

for 2016:

key trends to prepare you for the digital revolution

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Cover story

for 2016: key trends to prepare you for the digital revolution and biod to row r house

It's time to predict the future again. Telecom Asia presents six visions of 2016 from top telecoms/IT analysts, consultants and pundits. And perhaps unsurprisingly, you'll be hearing a lot about digital disruption and digital transformation, as more telcos take decisive action to transform themselves into digital service providers and take a lead in the digital disruption all around us.

Not all at once of course. To paraphrase William Gibson, the future won't be evenly distributed - the Digital Era will happen in phases, and in some markets may not happen for a few more years. Even for markets on the leading edge, digital transformation is a multi-faceted, long-term play.

But it's also inevitable, and telcos that haven't already started making moves (or at least plans) will do so in 2016. The successful strategies, our experts say, will focus on customer experience, fast execution (and fast fail), early recognition of disruption, smart partnerships, and creating teams that "get" digital (which also requires admitting that you don't get it).

That last element is the core of any meaningful digital strategy, which is why service providers will (or should) spend a lot of 2016 restructuring their marketing departments into "digital command centers" that enable CMOs to speed up time-to-market, align with an overarching marketing objective, and realizes cost-efficiencies in the long term.

Digital finance continues to be a sector to watch. Uptake of sexy mobile payment services from Apple and Google may be slow, but it's what's happening behind the scenes that really matters

as fintech enables the creation of decentralized digital banks.

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You'll also be hearing a lot about the Internet of Things in 2016 - and almost all of it will be overhyped. But the IoT will continue to have an impact in areas like decentralized computing and industrial apps. And of course there will be plenty of new "things" next year - some may even be useful.

A common thread throughout all of these is security and privacy. As we edge closer to the Digital Economy, both will become increasingly important, especially when (not if) we see repeats of sensational hacking headlines along the lines of Sony Pictures and Ashley Madison. And smartphones will continue to be a weak link in the security/privacy chain though perhaps not to the point of BlackPhone 2 becoming the bestselling smartphone in Asia. Or will it?



Spectrum, security, wallet and watch

Security of devices, data and networks will be paramount concerns in 2016. Also, better spectrum usage would be nice

In last year's Visions report, I highlighted falling revenues and net neutrality as being major issues CSPs would face in the year ahead. But neither became the big issue I anticipated.

The telecoms industry has an uncanny ability to weather storms, and even if voice revenues are down, overall revenues appear to be holding – with most of the pressure being felt in sustaining margins. This is likely to continue as CSPs offer an ever-burgeoning cornucopia of third-party products and services.

On the other hand, net neutrality seems to have fizzled as an area of concern for CSPs. The fact that the 'rules' have not been universally adopted and are vague in nature (plus the fact that there are more important things to worry about) have diluted the neutrality backlash – if there ever really was one. That said, if it looks like net neutrality impacts revenues, it will get far more attention.

The coming year will be dominated by far more mundane things like making networks more efficient, continued cost-cutting, spectrum and security.

Consistency and security

SDN and NFV received a lot of airplay in 2015 (some might say 'hot air'), but progressive network operators haven't wasted time pontificating over the value of these technologies but instead are actively implementing them.

Network transformation is a constant process but the ability to manage loads, capacity, failures and natural or man-made disasters in real-time is key. Customers look past the bells-and-whistles products CSPs now offer as they're more concerned with dependable and disruption-free connectivity.

Sure they expect speed, but above all they want consistent and secure connectivity. And those are the most contentious issues for CSPs in 2016: consistency and security. They can either take the initiative, or be forced to take it by customers or regulators.

More spectrum, please

Fixed-line and cable operators will continue to maximize the network capacity and speed any way they can – and fiber gives them some respite – but for mobile networks the continuing challenge of capacity restraints linked to spectrum will increase.

Pressure by the ITU on governments to release more spectrum bands will only temporarily relieve the expected surge in demand. Wi-Fi's popularity has led to off-loading from 3G and 4G networks, but 5G is years away. It seems absurd that in 2015 we can't do more with the spectrum we do have. Better spectrum utilization is my wish for the coming year – although I know full well that it won't happen.

Instead, we'll see thousands more apps for smartphones, a few hundred new wearable thingies, far too many absolutely useless IoT devices (and a few useful ones), but without them being secured in some way they'll be too risky to deploy. Security of devices, data and networks must be the biggest area of attention in the future.



Security versus privacy

We'll see an almighty battle between the arbiters of data and personal privacy versus the emotive arguments around national security, and CSPs will be 'piggy in the middle.' By providing the security their customers demand, they may fall afoul of security services on the lookout for criminals and terrorists. When CSPs were doing it 'in the dark' the public didn't know and didn't care, but now that they know, customers are all over it.

If the network are compromised by people with a mission to disrupt our lives and even our countries, what use are speed, capacity, and access from anywhere? The dilemma is that the very same security we demand will likely prevent the perpetrators from being detected and stopped. And there lies the conundrum.

So, it's going to be spectrum and security featuring in my vision for the coming year. Let's hope they are both addressable and managed in ways that cause us the least amount of pain.

- Tony Poulos



Digital command centers will become organizational imperatives

Telco CMOs must leverage customer obsession and disruption to thrive in the Digital Age

2016 will be a critical year for telcos and service providers to improve their ability to serve digitally savvy, empowered customers. To thrive in the age of the customer, they must internalize the concept of customer obsession and accept that digital innovations have disrupted their business models and created customers who are not only empowered, but entitled. Current marketing organizations need restructuring to ensure that the marketing team possesses increased control and responsiveness in the face of growing customer expectations.

To respond relevantly in realtime, marketers in the telecom industry must transform batchoriented and channel-focused campaign management teams into nimble teams. These teams will effect the shift toward providing the right digital customer experiences to suit their customers' needs and expectations – especially in a world of proliferating touchpoints.

Digital imperative

In 2016, Forrester predicts that the digital command center will become an organizational imperative. A digital command center speeds up time-to-market, aligns with an overarching marketing objective, and realizes cost-efficiencies in the long term. Digital command centers also bring a level of institutional knowledge of the brand.

We define the digital command center as "an in-house marketing organizational construct that integrates various marketing capabilities under the same roof to drive customer obsession and turn marketing insights into action for growth."

The center can come in a range of designs: from pop-up centers at major events, to a permanent room that house a roster of staff - from product marketing, PR, content/ creative, media planning/buying, production, and so on. For an increasing number of CMOs in Asia Pacific, such a center delivers actionable insights to improve market research, better support customers, and drive sales. Digitally transformed organizations, or those that already have started their digital transformation, will benefit from such organizational imperatives as it allows for better cross-channel collaboration and extraction of actionable insights from data.

The command center is a long term complex endeavor for leading, digitally transformed (or transforming) organizations. But CMOs with a clear focus on what the digital command center can ultimately accomplish will help their firms surge ahead of the competition.

Specialists required

In additional to reorganizing the marketing structure, another challenge that CMOs in Asia Pacific face is the struggle to adopt new marketing technology tools and strategies to serve increasingly empowered customers. The complex marketing tech landscape is limiting CMO's ability to fully engage customers throughout their journey across a data-driven digital landscape. Forrester predicts that demand for marketing tech specialists (MTS) will increase in 2016.

Forrester defines an MTS as an experienced technologist who works in marketing and has the ability to lead technology, software development, and agile project management processes.

This new role has become necessary as organizations seek to better understand the customer lifecycle, and transform that knowledge into positive business outcomes instead of focusing on siloed marketing channels or traditional product approaches. While the role will remain poorly defined throughout 2016, we expect CMOs to start hiring staff that combines marketing technology expertise with business acumen, or to begin using an existing internal marketing resource.

CMOs must have a single skilled player on the marketing team, and place technology decisions about digital channels, data analytics, customer engagement management, content management, and digital asset management under that person. The MTS serves as the liaison with the tech management organization and ensures that it implements the marketing tech stack successfully and in a timely manner.

Forrester expects 2016 to be another year of rapid change as firms learn to cope and respond to empowered customers and agile competitors. Only with a marketing organization that is agile can CMOs ultimately help their firms to win, serve and retain customers.

- Clement Teo is senior analyst serving B2C marketing professionals at Forrester



Five ways to embrace digital disruption

Operators must develop the right capabilities to survive the disruptive storm and become a disruptive force unto themselves

We live in exciting times. Industries converge, agile startups with new digital business models disrupt incumbents, and machines become more complex and connected. Digital is changing the way we shop, consume content, learn, exercise, travel, pay, and work.

Accenture research indicates that over 50% of ASEAN consumers use expert or company sites to research their purchase decisions. In Malaysia, 60% of customers want more digital channels than currently available to interact with providers.

Operators also face their share of digital disruption from OTT players. More is likely to follow. We see operators face difficult decisions as they plan their way forward. The overall digital direction is often composed of numerous fragmented and siloed digital initiatives without clear ROI targets.

Operators cannot afford to sit back and wait. They must develop the right capabilities to survive the disruptive storm and become a disruptive force unto themselves.

Five "no regret" capabilities

Winners see the customer experience as a source for competitive advantage and are ready to reinvent their business as customer needs evolve. We believe there are five key capabilities operators need to build to prepare for disruption and even drive it.

Design delightful customer experiences. Success in the digital world requires operators to understand their customers, design unique and satisfying experiences for them, and integrate themselves into ecosystems that provide these broader experiences. For example, telecoms operator 3 created a tool enables users to visualize the charges in their bill - My 3 Service. This experiencedriven tool helped the company reduce contacts to customer support significantly, while opening a new channel to interact with customers.

Develop and launch new ideas faster. Operators should learn the principle of "failing fast": testing new innovations (whether a service or business model) at a rapid pace and making consequent decisions on scaling or discontinuation as rapidly. According to Forrester: "Innovators now bring 10x the ideas to market, at 1/10 the cost, resulting in 100x the innovation." This results from the digital nature of the 'new' disruption.

Recognize disruption early. The underlying principle in sensing disruption is continuity – this means operators must set up regular practices for understanding their entire ecosystem, not only their own industry and customers. They must have accurate understanding of the start-up scene, universities, and technology providers. In September 2015, Singtel announced a partnership with Orange, Deutsche Telekom, and Telefónica "to bridge start-up ecosystems across Southeast Asia, Africa, Europe, Latin America and the Middle East. The partnership aims at catalyzing the growth of eligible start-ups and launching them beyond their respective home markets."

Build and maintain a digitally savvy team. Executives must be honest with themselves, take a look in the mirror and ask: "Do my teams and I honestly understand digital?" Fortunately, there are many ways to increase organizational digital savviness – for example, assigning younger employees as digital mentors for senior management or by acquiring talent outside the company.

Partner with others to deliver differentiating digital propositions. Partnering is a fast track to boosting digital skills and capabilities - it requires an open mindset and the ability to identify potential partners, even unorthodox ones, before competitors do. For example, AT&T assertively expanded its Digital Life smart home offering by integrating new products and services, and is currently working with Lutron, Samsung, Qualcomm, and LG to deliver more. Others like Bharti Airtel in India, which launched dedicated WhatsApp plans for its 2G and 3G users, are increasing their partnerships with OTT providers and content providers.

- Luc Grimond is managing director, and Janne Pajuniemi is industry strategy manager for Accenture Singapore



Accelerating growth will alter the fintech picture

Digital finance will help shift the balance of power from banks to customers

Fintech is rocketing. With investments in the sector quadrupling from \$3 billion in 2013 to \$12 billion in 2014, all signs indicate this growth continued throughout 2015 and that growth is accelerating. As consumers we see some signs of this, but there is much more behind the scenes – things that will change the entire financial sector.

Digital finance services can be divided into 5 categories:

- 1. Online and mobile access
- 2. Mobile payments and money
- 3. Digital currencies and transactions
- 4. Digital finance infrastructure
- 5. Digital finance instruments.

The first one is the most traditional category: access to web banking services or online trading tools. We're still in waiting mode with mobile payments: Apple Pay is getting more users and players like Google and Samsung are becoming active. But



progress is slow and consumers ask: "why should I use my mobile for payments if I can use my contactless credit or debit card, which I need to carry anyway?"

Cryptocurrencies and financial infrastructure

Digital currencies, especially bitcoin, are receiving attention and also acceptance, as some regulators have begun to treat them as a commodity. But they are still new and not for mainstream users. Now there are signs the transaction and data model behind bitcoin, blockchain, is more important than bitcoin itself. Blockchain is not tied to bitcoin, so it (or similar models) could be used to record all kinds of digital ownerships and transactions. Its decentralized model can even challenge the role of banks in many financial services. And it can offer a new way to handle digital investing and lending services, as well as different kinds of digital agreement processing and deposit servicing.

Digital financial infrastructure includes many components and has the most impact on the entire financial sector value chain. This infrastructure includes online investing, equity crowd-funding, and P2P lending services. The SEC recently ruled that basically anyone can invest in equity crowdfunding in the US, while the UK is the fastest growing market in these services.

Digital back offices (with user

registrations and accounts) user background checks, payment solutions, and other needed components with open APIs make it easy to develop these kinds of services. Data aggregation and analytics services help investors and enable new value-added services. Wealth and portfolio management services bring a new service layer to their users.

Digital finance instruments

The last category: new varieties of digital finance instruments – for example, a fund type service where an investor can define how he or she wants to diversify their investments. The system can then take care of this and use market data analytics to make investment decisions, without management fees for fund managers.

When we put together, for example, a digital finance back office, blockchain, online investing and lending platforms, data service with portfolio management, we have all the basic components needed for a full set of digital banking services. They can be decentralized: no single bank or central database manages all this, but there's still a full set of services from different service providers the user can control to suit their needs.

This development is already underway, but due to regulation, legacy systems, high reliability requirements, and customer adaption, it will take years and arrive in stages. Digitalization is changing the finance sector fundamentally by making it more effective, transparent, and accessible to anyone.

- Jouko Ahvenainen is cofounder of Grow VC Group Full disclosure: He is also a founder, partner and board member in several digital finance companies

5

The year of industrial-strength IoT

Decentralization will bring benefits, but complexity will bring cybercrooks

The IT industry tends to overhype new developments. Within APAC, for example, muchhyped cloud computing has only been adopted to any significant degree in developed economies.

The last few years have seen much hype on the transformative potential of the IoT. But M2M technology and the use of IoT tech in the transportation and logistics sectors are nothing new. Radical transformation in the way we live and work driven by the IoT remains away.

In 2015, despite the hype, it remains difficult to find examples of end to end smart grids or smart cities which draw upon the promise of the IoT. There has been some interesting activity in the manufacturing sector, driven by non-IT companies. Bosch and Siemens in Germany and GE in the United States are currently making advances in creating intelligent and autonomous factories. But, most practical applications, in manufacturing, have, so far, related to predictive maintenance. In Asia Pacific, the world's largest manufacturing region, most manufacturers have yet to see the benefit of IoT technology.

Here are three key trends to watch for next year.

Cybersecurity

Cybersecurity will be of paramount concern to all involved in IT as cyber attackers become increasingly determined. For every publicized successful cyber attack, there are thousands of others that go unreported. Mobile devices and the IoT increase the number of attack vectors. The convergence



of operational technology with information technology enables successful attackers to wreak far greater havoc than before. Industrial control systems are now more vulnerable, and security must be the single most important consideration as these systems are developed or modified. In the past, security was considered a sort of insurance policy which was purchased after a system was deployed. In 2016, we will see security prioritized and built into the architecture of any new system before it is implemented.

Decentralized computing

The IoT will lead a shift towards decentralized computing. Early mainframe systems were centralized, then we moved towards decentralized PC systems. Now we're shifting towards centralized cloud-based systems, but the IoT will shift us to a more decentralized computing environment. More processing will take place locally 'at the edge' and P2P networks will be used so connected things can communicate directly rather than sending data to a centralized data center first. The ability of connected things to interact directly with each

other is critical to the development of the IoT. Centralized architectures will make IoT deployments inflexible and ultimately unsustainable.

Industrial IoT

The Industrial IoT (IIoT) encompasses some of the more immediate IoT opportunities. The IIoT includes industries that depend on physical, durable assets: manufacturing, healthcare, automotive, transportation and logistics. Examples: GE now uses Internet-enabled sensor technology for the predictive maintenance of jet engines, ThyssenKrupp uses the technology for predictive maintenance of elevators, and oil/ gas firms use sensor technology on wellheads for predictive maintenance. There's also a move towards providing industrial-centric cloud-based resources with industryspecific apps and data analytics. Despite early moves towards a decentralized model of computing, the cloud model will continue to mature and offer ever more industry-specific applications.

- Andrew Milroy is SVP of ICT for Frost & Sullivan, Asia Pacific



The death (and rebirth) of data privacy

The success or failure of Blackphone 2 may tell us just how much mobile users really care about data privacy - or how much they're willing to do about it

With the number and scale of data breaches skyrocketing, many users have security battle fatigue. And 2016 is ramping up for more privacy intrusion on mobile and desktop platforms, not less.

The weak link in the privacy chain nowadays is the device with our most personal data: our phone. Governments want to listen in, and claim national security as eminent domain over our handsets. What of corporate responsibility? In Bruce Schneier's Crypt-O-Gram newsletter, the security guru sums it up: "It's only when the costs of insecurity exceed the costs of doing it right that companies will invest properly in our security."

However, one firm committed to smartphone privacy is Switzerlandheadquartered Silent Circle. In November, they partnered with Hong Kong operator 1010 (CSL's business-focused brand) to sell their Blackphone 2 handset in the HKSAR.

The Blackphone 2 is no mass-

produced Android-powered device preloaded with bloatware. In June, the first iteration of the Blackphone was added to the permanent collection at the privately owned International Spy Museum in Washington DC, in the gallery labeled: "Weapons of Mass Disruption." The device was earlier inducted into the Victoria and Albert Museum in London, and named one of Time Magazine's best 25 inventions of 2014.

Like its predecessor, the Blackphone 2 uses a proprietary Silent OS operating system based on Google Android technology, and offers standard features like remote wipe. Less standard is their private communications app Silent Phone, which "offers encrypted and secure voice calling, conference calling, video conferencing, as well as secure text and file transfers."

"Calls and texts between Silent Phone users are encrypted end-to-end between your mobile devices, whether your partner



is using Android, iOS, or Silent OS on Blackphone," said Silent Circle in a statement. "Built-in 'Burn' functionality lets you set an auto-destruct time for your text messages, from one minute to up to three months."

Selling "peace-of-mind"

"We are confident the innovative Blackphone 2, packed with remarkable capabilities, will provide our customers with the ultimate mobile experience and peace-of-mind," said Bruce Lam, CMO of CSL Mobile, in a statement. Hype aside, the device is intended to thwart unwarranted snooping.

Hong Kong boasts one of the world's higher penetration rates for mobile devices, and competition for customers is cut-throat. Is the strategy more about offering a sexy new device? Will the Blackphone 2's vaunted encryption render it unusable north of the border? To what extent will it preserve our data privacy?

Of course, the greatest pointof-failure is the user. Encryption isn't of much use when you're blindly uploading a dozen images onto a social network at 3:00AM. But the Swiss firm is serious about giving users a shot at avoiding unwarranted interception of private communications.

Now you can stroll into a commercial shop in Hong Kong and buy a handset designed for data privacy. Perhaps 2016 will see a greater interest in mobile security after all. ●

- Stefan Hammond

DIVE INTO BIG DATA WITH AMDOCS

BECOMING A DATA-DRIVEN ORGANIZATION

The era of Big Data is upon us. While service providers are handling more data than ever before and many solutions claim to support "Big Data", service providers are now asking themselves how they should utilize all that stored information to improve business results.

The answer lies with utilizing data to deliver more personalized, contextual and timely customer experience. Communication services are becoming ubiquitous and service providers compete fiercely on delivering the best customer experience, while today's customers expect the level of experience they receive from Amazon, Facebook, Google, Uber and the like.

But the challenge isn't only the new technology. As Matthew Roberts, Head of Marketing for Amdocs Big Data and Strategic Initiatives explains: "80% of the effort required to distill business value from the data stored by service providers is spent on the 'boring' stuff – being able to extract the data from the multitude of source systems and efficiently channel it to a centralized repository. Then, once you get your hands on the data, you need to know what you are doing and what to look for – that's the hard work. You need to be able to place the data in the right business context in order to provide actionable insights."

"We find over and over again that fully automated algorithms are not very efficient in handling telecommunication data, so the experience of the analyst is instrumental for getting results that can actually assist in decision making, not just producing graphs and reports. This is why we base our analytics solutions on our Amdocs Insight Platform that leverages the telco-specific Amdocs Logical Data Model to easily integrate multiple data sources (Amdocs and third party) and reduce the complexity of the data while ensuring high data quality. This telco-specific approach proved to deliver faster time to market than any other solution." Mr. Roberts continued to provide examples of how Amdocs has helped service providers improve their business results with analytics: "Utilizing advanced analytics over multiple data sources, we can help service providers go beyond service delivery and actually understand at any given moment how each one of their customers – consumer and enterprise – experience their services. Other examples are solutions such as 'Next Best Network Investment' that enables network planners to optimize network investment according to the value and experience of the subscribers served by the network."

Another important aspect of analytics is the ability to process information in real time. For example, for successful proactive care solutions, you need to be able to identify customer issues in real time and proactively handle them. But the impact is prominent: 46% reduction of call center call volume for relevant use cases.

Mr. Roberts concluded with a recommendation to remember that analytics implementation should be handled as a long haul and not a sprint. It's better to start small and safe and gradually add more services, provided your infrastructure is scalable and capable of efficiently handling different types of data sources in one central view.

"Eventually," concludes Roberts, "we will see Big Data and analytics as an integral part of every aspect of the telecommunication business, just as we see it in other industries – travel, banking, insurance and retail – as the potential is simply huge."

For more information, please visit www.amdocs.com/BDA



IoT: even more disruptive than you think

Barry Lerner, Chief Information Officer for Huawei Southern Pacific Region, outlines the challenges and opportunities of IoT, who will adopt it first (and how), and what's in the pipeline for 2016

Vision 2016: How disruptive will IoT be, and in what ways?

Barry Lerner: The Internet of Things (IoT) will revolutionize the way we live, work and play. Fundamental to IoT is the collection and management of data from various devices and sensors that will offer new insights and change. For example: how cities are planned and managed, how public transport and emergency services are coordinated, buildings and the environment is managed, how we interact with our home environment, and generally how businesses operate - e.g. how goods are manufactured. IoT is a disruptive technology that will enable new business models and new value chains, forever changing the way we interact with the world around us.

Who are the early adopters of IoT, and what use cases are they implementing?

The early adopters of this new technology are governments, medium & large enterprises, and service providers. We are seeing the largest opportunities in developing nations. These nations view the implementation of IoT as a key differentiator, enabling them to leapfrog and build sustainable cities, provide economic value and increase the standard of living of their citizens.

The IoT offers enhanced technology capabilities in diverse industries. In the healthcare sector, it will bring new connected medical devices that support near real-time monitoring of patient health information. In the transportation industry, connected vehicles will communicate securely with each other and with the environment surrounding them, offering safer commutes. In the utility industry, energy distribution and consumption will be regulated with more efficient grids. In smart homes, IoT will enable home automation of home appliances, utilities management and homecare for elderly.

What are the key challenges in implementing IoT?

One of the major challenges in IoT is managing the vast amount of data that is generated and collected from millions and millions of smart devices and sensors. This data often needs to be shared with different organizations so data governance is a key issue as well as integration into legacy environments and systems.



Also with data comes the need to ensure privacy of citizen information; therefore, having a trusted design to achieve data anonymization is a critical success factor for IoT implementation. The need by manufacturers to create open standards-based sensors that any application or database can access is a key inhibitor to the success of IoT.

Additionally, with IoT comes the need to manage a massive number of connections with differing requirements – i.e. video surveillance, industrial control, smart metering, etc – mandating the need for networks to evolve to support machine-to-machine type traffic. Lastly, security will always be an issue with a need to be able to take proactive actions to mitigate any threats through a carefully constructed security architecture.

How does Huawei view IoT, and what are you investing in?

Huawei's key investments in IoT are in the areas of sensor OS, agile IoT gateway, 4G and 5G networking, IoT platform and selected smart-city applications such as safe city, building management, smart parking and traffic management.

For example, our "Safe City" solution applies a comprehensive public security video surveillance platform to video surveillance resources from public security departments and other sources. This solution provides real-time urban surveillance and surveillance video query services. Police "cyber pursuit" is facilitated using realtime, space-based surveillance services for accurate tracing and analysis in combating crimes and securing public environment.

Another example is our energyefficient building management solution (BEMS), which supports green buildings enabling improved management of environments – i.e. lighting, air conditioning, security etc – all through a cloud based IoT gateway.

Recently we announced the Agile IoT Architecture and shared a light open IoT operating system (LiteOS) with the industry. Huawei's R&D has emphasized its focus on software-defined ICT/converged IoT gateway with flexible networking such as PLC, ZigBee/RF, RS485, 3G/LTE, Ethernet, etc.

Huawei's has also developed a Hi-PLC meter reading solution, which features 10-Mbps bandwidth with a 98% success rate. This enables an advanced metering infrastructure solution for smart-grid VAS with open services, allowing easy integration of multiple services, such as billing, line loss and electricity stealing analysis, etc.

We're focused on building a universal and open platform for IoT data supporting independent software vendors in developing new service applications to rapidly respond to customer needs.

What specific developments will we see with IoT in 2016?

NB-IoT (Narrow Band Internet-of-Things), Huawei's LTE-M technology, has just been approved by the 3GPP for

Release 13. This new technology will provide improved indoor and outdoor coverage and will support a massive number of low throughput devices, low delay sensitivity, low power consumption and longer battery life. The technology can be deployed inband, utilizing resource blocks within a normal LTE carrier, or in the unused resource blocks within a LTE carrier's guard band, or standalone for deployments in dedicated spectrum. NB-IoT is also particularly suitable for the refarming of GSM channels to further address the promising IoT market. IoT manufacturers and service providers will embrace this technology for applications demanding those characteristics.

The industry is working continuously, seeking a more secure and resilient architecture for the management of IoT. OTT giants Apple and Google have already announced their IoT platforms: Apple HomeKit and Google Brillo. They have promised their IoT platforms will be fully integrated to their App Store and Play Store, respectively. We expect to see some new disruptive IoT developments in the consumer market with these OTT companies' IoT plans in the coming years. **14** Survey

Transformation rumbles on the 2016 horizon

Our fifth annual Business Outlook Survey reveals excitement over new growth via cloud, video, and the IoT, but also growing awareness that it's time to start thinking seriously about digital transformation

John C. Tanner

With 2015 just about wrapped up, Asia's telecoms players are already looking ahead to 2016 with vigor and enthusiasm. We know this because *Telecom Asia* has conducted its fifth annual Business Outlook Survey, in which we ask the region's telecoms players to tell us their hopes, dreams and expectations for the next 12 months. And the results reflect more enthusiasm and optimism than fear and uncertainty.

According to this year's survey – conducted online in October and November – most respondents are expecting healthy market growth and financial returns in 2016, driven primarily by sexy new services including cloud, video, digital content, and the Internet of Things.

They also told us that LTE is still the technology that matters the most, but that technologies related to cloud, big data, and OTT will also have a significant impact on their business.

On the business side, it's onwards and upwards for revenues, profits, and capex/opex, and steadyas-she-goes for headcounts and wages. Network upgrades will also figure heavily in business plans for 2016.

Meanwhile, most telcos will direct their strategic focus on new markets and cost reduction as they continue to hunt for new revenue streams and deal with pressures from non-traditional competition while meeting customer expectations. And there's also a noticeable and growing awareness that "digital transformation" is no longer a futuristic buzzword – it's a strategic necessity that telcos should start planning for now.

An optimism supreme

Almost everyone's excited about the future – at least for the next 12 months. We asked respondents how optimistic they were about the growth prospects of their specific telecom sector compared to this time last year: almost 40% said they were more optimistic than last year, with another 18% saying they were

What sectors of the business do you think will be the key drivers for growth? Figure 1

Less than 20% expressed less optimism compared to their expectations for 2015 (including just 4% of respondents who said they weren't optimistic in the slightest). Around 23% said their level of optimism isn't appreciatively different to a year ago.

"very optimistic."

Meanwhile, optimism for financial growth if their own companies was slightly subdued, but followed the same basic pattern. Close to 39% of respondents are more optimistic about their financial prospects than they were a year ago, with an additional 17% feeling even more optimistic. Interestingly, the level of pessimism over financial growth is less than responses about sector growth - less than 13% are less optimistic compared to last year, and only 2% are expecting a rough 2016 in this category. Over 29% don't expect their financial prospects in 2016 to be any better or worse than in 2015.

Cloud-driven growth

We asked which three business sectors will serve as key growth drivers for 2016. Our respondents told us 2016 is going to be all about cloud, mobile commerce and video.

Cloud services (including hosting, storage, and apps) received the most votes, with 57% of respondents selecting it as a prime growth area next year (see Figure 1).

Close behind - and tied for second place - were video services (which includes mobile TV, OTT streaming, multiscreen services, etc) and mobile commerce, both of which were selected by 53% of respondents.

We also had a tie for third place - 37% of respondents selected digital content services (excluding video) and IoT/M2M as heavy growth prospects for the business. Not far behind was good old value

IoT/M2M Cloud services (hosting,

storage, apps, etc)

Voice/HD voice & SMS

Enterprise (managed services)

Value-added services

Digital content services (excluding video)

Video services (mobile TV, OTT streaming, etc)

Which technology trends do you see having the greatest impact on your business in the next 12 months? Figure 2



Source: Telecom Asia





added services (VAS, 33%).

To no one's surprise, voice and SMS remain the least cited growth prospects – even when factoring in HD voice – with less than 13% of respondents expecting enough growth from the traditional cash cow to include it in their Top 3. That said, the result is slightly higher than last year, which could be for two reasons:

- 1. We combined traditional voice/ SMS and HD voice into one category this year (as opposed to separate categories in the previous survey).
- 2. Some operators are finding ways to make additional money from voice outside of the usual perminute model. Some wholesale carriers, for instance, are making money from voice-focused VAS services like fraud management and revenue assurance. VoLTErelated services for termination and roaming are also starting to pick up as VoLTE becomes more widespread, although an argument could be made that VoLTE counts as a data app instead of voice.

I want my LTE

We also asked respondents to name the top three technology trends that will have the greatest impact on their business in 2016 (see Figure 2).

As with previous surveys, LTE and LTE-Advanced are far and away the biggest technology trends (74%), as operators either move to LTE, continue deployments of LTE, or move on to LTE-Advanced. And that's to be expected as LTE/LTE-A is a foundational technology that enables many of the new services operators want to launch.

Cloud computing ranked second overall (selected by almost 50% of respondents), followed closely by big data (48%) and OTT/social media (44%).

Security (which covers mobile security and the general security/ privacy landscape) was selected by just under 30% of respondents, indicating they're either unconcerned with cyberthreats or feel they have it covered.

We included video as a tech trend for the first time this year, and only 17% of respondents put it in their Top 3. Given that over half of respondents expect video services to be a key growth driver, we'll assume the impact of video as a tech trend is because their networks are already engineered to deal with video traffic.

But network engineering plans don't yet include network virtualization. Less than 20% of respondents cited SDN/NFV as likely to have a big impact on their business next year, which likely reflects that many Asia-Pacific operators - especially in emerging markets - are still working out just what they're going to with SDN/ NFV, and where. A recent report from Technology Business Research says that over 50 operators are engaged in trials and controlled implementations of NFV and SDN, but a relatively small group of early-adopter operators will lead the charge on NFV and SDN adoption over the next couple of years – with the rest of the industry to follow suit in 2018, once NFV and SDN prove to reduce the cost of delivering network services in highvolume operator networks.

According to TBR, they'll also be implementing SDN and NFV in stages, focusing initially on domains that are relatively easy to convert, such as routing and switching, optical transport, EPC, and IMS. Some of the more challenging domains, such as service delivery platform and the radio access layer, will be among the last domains to be virtualized. Thus, SDN/NFV's low score in this category is likely a reflection of telco strategies involving early trials and phased adoption.

More money

We asked respondents what changes they're expecting in 2016 in terms of their business operations (sales, profits, capex/opex, headcount, wages, upgrades, etc).

Expected changes are mostly positive. Over 64% of respondents are expecting an increase in sales/ turnover in 2016. Almost as many are expecting an increase in earnings. Around half plan to increase capex/opex next year.

What's less likely to change is the number of employees - almost 63% said they expect no change in 2016. Only 19% expect to take on more employees. Luckily for the rank and file, less than 18% of respondents expect to cut jobs next vear.

More good news: less than 7% of respondents said they would be decreasing wages and salaries in 2016. Mind you, around 49% said wages and salaries would stay the same. On the other hand, over 44% expect an increase in this category.

Network upgrades will also be in vogue next year. Close to 69% of respondents said they would increase network upgrades, while 54% will conduct IT upgrades.

However, R&D spend will remain largely static for 62% of respondents, while 30% intend to increase their R&D budgets.

The customer remains king

We also asked companies to tell us about the top three external and internal issues they'll face in 2016.

For the most part, telecoms operators face external pressure from two main sources: nontraditional players and their own customers (see Figure 3).

"Rising customer expectations" was the category that most often made the top three rankings, though it typically ranked second or third. Considering that consumer expectations ranked comparatively lower last year, this year's results seem like a clear sign that customercentricity and customer experience will be serious pain points for telcos in the coming year.

That's even more true with respect to competition from nontraditional players, a category that raised relatively less concern in past surveys. Not anymore - this category topped the "external pressures" list more than any other, and outranked concerns of competition from other telcos, which usually ranked third in the rankings.

On the bright side, there's comparatively less concern over



Figure 5



What is your company's strategic focus in the next 12 months?

slowdowns in consumer demand. People want communications services – but the more choices they have for buying them, the more telcos must hustle to keep their existing customers and attract new ones.

Interestingly, government regulations made a relatively stronger showing this year compared to previous surveys – they were frequently cited as a number 2 issue. That may be a reflection of growing moves by regulators and governments to address issues such as data privacy, spectrum allocations, and possibly net neutrality.

Transformation time?

As for internal issues, by far the biggest one remains finding new revenue streams to compensate for falling voice and SMS revenues (*see Figure 4*). More respondents selected this category – and put it at the top of their list – than any other.

There's also growing recognition

that telcos are going to have to take the term "transformation" seriously, both in terms of infrastructure and organization. Almost half of respondents said they need to "restructure their back-office infrastructure to add flexibility to deliver a better customer experience," with half of that group ranking it second in their Top 3. Almost a third put it at the top of the list.

A similar number put "corporate restructuring for the Digital Economy" on their Top 3 list, though usually in third place. So while organizational transformation may not be a top priority for operators in 2016, there's awareness that it has to happen sooner or later. And as we'll see in a moment, corporate restructuring will be a strategic focus for many telcos next year.

Increasing network capex to keep up with demand was also a frequent response, usually in the top two slots. Of lesser concern was streamlining IT costs, attracting and retaining qualified employees, and increasing investments in big data, which doesn't reflect a lack of interest so much as a sense that they have these aspects under control to their satisfaction.

New horizons

Looking at where telcos will be strategically focused in the next 12 months, the strongest focus will be on expanding to new market segments and/or geographical markets. The vast majority of respondents put this in their Top 3, and most of them ranked it No. 1 (see Figure 5, above).

The next closest response: reducing costs, which was a strong number 2 for many respondents, followed by flexible service creation and strengthened brand campaigns. As mentioned above, corporate restructuring will also be a key strategic focus, at least for a third of respondents, although most of them ranked it second or third. Clearly, the priority in 2016 is finding new markets to crack.

Full speed ahead for SDN in 2016

Sunil Khandekar, founder and CEO of Nuage Networks, says that 2016 will be a big year for SDN as adoption barriers drop and more commercial deployments demonstrate real-world benefits

Vision 2016: How much traction will we see for SDN in the telecoms space in 2016?

Sunil Khandekar: Adoption of SDN will continue during 2016. We have seen a lot of traction this year with both traditional telcos and cloud service providers deploying our SDN technologies to broaden their service offerings. 2015 has been an important year for SDN – we've seen the market mature from being oriented toward the future to one that provides real value today. This will only accelerate in the year to come.

Where in the network will telco service providers likely implement SDN first?

One SDN use case is to augment existing IP-VPN services with a more dynamic SDN-based solution set. SDN also is being used as the agile networking fabric for NFV. With core network functions - think IMS, CDNs and mobile core EPC - SDN makes those functions more flexible in adjusting to user demand. In other cases, customer service network features like firewalls, intrusion detection and security appliances are being virtualized. SDN allows for the service-chaining of these features into the customer's VPN service. Both are exciting use cases for the technology. The automation and agility benefits are huge! Uptake will only increase.

What obstacles remain for SDN migration?

There are fewer and fewer, as we've addressed the most important technical issues. The protocol stack for SDN has consolidated around open standards such as OVSDB and MP-BGP, and we have seen the ecosystem for vendor interoperability mature. The same is true with legacy interworking – there is good support for including legacy, or bare metal, workloads into the SDN fabric. It just isn't an issue any longer.

Why are SDN overlays the future?

The simplest answer is choice. SDN breaks the cycle of single vendor solutions. Gone are the days of ripping and replacing perfectly adequate network hardware investments just because of a new network feature or protocol. SDN overlays also provide comprehensive, consistent security as micro-segmentation capabilities for application and workload isolation. Yet another benefit is support for namespaces isolation and for overlapping IP addressing allowing for multi-tenancy.

With SDN the network intelligence is separated from the network transport and deployed at the network edge, be that at the hypervisor in the data center or at the customer branch. This allows you to choose when and where you



based on capacity. The industry is already seeing the benefits of this choice with a number of white box and competitive hardware vendors that are more than happy to slot into the SDN ecosystem and benefit from solutions such as the Nuage Networks portfolio.

Data centers are playing an increasing role in planning network architectures. What are the benefits of an SDN solution that connects the datacenter and the WAN?

Data centers are where applications reside, and are primed to benefit from the agility and flexibility of SDN. Application users, on the other hand, are on the end of the WAN at remote business branch locations. To offer pure seamless networking between the application and the users, you need a single networking fabric – not network islands as it is today.

Our Virtualized Services Platform delivers on this premise. It's a single policy-based management framework that controls the connectivity from the application all the way to the branch regardless of the network transport or hardware vendor used. After all if you choose an SDN solution that addresses only applications or only addresses users, the other half of the problem still exists.

READERS' CHOICE & INNOVATION AWARDS 2015 telecomasia

Telecom Asia Readers' Choice & Innovation Awards 2015 Shortlist

1. LTE Innovation of the Year

• Allot Communications, Virtual traffic detection function for vEPC

- Ericsson, Networks Software 15B
- Huawei, 4.5G solution
- Nokia, LTE-based network in a box

• Qualcomm Snapdragon X12 and X5 LTE modems for automobiles

2. Small-cell Innovation of the Year

- Airvana, OneCell C-RAN Small Cell
- Ciena, 3905 Service Delivery Switch (SDS)
- Ericsson, License Assisted Access (LAA) small cells
- Huawei, LampSite + Service Anchor
- ZTE, Qcell solution

3. Cloud Innovation of the Year

- Ericsson, Ericsson Cloud System
- Huawei, FusionSphere
- IBM, Identity Mixer
- VMware, vSphere 6

4. SDN Innovation of the Year

• Brocade, SDN-enabled Smart Packet Brokering for Mobile Service Providers

- Huawei, Agile Network
- Nuage Networks, Virtualized Services Assurance Platform (VSAP)
- ZTE, iSDN solution

5. NFV Innovation of the Year

- Cisco, Virtual Packet Core (VPC)
- Genband, NFV portfolio
- Huawei, CloudEdge, CloudCore and Digital inCloud
- Mitel, mOne Convergence Platform (Virtualized IMS Core suite)
- VMware, vCloud for NFV

6. 5G Innovation of the Year

- Ericsson, Multipoint Connectivity with Distributed MIMO
- Huawei Technologies, 5G new air interface on sub-6GHz band
- Samsung and SK Telecom, 3D Beamforming in mm-wave frequency bands
- ZTE, Pre5G Massive MIMO base station

7. Fixed Broadband Innovation of the Year

- Adtran, 10G wavelength symmetric ITU/FSAN for NG-PON2 FTTP
- Cisco, cBR-8 Converged Broadband Router
- Huawei, Fiber to the Door (FTTD) solutions

8. Analytics Innovation of the Year

- Amdocs, New Big Data Actionable Analytics
- IBM, Watson Analytics
- Netscout, nGeniusONE Service Assurance platform
- SAP, hybris Marketing solution
- Tektronix Communications, TrueCall for VoLTE

9. CEM Innovation of the Year

- Amdocs CES 9.3
- NetCracker, Netcracker 10 Suite
- NICE Systems, Complaints Management Suite
- Nokia, CEM on Demand
- Polystar, Customer Insights solution

10. Network Optimization Innovation of the Year

- Amdocs, Centralized Management and Optimization Solution
- Astellia, Nova RAN Optimizer
- Cisco, WAN Automation Engine
- Ericsson, App Experience Optimization
- Gladiator Innovations, G-Station

11. Optical Network Innovation of the Year

- Infinera, Cloud Xpress metro optical platforms
- MRV Communications, dynamic wavelength routing for OptiDriver platform
- ZTE 100G OTN solution

12. OSS Innovation of the Year

- Cisco Systems, Network Services Orchestrator
- Comptel, Comptel Operational Intelligence Module (COIM)
- Ericsson Adaptive Inventory

13. BSS Innovation of the Year

- CSG International, CSG Ascendon Digital Services Platform
- Elitecore Technologies, Bill Shock Prevention and Real Time Credit Control
- ZTESoft, ZSmart API Management Solution

14. Data Center Innovation of the Year

- Brocade, SDN Controller
- Ciena, Waveserver Data Center Interconnect Platform
- Cisco, Virtual Managed Services Solution
- Huawei, Service Driven-Distributed Cloud Data Center (SD-DC2)

15. Test & Measurement Innovation of the Year

- Accedian Networks, SkyLIGHT VCX Virtualized Instrumentation
- Anite, Virtual Drive Testing Toolset
- Ixia, 25 Gigabit Ethernet Validation Solution
- Rodhe & Schwarz, 5G test solution for mmwave apps
- Viavi, TrueSpeed VNF

16. Telecoms Security Innovation of the Year

- F5 Networks, BIG-IP 12.0
- FireEye, Next-Generation Endpoint Threat Prevention Platform
- Gemalto, LinqUs On-Demand Connectivity solution

Gigamon, GigaSECURE Security Delivery
Platform

• Ixia, Application and Threat Intelligence for Visibility Architecture

17. Video Platform Innovation of the Year

- Envivio, Nuage virtualized cloud-based SaaS video solution
- Ericsson, cloud DVR solution
- Qwilt, Mobile Video Fabric
- Verimatrix, Verspective Intelligence Center
- ZTE, integrated CDN platform

18. Future TV Innovation of the Year

- Brightcove Video Cloud
- Ineoquest, Endpoint Analytics SDK
- Kaltura, open source video library for HLS (HTTP Live Streaming) playback on Android devices
- Ooyala, Ooyala IQ
- SPB TV, OTT TV platform featuring 4K encoding and "swipe" feature

19. IoT/M2M Innovation of the Year

- Cisco, Cisco IoT System
- Huawei Agile IoT Solution
- Intel, Intel IoT Platform
- Nokia, IoT connectivity solution for LTE core and radio networks
- Sequans Communications, Calliope LTE Platform

20. Wireless Network Project of the Year

- Cisco Systems and Telstra, Telstra Air
- Elitecore Technologies and Tata Tele Services, Mobile Data offload, Public Wi-Fi and event-based Wi- Fi services
- Ericsson and China Mobile Hong Kong, FDD/ TDD 3CC Carrier Aggregation in Live Converged LTE Network
- Huawei and China Mobile, Cloudified VoLTE Solution and Mobile Network Architecture
- Nokia Networks and StarHub, LTE-Advanced at 600Mbps using 4X4 MIMO technology

21. Fixed Broadband Project of the Year

- AIS and ZTE, AIS transformation to full-service operator
- Arris and SK Broadband Gigabit Broadband over Cable
- Huawei and HKT, world's first 10Gbps FTTH access



Featured Innovators: Readers' Choice & Innovation Awards 2015

LTE Innovation of the Year Nokia: LTE-based network-in-a-box (NIB)

Public safety networks will gradually evolve to LTE-based technology in the coming years. Such networks must offer higher resilience and service availability than traditional mobile networks, making the public safety market a key driver for LTE-based network-in-a-box (NIB) solutions. Commercial mobile operators can enhance services with NIB, for example by offering reliable services in remote locations. NIB for LTE includes the eNodeB and integrated EPC functions. Deployable NIB can provide communications in uninhabited areas without existing network coverage, while pre-installed NIB is an effective recovery solution for mitigating network failures. 3GPP will focus on public safety resilience and its Release 13 will specify isolated E-UTRAN operations for public safety.

ZTE + K Small-cell Innovation of the Year ZTE: Qcell solution

Researches show that 90% of data traffic occurs indoors, which means indoor coverage and deep convergence of macro/small cells in the LTE era are very important. But the traditional DAS (distributed antenna system) is suffering from lots of bottlenecks, such as complicated devices, difficult installation, unmatched output power, hard MIMO evolution, hard monitoring, etc. With high integration, high capacity, seamless coverage, rapid deployment, smooth evolution, manageability, and controllability, ZTE's Qcell digital indoor coverage solution helps operators quickly build integrated multi-mode (2G/3G/4G) indoor coverage networks with high performance and at low cost. This solution involves three parts: picoRRU, pBridge, and BBU. PicoRRU, currently the world's smallest multi-frequency and multi-mode RRU, uses standard Ethernet cables for networking and power supply. The BBU and pBridge are connected through optic fibers for resource sharing between multiple cells. In addition, the Qcell system shares a network management system with traditional macro base stations. This simplified network architecture not only lowers engineering complexity, and deployment and maintenance costs, but also reduces deployment time by 60%.

Cloud Innovation of the Year

VMware: vSphere 6

This is VMware's latest version of their virtualization software for the hybrid cloud, and foundation for the softwaredefined data center. It features more than 650 new features and innovations according to VMware. The objective of vSphere 6 is to provide customers with an available, resilient, on-demand cloud infrastructure to run, protect and manage any application. The solution offers new capabilities to address the needs of business-critical and cloud-native applications, and drive higher performance, scale and consolidation ratios. New capabilities and features include: broad application support, new long-distance live migration capabilities instant clone technology, 3D graphics for desktop virtualization, and virtual machine-awareness for third-parties.



nuagenetworks

SDN Innovation of the Year

Nuage Networks: Virtualized Services Assurance Platform (VSAP)

The Nuage Networks Virtualized Services Assurance Platform (VSAP) illuminates the connections between SDN overlays and the underlying physical IP network infrastructure. By providing this correlation, VSAP makes it possible for Enterprise IT to operationalize their highly

dynamic and heterogeneous virtual environments. Operational groups need better IT tools to understand the IP network that supports their workloads within and across their data centers. VSAP does exactly that. If a link goes down in the multi-vendor underlay network, VSAP alerts IT Operations. They will know precisely which customers, applications or virtual machines are affected, and can quickly take remedial action. Nuage Networks envisions a world in which IT and IP work in concert to propel businesses and elevate the cloud for their customers. A world where innovation isn't hampered by infrastructure, and where network resources are as effortlessly consumable as compute. The cloud has made us all promises, our mission is to help keep them.

NFV Innovation of the Year Cisco Systems: Virtual Packet Core (VPC) The VPC solution can enable operators to capture untapped revenue opportunities, particularly

in concert with the Internet of Everything (IoE) and M2M connections. Cisco's VPC takes the promise of NFV to reality for MNOs. With the ASR5000 packet core series, the VPC provides a

tool to create new revenue-generating services by accelerating the process of adding new enterprise and M2M customers, bringing new applications to market faster than ever. Features and benefits include field proven stability, easy transformation to virtualization, opex and capex benefits, service flexibility and integration, and scale for new applications.



5G Innovation of the Year

Huawei Technologies: 5G new air interface on sub-6GHz band

Huawei's "5G new air interface" features a set of 5G technologies which triple spectrum efficiency on the sub-6GHz band. These new technologies include SCMA (Sparse Code Multiple Access), F-OFDM (Filtered-Orthogonal Frequency Division Multiplexing), massive MIMO, polar

code (channel coding technology), and full duplex. This year, Huawei completed a large-scale field test together with NTT DoCoMo which demonstrated that these technologies can support up to 24 layers – the greatest number of layers achieved in the multiple-user massive MIMO scenario. The test also showed that SCMA can increase the number of uplink connections by 300%, compared against 4G/LTE with the same frequency resource.

Fixed Broadband Innovation of the Year

Adtran: 10G wavelength symmetric ITU/FSAN for NG-PON2 FTTP

Using the latest 10G wavelength symmetric ITU/FSAN standards-based technology, Adtran accelerates the delivery of NG-PON2 architecture by transforming the economic paradigm that typically relegates new technologies to niche services delivery due to higher cost-points. For service providers, this is the first time both existing residential FTTP customers and early business adopters of next-gen premium technology can be immediately supported on a single, common access architecture. Adtran traffic engineering studies show that NG-PON2 can double the life of a FTTP network used for converged 1G residential and business services, while providing an architecture that supports cost-effective 10G business and backhaul services delivery.

amdocs

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Analytics Innovation of the Year

Amdocs: New Big Data Actionable Analytics

Amdocs Big Data Analytics and Data Management offerings are designed for service providers' unique sources and business processes, enabling them to become more data-driven and derive maximum value from their data assets. Amdocs is the market leader in customer experience software solutions and services for the world's largest communications, entertainment and media service providers. Its portfolio powers "The New World of Customer Experience", where a wide array of innovative and personalized services are delivered seamlessly to end users, regardless of device or network. For more than 30 years, Amdocs solutions, which include BSS, OSS, network control and optimization, coupled with professional and managed services, have accelerated business value for its customers by streamlining complex operating environments, reducing costs and speeding time to market for new products and services. Amdocs and its more than 24,000 employees serve customers in over 90 countries. Listed on the NASDAQ Global Select Market, Amdocs had revenue of \$3.6 billion in fiscal 2015.



NetCracker: NetCracker 10 Suite

NetCracker 10 combines capabilities in virtualization, cloud-based delivery of applications, embedded analytics, and biometrics onto a unified platform. The aim is to redefine the economics of network deployment and management, IT operations, customer experience and service creation and delivery. With its single-platform approach across network, service and customer domains, NetCracker 10 enables communications service providers to migrate from existing environments to the next generation of virtualized networks and IT infrastructure. The capabilities incorporated into the NetCracker 10 suite have demonstrated financial and operational improvements including: up to 40% reduction in TCO, over 30% increase in infrastructure utilization, and up to 30% increase in net promoter score.

Network Optimization Innovation of the Year

Ericsson: App Experience Optimization

A new service which transforms how operators optimize their networks to meet the demands of an evolving app ecosystem. The service correlates the local app experience with network-related KPIs. Ericsson network design and optimization experts then optimize for app experience by drawing upon global experience, tools, and methods. In a recent project, Ericsson optimized XL Axiata's network for the Facebook app – making substantial, targeted improvements to XL Axiata's network. As a result, app experience improved by 20-70%. Time to content improved by up to 70%, while upload time improved by up to 50%. This shows it's possible to optimize app experience using existing network resources.

Optical Network Innovation of the Year

Infinera: Cloud Xpress metro optical platforms

The Infinera Cloud Xpress is a purpose-built, optimized platform family for point-topoint hyper-scale bandwidth interconnect application across regional, metro and campus environments including data centers. It combines Infinera "optical engines," which feature the industry's only large-scale Photonic Integrated Circuit (PIC) technology, with off-the-shelf silicon chips to deliver feature-specific and cost-optimized optical transport in a remarkably small footprint. Infinera provides Intelligent Transport Networks, enabling carriers, cloud operators, governments and enterprises to scale network bandwidth, accelerate service innovation and simplify optical network operations. Infinera's end-to-end packet-optical portfolio is designed for long-haul, subsea, datacenter interconnect and metro applications. Infinera's unique large-scale photonic integrated circuits enable innovative optical networking solutions for the most demanding networks.

OSS Innovation of the Year

what THE NETWORK will be

Comptel: Comptel Operational Intelligence Module

The Comptel Operational Intelligence Module (COIM) performs service monitoring in real time, and detects deviations in usage data processed by Comptel's EventLink platform. With automatic triggering of early warnings, operators can respond quickly to anomalies, identify root causes, and protect their revenues – as well as better understand network and service behavior to effectively plan for future usage. COIM is the result of closely linking analytics, prediction and machine learning capabilities with data collection, processing and refinement capabilities. Key benefits include: faster access to "sleeping revenue," operational efficiency through automation, real-time view of different business streams, and the ability to detect anomalies at an early stage.

The Four 'Must-haves' that Transform CSPs into DSPs

The race is on to capture wallet share for digital services and content like movies, music and games. For entrepreneurial Communications Services Providers (CSPs) entering the contest to become Digital Service Providers (DSPs), CSG recommends they consider mastering four key areas to advance successfully.

Must Have 1: A ubiquitous consumer experience

It sounds like a basic concept, but presenting your content and services in the best way on every device is critical to a compelling customer experience. "Best" is not only personalized, but ubiquitous across devices, which means when a consumer buys a piece of content, they can consume it across tablets, smartphones, gaming consoles and their TV; if you limit content to one platform, you've lost the consumer. Taking it further, and pairing your portable content with the important profile attributes of each consumer like security credentials, preferences, entitlements, devices and preferred ways to pay, creates a smooth and easy experience that will keep consumers coming back over time.

Must Have 2: Efficiency and agility

We hear from many aspiring DSPs that they want to deliver a more compelling experience, but not at the risk of disrupting existing business with large-scale systems transformation, or spending months delivering the products and services consumers want to have right now.

Agility is the key must-have factor here – one of the characteristics of a 'true' DSP is the ability to quickly bring numerous offers to market and then either enhance them to maintain their success or let them die away having 'failed fast'. The more agile the organization, the better it can experiment to find that success. To many, the pursuit of agility has led to the utilization of cloud based service – both technical and functional. Operating in the cloud, embracing the right capabilities to complement or overlay in-house functionality, enables quick changes and rapid time to market for new offerings – without investment in new infrastructure.

Must Have 3: A strategy to minimize risk

Any business transition has risks, and transitioning to a DSP is no exception. Emergent DSPs need to do all they can to reduce the risk while maintaining that all-important agility.

One way to reduce uncertainty is to focus the company resources on the core value proposition, whether this be building relationships with partners or driving market take-up through creative bundling and packaging. The flip-side is to minimize the amount of change in other areas – such as the organisation structure or underlying technology. This might sound a little counterintuitive, given the massive change inherent for many businesses in becoming a DSP, but it can be possible. For example, leave the existing technology in place, and overlay the must-have systems and platforms that are needed to enable change.

Must Have 4: A path to profitability

No matter how much an organization wants to become a DSP, they still need to make money. Whether a consumer pays – via credit card, on a bill, from their e-wallet, using coupons or gift cards – or whether the digital service is subsidized in some way (by advertising for example), the business model has to stack up.

A repeatable, easy experience which ensures consumers come back to make further purchases is a critical piece of the monetization picture. Creating loyalty programs, digital lockers, and personalized communication based on preferences helps keep customers engaged, even when on the go.

No matter where the journey starts, the path to becoming a digital service provider requires mastery of these four fundamentals. By using technology as the enabler, aspiring DSPs can free their imagination, innovation and inspiration to create the best digital services to meet the needs of the always-on consumer.

INTERNATIONAL For more information, please visit http://info.csgi.com/csp2dsp

BSS Innovation of the Year

CSG International: CSG Ascendon Digital Services Platform

CSG Systems International, Inc is a market-leading business management solutions and services company serving market leaders across Asia including Telstra, Singtel Optus, Bharti

Airtel, Reliance Communications, Hutchison 3 Indonesia, Indosat, DST and Chorus NZ and globally with AT&T, Charter Communications, Comcast, DISH, Orange, T-Mobile, Telefonica, Time Warner Cable, Vodafone, Vivo and Verizon. CSG's portfolio includes CSG Ascendon, a cloud-based digital commerce platform that allows service providers to quickly create, launch, and monetize compelling offers of video, content, and data across users, channels and devices. Ascendon integrates the full scope of business operations – from product creation and sales offer, to order and activation, to revenue management and partner settlement. Ascendon is offered through flexible delivery models, including cloud and managed services.

Data Center Innovation of the Year

Ciena, Waveserver Data Center Interconnect Platform

Ciena's Waveserver Data Center Interconnect Platform integrates optical networking with a web-scale IT toolset to tackle scalability and automation challenges in metro data center interconnect (DCI). It leverages open interfaces for integration with existing software tools, and provides high-speed connectivity over any fiber in the metro. The unit provides two wavelengths of 200 Gbps using 16QAM modulation – equal to 400 Gbps of total wavelength capacity – and can scale to 25 Tbps per fiber. It's the first DCI platform featuring open APIs and a virtual emulation and testing environment. The unit can be controlled by custom-built apps such as apps for enhanced shelf visualization, fault/ capacity issue notification, or detailed performance monitoring.

Test & Measurement Innovation of the Year Viavi: TrueSpeed VNF

JDSU is now Viavi Solutions. Viavi's TrueSpeed VNF provides network operators and enterprise users with a repeatable, standards-based test methodology to resolve complaints about poor network performance faster than ever before. With TrueSpeed VNF, operators can leverage their installed base of commercial-off-the shelf (COTS) server resources to quickly evaluate the customer experience of their network and provide actionable information to resolve any problems. Based on the IETF RFC 6349 TCP throughput testing methodology, TrueSpeed VNF performance tests serve as a neutral 3rd-party evaluation of network quality. Operating as a VNF in conjunction with VMware hypervisors, Red Hat Linux, and x86 compute resources, TrueSpeed VNF deploys quickly and tests reliably in all parts of an operator or enterprise network.



Telecoms Security Innovation of the Year

Gigamon: GigaSECURE Security Delivery Platform

Gigamon provides active visibility into physical and virtual network traffic, enabling stronger security and superior performance. Gigamon's GigaSECURE is the industry's first Security Delivery Platform to provide pervasive visibility of network traffic, users,

applications and suspicious activity, and deliver it to multiple security devices simultaneously without impacting network availability. GigaSECURE incorporates scalable hardware and software – it improves effectiveness of third party security appliances, while reducing the cost and complexity of security infrastructure. The subscriber-aware security solution offers multiple benefits to service providers. It enables deep inspection of subscribers and content; assigns dedicated security treatments to different subscriber or device groups; and focuses costly security resources where they are most needed. Its efficient remediation treatments include the blocking of malicious traffic, and blocking malicious subscribers or devices.



How subscriber level intelligence can secure networks

By Andy Huckridge, Director of Service Provider Solutions, Gigamon

The telecommunications market has changed dramatically in recent years. A decade ago most subscribers used a mobile device for making calls and SMS: today they expect to browse the web, use applications and check emails – all while using SMS and phone services.

The huge volumes of data crossing service provider networks and swamping an already complex environment present huge security and business challenges. Already facing high levels of churn, operators have to keep Quality of Service (QoS) high and introduce new services such as VoWiFi and VoLTE to differentiate themselves.

Clearly a transformation is required. 100Gb pipes are difficult to monitor as no analytic tools can connect directly, while VoLTE is a complex and hugely sensitive real time service that requires high levels of visibility to keep it functioning.

Virtualisation technologies – Software-Defined Networking (SDN) and Network Functions Virtualisation (NFV) – are increasingly attractive propositions, yet they add layers of network abstraction, decreasing visibility into traffic crossing the physical layer.

There is an urgent need for real-time visibility into the entire environment, to identify and remove threats quickly and as seamlessly.

Visibility and the subscriber

Without true visibility, packets will be dropped and blind spots occur, making it easier for cyber-criminals to access and remain on the network. Using a Security Delivery Platform to access the network at various points can achieve pervasive visibility across the network, so that detecting fraud, malware and data exfiltration in real-time becomes a better prospect.

To ensure accurate, cost-effective analytics, service providers need two critical components: the ability to correlate traffic flows to subscriber(s); and visibility across their mobile networks. They must analyse data streams quickly to allow them to detect and prevent criminal activity. Real-time analysis of packets is essential. Existing tools need a Security Delivery Platform to feed them intelligently with the specific data packets and streams they need. GPRS Tunnelling Protocol (GTP) is often used to carry mobile data across networks , but each separate analytic tool hides its insight from the others.

Subscriber-aware security

Visibility into a subscriber's activity needs to understand the stateful nature of GTP traffic and correlate subscriber-specific sessions to gain an accurate view of the subscriber's activities. Only then can traffic intelligently sorted to optimise flows based on what the tools need to see.

From there, tools designed to identify suspicious activity can work without having to sift through petabytes of irrelevant data. Combined with the GTP Correlation capability in Gigamon's GigaSECURE Security Delivery Platform, mobile carriers can create custom whitelists of specific subscribers using their International Mobile Subscriber Identity.

GigaSECURE provides pervasive visibility of network traffic, users, applications and suspicious activity, and delivers it to multiple security devices simultaneously without impacting network availability. As a result, third party security appliances are more effective at protection and remediation, reducing cost and complexity.

Gigamon's subscriber-aware security solution offers multiple benefits to service providers. The technology enables deep inspection of subscribers and content; assigns dedicated security treatments to different subscriber or device groups; and focuses costly security resources where they are most needed. Its efficient remediation treatments including the blocking of malicious traffic, and blocking malicious subscribers or devices.

For more information, please visit www.gigamon.com

Video Platform Innovation of the Year

Verimatrix: Verspective Intelligence Center

This platform is a cloud-based engine for system deployment, management, monitoring, and analytics to optimize performance and reduce opex. Next-gen video service providers can use a broader range of resources to more optimally manage the system and identify potential threats. Service providers see the benefits of software-centric security architectures in a multi-network, multi-device, multi-DRM environment. The Verspective interconnects otherwise isolated operator security instances and capitalizes on global management of a highly distributed world of connected devices. As IP-based technologies continue to transform the delivery of video, the capacity of Verspective to gather and analyze big data on system performance and potential threats will exponentially expand.

Future TV Innovation of the Year

Brightcove: Brightcove Video Cloud

Brightcove Video Cloud has been re-architected to simplify next-gen online video distribution and publishing. The platform now incorporates a new HTML5 user interface, faster upload and playback, mobile publishing, and new custom analytics to scale workflows, speed time-to-live, and measure the impact of video content. Organizations can expand audience reach, propagate their brand, and engage audiences across devices and platforms. Brightcove Video Cloud is engineered to simplify the complexities of publishing video across devices and destinations. New features include: faster time-to-live, mobile publishing, advanced video analytics, industry-leading playback, social publishing, connections to leading content management systems and platform APIs.

IoT/M2M Solution Innovation of the Year

Intel: Intel IoT Platform

Intel's IoT platform provides a foundation for connecting devices, delivering data to the cloud, and delivering value through analytics. It increases the viability of IoT so that its full promise can be realized worldwide. Key benefits:

- Security: Deliver trusted data with a tight integration of hardware- and software-based security that starts where data is most resilient to attack.
- Interoperability: Utilize technologies that help accelerate time-to-market and reduce the cost of deploying and maintaining IoT solutions.
- Scalability: Achieve scalable compute from edge to cloud with Intel-based devices, gateways, and data center solutions.
- Manageability: Get advanced data management and analytics from sensor to data center.

ZTE small cell solution enhances indoor and outdoor 4G coverage

With rapidly increasing mobile internet usage, telecommunications operators need to constantly evolve their networks to offer higher capacity and deliver a superior experience.

Compact small cell solutions are key to the construction of high-quality 4G networks, as they offer good user coverage, and are easy to operate and maintain, generating cost saving for operators. ZTE's small cell-based coverage enhancement solution provides a complete set of small cell products that allow effective coordination with macro-cells through the hotspot location tool. ZTE's small cell products effectively address problems such as difficult site construction, dense hotspot deployment, and poor indoor coverage, helping telecom operators optimize indoor and outdoor network coverage in urban areas.

ZTE's new digital indoor Qcell solution uses the multi-frequency and multi-mode pico RRU, enabling the highest level of integration in the industry. Qcell replaces feeder lines with traditional network cables for data transmission and Power over Ethernet (PoE), supporting a maximum data rate of 2.5 Gbps per single cable, greatly enhancing indoor network coverage and shortening the network deployment period. By allowing third-party signal sources to access the network through the Media Access Unit (MAU), Qcell delivers powerful hardware performance and features flexible network architectures to meet operators' demand for network sharing capability while protecting their existing investments.

Poor network coverage in urban and suburban areas and on islands negatively affects the user experience. The construction of network sites and backhaul networks in these areas is therefore an urgent challenge for operators. As an important part of the ZTE small cell-based coverage enhancement solution, the Smart Relay solution makes use of the macro radio resources as the backhaul channel, with no need for network upgrade. It is the only solution in the industry that provides a multi-level QoS mechanism to enhance network coverage at low cost and with high quality.

Better yet, ZTE continues to improve the small cell solution by introducing License-Assisted Access, LTE/WLAN Aggregation, Ultra-Dense Network and other key technologies, to help telecom operators deliver super-fast network access, LTE/WiFi network convergence and network capacity expansion.

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For more information, please visit www.zte.com.cn

Accedian Networks

SkyLIGHT VCX Virtualized Instrumentation: Accedian's SkyLIGHT VCX Virtualized Instrumentation is the first fully virtualized, real-time performance monitoring solution that provides uniform QoS and QoE visibility over multi-vendor networks. Accedian's SkyLIGHT Performance Platform and Nano smart SFP modules deliver the capabilities to maximize performance across the network, using centralized, industry standards-based monitoring to achieve real-time virtualized control.

Elitecore Technologies

Bill Shock Prevention and Real Time Credit Control: Elitecore's Real Time Credit Control enables personalized offerings that ensure network utilization and increased ARPU by enhancing the customer experience. Crestel Online Charging System (OCS) empowers subscribers keep track of their account, services and usage in real time, with support for dynamic notifications to customers prior to reaching their credit limit thresholds.

F5 Networks

BIG-IP 12.0: BIG-IP version 12.0 takes advantage of F5's application delivery services fabric, extending the F5 Synthesis model by combining physical and virtual resources to better support cloud and hybrid scenarios. This approach allows customers to more easily transition workloads to cloud environments as needed and incorporate technologies like HTTP/2, while maintaining the same visibility, security, and control of traditional infrastructures.

Huawei Technologies

Fiber to the Door (FTTD) solution: Huawei's FTTD solution reuses existing copper infrastructure while boosting its capability to provide high speed broadband with minimal capex and opex. Through VDSL2 vectoring, broadband speeds up to 100 Mbps can be delivered, while G.Fast can deliver up to 1 Gbps. Huawei's FTTD solution is the first in industry to be able to achieve 1 Gbps through copper with the largest equipment capacity.

Mitel

mOne Convergence Platform (Virtualized IMS Core suite): Mitel's software-only solutions have been designed from the beginning for a virtual environment, rather than simply ported over from purpose-built legacy hardware. As a result, the breadth of carrier grade software-only solutions supported provides tremendous flexibility and operational assurance to operators trying to smoothly integrate and migrate legacy infrastructure towards virtualized architectures.

Netscout

nGeniusONE Service Assurance platform: The nGeniusONE Service Assurance platform and Adaptive Service Intelligence (ASI) technology provide a carrier grade, highly scalable, distributed service assurance solution that takes a holistic approach to monitoring service delivery. The solution provides multi-dimensional customer experience metrics, and simplifies complex IP networks into a series of services upon which Netscout run real-time analytics.

Ooyala

Ooyala IQ: Ooyala IQ is the first analytics platform to provide a 360-degree view of video performance and audience behavior, including multi-dimensional filtering by device, operating system, browser, location, player or traffic source, all processed in milliseconds and provided in one view. Ooyala's analytics engine maximizes video monetization across all screens through real-time, actionable insights that help providers better understand and target audiences, based on actual usage patterns.

SAP

hybris Marketing solution: SAP's hybris Marketing solution unifies customer data into one centralized hub, using real-time contextual data to continuously update a 360-degree dynamic profile of both identified customers and prospective customers, spanning current, past and even future activities. Adding telco industry functionality to the solution sets a new standard for telco marketers.

ZTE

Integrated CDN platform: ZTE's iCDN video platform accelerates content distribution via innovative features include OTT multicast/unicast, integrated cache, and video acceleration. Together with PCRF and PCEF network elements, the solution can provide each CP with QoS differentiated intelligent pipeline services. In addition, the iCDN enables operators to lease services for contracted CPs, including CDN bandwidth, traffic, concurrency, storage resources, and intelligent pipelines to realize traffic operation.

Empowering our customers to become VISIONARIES

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