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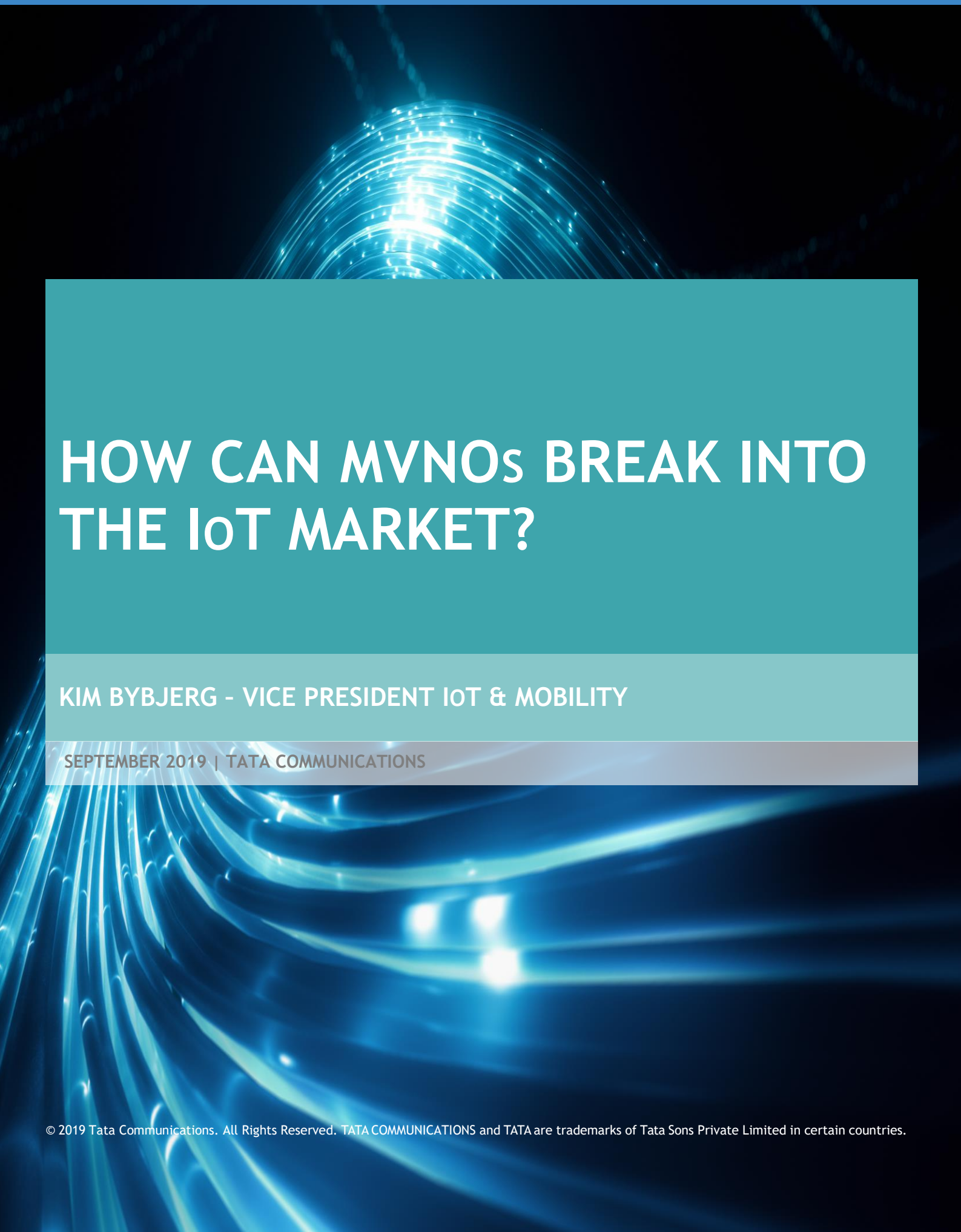

HOW CAN MVNOs BREAK INTO THE IoT MARKET?

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INTRODUCTION

As the IoT ecosystem continues to evolve, more verticals are finding value streams in connected devices - in both business and consumer contexts. Driven by reduced manufacturing costs, increased scope of application and new revenue streams, the IoT market is predicted to grow to USD $520 billion by 2021, with the number of connected devices surpassing 27 billion in the same year.

In healthcare, IoT is helping connect patients and devices to ensure continuous monitoring and fuel AI-based diagnostics and treatment options. In logistics, it's helping cut costs and improve service delivery. In automotive, it is creating a new driver experience and enhancing safety. As the connected device network continues to grow, similar applications are being uncovered in aviation, construction, energy, public utilities, consumer services and more, pushing the ecosystem further.

Given the proliferation of IoT devices, the threat of data breaches with sensitive business and consumer information being leaked to bad actors is an immediate concern. Leveraging existing encrypted cellular networks for connectivity is an obvious opportunity for the fledgling IoT industry, and that's where mobile virtual network operators (MVNOs) are likely to see new business opportunities.

In the past, the MVNO sector has largely directed the bulk of its growth strategy towards B2C services. However, IoT and machine-to-machine (M2M) data connectivity offer a vast new spectrum of growth opportunities. The IoT market represents a chance for MVNOs to segment their service offerings, create tailored packages for each industry and gain share within regional markets without the hassle of having to develop new physical infrastructure.

But despite optimistic growth projects for IoT over the past decade, MVNOs are yet to see commensurate demand from the market. This has resulted in MVNOs being more cautious about committing to new offerings and delaying the consolidation of their position within the broader IoT value chain.

THE DEMAND DYNAMICS IN THE IoT MARKET

IoT is growing and maturing at different rates within various industries, regions, and markets. With global M2M connections growing by over 200% between 2014 and 2019, MVNOs are uniquely positioned to reap commercial benefits from the IoT opportunity[1].

However, at present, MVNOs' share of the M2M market is not significant. While they are making a bigger and bigger play for discount, roaming, and telecom, focus on M2M so far has been limited[2].

Cataloging and becoming familiar with the opportunities at hand is a critical step for any MVNO looking to tap into M2M network services. This requires both market research and collaboration with firms already invested in the IoT space, to better understand their requirements and build relevant service offerings.

For example, smart meters with embedded IoT data collection devices are giving public utility service providers real-time data about demand and usage patterns, helping pave the way for smarter grids and more efficient service distribution. At the same time, IoT is facilitating a surge in smart meters and micro-production via solar panels and wind-turbines. these developments are creating new revenue streams and efficiencies within the sector, and fueling interactions with players that are outside the traditional utility ecosystem.

However, the prevalence of smart meters and digital utilities management tools varies hugely with regions and infrastructure maturity, making it critical for MVNOs to offer region-tailored offerings in order to minimize risk early on.

Similarly, in aviation, IoT is being used to enable preventive maintenance and reduce catastrophic equipment failure. Tapping into this market requires a borderless IoT network offering, with stringent security controls and low latency infrastructure.

Energy & Utilities

The utilities sector will require bespoke, geo-specific IoT network service bundles that include long-term connectivity and low-volume data plans.

Applications

- Smart metering
- Smart grids
- Remote diagnostics and services

Challenges

- Huge deployments
- Network policy enforcement
- Hard-to-reach locations
- Indoor and in ground coverage capabilities
- Low-data usage

Commercials

- One-off cost per SIM
- Flat rate for several years
- Secure data channel via VPN
- Low data volume

Also, considering that IoT is still in its relative infancy, any strategy aimed at cornering the market must incorporate a significant long-term aspect with room to introduce disruptive technologies and business models.

While it may make sense for MVNOs to take a consultative sales approach in a new market, they shouldn't neglect price differentiation as part of a successful long-term strategy. Continued market expansion, maturation and service standardization may eventually swing the scales in favor of competitive prices. This is one reason for MVNOs to keep a sharp eye on market dynamics and avoid centering their core value proposition on support services alone.

CHALLENGES FOR MVNOs

Currently, MVNOs working with MNOs (Mobile Network Operators) face a few crucial roadblocks that threaten their successful entry into the IoT space.

Lack of Control

When it comes to capacity, bandwidth, and speed, MVNOs have to rely almost entirely on their MNO hosts, in order to address fluctuating demand. This is a critical challenge, considering the fact that the exponentially growing number of IoT devices will create significant strain on current network capacity, with billions of new devices increasing demand across various regions and industry sectors. The issue of control extends to include elements such as pricing, tariff structures, billing, and margins – where existing MNO-MVNO relationships can restrict both agility and visibility.

Demand Differentials

Current mobile network infrastructure is aligned with voice and data demand patterns, which may not match those of IoT implementations. Connected devices can cause demand patterns to be volatile, with long periods of inactivity followed by sudden spikes in bandwidth and data demand. Also, it's important to consider that the average revenue per user (ARPU) on IoT devices is often low (measured in cents per month), as opposed to the relatively higher returns on a consumer SIM card - this makes it critical for MVNOs to identify demand scaling opportunities at the earliest.

Diverse Communication Layers

Currently, there exist few standardization protocols in IoT technology, and different hardware and software layers may have use-case-specific signaling and communication protocols. Combined with the need for low latency networks and demand fluctuation, MVNOs will need to develop new systems architectures to ensure reliability and resilience in their product offerings.

Poorly Understood Market Dynamics

While many MVNOs are expanding into IoT, most are simply crafting a service offering that addresses the entire market as a single vertical. Considering the diverse, application-specific needs of IoT-enabled industries; this passive approach to tapping into IoT is not an optimal strategy. MVNOs should take a long, hard look at their IoT customers, understand the requirement in relation to the expected outcome, and tailor their services accordingly.

Not only does this help an MVNO differentiate, but also establishes that they can become a valued business partner and actively contribute to the technology-driven economic ecosystem.

Given these challenges, MVNOs will need to reconsider how they approach the growing IoT market opportunity.

Up until now, most MVNOs have been relying on price differentiators to capture market share among their subscribers. However, IoT unlocks a whole new paradigm, one that will force MVNOs to build out new service offerings and business models, while harnessing emerging technologies as competitive differentiators.

KEY TECHNOLOGY ENABLERS FOR MVNOs

Network Virtualization & Cloud

The growing shift from CapEx to OpEx-based spending is part of the digital transformation process and is perfectly suited to the MVNO model within the mobile value chain. In the context of IoT, pure-play cloud-based business models give MVNOs the quick scaling capabilities that are essential to delivering IoT network services, since few can afford the cost of a lot of on-premise equipment or capacity building via physical infrastructure.

Although still in its nascent stages in terms of wireless network availability, network virtualization has the potential to redefine the MVNO model. Network function virtualization delivers new agility for service providers to launch new IoT connectivity services, without needing to rely on long and slow processes to install equipment from the host MNO side. While service rollouts on virtual networks can be remotely accomplished via APIs, the tremendous amount of bandwidth required for some IoT use cases implies that true network virtualization will only be available on the 5G spectrum.

Most MVNOs are already familiar with cloud-only businesses and managed services offerings, so the Connectivity-as-a-Service model should not be challenging to monetize in the context of IoT. In fact, virtualization offers the opportunity to create dynamic pricing models for IoT applications with different data usage rates and patterns. That said, MVNOs will also need to develop new skill sets and broaden their existing talent base in order to create significant differentiators in a 5G-enabled, virtual networking world.

eSIM - Borderless, Network-Agnostic Connectivity

Embedded, network-agnostic SIMs will play a key role in expanding the current IoT ecosystem, and in building new IoT solution frameworks. Unlike legacy SIM cards, where access to the proprietary networks is determined by specific access protocols, eSIMs are embedded in devices during the manufacturing process and are activated using over-the-air provisioning of service subscriptions. It's important to note that both network access and applications can be modified remotely with eSIMs, which is key for IoT providers deploying solutions in remote locations or in use cases where devices will travel across multiple geographies, creating dependence on multiple service providers. Remote application provisioning is also useful for IoT connectivity service providers who need to deploy value-added services such as analytics, data management, and security and compliance safeguards.

Retail Service Industry

With 24x7 data throughput, the retail service industry represents one of the most commercially profitable sectors for MVNO, especially at scale.

Applications

- Vending machines
- Automatic Teller Machines (ATM)
- Mobile payment solutions

Challenges

- Security & privacy
- Seamless system integration
- Reliable connection
- Wide coverage
- High-data

Commercials

- Highest data throughput or lowest pricing
- Restful APIs
- Encrypted communication
- Reliable, constant connectivity

If eSIM technology changes the communications paradigm, and the way that devices connect to networks, it creates a significant new opportunity for intermediary and brokerage models which MVNOs can take on, to deliver a broad range of Connectivity-as-a-Service capabilities to the end-user.

REALIGNING MVNO SERVICES

MVNOs are no strangers to disruptive business models and market segmentation, capitalizing on the shift from voice to data demand in the late 2000s. IoT presents a similar challenge - one where MVNOs may have to reinvent themselves to cater to a radically different market than the traditional consumer-focused mobile ecosystem.

A significant majority of IoT applications exist within the B2B2B market, whereas many MVNOs package their services toward B2C consumer-facing applications.

But even within the B2B sector, it's critical for communications service providers to understand that IoT is not one large integrated vertical market and tailor their offerings to industry-specific use cases. For example, MVNOs can differentiate by providing more of an end-to-end supply chain management approach, orchestrating different logistics-oriented IoT services with low-cost, borderless connectivity solutions. Enterprises can also become MVNOs, themselves. For example, an international logistics business could become an MVNO to manage its own cellular connectivity services. In the case of e-health and medical services medical oriented MVNOs can focus on delivering the low latency services critical to IoT-enabled healthcare. Similarly, the digital signage industry will require a different package altogether - perhaps one that allows for infrequent, high-volume data transfers at a reasonable cost. The same differences exist for IoT applications in mining industries, consumer devices, construction, aerospace, manufacturing, and a host of other industries.

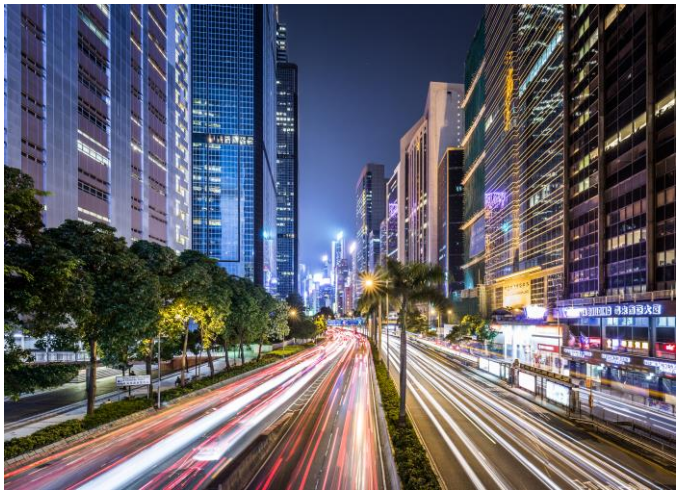
How MVNOs can showcase their value to customers on both commercial and technical fronts:

- Use success stories and pedigree to establish trust
- Be more flexible with commercial models
- Build dedicated expertise in IoT and offer applicable propositions per vertical
- Offer better connectivity management along with support for specialist requirements like eSIM, multi-IMSI subscription management, and eUICC support
- Develop cloud-based solution offerings
- Ensure geographical expansion, supporting cross-border coverage options and regional breakout capabilities

This approach to winning a larger share of the IoT market can only be realized if MVNOs work with a Mobile Virtual Network Enabler (MVNE) that understands and supports their business. The need for a partner who will allow MVNOs to control and monitor their connections becomes even more crucial when you consider that IoT is an evolving market and that MVNOs will need a significant degree of flexibility when it comes to building connectivity packages for new and innovative use cases.

HOW DOES TATA COMMUNICATIONS HELP MVNOs CRACH THE IoT MARKET?

By delivering key enablers to organizations looking to enter the IoT market, Tata Communications helps a new generation of MVNOs create targeted offerings to different industry verticals. We go beyond simply providing hosted infrastructure and deliver low latency connectivity worldwide with regional POPs on five continents - this means MVNOs can deliver services on a global scale while developing their business operations from a domestic or regional base, without ever having to shift MVNE partners.



Consumer Devices

The wide variety in consumer IoT devices and applications mean that MVNOs will need to segment their offerings toward specific use cases.

Applications

- Children/pet/elderly tracking
- Wearables
- Personal navigation
- Distributed Media

Challenges

- Borderless connectivity
- Out-of-the-box connectivity
- Reliable connectivity (even in rural areas)
- Potentially high-volume devices
- Power-efficiency
- Mobile voice communications for emergency calls

Commercials

- eSIM
- Bootstrap
- Voice and data
- One contract for global connectivity
- High data volume
-

Mobile Network as a Service (MNaaS)

Tata Communications MOVE™ is a network-independent, cloud-based global mobility platform that enables end-to-end MVNE services, helps eliminate capital expenditure and offers on-demand network access and scalability. Combined with API integration, the platform allows MVNOs the flexibility to customize their offerings for new applications, and create customer portals for more control, policy enforcement, and security.

The Tata Communications MOVE™ platform is also geared towards scalable operational management for billing, workflow, product set-up, customer care, and reporting.

Mix and Match - Modular Services

Using 'mix and match' modules, Tata Communications MOVE™ lets MVNOs pick the combination of services that best addresses their offerings, to create true differentiation and market disruption.

Tata Communications MOVE™ - Mobile Network Enablement delivers everything that an MVNO needs – like quality, reliability, and scalability - combined with faster time-to-market, lower investment and a range of value-add services to create a seamless user experience.

Multi-tenant architecture, plus secure, carrier-grade infrastructure with built-in redundancy, means that services will always be available. Additionally, Tata Communications MOVE™ supports implementation across Wi-Fi, 2G, 3G, 4G and 5G cellular, so MVNOs never have to worry about network upgrades impacting their service offering. Other benefits include:

- **Independence** - with a combination of Tata Communications own infrastructure, and multiple local MNO connectivity agreements, we deliver unprecedented levels of network flexibility, control, and optimization
- **Grow business internationally** - leverage Tata Communications mobile global virtual network with regional PoPs on five continents
- **Minimum up-front investment** - an OPEX geared model enables us to deliver MVNO services built and hosted on our network independent MVNE platform
- **Self-care/management portal for full control and visibility** – manage products and services, create new value propositions, access account information, and customer reports and drive stronger customer relationships with a branded self-care module for end customers
- **Responsive, agile, scalable** – access valuable new revenue streams by quickly launching differentiated mobile IoT service propositions

Helping MVNOs Go Further

Which IoT markets are ripe for the taking in a given region and technology domain? And how does an MVNO decide on the right technology mix for a given solution?

Tata Communications extensive domain expertise and market experience within multiple IoT verticals can help MVNOs shape winning value propositions, and segment their service bundles. Engage with consultants who have worked on some of the world's largest IoT implementations to understand the needs of the market, and tailor a service portfolio that stays relevant for decades.

IN SUMMARY

Given the explosive growth of IoT devices and applications, we have moved past the time where IoT was merely a proof-of-concept. While the technology is in its growth stage, the window of opportunity for MVNOs to specialize in IoT service delivery is wide open.

Europe, China, Japan, Korea and the USA are currently viewed as the most mature IoT markets, although much like smartphone proliferation, we expect IoT to quickly be embedded into the broader business and consumer experience over the next decade. Tata Communications is already deploying its technology and business expertise to help MVNOs get off the ground and cement their place in the IoT value chain. What remains to be seen is whether MVNOs will continue to wait for IoT demand to grow more, or whether they will move now to carve new niches from this high-potential future market.

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If you would like to know more about how Tata Communications can help your MVNO break into the IoT market, get in touch at http://www.tatacommunications.com/contact

About Tata Communications

Tata Communications is a leading global digital infrastructure provider that powers today's fast-growing digital economy.

The company's customers represent 300 of the Fortune 500 whose digital transformation journeys are enabled by its portfolio of integrated, globally managed services that deliver local customer experiences. Through its network, cloud, mobility, Internet of Things (IoT), collaboration and security services, Tata Communications carries around 30% of the world's Internet routes and connects businesses to 60% of the world's cloud giants and 4 out of 5 mobile subscribers.

The company's capabilities are underpinned by its global network that is the world's largest wholly owned subsea fiber backbone and a Tier-1 IP network.

Tata Communications Limited is listed on the Bombay Stock Exchange and the National Stock Exchange of India, and it serves customers in more than 200 countries and territories worldwide through its technology capabilities and partnerships.

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