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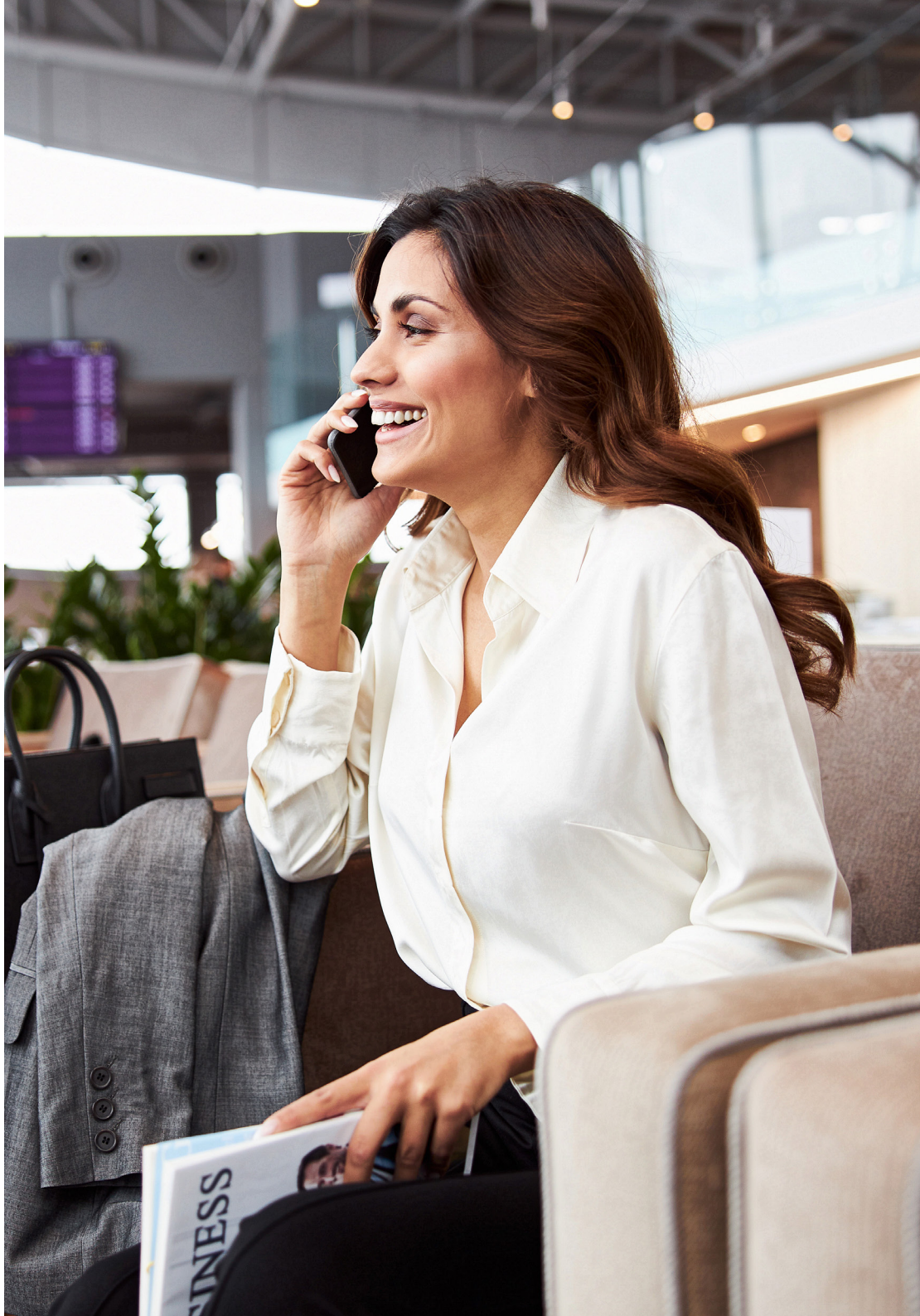
End-to-end guide: How to use big data to maximize your roaming business

Introduction

Millions of people cross international borders every day, and their smartphones go with them. This evidently holds huge potential when it comes to growing international roaming revenues for operators and MVNOs alike. However, the reality is that a group of complex factors have made it difficult for them to get roaming right in practice. Instead of growing roaming revenues in tandem with international travel and smartphone use, many operators are seeing this revenue stream roam away from them.

The answer to this problem lies in better analytics and mining of the wealth of network and subscriber information that operators already collect. Big data analytics is well recognized within the industry as having huge potential to unlock the hidden value of the mobile network. By 2027, annual revenue from the global big data and business analytics market is projected to reach $420.98 billion[1].



[1] Allied Market Research: https://www.alliedmarketresearch.com/big-data-and-business-analytics-market

The current state of the roaming market

Operators work hard to create expansive network footprints to ensure consumers can use voice, messaging, and data services practically anywhere they go, and seamlessly get the same experience as if they're at home.

Roaming has become a staple part of the mobile environment as a result. There's a significant cost attached for operators, and now, achieving growth and profitability in roaming is at risk, as potential revenue loss for operators has risen due to a variety of factors:

Silent roamers

These subscribers 'go silent' once outside their own network, turning off data services altogether. It's estimated that nearly two thirds of roamers switch off mobile data when abroad – a prime example of a missed roaming opportunity.[2]

Bill shock

'Bill shock' – where subscribers are hit with huge bills incurred inadvertently during roaming – is a major hurdle. This fear, and subscriber confusion over how to avoid bill shock, is a contributor to roamers falling silent when abroad.

Customer experience management

Operators are unable to 'steer' subscribers to networks operated by preferred roaming partners or to control the QoE on other networks, often leading to customer complaints and affecting uptake of roaming services.

Telecom fraud

Telecom fraud is estimated to cost operators an average of €28.3 billion a year, and two-thirds of all fraud losses are tied to international traffic.[3]

[2] BICS estimate: https://disruptive.asia/roaming-revenues-revisited/
[3] CFCA Fraud Loss Survey, 2019

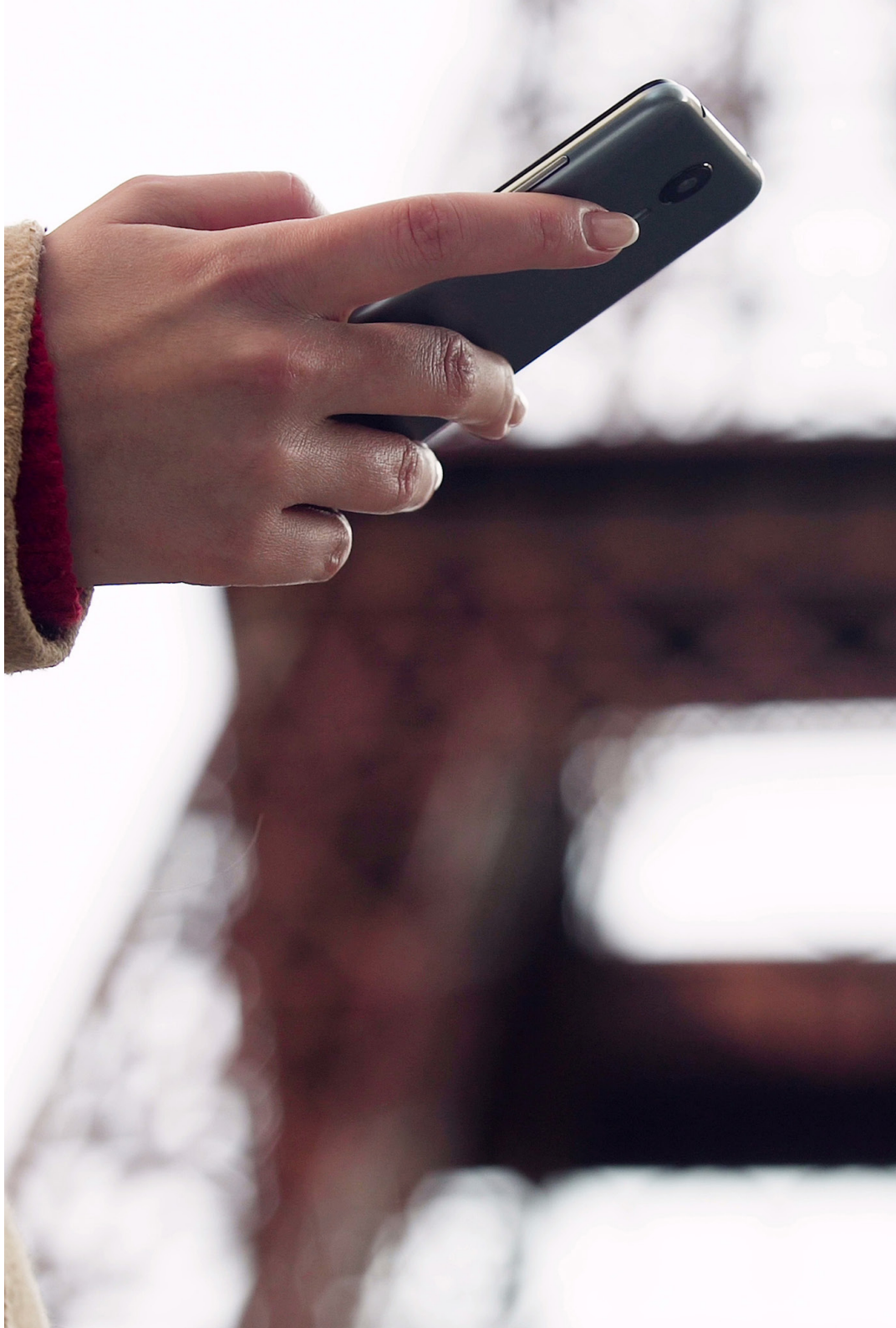
Yet positive changes are on the horizon. In the EU single market, for example, changes to roaming regulations have had a positive impact.

The average cost per unit for calls, messages, and data has dropped significantly in recent years, but this has led to an explosion in traffic volume. Subscribers, who are now steadily more reliant on data services and applications, now continue to use these services even while abroad.

The Internet of Things (IoT) is also set to grow roaming revenues. Recent findings from Kaleido Intelligence estimate that global IoT data roaming traffic will increase by 300% to reach 500 Pb in 2025.

But to truly capitalize on the growth and revenue potential that roaming holds, telecoms companies need to:

- Invest in new intelligence solutions to drive QoE,
- Access actionable, data-led insights to breathe new life into their roaming business, and
- Accurately track and forecast network usage to uncover new business opportunities that will make the most of emerging trends.



Big data: The key to regaining control over roaming

Operators have long been accustomed to using network data and subscriber information for engineering purposes, for example to detect network faults or make it more efficient. But, until recently, operators have not had the tools needed to convert this same data into actionable insights that have a bottom-line business benefit.

But today, by using multiple sources of data (including signaling information, GTP data, subscriber location, application traffic streams, and much more) operators can improve QoE, deliver personalized services to subscribers, and even create new revenue streams.

How are operators doing at the moment?

IDC research suggests 37% of large service providers now store more than one petabyte of data in data lakes.[4] This includes information about location, choice of handset, voice and data usage in a given session, subscriber browsing preferences, and much more. With so much information readily available, operators must do more to derive value from it and use it to aid in decision making.

In recent years a lot of industry attention has been given over to big data and its potential to facilitate business transformation. Across the globe, significant levels of investment are being made in systems to extract insight and value from this data to improve QoE, customer service, and ultimately revenues.

A large proportion of operators currently have 'siloed data', one of the biggest challenges associated with implementing big data analytics effectively. The first step to extracting insight from this data is to have it all in one place. Only then can operators start to become proactive with roaming QoE and revenue opportunities, rather than reacting to problems.

It is well recognized that operators will need to use big data to improve customer loyalty and service, and progress is being made on this front. However, the focus is on improving national network experience and not much focus has been given to the applications of big data as far as the roaming market is concerned. This is because operators have no way of gaining visibility over the customer's experience on their partners' networks.

However, this is a huge missed opportunity and operators serious about extracting value from the roaming business are investing in roaming intelligence solutions.

[4] https://www.amdocs.com/sites/default/files/2017-03/Amdocs-DATAHUB-Infographics-Rebrand.pdf

Practical applications: Understanding the value of analytics in the roaming business

Here are three of the most common use cases that actionable business intelligence, garnered from network and subscriber data analytics, can help to drive new revenues, although many others exist:

1. Marketing and bundling
2. Taking silent roamers off mute
3. Managing QoE challenges

1. Marketing and bundling

Big data analytics makes it possible for operators to drive additional revenues before international roamers have even left the country. Pooling contextual and location data and contrasting that against the operator CRM database can open the door to new up-sell opportunities that drive roaming usage.

Scenario

A subscriber arrives at a local airport. The operator detects his / her location based on the local cell ID and automatically checks the CRM database for the record of their historical roaming frequency, average service usage per trip, and dispute history.

The subscriber in question typically incurs a data charge of $100 during a five-day period while abroad. Currently, the subscriber is only $50 away from hitting their limit, and previously flagged a performance issue with the roaming partner's network while they were away.

The real-time analysis of this data by the operator's analytics platform triggers an SMS notification to the subscriber. They're offered free access to airport Wi-Fi and a time-limited deal on a data usage bundle while abroad.

The subscriber accepts and, after the bundle is activated, the operator's system flags them as a frequent roamer and activates proactive QoE monitoring to ensure they get a consistent experience while abroad – a win-win for both operator and subscriber.

2. Taking silent roamers off mute

Big data is particularly helpful for identifying silent roamers and steering them towards re-engaging with operator services while abroad. In order to address this problem, operators need to identify silent roamers in real-time. Additionally, they must establish which subscribers among this subset have the strongest potential and then give them the confidence that they will be safe from bill shock.

Once silent roamers have been identified, they can be targeted in real-time with promotional offers and messages to drive usage. But it doesn't stop there. As a vital step for preventing bill shock while roamers are abroad, operators can also incorporate proactive policing of data-hungry applications to limit unintended data consumption by the subscriber's device.

3. Managing the ever-present QoE challenge

In order to ensure the experience of their subscribers when they roam onto other networks, operators can use big data to hold roaming partners accountable to SLAs based on KPIs.

By tracking network performance of its roaming partners on a proactive, real-time basis, an operator can ensure that its VIP subscribers receive the experience they expect from their home operator, regardless of where they are in the world.

By using KPIs designed to measure the overall roaming experience, operators can:

Identify problems in real-time

Measure how they impact revenues

Automate QoE management or tackle manually

For example:

- Proactively contact high-value subscribers who may be experiencing a problem.
- Automatically offload subscribers to carrier Wi-Fi if the data experience deteriorates beyond a certain level.

Many other use cases exist where network and subscriber analytics can improve roaming performance.

Use cases	Problem	Solution	Benefits
 Policy control	Subscriber tolerance for poor data performance is at breaking point. This is resulting in increased pressure and cost implications, for operators to deliver the high capacity networks needed to meet demand.	Big data analytics can drive real-time QoE and QoS decisions to seamlessly swap subscribers between the mobile network and carrier Wi-Fi based on current conditions.	• Protects the mobile experience for other users • Data-intensive subscribers notice no difference in the experience they receive
 Intelligent campaign management	Operators must ensure that any engagement with a subscriber is not interpreted as spam.	Operators must deliver real-time value based on each subscriber's needs, behavior, and usage preferences.	• Network traffic analysis, based on subscriber roaming profiles, can offer value in emergency situations, such as natural disasters • Drive loyalty by offering temporary benefits so that affected subscribers can stay in contact with loved ones
 Margin leakage and monetization protection	Mobile operators are key players in today's hyper-connected digital environment. They need to simultaneously allow access to third parties, including OTT players and digital service providers, while taking steps to protect their network and subscribers from illicit activities.	Big data analytics makes it possible for operators to automatically detect, rank, and classify unusual application or network traffic based on pattern recognition.	• Blocks illicit traffic in real-time based on data-led business intelligence • Contributes to subscriber QoE management
 Performance trend identification	Operators have limited control over the experience delivered by partner networks, yet subscribers hold them accountable while roaming.	Operators can use big data analytics for real-time, proactive performance measurement of roaming partners.	• Subscribers can be categorized in real-time based on ARPU and usage history • If there's a performance issue with a preferred roaming partner, the operator can automatically turn off steering for VIP subscribers to protect the experience

Business intelligence strategies for the roaming business

Business intelligence can offer value to operators' roaming businesses at a number of different levels, from network performance optimization to sophisticated predictive analytics enabling micro-targeting based on travel patterns.

There are four broad approaches through which business intelligence can be used to improve the roaming business:

1. Network intelligence to improve QoE

Advanced big data analytics solutions provide access to immediately actionable network intelligence. By analyzing data pulled from the network in real-time, operators can use these insights to develop strategic responses to certain situations that threaten QoE. Sophisticated analytics can be used to evaluate traffic data in real-time and uncover a clear, user-friendly perspective of the network's technical performance.

This can drive effective end-to-end network experience management, enabling the operator to gain control of the subscriber's roaming experience. After all, roaming surveillance and in-depth root cause analysis has a key role to play in helping operators and MVNOs identify which services their network is capable of delivering effectively.

If big data-led intelligence indicates that a particular roaming partner's network consistently experiences problems with VoIP or video streaming experience, for example, that information can enable operators to initiate remedial action.

Input
- Performance data collected from the network – from the edge to the core

Process
- Data analyzed and structured by the big data system
- Creates a 'baseline' of network performance
- Track baseline activity and flag erroneous results through the big data analytics dashboard

Output
Allows operator to:
- Automatically detect changes in roaming partner network traffic
- Identify areas of poor coverage
- Gain insights into LTE signaling performance
- Future-proof for 5G and other technologies

2. Business intelligence to control the roaming experience

Operators can use analytics to yield insights into roaming behavior, fraud and VIP subscriber activity that they then can use to better understand and interpret subscriber behaviors and preferences, thereby improving the roaming experience.

What operators need are tools to convert technical information into business and customer intelligence with information presented in formats suited for business decision-making.

These insights allow them to proactively understand and tailor the VIP subscriber experience, optimize data roaming cost structure, and control and prevent fraud.

Input
- Subscriber activity data collected from the network
- Pooled with performance data to create a high-value data insights hub

Process
- Data analyzed and structured by the big data system
- Creates a ‘baseline’ of normal behavior for roaming activities
- Track baseline activity and identify trends, typical behaviors and suspicious actions

Output

Allows operator to:
- Discover how roamers use apps by country, network, and technology
- View websites
- Identify new roaming revenue opportunities
- Tackle fraud, prevent subscribers being affected by outages, identify location spoofing, etc

3. Business analytics to upgrade roaming services

Business analytics can provide a complete perspective on roamers in near real-time that operators can use for rapid or strategic responses to better monetize their roaming business, and create new revenue streams. By conducting statistical analysis combining information from different sources within their systems, they can gain an intimate understanding of roaming subscribers.

They can detect silent roamers and offer strategic responses in near-real time: for example, offering tailored offers on-the-spot to stimulate use. They can also detect if tools are being used to block legitimate steering agreements, and take remedial action accordingly.

Input
- Subscriber usage patterns and historical data is collated and analyzed

Process
- Silent and high-usage data roamers are identified
- Extent of silent roamer issue is determined with real-time traffic data
- Big data analytics tools deduce that it's due to previous bill shock concerns
- Real-time strategic responses are identified to stimulate service usage

Output
- Customized roaming bundle offered to the subscriber in real-time
- Bill shock prevention campaigns – data use measured during roaming, and subscriber is blocked when they reach their limit.

4. Predictive intelligence

The most sophisticated use of big data in roaming is for predictive analytics. Using sophisticated algorithms that combine intelligence and discovery, operators can create customer intimacy with highly targeted and responsive marketing and IoT strategies.

These techniques combine real-time analysis of content, KPIs, usage patterns, behaviors and parameters with predictive intelligence algorithms, and can accurately 'predict' what services a subscriber will want. This technique allows operators to create customer intimacy, automatically offering highly tailored services to enhance the customer experience. For example, an operator could use this information to:

- Accurately conduct micro-segmentation based on subscriber travel patterns
- Offer family data bundling or other bespoke upsell services for roamers
- Conduct real-time marketing campaigns with immediate feedback to improve the business bottom line in the future

Input
- Historical subscriber roaming behavior is recorded

Process
- Subscriber's travel patterns during specific times of the year are identified
- For example, the family travels to an overseas location during the summer holiday and they are heavy users of social networking

Output
- Highly targeted micro-segmentation and marketing offers
- In the run-up to summer, operator offers the subscriber a family roaming bundle with discounted access to the social networking site

Big data deployment models and how they differ

Operators looking to enhance their roaming business with big data can take one of two approaches:

Custom-built solution

Operators can build their own data analytics and business intelligence platforms.

The primary challenge with this approach is the complexity of processing terabytes of network performance data and subscriber information, as well as the difficulty of incorporating and analyzing roaming partners' network information.

Additional challenges include:
- A lack of access to high-level insights required to fully monetize roaming
- White-label tools do not offer sufficient granularity, making it very difficult to identify high-value customers or target silent roamers

Managed solution

Operators can implement a managed service to rapidly deliver actionable insights from a roaming specialist.

For operators and MVNOs looking to optimize network performance, identify and introduce the right services, gain deeper insights into their subscribers, and increase customer intimacy, BICS offers a suite of business intelligence and analytics technologies that harness the power of big data to turn network traffic into insights that positively impact the bottom line.

These tools allow operators and MVNOs to avoid the complexity and prohibitive cost associated with collecting and analyzing terabytes of data in real-time, helping them go straight to value creation and revenue maximization.

Additional benefits include:
- Easy to understand insights, delivered through a dashboard system centered on business decision-making
- A light-touch, low-cost model to preserve network performance while rapidly identifying, investigating, and resolving issues
- Future proofing for 5G and other technologies

Conclusion

Demand for roaming services will increase significantly in the next few years. Operators stand to grow their revenues on the back of data demands alone, but it’s only the tip of the iceberg.

There’s no doubt that accessing the hidden growth potential in roaming depends on having advanced business intelligence and big data analytics. Without this level of insight, operators will never be able to fully understand the usage or spending habits of their subscribers. They won’t have the opportunity to target their subscribers in real-time with targeted offers. And they won’t be able to perform the greatest telecoms magic trick of all – unmuting silent roamers.

BICS’ business intelligence and data analytics solutions have been designed with this need in mind, building on its heritage as a leading wholesale carrier. BICS makes it easy for operators to turn traffic data into actionable insights that broader revenues, increase QoE, and enhance customer loyalty.

For more information, please visit:
www.bics.com