to protect their business. To boost network performance and customer ARPU and enrich the customer experience, operators know that they must innovate to survive in this new environment.

Additionally, mobility has become an essential part of daily life for most subscribers, who are now demanding Internet everywhere. With the rising use of smart devices, mobile applications and content, LTE, M2M and demands for extra bandwidth, operators find themselves with yet another level of complexity to add to the stack of mounting challenges. To successfully manage these new requirements, operators will have to invest in new solutions as existing solutions available today will not be able to support this new mobile way of life.

Off the hook with bill shock

SoLoMo has created a new kind of environment where all subscribers and all devices are always connected. With set pricing packages for fast data usage in a domestic environment and complete transparency for spending, subscribers feel confident of mobile phone usage - without incurring extra fees. In an industry where technology reigns, subscribers expect the same experience abroad.

However, once a subscriber travels abroad, they are not given the same transparency for

spending and often find themselves in the dark as to how much data they are actually consuming. Switching off their mobile device is one way to protect against bill shock, but this translates into a substantial revenue loss for operators.

Until now, network technology did not support similar domestic and roaming packages. However, new technology and accompanying solutions have made it possible for subscribers roaming abroad to enjoy comparable packages to those at home. It all seems complicated, but fortunately, the transition into a new multi-network environment does not have to be difficult. Solutions designed to tackle today's major issues, maximise the subscribers' experience and boost operator's earning potential are already emerging.

Meeting the challenge

To keep up with market momentum and realise new market opportunities, operators require innovative solutions that will simultaneously and dynamically adapt and react to new market demands. To maintain a competitive edge, it is essential for operators to prepare themselves for the challenges and opportunities of a multi-network environment.

New technology can now bring domestic and roaming usage in line. Operators can encourage fearless data roaming by empowering their subscribers to control and manage their data consumption and expenses in real time by providing better, customised, tariff packages that meet their individual needs. With complete transparency of spending, roamers will feel confident using their devices when they need them most. An increase in data usage means an increase in operator revenue.

Furthermore, in an LTE network, mobile operator roaming agreements will be expanded to include policy-based arrangements. This means that operators will be able to steer subscribers to preferred partners to ensure that individual roamers are provided with the best possible services suited to their roaming needs and packages.

A key success factor in a multi-network environment is to ensure seamless network mobility. Roamers will be unaware of network handover - until their services are lost. This can be easily prevented with solutions that support roaming in a multi-network environment. Quality of

User Experience solutions that employ an innovative approach to performance monitoring will ensure that roamers receive the best possible service at all times.

The mobile industry has undergone significant changes over the years. Smart devices have created a massive increase in demand for speed and higher data rates, wider coverage and improved mobility. Multi-network environments will revolutionise the use of roaming services in general, and data in particular. It's all good news. ●



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Travelling and communications - hand in hand

by Andy Tipping, sales director for online sector, Geo Networks

Communications permeates all facets of travel. Booking online has changed the business dramatically, but travel agency shops can still draw in consumers by offering resorts video viewing and direct site connections. Online comparison sites process huge numbers of queries and must have the capacity for 'always-on' reliability and full protection from malicious attacks. 'Social travel' booking is now embedded in social network sites like Facebook, offering group discounts, for example. Once travelling is booked, real time updating apps, such as weather and currency, come into play. While travelling, timely alerts could make all the difference to public transport users and NFC for guiding through terminal buildings. Arriving there, concierge services, like finding hotels and restaurants, are often accessed. Back at home, uploading holiday snaps and writing blogs rounds up the communication experience for the traveller.



Andy Tipping is Sales Director for online sector at Geo Networks. Andy joined Geo in September 2011. He leads the development of propositions for this high-transaction, web-based sector, covering Gaming, Gambling and Ticketing.

With over 30 years of experience in the telecoms market, Andy brings a wealth of expertise to this evolving sector. His previous roles include Client Director at Cable & Wireless and a variety of senior posts at BT including Head of Operations for BT Wholesales Market Ventures, and Sales Manager for BT Wholesale.

Technology is a fundamental part of life, and travelling for both business and pleasure can be augmented through technical innovation. Wise travel firms are embracing technology, its challenges and its rewards, to deliver services to customers to enhance their journeys - whether before, during or after the experience.

The travel industry is one sector in which we are seeing technology permeate every step of every process. In this article, we'll address how technology is increasingly catering for the high expectations of the traveller - from the Twitter-based CRM (*Customer Relationship Management*) approach to global tap-and-pay, and how the right infrastructure can support this evolving world.

Booked it

With online travellers each owning 2.7 web-enabled devices, according to a report by PhoCus Wright, and Google's white paper claiming that the number of travellers who would use their mobile device to research their trip was expected to climb

to 51 per cent this year, our need for information is evident. Whether we're accessing comparison sites to compare deals, aggregator sites to compile the perfect suite of add-ons, user-generated content sites for the real scoop or just plain old tourism sites, we are doing this on-the-go.

Meta-search companies are a critical consideration for today's travellers. We are using them to find choice and independent price comparisons to save time. We are doing it in droves. Just a few days ago, Kayak announced that it processed over 100 million user requests for travel information in January.

Imperative to travel companies and, in particular, comparison sites, is the ability to trawl through millions of offers to deliver accurate and fast results to the end-user. That's why specialist software organisations such as ParStream are developing programmes to deliver complex search and algorithm functionality, to make sense of the 'big data' inherent to the industry.

Underpinning the need for the safe, reliable and low-latency flow of data is of course the infrastructure, and we are witnessing a rise in enquiries related to the transit of big data. Sharing fibre networks results in delays, as multiple sets of transmission equipment cause data lag. Online travel firms need to select their supplier with care. Only the newest, legacy-free infrastructure will cater for today's low-latency, high transaction intensity.

Feet vs fingers

It's interesting to see the industry dynamics change. Travel agents, for example, are becoming polarised. Whilst many are being forced off the high street, the likes of Virgin, Kuoni, STA and Flight Centre are still investing heavily in local stores. Why is it working for them? Perhaps they are the most effective at linking their online and offline proposition, marketing and brand building.

What could entice consumers back in-store? An openness and willingness to cater for people's changing requirements is a good start. Free Wi-Fi

in-store, and access to comparison and review sites for customers may be one option. The integration of QR (*Quick Response*) codes to take viewers directly to videos of the resort, for example, could be another way of delivering a virtual tour and booking facility. Live Skype access to resorts, which enables interaction with representatives on-site could provide the impetus to buy there and then.

As travellers forgo routine destinations in favour of the thrill of more remote terrains, companies such as Trailfinders and Expedia will need to source accurate and timely data from all corners of the globe. Having secure and reliable links to information from wholesalers and ensuring up-to-date prices and availability will support their continued success in the market.

Always on

As well as enhanced software capability to deal with the millions of transactions, online travel companies need to be available to consumers at all times. Organisations that provide last-minute deals to consumers, such as flights or rooms, have to deal with constantly changing information, while retaining good margins.

Having a secure and reliable infrastructure can ensure that any changes in spot prices or a sudden influx of released services can be marketed quickly, effectively and profitably. Exceptional peaks, whether planned or unplanned, should feature in all online business continuity plans, but it is surprising to see that firms are not always as focused on future requirements. In an age where loyalty is lost at the click of a button, it is critical to keeping consumers that your site is secure and always-on, as well as 100 per cent accessible by smart devices.

A private, dedicated network is one way to ensure that your network never buckles under the weight of visitor traffic. Distributed-Denial-of-Service (*DDoS*) and other cyber-based attacks are a permanent concern, not just with the enormous threat of losing customers' personal and financial information, but also related to the business continuity. Malicious attacks take enormous amounts of bandwidth, and this should encourage businesses to consider whether their bandwidth is currently sufficient to enable the smooth, continuous day-to-day operations.

The social revolution

The volume of data being stored by TripAdvisor is growing at a phenomenal rate, and last year the company witnessed 13 million downloads of mobile apps and 16 million unique visitors

via mobile sources per month. Access to this information by the masses is critical. All of this content has to be available by and from all different media types.

Welcoming, and even providing, online reviews and forums will encourage today's new breed of consumer. The lines between social and business interactions are continuing to blur, with Hotels.com and Columbus Insurance just this month announcing an affiliate programme via Facebook. Their joint app, 'Hotels WithMe', a hotel search engine that runs entirely through Facebook, and encourages group buying for rewards. Social commerce and peer-to-peer networks are gathering huge momentum, and the whole sector - from ticketing firms to specialist resorts - need to factor this channel into their business plans. Effective connectivity, whether to data centre hubs or between individual sites, will ensure the swift transit of data between collaborative parties.

Packed it

Once travel has been booked, today's users are switching from online comparisons and purchases to real time updates. From the simplest of weather apps, currency monitoring or travel updates, we continue to scrutinise every aspect.

Travel firms that recognise consumers' preferences for regular updates have the ability to interact with them. Social media is at the forefront of this interaction, with companies regularly posting updates, pictures and reviews, encouraging two-way dialogue and engaging their customers.

The explosion of apps (for either Android or iPhones) is paramount to attracting and retaining new customers. There are currently over half a million apps available and around 700 created every day, illustrating both the opportunity for interaction and the profound need that consumers have to engage, whether for real information or for fun.

And we're off

The old rules are out of the window, as the traveller takes all of their suppliers with them on their journey. Any event along the way is an opportunity for the company to interact with the consumer, as well as an opportunity for the consumer to present to a global audience.

The industry has to recognise this platform, and use it to manage any situation. By proactively adopting Twitter to inform customers of suspected train delays, a train operator has publicly taken control of an issue prior to the influx of Tweets from disgruntled passengers. This early warning could inform many customers due to travel,

enabling them to change their plans. This allows train operators to publicly co-operate by allowing ticket-holders onto different lines, diffusing the crisis and instilling faith in the operator. Train operators are also investing in gigabit Ethernet networks on board, for both internal requirements such as recording and controlling systems, and passenger-facing initiatives. These include multimedia passenger information, entertainment and Internet access, as well as travel-related updates such as arrival times and connection points, all of which will foster passenger loyalty.

Airports and major train stations are becoming hubs of activity as new technology enables consumers to progress more easily through steps like boarding and purchasing, with near field communication (*NFC*) dominating many of the headlines. 80 per cent of the world's top 50 airlines, according to SITA (South African State Information Technology Agency [Pty] Ltd), will be deploying *NFC* by 2014. Many airports and major transport hubs are currently providing mobile augmented reality to support the smooth transition. All of this points to the need to have controlled, secure and dedicated network bandwidth. Without it, organisations will be exposed to possible outages.

Once the destination has been reached, TripAdvisor suggests, in its 2012 Travel Trends, that 47 per cent of travellers expect to use their mobile for further travel needs. One collaboration ahead of this curve is the partnership of HotelTonight and in-flight connectivity specialist Gogo in the US. Domestic passengers can download, free of charge via smart devices, last minute hotel deals during the flight, appealing to a market that may have stayed with friends or simply made the long journey from the airport home. This could easily be replicated to offer public or private transportation, restaurants, or other concierge-type services. The mobile operators are providing more and more data services, and with the coming of 4G within the next few years will need capacity to handle the increased demand. Dedicated fibre services with the flexibility to add bandwidth within days rather than months to support growth will promote customer retention.

Home sweet home...

Once home, the consumer may have posted pictures, blogs, videos and reviews of their personal journey, or will be relaxing following a business trip. Successful travel firms will continue to engage with their customers beyond just a satisfaction poll. Those organisations that can process and make sense of the vast amounts of behavioural data that they have on their customers will surely be in a better position to be at the front of their mind for the next trip. ●

Travelling makes you mobile - on the smartphone, too

by Gerald Tauchner, CEO, DIMOCO

Travelling is increasing and so is the ownership of smartphones. The mobile smartphone as a travelling companion is a perfect example of the synergy - it can plan trips, book the transport and accommodation, pay for tickets, provide price comparisons and guide through all the phases of the trip. The smartphone is a shopping assistant while away, and provides local information and entertainment while on-the-go. It even allows sending electronic postcards. Most importantly, the smartphone provides email access and messaging to enable you to carry on working, wherever you are, even on holiday.



With the aim to make the mobile phone a modern pocket book, Gerald Tauchner and his brother Roland Tauchner founded DIMOCO in the year 2000. The two brothers thus joined the ranks of pioneers in the mobile industry, especially in the field of the first payment possibilities via the mobile phone. What began as an idea has become a success story, 12 years later. During this time Gerald Tauchner, together with Roland Tauchner, developed the company's business to become one of the leading mobile operator payment providers in the European market. DIMOCO offers companies the possibility to bill their digital content via the consumer's mobile phone account.

Before becoming proprietor and CEO of DIMOCO, the Marketing graduate was head of sales at Feibra, Austria's leading advertising distributor. From the very beginning, travelling played a central role in his career. Today, Mr Tauchner still spends a lot of time at airports, in airplanes and taxis. Working while on-the-go is a matter of routine for career-driven Gerald Tauchner. His most-used mobile tool is, first and foremost, the email function on his mobile phone. "I can wrap up all my correspondence on my smartphone; it's child's play," says Mr Tauchner.

Every day billions of people travel. By plane, bicycle, train or car - they are constantly on the go from one destination to another. The reasons for their mobility are just as varied: people travel on business, for personal occasions or simply to go on holiday.

What to some is the suitcase is to others the travelling bag. In short: when people travel, they don't do it unaccompanied. They always have a load of luggage with them. Besides the average 20kg of personal belongings that we tend to lug about with us, another travel companion has joined the ranks - the mobile phone. Or, in its even more intelligent form, the smartphone. Thus the mobile wave

has not stopped at the tourism industry either, and taken it by storm. With mobile applications, mobile websites or QR (*Quick Response*) codes, travellers can constantly stay connected with the mobile world.

Mobile travel companion

They say that a trip is only as good as its planning. Mobile travel companions can plan your trip by road or air by means of mobile applications, web apps and mobile websites. These mobile helpers make it so easy to simply enter the departure and arrival destinations and define itineraries. The big advantage of a mobile travel companion on the smartphone is the

mobility of the device itself. It is always with us.

When you want to switch from the road to rails, mobile travel companions not only help you plan your route, they also keep you up-to-date about the current departure and arrival times. Even if there are changes or delays, the transport providers can inform their passengers in real time.

So now you've planned your route and any changes have been communicated, you still need a ticket? The mobile travel companion will book train or plane tickets and, in most cases, even pay for these. Depending on the validation system, there are different types of mobile ticket.

Tickets with barcodes similar to those you see in the supermarket hide all the information of a rail or plane ticket in this 2D pixel code. Depending on the provider, billing is done either by mobile operator payment - that is, with the mobile phone bill - via a credit card or you can simply pay cash at the point of sales.

About shopping and packing suitcases

Sun lotion, bikinis and beach towels - what do you take with you on vacation? The smartphone's intelligent services even help you do your holiday shopping and plan what to pack. Even before you leave the house the little all-rounder is a great personal shopping assistant. User evaluations help you make decisions in the shopping centre and compare prices when bargain hunting, while mobile shop systems take care of all your shopping for you. When you're finally at your holiday destination, the mobile currency converter and language assistant are at your side to help you overcome the first challenges.

Mobile entertainment

While listening to music, reading, strolling through the museum - in other words, whatever you do to relax while on vacation - again, the smartphone is your constant companion. Things once strictly only enjoyed at home, like the latest music tracks, audio books and even videos can now be enjoyed at the beach or on camping holidays as well. The mobile phone provides the best entertainment - even infotainment programmes such

as current navigation software, weather services and much more - on the go.

To ensure that those who had to stay behind get a bit of entertainment, too, it is even possible today to send postcards via smartphones. We don't mean text messages - this has been all the rage for years already - we mean mobile services by which photos can be uploaded and the recipient receives them as haptic postcards. The mobile postcard service is, of course, billed the mobile way.

When work calls

The mobile phone not only delivers a multitude of benefits for private use when travelling - it has become impossible to do without it in professional environments. Emails can be read on the mobile, appointments managed and even office documents edited and accessed on in-company systems. The smartphone has become a mobile computer for business people and, if the worst comes to the worst, provides mobile support even when they are on vacation.

Whether for planning, entertainment or work reasons, people are more mobile every day. They travel and do it always, everywhere, every single one of them, with the smartphone. According to the market research institute IDC, 2.1 billion mobile phones, of which 1 billion will be smartphones, will be delivered by the year 2015. This will make mobile applications for the tourism industry even more widespread and attractive and companies

from the hotel & catering industry will jump on the bandwagon. After all, this mobile world should be conquered to provide users with maximum benefit even when they travel.

In this spirit I wish you a great mobile trip with your mobile phone and to your mobile future. ●



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The telephone - the door to the rest of the world

by Johan Andsjö, CEO, Yoigo

Smart devices transform the phone into a versatile travelling companion. The phone can now navigate to our destination (Global Positioning System - GPS), find what we need locally, take high-resolution pictures and entertain us during the tedious travel time. The mobile phone is a great help in managing travelling arrangements while on-the-move and can even replace the printed boarding cards altogether. With ubiquitous Internet, you can stay in touch constantly, anywhere on the globe. All that - while roaming charges are becoming so much more affordable.



Johan Andsjö is the CEO of Yoigo. He was born just 39 years ago in a working-class suburb of Stockholm and graduated at the Royal Technology Institute in Telecommunications Engineering. Mr Andsjö started his career as an adventure guide and has made an adventure of his professional life within TeliaSonera ever since. He worked his way up in TeliaSonera as an engineer and his first adventure was setting up their business in Brazil with the start-up Tess. That, together with his knowledge of the mobility arena in the Nordics, brought him to Spain for his biggest challenge yet, to set up the 4th operator, Yoigo, in the fastest time ever and bring it to profitability in record time for a European Operator.

Johan Andsjö collects languages as he does wine; enjoys leading teams but letting them develop their own potential. He makes things happen with a positive personality and sense of humour, which are the traits of his type of leadership.

You probably all remember the time not so long ago when you went away and your phone was simply something which you took with you to let people know you had got there and to say you were home so that someone could come and pick you up. You got to your hotel and you left it in a drawer until the day you left. Especially if you were travelling abroad and the cost of phone calls was too high. Nowadays the telephone is much more. It is your travelling companion that makes your life a little easier from the very first minute of your journey. You've just made your reservation and just a few seconds afterwards you receive a Short Message Service (SMS) or a BiDi (Bi-Directional) code message. You load it onto the screen and bingo! you have your boarding card! The same goes when you're going to arrive late and miss your ride - you can enter

into the relevant application on the company's website and make a last minute change to your ticket. I speak from experience as someone whose phone has helped him more than once to make his travel plans more flexible.

When you are travelling, a phone or any other mobile device, such as a tablet, helps make life a little easier and more fun. This is a fact of everyday life. A few days ago I went to the Mobile World Congress on the Inter City and over half the passengers were connected to the Internet on tablets, mobiles or laptops. All these devices, plus the possibility of connecting to mobile broadband Internet, mean that now you can take your office with you wherever you go, so you can get on with your work and avoid being snowed under on your return to the

office. You can access all your documents as if you had never left your workplace. Work isn't everything - mobiles have now become an amusement arcade, helping the time we spend on the train, bus or plane to fly by. Films, games, music... it's all there, on the smartphones and tablets. You can have hours of fun simply by having Spotify on your mobile, downloading your favourite film or keeping your friends up-to-date with your escapades on Facebook or Twitter.

The only limitations are memory capacity and the battery-life of the Smartphone or tablet.

Even when you arrive at your destination it's not time to put your phone away. "Where am I?", "Where do I want to go?", "What is there nearby?"... The answers to all these questions

“The development in Spain of these types of devices never stops and we estimate that by the end of this year, 50% of our customers will own them. People who have this kind of device don't only want it so they can speak or send texts, but so that they can get the most out of it. It's the ultimate expression of the concept of 'Always on'.”

are only just a click away in your pocket. There is nothing better than a smartphone to find out where you are, or to show you around an unknown city. These smartphones have an incorporated map and navigation service to get you out of a tight spot and so that you don't need to waste hours staring at maps in order to find your destination. There's nothing more annoying than having to stop every ten minutes in an unknown country in order to find the way to the place you are going.

What's more, the mobile phone is also a space saver. Not long ago you had to travel with your camera around your neck, but thanks to the mobile we can now take good quality photos (they've just brought out a phone which has up to 41 megapixels!) and share them with our friends straight away without having to download them onto the computer.

You can even use it as a phone!

We've already spoken about everything you can use a phone for when you're travelling... but we forgot one very important thing! The first thing we normally think about when talking about taking a phone abroad is the cost. This has been changing. In the last few years operators, regulatory authorities and public administrators have been paving the way for a steady decline in international roaming prices. Let's concentrate on the mobile phone in the Spanish market, the area in which I have the most expertise: the drop in prices has been significant. Now, you don't need to think twice before calling or sending a message when you're away from your home country as it's perfectly affordable. It is even cheaper to send a text message from another country to Spain than it is to send one within your own country!

A contributing factor to this decrease in prices is the appearance of applications that allow you to speak for free between any two computers that have the same application downloaded and are connected by the Internet. Probably Skype is the best known of these and it is now available universally, mainly thanks to the widespread use of the Internet. In fact the never-ending increase in the use of VoIP programmes is a challenge which we, mobile providers, need to meet to ensure that we can stay in business in the

future while providing the best possible service to our clients.

We're already taking our first steps within this world and for some time now we have been providing a service that allows our clients to talk on their landline in more than 40 countries worldwide without installing any programmes. Calls are made via the Internet and this means that our clients can catch up with their friends and family across the globe at competitive prices.

The obvious next step with voice over Internet will be to find the model that allows access to programmes like Skype, Viber and Tango, in a way that fits in with the operators' business model. This will make communication effective internationally. So we are trail-blazing a path that adapts to an ever-changing market in which the mobile Internet is becoming more and more important each day.

Smartphone and international connection.

Having overcome this first obstacle to reach true globalization of mobile communication, it is now clear that the mobile Internet and smartphones have become the true stars in the world of communication. The phone is no longer just a device for talking, but our access to the Internet, our GPS system to find our whereabouts, and our entertainments centre from which we can play or listen to music. All of these services need a connection to the Internet, in order to download maps for the GPS, connect to Spotify account to synchronize music on our phones or check our emails anywhere and at any time.

The development in Spain of these types of devices never stops and we estimate that by the end of this year, 50% of our customers will own them. People who have this kind of device don't only want it so they can speak or send texts, but so that they can get the most out of it. It's the ultimate expression of the concept of 'Always on' - always connected, always able to be located, always available. Operators have to be responsible for making all this possible, finding solutions for challenges like access to the Internet in aircraft, which is possible, but we need

to find a way of invoicing and of giving a great service.

To sum up, your mobile is your new travelling companion who is with you on every stage of the journey to make it more fun and safe, and when on business, more profitable. ●



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Communication in travel: new technologies create both new challenges and opportunities for air carriers

by Phil Douglas, CEO, 2e Systems GmbH

Mobile technologies are already utilised in the travel industry, with SMS notifications and boarding passes on smartphones. This is only the beginning. With online check-in systems, staff have been reduced, but the effect is felt when serious air travel disruptions, or ‘irregularities’, occur. Using mobiles, passengers can not only be notified of delays and cancellations but also informed of alternative flights automatically booked for them, or alternative travel options. In addition, crew and ground staff must also be informed and coordinated in the effort of getting back to normal.



Phil Douglas is the current CEO of 2e Systems GmbH. He is also the CCO of Flightsurance GmbH, CCO at Nearmiss GmbH and CEO at 2e Solutions AG. 2e Systems is an aviation software company that provides Internet booking engines, check-in solutions, mobile communications and other IT products for air carriers worldwide. Mr Douglas founded 2e Systems GmbH in February 2000, bringing over 30 years' senior management background in airline IT, Project Management and Software Development. Throughout his more than 12 year tenure, the company has seen substantial revenue and profit growth, and has developed cutting-edge Internet and mobile solutions for airlines. In his capacity of CEO, he kept the company focused on further developments and innovations in IT management for air carriers. In addition to providing Internet Booking Engines for major carriers such as AUA, dba and airBaltic, the company developed the first irregularity and passenger notification platform for Deutsche Lufthansa AG. Most recently 2e Systems has developed an innovative crew notification system for JetBlue, which enables JetBlue to manage crew changes more efficiently.

Mr Douglas gained extensive experience in airline software solutions, first at Qantas and then with the Unisys Airline Development Center. At Unisys he was responsible for managing the implementation of major IT projects for Lufthansa, Mexicana and JAT. Then in 1992 he joined Deutsche Lufthansa AG as a consultant and in 1995 took on a senior role in the project team for the technical development and implementation of their Internet booking engine, www.lufthansa.com. This was one of the very first airline Internet booking engines developed worldwide.

Whether flying regularly for business or for an occasional vacation, most of us can recall at least one bad experience of being stuck in an airport for hours on end, waiting in long lines to speak to the few available staff and having no idea when or how you're likely to reach your destination. To make it worse, you look around and realise you're just one of hundreds or maybe even thousands of travellers, all with the same problem.

Welcome to the world of air travel disruption, or ‘irregularities’ as it's known in the business. In serious cases, even the biggest airlines struggle, seemingly unable to handle the situation or deal with the volume of passengers. As the day goes on, passengers who might have been rebooked to other flights end up missing those too because they

had to wait in line too long or didn't know to which counter they should go. The result: frustrated passengers, stressed staff and crowded airports.

Over recent years major disruptions seem to be ever more frequent: severe winter storms affecting the entire eastern seaboard of the USA, volcanic eruptions shutting down most of the airspace in Europe and Australia, and terrorist attacks grounding thousands of aircrafts. Such incidents are just the beginning of new challenges being faced. However, is it enough to convince airlines to take irregularities more seriously given that they are so difficult to predict? Perhaps yes, perhaps no, but one fact is undeniable and it has a big effect on the scale of any

major irregularity: the sheer volume of displaced and unhappy passengers.

At the same time airlines and airports alike have been reducing staffing levels and placing a new emphasis on mobile technologies. These have had a huge impact on the entire passenger experience and have also allowed airlines and airports to expand faster due to the reduced dependency on physical and manual airport services.

Let's take a closer look at what is actually happening here: as mobile technologies and self-service is catching on and passenger numbers are increasing on the one hand, ground staff numbers are decreasing on the other. At first this seems a triumph, but when we take a closer look, along comes

another unexpected disruption and this time it's a big one. An SMS arrives telling the passenger that his flight is cancelled or delayed. Suddenly our rows of shiny self-service kiosks become nothing more than clutter because the passenger no longer has a flight for which to check in. The big question therefore is: "Have the innovations in self-service and mobile solutions kept in step with the passenger's needs?" In these situations, it seems that staff intervention is the only option.

Information is mission critical

Let's look at it from the point of view of the passenger. Customers expect in such situations to be kept informed. That's the easy part. More importantly, they want to reach their final destination as soon as possible and therefore need to know the options as soon as possible. At all times, the passenger wants the feeling that the airline and airport (passengers often can't separate them) are doing everything they can to help.

Recent technologies offer mobile-based notifications for flight irregularities such as Delays, Gate Changes and Cancellations. These can be classed as 'informational' services and they are extremely helpful and effective. However, once the point is reached that the passenger is suffering a serious inconvenience, such notifications usually fall short since the passenger must still wait in line to speak to a member of staff.

Can mobile technologies help?

As you can imagine, bringing in large numbers of additional staff is not always the most practical solution. The next step-up on communication and notification from airlines provides customers with a complete self-service 'Schedule Change' solution, where passengers are contacted by SMS and/or email, leading them to a website where they can select from a range of available options. These options can also include alternative modes of transport (such as a train), flights to nearby airports or, if necessary, an overnight stay in a hotel. This is an invaluable tool that empowers those passengers who have access to a smartphone. However, there are still many in the travelling public with mobile phones that are not Internet-capable. How is it possible to help these customers?

Back to those shiny kiosks

Looking around the departures area, the rows of self-service kiosks need not be redundant

during an irregularity. In fact those kiosks are the key, allowing passengers to print new boarding passes, along with train, meal and hotel vouchers. For example, in the flight cancellation SMS, the passenger can already be offered several options: web, smartphone or kiosk.

Of course, the number of travellers carrying smartphones is increasing every day, so providers are focusing ever more on innovative mobile apps and user-friendly mobile web portals. Services can be in 'push' mode, such as automatically dispatching a new mobile boarding pass after the airline has rebooked the passenger, or 'interactive' mode where the passenger chooses from a list of possible new flight connections.

Individual and personalised communication

The concepts described sound great, but one must remember that these options also pose many challenges for airlines. Information and data related to each individual customer are often spread amongst various airline systems such as Reservations, Check-in, Ticketing, Loyalty, Flight Operations and many others.

The key is to consolidate all this information and effectively manage the dialogue with the passenger. What is needed is not only pioneering innovative products like Mobile Check-in and SMS-based services, but also building a solution that offers the passenger timely, relevant information via the latest channels (SMS, email, IVR, Mobile Apps - or even Social Media channels, such as Facebook and Twitter). The end result is a personalised experience where the passenger has the feeling of individual care.

Staff & crew

Passengers are not the only 'customers' that need up-to-date information. Airlines have started mobile notifications and messaging for both ground staff and in-flight crew. New products have focused on providing Pilots and Cabin Crew with not only flight operations information, but also last minute changes to their flight pairing schedules, hotel layovers and ground transportation. Such solutions utilise various contact channels depending on the time-criticality of the message, allowing crew to self-acknowledge. This reduces the human intervention required in the Crew Control Centre and leads to a significant improvement in recovery to normal operations.

For ground staff, similar mission critical information is crucial during all aspects of

airport operations. With mobile technologies it is often the case that customers can be informed of flight disruptions and irregularities before airport staff! This provides an additional challenge to airlines - to provide staff members on duty who are assigned to particular flights with the relevant up-to-date information concerning their area of responsibility.

Airlines now realise that both internal and external customers are key in any mobile solution provided. Some have started equipping flight and ground crew with wireless tablets to support information dissemination as well as itinerary updates and re-bookings.

Mobile communications and travel: what does the future hold?

Irregularities will always be a challenge for the air travel industry, no matter how communication technologies and innovations simplify one-to-one information for both customers and staff. Such innovations bring about efficiencies of scale and productivity, and provide dynamic features and services to customers.

Airlines have begun investing resources in developing cutting-edge technologies related to mobile technologies such as push notifications, automatic re-booking, SMS information related to flights, lost baggage, automatic check-in, gate changes and much more. A customer may experience a delay in the air due to air traffic control. When the customer arrives at the terminal and turns on their smartphone, they find a mobile boarding card for their re-booked flight. Alternatively, the in-flight Purser provides customers in the air with new flight information directly and initiates the sending of mobile boarding passes. On arrival, if the customer has no smartphone, they proceed to the next available kiosk and re-print their boarding card.

No lines, no waiting, no additional aggravation. Vouchers, new boarding cards, hotel reservations, baggage irregularity reports and much more can be processed through mobile and smart technologies. Communication has brought about some short-term challenges to airlines but long-term benefits to all concerned. Information is mission-critical in all aspects of travel. Mobile communication has afforded the development of next generation travel, which is now growing faster than ever imagined and providing features to both carriers and passengers, way beyond expectations. ●

Roaming charges - let's help businesses by becoming more efficient!

by Lars Houbak, founder and CEO, Mobilethink A/S

Roaming charges are prohibitively high, and the pressure to reduce them is growing as Mobile Data usage soars. Operators should consider a new business model that provides seamless handover to local pre-paid SIM card partner. Although the lucrative Data roaming revenues are reduced considerably, the trade-off is gaining greater customer retention. The key is to provide on-device self-care with automatically streamed re-configuration of the local SIM card. This on-the-air self-care eliminates the high costs of call centres, making this proposition viable.



Lars Houbak is the founder and CEO of Mobilethink since its inception in 1999. Mr Houbak has an engineering background, with several years of international experience in the global telecommunications and software industry, working in both Spain and the US. He dedicates most of his time to sales and marketing initiatives including go-to-market strategies and the overall positioning of the company and its solutions to the market.

Much has been written over the years about roaming costs being excessive. Surveys on the subject proliferate, and legislators are now getting involved, trying to set roaming capping that costs the taxpayer millions in the process. The simple fact is that network operators are under significant pressure to enhance falling ARPU and roaming charges are now a significant part of their revenues.

The rapid increase in the use of mobile email and Internet means that mobile data bills will continue to soar unless the industry takes steps to reduce operational costs and make new investments in their networks. Roaming charges have become a topical issue. They will continue to be so

while industry forecasters are predicting mobile data usage over the next few years growing almost 40-fold from 90.8 million Gigabytes in 2009 to 3.6 billion Gigabytes by 2014.

Perhaps most concerned about roaming costs are, and will continue to be, business travellers. They simply don't have time to pop into a local Costa Coffee shop (if they can find one) for free Wi-Fi. They need to keep in regular touch with headquarters. They need to receive emails and calls from their regular customers back home or in other locations.

According to a recent study, two-thirds of US business people in Fortune 1000

companies are being asked to use their mobile phone less when abroad. Forty-eight per cent admit to checking email and browsing the Internet less when abroad than they would if at home to reduce costs; 70 per cent make fewer or shorter phone calls; 20 per cent tie themselves to landlines to make calls; and currently only ten per cent swap to a local SIM to avoid high charges.

Legislators in Europe have set about trying to limit roaming charges within European States. In a Europe-wide survey published by Eurobarometer on international mobile roaming prices, they found that an overwhelming majority of EU citizens believe the EU should step in to make sure

“Legislators in Europe have set about trying to limit roaming charges within European States. In a Europe-wide survey published by Eurobarometer on international mobile roaming prices, they found that an overwhelming majority of EU citizens believe the EU should step in to make sure that prices for making and receiving calls on mobile phones when travelling in other EU countries should not be substantially higher than those at home. They established that European mobile phone users continue to pay between €4 and €6 for a four-minute call abroad and roaming prices for such a call could exceed €12.”

that prices for making and receiving calls on mobile phones when travelling in other EU countries should not be substantially higher than those at home. They established that European mobile phone users continue to pay between €4 and €6 for a four-minute call abroad and roaming prices for such a call could exceed €12. This is bureaucracy in blinkers. If you're doing business in Africa or China, any European legislation capping roaming charges has no bearing on the subject.

Clearly, the best solution for operators for better serving a travelling business person is to hand over the customer to local roaming partners via pre-paid SIMs. This ensures customer retention since they will receive more stable services from a local SIM card. The home operator may receive a smaller income from the subscriber as a result, but in the long run this will lead to improved subscriber retention if the local SIM switch is hassle-free. Of course, it is also important that each operator has an automatic device re-configuration installed as an option, to prevent losing out on business from the pre-paid high data volume business customers... A new mobile business model!

So, in these challenging economic times, with businesses increasingly focused on emerging economies, it's time to ask: "How can we, as a mobile industry, better serve the business traveller?" Quite simply, the mobile industry needs a radical change in the way it goes about business and needs to embrace new, best-practice operations in the rapidly changing and fragmented mobile landscape.

One way would be to continue betting on high revenue from roaming customers. However, the question is: Will this continue to create revenue if the customer is unhappy about the spiralling costs?

The other way is to bet on customer retention by providing a seamless handover to local pre-paid SIM cards from local roaming partners, which will provide

a fast-track mechanism to get business people using ARPU-enhancing Internet services without delay.

To make this work, operators need to eliminate the current high cost of call centre support. If they move to on-device self-care, the customer becomes his own call centre at no cost to the operator!

Intelligent on-device self-care services through Over-the-Air configurations will enable a business person in Africa, or any other continent, to simply switch on his handset and the new device configuration will be streamed to him automatically and seamlessly, enabling him to surf the net, pick up mail or send MMS immediately.

From an operator's standpoint, on-device self-care offers other significant savings in customer care. It's known that one of the top three issues being handled by call centres concerns connectivity and that it takes on average three calls to resolve a smartphone issue. If you run the numbers and take the cost of a call centre agent being US\$10 per call, a network operator is losing US\$30 per user by simply hanging onto the archaic call centre practice of customer care. By investing in low-cost automated connectivity systems that allow OTA on-device self-care, the cost can be recovered within months.

Device manufacturers also have a key role in this new mobile business model, by offering mobile users automated on-device, self-care support. By embedding OTA connectivity standards into devices, which enable the operator to automatically set up the devices with the latest settings, the switch from one SIM to another becomes seamless and user-friendly. At the end of the day, that's what we all want... customers who are delighted with their hassle-free service, wherever they may be. That spells high retention and recurring revenues. ●



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Deliver shared data plans with the New Diameter Network

by Doug Suriano, CTO and Vice President of engineering, Tekelec

Allowing multiple devices and multiple users to share data plans enables mobility and flexibility that attracts subscribers. To facilitate this, operators need to install the New Diameter network that can distribute and consolidate signalling of policy and accounting information. Sharing plans must still deliver consistent policies and track usage per user, per device. Sharing data plans calls for more complex techniques, such as pooling quota, quota roll-over, top-ups, concurrent limits and comprehensive notifications.



Doug Suriano, CTO and Vice President of Engineering at Tekelec, has more than 20 years of telecommunications and technology experience. He is responsible for product innovation, leadership in standards bodies and industry forums, and advocacy for innovative mobile data solutions.

Doug Suriano earned his Master of Science in Information Technology at the U.S. Naval Postgraduate School and a Bachelor of Science at the U.S. Naval Academy.

Mobile data is the greatest opportunity that operators have ever seen. The number of connected devices on networks reached six billion in 2011,¹ and this figure is expected to double to 12 billion by 2020. To capture this growing opportunity, operators need to become service and content enablers and intelligently control their networks to create, personalize and launch new services faster.

Shared data plans are one innovative way for operators to respond to subscribers' needs and their many devices. For example, last September, StarHub became the first operator in Singapore to offer a post-paid plan offering subscribers the ability to share data, minutes and SMS messages with other users. Several Orange subsidiaries in Europe also offer a shared iPhone/iPad plan. While shared voice and SMS message plans have been common for many years, the introduction of shared data plans is a new - and rapidly growing - development.

Tekelec, the mobile broadband solutions company, sponsored a study from the analyst firm Infonetics Research on the forecasted rise of devices with shared data plans from 2011 to 2015. The top finding was that devices sold globally with shared data plans will grow at an average of 89 per cent per year, reaching nearly 187 million in 2015. The analysts linked the most rapid adoption to markets with advanced 3G competition, including North America, Western Europe and Asia Pacific countries like Japan and South Korea.

Infonetics identified two forms of shared data plans:

- **One user, multiple devices:** this allows a mobile broadband subscriber to apply a volume of data to more than one device, such as a smartphone and tablet. The consumer eliminates separate plans per device, consolidating data into one bucket. The only additional cost is a minimal monthly fee to provision multiple devices to one user.

- **Multiple users, multiple devices:** this includes more than one device and more than one user. A family or small business receives a pool of data to share across any number of devices - smartphones, tablets, USB dongles, etc. - allowing individuals to select their preferred devices and making adoption of multiple devices more desirable.

Combined, these plans will increase the proportion of mobile broadband devices sold on shared data plans from just over two per cent in 2011 to more than 15 per cent in 2015. Smartphones, tablets and USB cards will comprise 89 per cent of the shared data devices in 2015.

Network requirements for shared data plans

This growth in shared data plans provides exciting opportunities for new revenue models and service innovation. Rolling out new services quickly is a must in the battle to capture customers and generate revenues

¹ GSMA, 2011

from over-the-top, Cloud, and machine-to-machine services. Operators need to create new services in weeks, not months.

However, operators often lack the full range of network equipment to best support this pricing plan option. The challenge is that legacy charging systems have been slow to adapt and are overburdened by new service plans. The delivery of new services such as shared data plans requires programmable rules engines with easy-to-use, service-creation tools, advanced quota management features such as quota pooling, integrated analytics, standards-based interfaces, and a wide variety of preconfigured use cases. It also requires a unified database with open application interfaces that can manage unpredictable, event-based, dynamic and distributed subscriber data and allow operators to personalise services.

To scale shared data plans across a range of 3G and LTE devices, service providers need to deploy the critical elements of a New Diameter Network.

The New Diameter Network defined

The New Diameter Network is the foundation for a successful mobile data business model. As one Tier 1 operator put it: “100 per cent of revenue-generating mobile data services will run on it.” The New Diameter Network is comprised of control elements - policy servers, charging systems, subscriber databases, gateways, and session and mobility management - that rely on the Diameter protocol to exchange network, subscriber and charging information. Unlike old Diameter solutions that provide point-to-point transport of Diameter signalling traffic, such as load balancers and protocol converters, the new Diameter network is an enduring framework providing the scalability, reliability and flexibility for mobile data and signalling growth.

The New Diameter Network has three critical elements:

A Diameter signalling infrastructure at the network core facilitates signalling between network elements such as online and offline charging systems (OCSs/OFCSSs), mobility management entities (MMEs), policy and charging rules functions (PCRFs) and home subscriber servers (HSSs). Like the central nervous system that relays messages back and forth from the brain to different parts of the body, a Diameter signalling router

integrates with all Diameter-based control elements and relays messages among them. It balances message loads across these Diameter elements to ensure scalability, manage congestion, and translate messages that are in different languages. It also binds subscriber information transmitted in Diameter messages to a single policy server, ensuring that all messages associated with the same subscriber or device are routed to the same policy server. This helps operators maintain consistent policies by grouping all relevant data together.

Even a common activity, such as downloading a YouTube video to a smartphone, creates several Diameter messages to validate subscriber permissions, check the available data quota, verify the user's device and ensure that there are no parental control violations. An increase in shared data plans will only drive up the number of Diameter messages. Infonetics anticipates “that this rapid ramp-up in Diameter transactions will drive demand for Diameter Routing Agents (DRAs), a functional element first introduced in 3GPP Release 8 to better manage the onslaught of Diameter messages exchanged among network elements”.

A Policy server, defined as a 3GPP-compliant policy and charging rules function (PCRF), manages rules across subscribers, device and networks using Diameter messages. The policy server also controls policy enforcement points like access devices. Service providers can easily create and edit policies to manage subscribers' quality of service (QoS), charging rules, quotas, optimisation and admission control. In shared data plans, policy control equipment uses performance analytics to track and analyse customer and group usage with advanced techniques that include:

- quota pooling to share one quota across multiple devices-based on time, bandwidth, or application usage; for example, a family of five members can share a ten GB quota per month regardless of the device used;
- multiple concurrent quotas across different devices such as 20 videos, unlimited social networking and web browsing, and 200 hours of voice over Internet protocol (VoIP) calls per month;
- quota top-ups and monthly roll-overs for a group or family plan; and
- enhanced notifications to the customer on multiple device usage.

Infonetics notes that operators need to implement rules associated with dynamic criteria, such as: time of day, usage, subscriber profile, and real time network conditions, across network types, service types, devices, etc. For example, a parent would likely want content restrictions to be applied consistently regardless of whether a child is accessing a service from a laptop over a home WiFi network or from a tablet over the 3G network. This necessitates a high performance rules engine flexible enough to allow the operator to implement a wide range of policies that can span devices, services, etc., without sacrificing performance. It also requires an intuitive user interface that enables the operator to easily create rules on a per-service and per-subscriber basis without needing to go back to its PCRF supplier.

A unified data repository (UDR) contains the essential profile, state, and usage information for subscribers and their associated devices. It is the key data repository for policy servers and Diameter signalling routers that need to correlate rules with individual subscribers and groups of users.

According to Infonetics: “That contextual information becomes even more important-and complex-in shared data plans. When there is a one-to-one relationship between a subscription and a customer, it is relatively easy for the operator to understand who the customer is and what device he or she is using. However, with a shared data plan, the operator must be able to segment which user or which device is actually consuming the bandwidth, and must also be able to make that information available to the subscriber, who may want to track how the bucket of data is being consumed and who is consuming it within the shared plan.” Additionally, operators may need to dive deeper “to correlate a specific user with access to specific applications and services that are resident on the device”.

Conclusion

Shared data plans give service providers the opportunity to evolve from device-centric to customer-centric mobile broadband services. Providing customers with one plan that spans many devices allows for greater service and tariff personalization and more knowledge on device and application usage. To realise the full benefits, however, operators need the core elements of the New Diameter Network: Diameter signalling routers, policy servers and subscriber data management solutions. ●

Personalised charging - the future of broadband?

by Cam Cullen, Vice President global marketing, Procera Networks

The rapid mobile data growth necessitates prioritisation of broadband resource by personal preference and Quality of Experience (QoE), that is, personalised charging. Operators are seeking value-charging, beyond 'fair usage', and beyond volume-/time-based charging. Great improvement of QoE perception is achieved by letting consumers select application priorities, so that their favourites will perform better. This requires intelligent policy-based infrastructure that can detect the service type, define the policy per user, enforce it in both the 'last mile' and the backbone, and charge for it accordingly. The Policy server and the charging systems must scale to support numerous transactions in real time. They must enable introducing novel charging-based services without impact on performance.



Cam Cullen is the Vice President of Global Marketing at Procera Networks. He is responsible for Procera's overall global marketing and product management, and is an active evangelist for Procera's solution and general market trends as well as an active blogger for Procera. He joined Procera as VP of Product Management to implement product strategy and to expand the company's product offering.

Prior to Procera, Mr Cullen held senior Product Management and Marketing roles at Allot and Quarry Technologies/ReefPoint Systems, where he was VP of Product Management and Marketing. He also held various roles in business development, marketing and sales at 3Com. Mr Cullen was a captain in the US Air Force, where he worked at the National Security Agency and the Air Force Information Warfare Centre.

Cam Cullen holds a Bachelor of Science degree in Electrical Engineering from the University of Alabama.

The broadband market has matured considerably from the days of email and simple web browsing. Consumers today want quality access to streaming video, social networks, and real time news feeds. The expectation of a consumer is that their access will be fast, with minimal latency, and be reasonably priced. It is not uncommon for news to break on Twitter and Facebook before any news outlet (print or video) manages to break the story - a good case in point for why broadband access has become a utility and not a luxury.

However, as bandwidth consumption is growing, the challenge has also grown for broadband providers to meet consumer expectations in a cost-effective manner. The 'last mile' is always a potential bottleneck in broadband deployments (whether they are fixed, mobile, or wireless), and the

backhaul is also an issue as it is routinely oversubscribed. In order to allow broadband operators to manage their networks, many new technology options have been explored to optimise networks. For example, operators have implemented versions of 'fairness' (often on fixed networks), explored usage limits on both mobile and fixed networks and rudimentary 'power user' traffic management.

However, operators have quickly realised that none of these solutions meet the challenge of quality broadband access at a reasonable price. Consumers judge their Internet experience by the applications that they use: a social networker uses picture uploading and Tweets or status update refresh, whereas a video streamer judges by how many times they see 'buffering' on their video screen. 'Fair use' does not take this into account, as

the consumer cannot choose what application they want prioritised during congestion, or manage what applications can consume what portion of their usage limit.

As a result, broadband operators have begun investing in Policy Management and Policy Enforcement solutions. Policy Management enables operators to manage policies in their network and enables a 'personalised' service for each subscriber on the network. The linchpin to the success of Policy Management is Intelligent Policy Enforcement (IPE), which allows the creation and enforcement of services at the subscriber, device, location, and application perspective. IPE enables operators to create and enforce these service plans as well as helping operators with analytics on the types of attractive service plans that they should offer to consumers.

IPE enables operators to better manage congestion by allowing Quality of Experience (QoE) expectations to be controlled during congestion. An IPE-based congestion management solution allows a consumer to choose what applications they want prioritised out of their 'fair use' allowance - so the video streamer can prioritise video; the social networker can prioritise Facebook and Twitter. This ensures that their QoE expectations can be met. Analytics can also reveal the result of congestion management - what delay is introduced due to congestion management, what applications are negatively affected (QoE), and which users are being impacted by congestion management. This is key in countries where regulatory systems will require this information to justify congestion management techniques.

IPE is also a great enabler of creating innovative usage-based charging, for example, Personalised Charging. By using detailed analytics to understand the applications and content that are driving usage, broadband operators can offer service plans that reflect the usage consumption and the application mix of consumers. Offering usage plans that are appealing to consumers will enable operators to shift service plans from unlimited (which many are struggling to do) to consumption-based models. This cannot be done with existing infrastructure equipment, as these systems do not have the intelligence to perform analytics or enforce services-based on applications or content on a per subscriber basis.

The challenges of personalised charging or charging-based on applications have generated much discussion. The key challenge in any type of service like this is the proper setting of expectations with the customer. There have been a few examples to date of mobile operators attempting to offer prioritised services (mainly gaming) or 'enablement' services (that is, pay US\$5 to use Skype on the mobile broadband), but application or even site-based charging will require even more techniques. Many GGSNs, CMTSS, or even BRASs in the past have offered limited zero-rating capabilities for ringtone downloads, system updates, etc.-based on IP addresses or a small number of URLs. There are many cases of IPE systems being used for charging today, however many of them are volume-based or time-based charging to help existing charging systems, or have been installed for future application-based charging use cases.

On the other hand, 'application-based' charging or even 'site-based' charging in today's Internet environment brings all new challenges to the table. The biggest challenge is that the user experience on a site is very different than it used to be. Facebook, for example, is now also a container for YouTube videos, ads, games, and chat. Or YouTube can serve up videos in formats other than flash video for Apple devices. To determine this, the operator needs to understand the user experience, and will need to use tools from an IPE to ensure that the user experience is matched through the proper application of signatures, policies, and charging models.

Operators looking to offer new charging models need tools to ensure that the service that they offer matches the user expectations for a site. Operators need the ability to look at a customer's connectivity in real time to troubleshoot billing discrepancies, much less to test service ideas in their labs. They need systems that can use properties of applications or sites - for example, the ability to key off the referrer field in http. They need to be able to log user connections to specific sites to have forensic details for value-based or zero-rated charging. They need quickly updated signatures when new versions of applications come out, and the ability to retroactively zero-rate traffic (unknown or incorrectly identified) if a signature changes and is identified as incorrect.

Beyond the features required, another huge challenge for personalised charging looms - signalling load. This is potentially the biggest scaling challenge and it needs to be architected carefully from the beginning. When a user initially accesses the network, the network must be provisioned with the correct service plan for that user, which can require interaction between multiple systems for each service that the customer has purchased. If architected correctly, signalling load can be minimised and only refreshed as necessary, but this can also operate on an on-demand basis, which would create transactions every time a new piece of content is accessed. The IPE, PCRF, and OCS/OFCS systems need to support tens of thousands of sessions per second in a mobile network of any size. Any less will result in severe limitations for operators who want to offer mass market personalised charging plans. On the PCRF/OCS side, a new class of product (diameter routers) is designed to allow network signalling to scale. The IPE solutions will need to scale independently, since they are

doing both the heavy lifting for charging as well as the reporting.

Personalised charging is one of the most intriguing new services for broadband operators, but will require a system that can adapt rapidly to service changes and can be adjusted in real time by the operator. It will need to scale on multiple fronts without losing performance or functionality, and certainly without losing accuracy - both for billing and for application identification.

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Wherever I may roam...

by Michael Manzo, chief marketing officer, Openet

The issue now is not just 'bill shock' - when travellers receive high data roaming bills when they return back home - but the fear of bill shock. There is great confusion of what data roaming is and how it is charged, which results in subscribers switching off their devices altogether. Instead, timely communication of usage information and personal-based capping (as imposed on operators in the EU) will bring peace of mind to travellers. This encourages customer-operator contact that can be used further for ad-hoc promotions that are triggered by actual usage.



Michael Manzo is Chief Marketing Officer of Openet. He joined Openet in 2006 and has served as Chief Marketing Officer since January 2007. Prior to this, Mr Manzo served as Vice President, Global Marketing.

Prior to joining Openet, Mr Manzo served as a consultant in the Enterprise Solutions Groups at Nokia Corporation from 2005 to 2006. From 2003 to 2005, Mr Manzo held executive positions at Traverse Networks, Inc., a developer of enterprise mobility solutions for unified communications which was acquired by Avaya. From 2000 to 2001 he served at OmniSky Corporation, a provider of wireless data applications and services for users of mobile devices, which was acquired by Earthlink. From 1999 to 2000 he served at Telocity, Inc., a developer of interactive online services which was acquired by DirecTV Group, and from 1996 to 1999 in Notify Technology Corporation, an independent software vendor specializing in wireless mobility solutions and services.

Michael Manzo holds a B.A. in Journalism from the University of New Hampshire.

If you are an iPhone, Blackberry or Android smartphone owner and you're planning a foreign holiday any time soon, be warned, you could quite easily return home to find yourself facing an unexpectedly large bill. EU travellers, travelling within the zone are protected to some degree by regulations limiting the charges that carriers can level. However, once outside, the relative safety zone of Europe, there is no such protection and the cosseted Europeans face the same dangers that non-EU travellers face everywhere: data roaming.

Something as simple as opening an email, Tweeting or checking a map of the local

area using your smartphone can cost huge amounts. Last year, the European Union moved to combat the problem by capping the amount that the network carriers can charge for data roaming within its borders at €50 per month. However, this cap only applies to the fortunate citizens of countries inside the EU. If you're an EU resident who travels beyond the protection of Brussels, or a non-EU citizen, you run the risk of racking up a massive bill.

Part of the problem for consumers, of course, is ignorance. Over 60 per cent of Britons admit to being 'confused' about data roaming and nearly two-thirds of UK mobile users are not fully

aware of what the term 'data roaming' actually means, according to a recent report by GoodMobilePhone.co.uk. The study reported that just over a quarter of the people surveyed believe that the phrase 'data roaming' refers to the ability to access the web while abroad, via a mobile network, while just over a half of respondents thought the phrase was a technical term referring to the ability to access emails while on the move.

The GoodMobilePhone survey is just one of many consumer awareness stories that have helped to raise the profile of mobile phone bill shock. Which? Magazine, one of the most widely regarded consumer

titles in the UK, revealed recently that data roaming on an iPad or tablet PC could be up to 1000 times more expensive than any equivalent 3G Internet use in the UK and even more expensive outside of Europe.

As a result of these combining factors, many mobile subscribers now avoid using their phones and data dongles while travelling abroad due to high perceived costs and a lack of understanding of roaming charges. Given that operators are looking at mobile data as a growing source of revenue, it is vital for them to address customers' fear of bill shock.

The EU regulations mentioned above mean that consumers will automatically receive a warning when they reach 80 per cent of the chosen limit and that operators should do a better job at informing subscribers of the costs of data roaming services when they enter a Member State.

In today's crowded marketplace, nurturing customer loyalty is of vital importance to a mobile operator but, despite the central role they play, operators are becoming less and less visible to the subscriber. Recognition, influence and loyalty have slowly migrated to other parts of the value chain, namely device manufacturers and content providers. In reality, most people are only reminded of their mobile operator when their bill is delivered. Mobile operators urgently need to create a more active engagement with their subscribers to increase the visibility and relevance of their services.

Operators should encourage individuals to use their mobile devices when abroad by educating users on roaming data bundles and providing more transparent billing options, not just before they leave home, but also when they start using their service abroad. This will give subscribers certainty as to their costs and comfort in using their service.

The need to inform and educate subscribers about usage is increasingly recognised. Operators have been moving towards an informative, educational type of engagement, providing visibility of network usage. They can make a lot of useful information available to the subscriber, including where their billing or family plan spending stands at any given moment, which service plans they currently have, how far into consuming these plans they are and how much is left. They need to make it

easy for people to discover the information, to engage with their plan and manage the use of promotions.

Unfortunately, complexity is still an issue. The rise of the smartphone has opened up myriad ways of using a device. In response, operators have introduced more sophisticated and complex data plans in an attempt to become more customer-centric. However, having so much choice brings confusion for the customer, as mobile service provider offerings become fragmented and complicated, with thousands of products and rating plans and all manner of bolt-on services and promotions. To help subscribers feel informed, in control of their options and comfortable that they are selecting a plan that meets their needs, the operator must simplify the choices and make them easy to access.

Informing and managing dozens of options on behalf of customers can be a logistical nightmare and very costly. Most methods currently in use are not convenient for the customer - push-based marketing via mail, SMS or customer service representative are intrusive, and having to log-in to a portal and navigate a customer care website is inconvenient and cannot deliver time-sensitive notifications, such as high-spend alerts.

If operators are to sell more segmented offers and empower customers with more flexible service plan options, personalisation must go further than just displaying basic account information. Rather than just inform, the operator should be looking to provide control - bring opportunities and promotions triggered by actual usage, which can be changed in real time; for example, real time ability to spend loyalty points, to set and monitor parental controls, and frictionless purchasing of new services. This hails a move towards self-personalisation, the next step in a more symbiotic customer-operator relationship.

Subscriber Engagement Engine, a single platform that integrates with multiple nodes that hides complexity. It is subscriber and service aware, not only giving end-users real time visibility into their usage but enabling them to directly control, manage and self-personalise their services, balances and spending. Operators need to harness their back-office intelligence to deliver promotions

that subscribers can purchase and have provisioned immediately.

As a mobile user can you imagine a scenario where in 30 seconds you can check exactly where your billing plan stands, review what telecom services you can buy with the loyalty points you have earned using your mobile, purchase a new bundle, configure the service options for one of your kids, or decide whether to accept a recommendation you just received from a friend about a new service? All of this will be on a mobile application which has your operator's logo on it. Configuring your plan and buying add-ons will be as important as checking your credit card or bank account online - something most of us do every few days. The capabilities are already there, they just need channelling in a new way in order for operators to transform the customer experience and become truly relevant again.

Consumers will welcome steps to protect their wallets from unexpected bills as there is still confusion regarding the cost implications of mobile phone calls or data roaming charges when travelling abroad. Users don't understand the charging structures used by mobile operators.

The EU regulations offer operators a push in the right direction, giving them the opportunity to take the moral high ground by making it easier for customers to manage their mobile phone bills. Central to avoiding bill shock is the timely communication of usage information. Consumers should be able to set up thresholds for different services and manage balances in real time, so that whenever a specified threshold is reached, spend alerts can be sent, and usage restrictions applied, with configurable options to override a limit.

It is time for the mobile industry to take in hand the best interest of their customers by providing greater transparency and simple billing options. Instead of mandating limits to customers, service providers should create tailored services that allow peace of mind for mobile subscribers when travelling. ●

Working and playing at home whilst abroad: How technology is helping the travel industry remove international borders

by James Hughes, Director of Travel and Transport, Level 3 Communications

Communications is 'democratized' in very much the same way as air travel was in previous decades. This is due to lower smart device prices and the growing ubiquity of Internet connectivity. The travel industry's main interaction mode with customers is now digital. Content is made available anywhere via the Cloud, to allow for full mobility. Connectivity that facilitates travel information flow is now perceived as one of the basic amenities for any venue. All this needs to be supported by global IP network infrastructure that provides appropriate capacity and quality.



James Hughes qualified as an accountant in 1999, working for a stockbroker in the city. Having qualified, James wanted a new challenge and so joined Global Crossing and worked his way up to a Senior Finance role. Two and half years ago he was promoted into Sales to lead the Transport Sector which has now been rejuvenated under his leadership, re-establishing Level 3 as the number one telecoms provider in UK bus and Rail.

With the advent of cheap air fares and increasingly easy consumer and business travel, moving around the world has become relatively painless. The late 20th century saw the gradual dissolution of many international borders and the travel industry helped drive globalisation by shrinking the physical world. However, the travel industry is not unique in this; technology is now a major force in this process.

Travel and its impact on globalisation is not a new process. It has been taking place since the Mongol era when traders started using the newly opened spice

route for trading purposes, spreading ideas on politics, culture and commerce across what was then considered the civilised world. This phenomenon has gradually evolved throughout human history, driven by industrialisation and the creation of trans-national political and economic organisations such as the World Trade Organisation and the International Monetary Fund.

Throughout the latter half of the 20th century the introduction of airline travel for the masses truly opened the world up to the common man. Previously something that

was considered a luxury, literally spurning the term 'high-flyers', was becoming gradually available at a price that everyone could afford. All of a sudden people could go on holiday in different continents, and, just as importantly, travel to business meetings many thousands of miles away.

There are parallels here with the technology industry. Not only because technology is helping to create, and to some extent homogenize, the global village, but also because one of the key drivers is that connected devices are becoming democratized in very much the

same way that air travel was. One reason for this is that the decreasing price of smartphones, laptops, tablets and other Internet-ready devices has opened them up to a truly mainstream audience. The fact that shoppers can now pick up an Internet-connected tablet along with their bread and milk for £30 is proof of this. Not so long ago a desktop computer with 16GB of memory and built in Wi-Fi would cost thousands of pounds. Nowadays, such functionality is squeezed into the average smartphone. Just as important is that the promise of truly ubiquitous high-speed Internet connectivity is gradually becoming a reality. An ever-growing footprint of public Internet hotspots and high-speed mobile data infrastructure, backed by increasingly consumer-friendly price points, means that people with connected devices now have the access they need.

So how does this impact on the traveller? People's main interaction with the travel industry is now largely digital. Driven by a desire to decrease costs and provide people with increased flexibility, companies in all sectors now host a vast range of content, services and customer interactions in the Cloud. This sea change in the way that companies do business now means that the travel industry as a whole has to adapt. Airlines, hotels and agents now have to provide tickets, vouchers, booking references and other documents in the Cloud. It is now commonplace for people to be able to change their airline seats, request new rooms, see rich media of their chosen hotel and even have questions answered by a customer service representative using online chat, Twitter or Facebook.

This means an additional layer of complexity for these organisations, as they are forced to react to the seemingly convoluted world of technology standards and a growing number of online platforms. Nowadays, websites and associated digital services have to be coded for a variety of different web browsers, be mobile-optimized, and even made into apps for a number of different operating systems. This can initially be daunting to say the least. Embrace these changes and it opens up a whole new realm in terms of customer service and loyalty. The company who provides the technologically savvy customer with the ability to engage with them in the manner they desire can be well rewarded. With some companies, this can be the only

way of relating to their customers, so it is crucial to get it right.

Technology is also serving to continually disrupt established industry norms, as it does in many sectors. Whereas during the dotcom boom a range of start-ups served to disturb established travel industry business models, largely by reducing the cost of booking last minute deals, a new wave of start-ups are pushing this even further. Spurred on by the availability of cheap and flexible mobile and web-platforms, a mixture of social media and geo-location technology means that small, innovative companies are now seriously starting to re-invent the way that travellers behave. Smartphone users, for example, simply have to press a single-button nowadays to find a last minute hotel deal within ten miles of their current location. They don't even have to know where they are.

Whilst these disruptive influences typically sound unsettling, they can be an immense leveller for any industry. Right across the board, connected companies which embrace these ideas are usurping established global hegemonies, typically because they provide consumers with choice, flexibility and a service that offers the best possible experience at the best possible price. While many hold out against such developments, moving too slowly on an emerging trend can often be at the expense of market-share. Driven by the ever-increasing valuations of the so-called Internet 'subscriber giants', companies are competing hard to either claim this position in their sector, or dispense with the halo effect created by these companies which have an innate viral appeal to consumers.

Aside from the growing use in travel-specific connected services, there is a second, much wider, usage trend afoot related to the growing adoption of connected devices. People now expect to be able to access and consume content wherever they are from the Cloud. With more and more devices in people's hands, an increasing number of companies are now moving towards hosting all content online. This is true for everything from leisure content, such as music, film and TV, to business documents, calendars and even meetings.

The fact that this has become mainstream means that travellers expect to be connected wherever they are. People expect travel hubs, hotels, restaurants, conference

venues and other locations to have access to a high-speed data connection. Whereas previously this might be seen as a novelty, and provide an opportunity for these locations to differentiate, a lack of connectivity is now perceived as a lack of basic amenities.

An increasingly mobile population means that the need for widespread connectivity is paramount. As the digital world becomes more and more imbued in the everyday activities of the physical world, the importance of reliable, high-speed data connectivity is vital. At no time in human history have more people had more of a need to access content, information and services from the web.

This means that the need for scalable global IP networks is more important than ever. The technology underpinning this massive growing demand for content and services is continually being augmented to support the tidal wave of demand for data. With more users, more requests per user, longer session time and highly demanding content such as video-streaming, web-conferencing and IP voice calls now common-place, the infrastructure simply has to be up to task. This means ensuring that local points of access, whether they are cell-towers, Wi-Fi routers or good old-fashioned hard connections, are optimised. In addition the appropriate backhaul must be in place to cope not only with the current demand, but also with future activity.

Technology is helping to shrink the world in a very different way to how international travel achieved that effect in the latter part of the 20th century. As opposed to bringing places closer, it allows travellers to take their home with them, whether this is social interactions, information, media or documents. Embracing this and allowing people a seamless interaction with the content and services they desire, wherever they are, is a hugely valuable tool for any business. Travellers now expect to have the world in their hands, literally. ●



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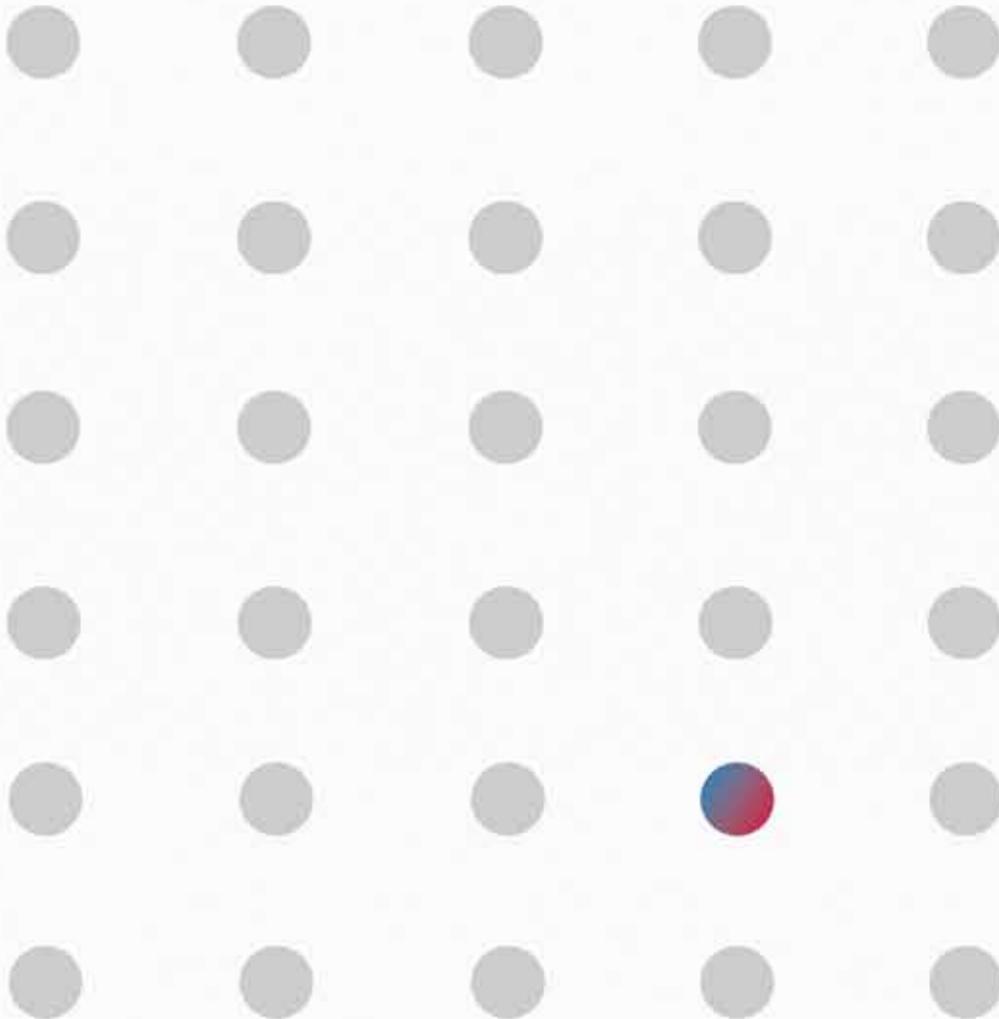
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