

Next generation networks **in the era of customer centricity**

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Featured Contributors

During the research undertaken to produce this eBook, various industry experts were interviewed for their insights. Here are our featured participants:



Nuno Sousa	Group Director Digital Integration, Veon
Eric Kuisch	Chief Technology Officer, Vodafone
Konstantinos Chalkiotis	Vice President Access and Home Networks, Deutsche Telekom
Lucy Lombardi	Senior Vice President, Digital & Ecosystem Innovation, TIM
Bernd Meurer	Chief Technology Officer, BT Group
Stefan Metzger	Head of Smart City, Swisscom
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Bill Barnett	Vice President of Assets and Network Performance, Crown Castle
David Dudsak	Vice President Network Operations Service Assurance and Support, TDS Telecom
Peter Batty	Chief Technical Officer, IQGeo

See page 15 - 17 to read our contributors' biographies.

Introduction



The telecommunications industry is undergoing a major digital transformation. From modernizing their products and services to transforming their networks and infrastructure, the major driver is to provide new and higher quality services in an extremely competitive landscape.

Today more than ever, market changes are being driven by customer demands and expectations. But here's where things get interesting. When we look across the telecoms industry, we see that customer loyalty for network providers is poor. We also notice that customers are often unhappy with the level of service they receive. In a world where so many businesses are fighting for the same customers, offering a memorable, seamless and enjoyable experience is the best way for an organization to differentiate themselves from their rivals.

This requires businesses to stop thinking of their clients and consumers as people they can sell to. Instead, they need to start thinking of them as partners in the business because they play such a pivotal role in the organization's success. "We see our customers as invited guests to a party, and we are the hosts," **Jeff Bezos, American technology tycoon and the founder of Amazon.com**, once said. "It's our job, every day, to make every important aspect of the customer experience a little bit better."

In line with Bezos' sentiment, research conducted by Harvard Business Review – sponsored by SAS, Intel and Accenture – reveals that modern customers expect frictionless, immediate and personalized interactions. The study also highlights that if businesses want to differentiate themselves, they must offer timely, targeted and carefully tailored customer experiences during each and every interaction with their customers.

IQGeo recently partnered with [TechPros.io](#) to find out how network providers are navigating their digital transformation in this increasingly customer-centric business landscape. Conducting interviews with CDOs, CIOs and CTOs at some of the top telecoms firms across North America and Europe, we were keen to discover how they were meeting their business objectives, embracing market disruptions and managing operational challenges in highly competitive industry.

Here's what they had to say.

Chapter 1:

Meeting business objectives

Customer focused KPIs that drive the business digital transformation success?



Businesses are shifting their focus away from internal drivers and towards understanding what's driving customer behavior. This isn't because they're nice or altruistic, it's because they acknowledge that if they don't meet their customers' expectations, one of their competitors will.

To guarantee that there is some sort of accountability around keeping customers happy, these firms are commonly including customer satisfaction scores as part of their broader KPIs. This focus on customer-centricity shouldn't only apply to customer-facing staff. Everyone, across the entire business, must understand the value of delivering engaging high-quality services to customers. It can be as simple as an online interaction or the resolution of a complaint when a problem occurs. Every customer interaction is an opportunity to build loyalty and strengthen the business.

But outlining key KPIs is only the first step. As Henry Ford, American Industrialist, business magnate and Founder of the Ford Motor Company, once said: "You can't build a reputation on what you are going to do." Ford was also famous for saying: "Vision without execution is just hallucination." Having plans in place is one thing, actioning those plans is another.

Here's how some of our survey participants are directing their energy in an effort to boost customer satisfaction.

We are incredibly product-driven and highly skilled at technology but we are realising that this is no longer enough, explains **Lucy Lombardi, SVP for Digital and Ecosystem Innovation at TIM**. As such, we are increasingly realizing the importance of changing our perspective and listen to the needs of our customers and developing the technology accordingly. "Customers are our centre."

"Customers are our centre."

Lucy Lombardi, SVP for Digital and Ecosystem Innovation at TIM

As part of this change, the TIM team want to provide customer interfaces that leverage digital tools, offer better services and earn customer loyalty. "You can have all the tools, but if we don't engage and listen to customer feedback, the circle is incomplete," Lombardi adds.

Customer focused KPIs that drive the business digital transformation success?



According to **Bernd Meurer, BT Group CTO**, the telecoms industry can learn a lot from a business like Amazon. Not only are they servicing business customers but they're also working with consumer customers. Brands like Amazon offer their customers a single pane of glass where all services, issues and bills can be viewed. When customer interfaces are digital, users can control their everything online and make changes as they go along. With this interoperability in mind, APIs are a focus across the entire telecoms industry, Meurer points out.

Beyond offering customers a single view of all products and services, **David Dudsak, VP of Network Operations Service Assurance and Support at TDS Telecom**, believes that geospatial solutions help them to serve their customers better. Particularly when broadening their fiber optic networks. The more we expand our network and leverage fiber capabilities, the more we rely on various geospatial solutions. These provide the correct address information, demographics and accurate distance measurements so that we can better service areas that have traditionally been served by copper spans.

And let's not forget how the increased distribution of the internet of things (IoT) is changing the game, notes Lombardi. Especially when it comes to data. The amount of data that will need to be transferred, stored and made available is significant. But data by itself does not necessarily provide the insights you need to improve your business. Only once it is properly analysed, can it provide very valuable insights, she asserts. More about this later.

According to **Fred Lutz, SVP at Wave Broadband**, the benefits of innovation may appear obvious but it remains important to be mindful about capital deployment. "We spent a lot of money to put our network in the ground. The marketplace wasn't all that competitive 20 years ago. Fast forward to today, 5G and wireless technologies are highly competitive, though not as scalable, but certainly impactful in the highly dense metropolitan markets." From a customer experience perspective, providing high performance next-generation networks is vital, adds Lutz. As long as people are dependent on Internet connectivity, mitigating and responding to network operation issues will be the cornerstone of customer experience.

"We spent a lot of money to put our network in the ground. The marketplace wasn't all that competitive 20 years ago. Fast forward to today, 5G and wireless technologies are highly competitive, though not as scalable, but certainly impactful in the highly dense metropolitan markets."

Fred Lutz, SVP at Wave Broadband

"All the companies out there have access to the same equipment, cables, and infrastructure capability," says Dudsak. "Customer service experience will always be the most important differentiator."

Customer focused KPIs that drive the business digital transformation success?

"What really strikes us, and what strikes our customers, are the endless possibilities that we have," adds Meurer. Once we have installed some basic infrastructure and that is connected, the platform is then fully software-driven. Basically, this means that you can rollout functionality, within minutes, for every customer and for every geography. This is so exciting because the lead time for products is shortened and there is more of an incremental approach to improving functionality. "Now, we can continuously add micro functionality to our customers' systems, which will make a huge difference. We can do that immediately over the network. And you can do it globally – for all countries, regions and languages."

In Summary:

Customer-centricity is about looking outwards, not in. You can have the best team and the latest technologies but if you don't understand what your customers want and need, chances are that you'll miss the mark. If the survey participants are to be believed, they want a single view of all of the products and services they are using, they want interoperability and improved functionality. And all of this should be delivered via a real-time connection.

Finding the right team

Next generation networks may be exciting, but only when you have the right people in place to make the most of them.

Finding staff with the required skills is a must to ensure that new technologies and networks are deployed correctly.

"This is the most challenging part," according to **Konstantinos Chalkiotis, Deutsche Telekom's VP for Access and Home Networks**. It's not actually about the technology, it's about finding people with the knowledge and the right mindset. Sure, training does help but things don't just happen overnight. You can't simply press a button and the right people, with the right mindset will magically appear, jokes Chalkiotis. We also must acknowledge that people who have worked in a specific way for years, and who have worked on specific systems for years, will need some extra time to wrap their heads around the system updates and modifications you plan to do.

In line with this, **Bill Barnett, VP of Assets and Network Performance at Crown Castle**, worries about how telecoms businesses plan to maintain their new, extensive infrastructure.

It may be relatively easy to build the infrastructure but most carriers cannot afford to hire a large enough maintenance force to address all of the issues that come up. In addition to this, as technologies change, telecoms operators will need to deploy different types of skilled workers or technicians, with a unique blend of technology expertise, to handle problems when they arise.

Chapter 2: Making the most of market disruption

5G, IoT and the demand for a real-time asset visibility



In addition to describing his customers as guests at a party, Jeff Bezos also made the following comment about customer experience: "If you make customers unhappy in the physical world, they might each tell six friends. If you make customers unhappy on the Internet, they can each tell 6 000 friends".

While telecoms businesses may be rather different from Jeff Bezos' Amazon, the same customer satisfaction principles apply. These telecoms firms often feel the wrath of frustrated customers when they are not getting the service they expect. This is because no one likes to have their connectivity interrupted. However, we would argue that disruptions can, in some instances, yield good results.

Many businesses see technology disruption as a negative thing, but in our new customer-centric world it should be embraced as an opportunity to meet and exceed customer expectations. Market disruptors like 5G and the Internet of Things (IoT) provide the potential to offer amazing new services that will transform our communities and the lives of their customers. There's no denying that these innovations will be very disruptive to telecoms industry operations, but those who hesitate to embrace these next generation technologies will, inevitably, fall behind.

As network providers come to realise that these digital disruptors demand new strategies, they will have to reimagine legacy infrastructure and technology. Their network assets are becoming more and more distributed and are being pushed further to the edge of the network where real-time asset visibility is mission critical.

Earlier this year, **Peter Batty, IQGeo CTO**, noted that modern telecommunications and utility companies have to manage extremely complex network environments. They have millions of assets, across miles of networks, with hundreds of field service professionals constantly maintaining equipment and expanding infrastructure. Innovations like 5G, machine learning, artificial intelligence (AI) and Internet of Things (IOT) may be disrupting markets and opening up a world of opportunity.

Describing 5G as "interesting", **Fred Lutz, SVP at Wave Broadband**, notes that putting networks in the ground will prove capital intensive for terrestrial broadband companies. These service providers need to get licenses and sign access agreements before they can build their network connectivity.

5G, IoT and the demand for a real-time asset visibility

Securing deals with real estate companies, buildings and municipalities that have the infrastructure capabilities is not the issue. Coming up with the capital to fund expansion is where the competitive threat lies.

"2019 is the year of 5G deployment," states **TIM's SVP for Digital and Ecosystem Innovation, Lucy Lombardi**. While she cannot disclose too much as it is a competitive issue, she reveals that various telecoms operators are making big investments in 5G licenses. "We foresee very tight competition within the 5G space during 2019."

"2019 is the year of 5G deployment. We foresee very tight competition within the 5G space during 2019."

Lucy Lombardi, SVP for Digital and Ecosystem Innovation at TIM

Nuno Sousa, Veon's Group Director for Digital Integration, shares this sentiment, stressing that the biggest challenges relating to 5G will be cost related. "To leverage a proper 5G network, you will need to have an aggressive strategy. You will need to go to areas that you have never been to before. You must understand all the different aspects of the different ecosystems. Truly, the numbers are insane." And let's not forget that there is an expectation across the market that everyone will have 5G everywhere. "But I don't believe that we will get anywhere even close to that for a very long time." In fact, Sousa explains that embracing market disruption goes beyond 5G. "It doesn't matter how we deliver it, what we really need to deliver is low latency."

"It doesn't matter how we deliver it, what we really need to deliver is low latency."

Nuno Sousa, Group Director for Digital Integration at Veon

The super fast connectivity Sousa is talking about is what is required to power the rise of the IoT. "We're trying to provide unlimited bandwidth, not just for personal users with smartphones who want to download content, but also to allow machines to talk to other machines," adds **Bill Barnett, VP of Assets and Network Performance at Crown Castle**. For customers, we're talking about smart doorbells, driverless cars and remote security monitoring systems; all of which is enabled by solid connectivity technology and the infrastructure that supports it. For service providers, having access to real time data gives them a better sense of how their products are performing and empowers them to respond quickly should something go wrong.

Lombardi describes intelligence as a fundamental feature of next generation networks. She forecasts that interest in network intelligence will explode in the coming years. Her team are already creating use cases for trends like machine learning and artificial intelligence (AI) and, thus far, the results are very encouraging.

5G, IoT and the demand for a real-time asset visibility

Some of the survey participants also touch on a few of the challenges that come along with disruptive new technology.

Organizations are always looking to improve efficiencies across their internal processes and procedures and AI and automation are the perfect tools to help them do so, notes **VP of Network Operations Service Assurance and Support at TDS Telecom, David Dudsak**. And yet, fear of automation still exists across global workforces. "It's based on the idea that machines will be taking over jobs," says Dudsak. Leaders must respond to this uncertainty by making sure that their teams understand that automation is just one piece to the puzzle. And that it has the potential to vastly improve their work experience.

Security is another concern. Keeping everything safe is one of the biggest challenges our operators and customers have, states **Bernd Meurer, BT Group CTO**. When you are working on the edge of the network, you have to implement a really rigorous security, which was not necessary in the past. It has to be absolutely secure. It must be stable, it must scale and, ideally, it should be handled by a software solution, he adds.

In Summary:

5G, AI and machine learning hold incredible potential only if they are seen as positive market disruptors and not as hurdles that need to be overcome. Laying the groundwork to make the most of these innovations can prove costly and demands a proactive strategy. But every new innovation has a flip-side with new challenges. Uncertainty about job losses and apprehensions around security on the edge of the network are the major issues keeping our survey participants busy.

Chapter 3:

Managing operational challenges

Improving data quality, reducing update backlogs, reducing total cost of ownership



Having painted a picture of the current telecoms landscape, it's important to unpick how network providers can respond effectively to their changing ecosystem. As part of our surveys, we asked some of the participants to answer a short poll. Most agreed that major migration projects for legacy GIS are costing their organizations significant amounts of capital, resources and time. At the same time, most admitted that their current GIS is not fit-for-purpose when it comes to handling next generation network requirements. As such, the majority of these business leaders plan to deploy a new or migrated GIS in the next few years.

Having the right people and resources is a must for any business faced with new requirements and changing customer expectations. More often than not, the responsibility of securing these people and accessing these resources falls on the shoulders of IT and field operations teams who are at the forefront of deploying and leveraging new innovations. However, it is not uncommon for there to be a huge gap between theory and execution. Major operational challenges include poor data quality, growing update backlogs and escalating costs.

As **CTO at IQGeo, Peter Batty**, recently said: "No individual or department has an accurate view of their network assets, creating massive business inefficiencies and huge operational risks. This has a very direct and negative impact on time-to-market, maintenance and construction performance, safety, network service quality and customer satisfaction." According to Batty, the legacy GIS update process is simply broken and is not sustainable as network complexity increases and the expectation for safer, more responsive and real time customer service intensifies."

A huge challenge for **Fred Lutz, SVP at Wave Broadband**, is around mapping. "We find most of the time that we do not have accurate mapping, or any mapping at all. Understanding the network infrastructure and configuration is critical but it can be a roadblock when we are dealing with legacy network infrastructure acquisitions that we did in the past. It all comes down to how well or poorly the due diligence was done when the acquisition was made. This can affect our ability to make progress as quickly as we'd like to, adds Lutz.

Many of the systems that we were using in the past are incompatible with newer, higher resolution systems, says **Konstantinos Chalkiotis, Deutsche Telekom's VP for Access and Home networks**.

Improving data quality, reducing update backlogs, reducing total cost of ownership



And when your new system doesn't integrate with your old system, chances are that you'll have a whole lot of data that you can't use.

But it's not only about managing legacy infrastructure, says **Bernd Meurer, BT Group CTO**. You also need to deal with your "legacy" workforce. Next generation networks demand a total transformation of our workforce. Especially because certain tasks that were typically done by technicians will now be done by software. And other tasks – typically those that require more planning – will need to be done by people. So there's a people, process and technology conversation that needs to happen to ensure that everyone is on the same page.

"We have quite a big field force in various countries. And as we all know, when you're working on the last mile, your field force is very expensive," explains Meurer. In order for these "costly" workers to be effective they need access to the most up-to-date information no matter where they are. They also need to have the right software in place to optimise field force management. Similarly, the data the field force is getting must be absolutely correct. "If not, you can lose a lot of money."

*"We have quite a big field force in various countries.
And as we all know, when you're working on the last mile,
your field force is very expensive,"*

Bernd Meurer, CTO at BT Group

The devil is in the data details

For **Stefan Metzger, Head of Smart City at Swisscom**, real-time data is becoming more and more important. But when we talk about "real-time", he explains that this can actually mean data from five minutes ago. So one is actually talking about "near real-time" and not an actual real-time information exchange. Data handling and doing data-driven business is becoming increasingly important for the industry as these businesses expand their capabilities in a more vertical way.

Nuno Sousa, Veon's Group Director of Digital Integration, is cautious about making broad statements about data and the processing of this data. That being said, he is adamant that data must be business-driven. Over the last 10 years, we've seen so many businesses make the mistake of simply grabbing everything. But why should a business ingest a certain pipeline in real-time or deploy software or put maintenance teams in place for something that won't provide any useful information that can be used to improve business processes? In line with this, Meurer stresses that everyone should have a very intelligent system in place to cleanse the data or you may find that the information you are collecting doesn't make much sense.



The devil is in the data details

Having the right data and a single pane of glass to view all of this information is imperative, says **Bill Barnett, VP of Assets and Network Performance at Crown Castle.**

Consider that there are engineers, vendors, operational staff and finance teams working on any single rollout project at any given time. All of these different parties must have unlimited access to the same information, at the same time. "That, to me, is the most critical thing; that we all have the same tangible picture. Only certain people should be able to update the data, but everyone must have the capability to see it live, at the same time."

TDS Telecom are currently running a variety of projects that require teams to upload field data. As they expand their networks, they plan to have all of this disparate information updated in real-time, says the brand's **VP of Network Operations Service Assurance and Support, David Dudsak.** In new cities, they may still have to deal with manual records for a short period but the goal is to make everything happen in real-time.

While they are building new networks, they are also revisiting their legacy networks to update these systems so that all of the information relating to any changes that are made, will eventually be loaded in real-time. And with the amount of inventory and equipment that the TDS Telecom team delivers to customers, solid data management is also about keeping tabs on everything, explains Dudsak. This data must answer questions like: Is it in a warehouse? Is it en route to a warehouse? Is it on the back of a truck and en route to a customer? Has it now been installed? And is it running at that customer site?

We can see that there are so many possibilities out there, says Sousa, but the telecoms industry is an "old school industry". They want to stick with what they know – towers, telephony and packages of data. "Beyond that, it's a huge challenge because the culture at all levels is a culture that is not really ready for change."

"Beyond that, it's a huge challenge because the culture at all levels is a culture that is not really ready for change."

Nuno Sousa, Group Director for Digital Integration at Veon

In Summary:

Legacy geospatial infrastructure, operating costs, and system compatibility are just a few of the operational challenges modern telecoms are facing. In addition to a broad range of data quality challenges. The evolving technology and customer ecosystem demands new thinking to solve previously unimaginable problems. Service providers must be able to access real-time accurate data, that enable rapid operational decisions for more successful streamlined businesses.

Conclusion:

Final thoughts from IQGeo



Throughout this eBook, we've highlighted the importance of customer experience and customer satisfaction because we truly believe, and our participants confirm that, focusing on the customer is vital to business success.

This is why we ran this survey in the first place. Because we wanted to gain a better understanding of the pain points facing customers and network operators. And our efforts have been worth it. The wealth of insights we have gained throughout this process from all of the technology leaders who participated in the survey are truly invaluable.

Alongside surveys like these, we also try to tap into the minds of our market by regularly hosting webinars where industry insiders discuss a trend or topic affecting the telecoms and utility industries. Our recent webinar – titled: "Is legacy GIS failing network infrastructure companies?" – was extremely well attended, indicating just how important these issues are to the telecoms industry. And many of the insights shared in this eBook affirm our suspicions.

The webinar attendees, the webinar panelists and the contributors to the eBook all agree that the time for change is now. Siloed network models, legacy infrastructure, unreliable data and fear of automation and digital innovation can no longer be tolerated. Network infrastructure providers are clearly focusing on their customers, embracing market disruptions and developing strategies to address operational challenges to ensure that they don't negatively impact their bottom line. When you look at all of the amazing technology breakthroughs, there are so many possibilities to find a solution that best addresses your business' needs.

Digital transformation sees telecoms network operators standing at a major technology and operational turning point. Do they continue along the same path, or do they totally reimagine their operation and shake things up? The winners will be those that seize the challenge.

Talk to the IQGeo team about how we are helping network operators meet their ambitious digital transformation objectives.

Acknowledgements

Thank You

On behalf of the IQGeo and Techpros.io teams, we'd like to thank everyone who contributed to this eBook. We appreciate you taking the time to participate in the interview process and have gained so much value from the insights you've shared.



Stefan Metzger Swisscom

Stefan joined Swisscom (Switzerland) AG in 2017 as Senior Vice President and Head of Smart City. As responsible for Swisscom's group wide Smart City program he managed to bring Swisscom into the thought leadership regarding national Smart City developments. In his current role Stefan is actively pushing the sustainable development of digital transformation in Switzerland and as well as co-initiator and co-founder of the national association "Smart City Hub". Stefan Metzger holds a diploma in mechanical engineering as well as a Master degree in industrial engineering and economics.



Lucy Lombardi TIM

Ms Lombardi is working for TIM as VP of Innovation. She started her carrier in software development in object oriented language then won a European contest at the European Space Agency (Noordwijk, The Netherlands) which expanded her experience to satellite radiometry. She landed in the mobile telecommunication business in 1996 where she has taken up several roles with increasing managerial responsibilities in the Technology, in the Commercial and in Strategy & Innovation Departments. She has had leadership roles in international groups of the GSMA, has been on the Board of startups and on the Scientific Committee of Fondazione Telecom Italia, and is currently serving on the International Board of GTWN, on the Technology Group of the GSMA and on the Big Data Committee of ISTAT. Ms Lombardi received a Masters Degree in Physics from the University of Rome with a thesis on an original research project studying infrared radiometry for advanced robotics.



Bill Barnett Crown Castle

Experienced Vice President with a demonstrated history of working in the telecommunications industry. Skilled in Network Operations, Fiber Plant Management, 4G, Asset Data Management, 3-GIS, Vendor management, Contract Negotiation, and Business Process Improvement.

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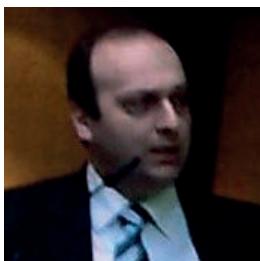
David Dudsak TDS Telecom

Dave was named VP of Service Assurance and Support in February 2017. In this role, Dave leads the teams responsible for all consumer and commercial order documentation, provisioning, circuit design along with installing, monitoring, and repairing all aspects of TDS' phone, internet, and video solution networks, throughout the company's wireline and cable footprint. Under Dave's guidance, these teams manage the outside plant, electronic transport, core site switching, and routing to provide service for all customers. In addition, these groups handle all network change event activities, repair network disruptions, and perform routine, preventative and proactive network maintenance. Having joined TDS Telecom in 1997 as the manager of Network Operations, Dave has taken on numerous leadership roles, with advanced levels of responsibility. Before moving into his current role, Dave was the VP of Field Services. Prior to joining TDS, Dave gained experience in call center management, transmission systems, and management of sectors of the Federal Aviation Administration (FAA) network. In addition to his professional responsibilities, Dave enjoys sports, muscle cars, and motorcycling. Dave holds a Bachelor of Science in Business Management from the University of Phoenix and a Master of Business Administration from the University of Wisconsin-Madison. He is also a graduate of the Electronic Technology Institute in Cleveland, Ohio.



Nuno Sousa Veon

Seasoned Senior Executive with strong proficiencies in change & transformation, strategy and organization development in the areas of data management/artificial intelligence, software development, program management and operations; with 18+ years of experience in telco's, fintech, insurance and consultancy services. Proven people manager with a focus on mentoring, delegation and team development. Skilled at Board level communication, budget creation and P&L monitoring. Recognized as adaptable, goal oriented, innovative and trustworthy.



Konstantinos Chalkiotis Deutsche Telekom

Experienced Manager on Fixed and Mobile Telecommunications, especially on technologies like LTE, LTE-Pro, FTTx,WTTx and 5G networks. Job function on technology innovation, architecture, network planning and deployment. Excellent technical knowledge on legacy networks (like GSM/3G/WLAN) as well as to the development of concepts for future technologies (like LTE-A Pro, 5G, Nb-IoT, FTTx, WTTx). Major focal point from DTAG on NB-IoT standardization, concept development and initial implementation. Member of NB-IoT Forum of GSMA.

Acknowledgements



Bernd Meurer **BT Group**

Experienced Senior Manager with a demonstrated history of working in the IT and telecommunications industry. Skilled in sales, IT and cloud, go-to-marketing, innovation and team management. Strong operations professional with a deep background in IT, project management and technology. Graduate from Ecole Normale Supérieure Paris and Max-Planck Institute Germany.



Fred Lutz **Wave Broadband**

Senior operations executive with leadership experience (domestically and internationally) in re-organization/consolidation. Recruited in various firms to provide leadership while executing operational performance in a variety of situations (complex metropolitan, multicultural and international). Mostly public company experience in managing intensely competitive markets (public and private sector competition) with labor complexity. Specialties: Operational integration and turnaround, labor relations/union negotiation and decertification, culture transformation, niche business sector creation and growth, International (middle eastern) experience



Peter Batty **IQGeo**

Peter has worked in the geospatial industry for 30 years and played a leading role in creating multiple industry leading geospatial products. Peter has served as CTO for Intergraph and Smallworld, two of the top three traditional GIS companies (and two of the world's top 200 software companies). He served on the board of the Open Source Geospatial Foundation (OSGeo) from 2011 to 2013 and chaired the FOSS4G 2011 conference in Denver. He is from the UK originally, but has lived in Denver in the US for the past 25 years. He has an MA in Mathematics and an MSc in Computation from Oxford University.

Acknowledgements



Thanks to all other participants

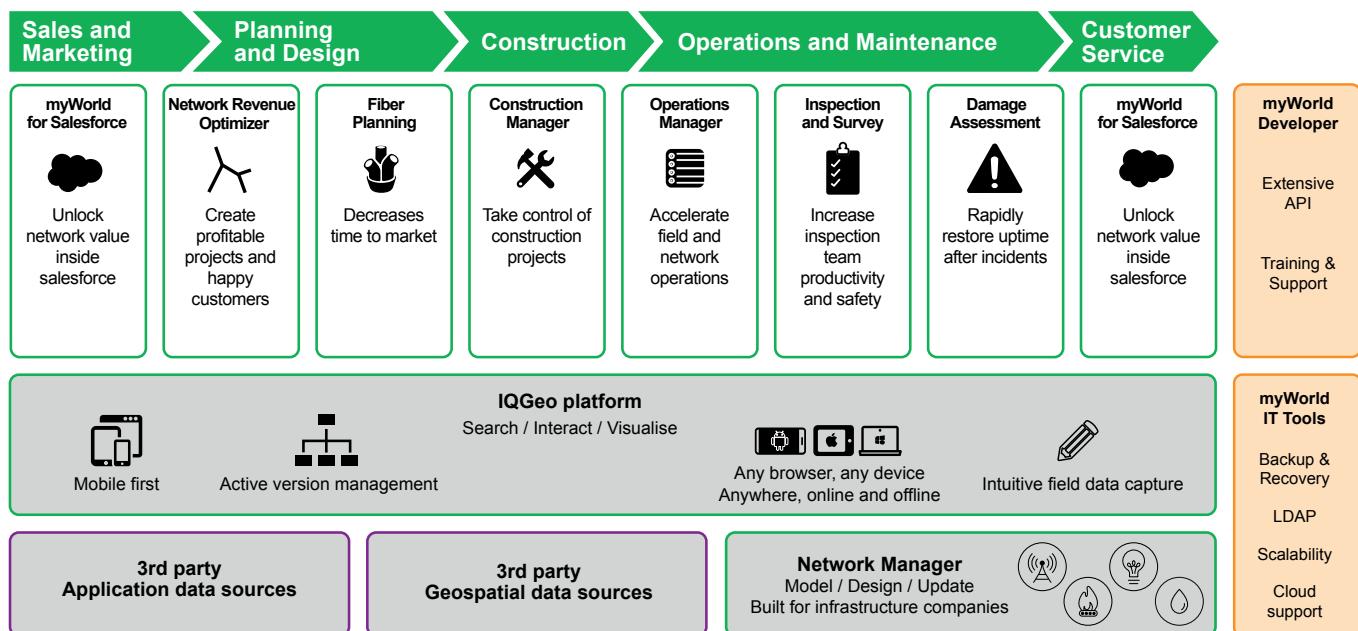
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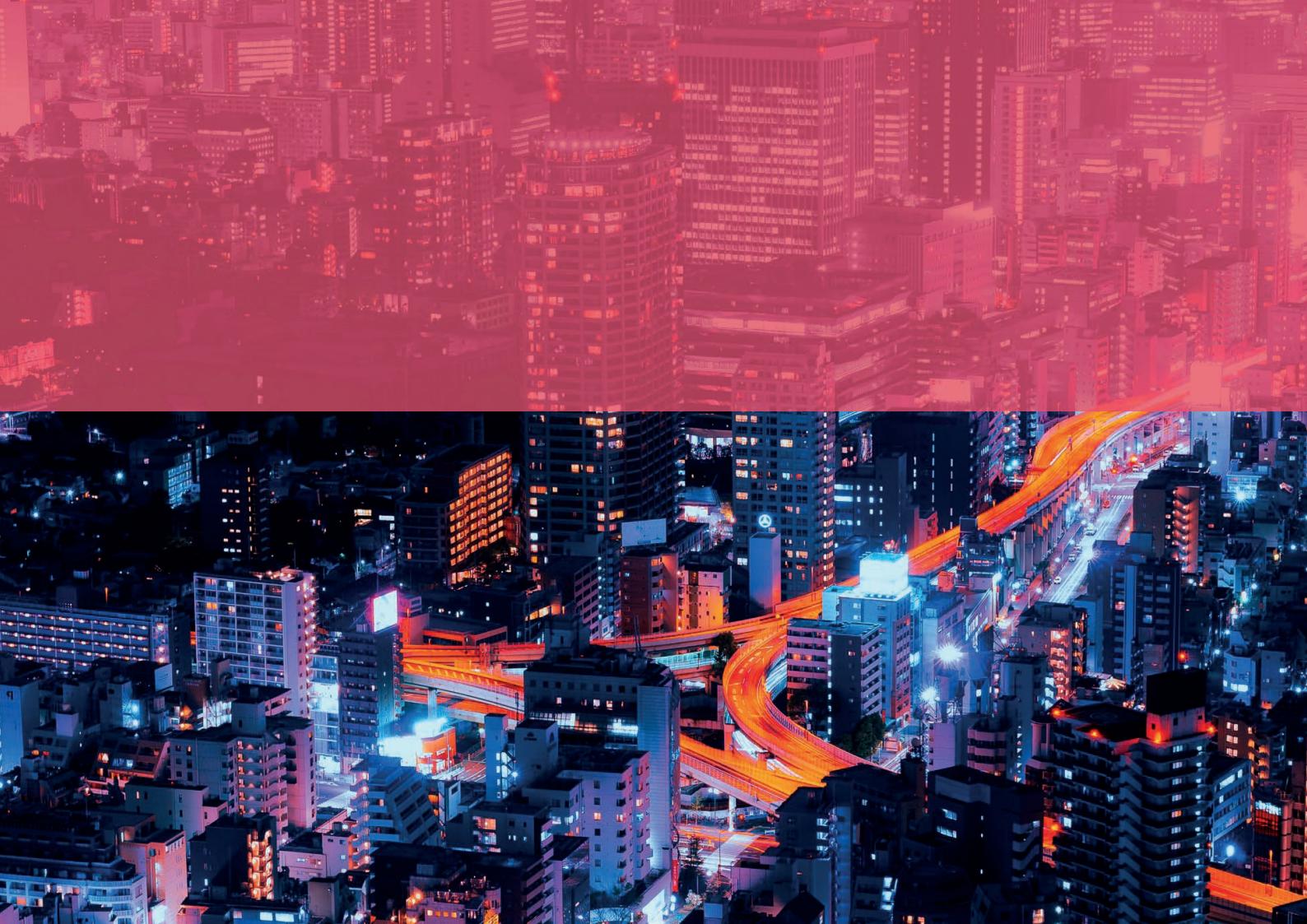
About IQGeo

Accelerating productivity and collaboration

IQGeo is a leading developer of geospatial software for the telecommunications and utility industries, accelerating productivity and collaboration across enterprise planning, design, construction and maintenance processes. Our reality-centric solutions create and maintain a real-time, accurate view of complex network assets, dramatically improving data quality and currency. IQGeo's open, mobile-first architecture streamlines operational processes using any device, in the office or in the field, enabling greater business collaboration. We help network operators meet their digital transformation ambitions, saving time and money, while improving safety and enhancing customer satisfaction.

- Built for infrastructure companies
- Mobile-first architecture
- Open and flexible platform
- Fast and cost-effective to deploy





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