

Next generation cell site management





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Smarter cell sites: the route to efficient and sustainable operations

With remote monitoring of cell sites, mobile operators can drive down energy usage and extend the life of passive infrastructure. It's good for business and the environment.

The challenges of passive infrastructure management in cell sites typical fall into three categories: energy costs and CO2 emission control, operational efficiency, and compliance with safety and security regulations.

Including energy-related field services, it's estimated that energy can account for up to 30% of network OPEX. And a lack of visibility of what goes on in your cell sites results in avoidable labor costs: that can mean overspending on maintenance resources, working capital tied up in excessive spares holding, lower first time fix rates and overpaying for maintenance contracts. Cell site uptime is critical to operator revenues, profitability, and customer satisfaction. Every security incident or equipment failure puts these at risk and negatively impacts brand reputation. However, help is at hand. The Vodafone Cell Site Management (CSM) solution can help you to digitally transform your passive infrastructure from a source of cost and risk and into sources of business value.

~40%

energy related costs account for 20-40% of network OPEX (GSMA)

25%

data-driven operations can lower maintenance costs by an average of 25% (Deloitte)





90%

up to **90%** of fault resolution is taken up by fault finding (Gartner)

The keys to effective cell site management

Deploying an advanced IoT-based solution for cell site management, enables operators to bring their passive infrastructure operations into line with their active infrastructure management making sites safer, more efficient and helps contribute to sustainability goals.

1. **Visibility:** operators have been able to monitor active infrastructure for some time, using real-time data to evaluate system status and identify problems. Having similar visibility of passive infrastructure and its operating environment remains a challenge.
2. **Control:** with active infrastructure, you can carry out day-to-day management and control operations without visiting sites. Passive infrastructure often has no remote management capability or has standalone, proprietary remote management systems that don't integrate with other systems.
3. **Automation:** you're able to deploy automation for routine tasks in active infrastructure, removing the need for human intervention and streamlining operations. Automation in passive infrastructure eliminates unnecessary site visits and improve uptime.
4. **Data-enabled operations:** passive infrastructure is typically multi-vendor, making data gathering and analysis complicated, and making predictive maintenance impossible. Data analytics in passive infrastructure that utilizes data in real-time from all systems and the cell site environment can significantly enhance efficiency.



Introducing the Vodafone Cell Site Management (CSM) solution

The Vodafone CSM solution is a holistic IoT-based offering that uses the power of edge to digitally transform passive infrastructure management.

With intelligent edge gateways connected to your passive infrastructure assets, our three tier architecture harnesses huge volumes of data to enable you to visualize, manage and control passive infrastructure remotely. Our solution uses artificial intelligence (AI) and machine learning (ML) to automate business rules and policies, helping you drive down costs, reduce CO2 emissions, control site access and more.

The Vodafone CSM solution is network, technology- and vendor-agnostic, meaning it is retrofittable to whatever equipment you have in your cell site. Thanks to its extensive library of communications protocols, it can speak the languages of any and all devices connected through it (no matter the manufacturer) and utilises your own data network to connect to the CSM platform.





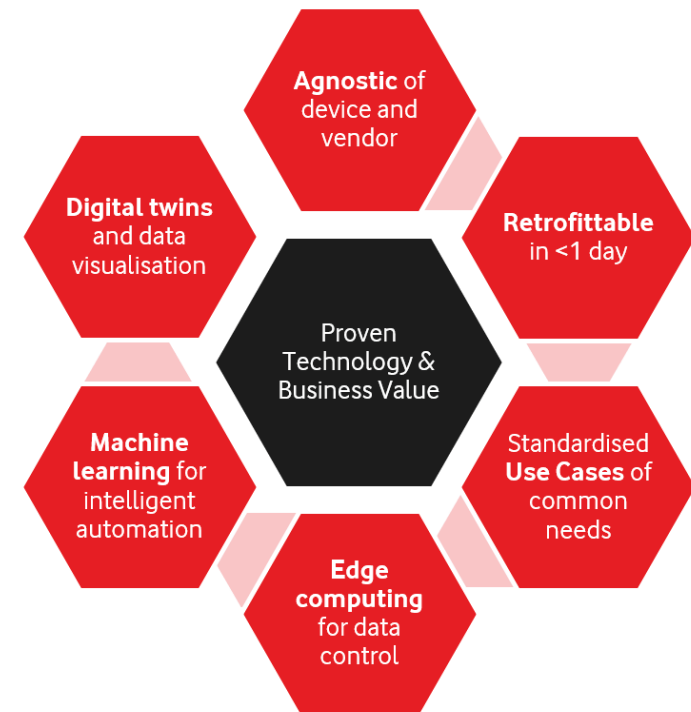
Introducing the Vodafone Cell Site Management (CSM) solution

Key features of our CSM solution

We worked in partnership with mobile network operators (MNOs) to develop a CSM solution that is tailored to their demands. Our CSM offering is highly adaptable, delivers fast ROI, rapidly helps you reduce risk in your cell sites and take control of your passive infrastructure.

- Built-in geographic information system (GIS), wizard-based digital twins and visualization tools help turn cell site data into actionable business insights
- When alarms are triggered, our CSM system employs data analytics to identify root causes and creates precise, context-rich alarm notifications, which also include potential solutions to alerts. Notifications are allocated to the most appropriate person to deal with the issue based on rules and policies designed with you and implemented into the system
- Universal compatibility thanks to being device, protocol and manufacturer-agnostic
- Retrofittable – installation in just 2-6 hours with no need to remove and replace existing equipment and minimal disruption to network operations
- Easy configuration - no coding necessary thanks to over 20 pre-defined use cases
- Edge computing capabilities manage and execute data locally, reducing time to insight and cloud computing costs. Enhances efficiency over centralized systems, enables remote interventions by engineers and eliminates need for physical site visits
- Environmental dashboard correlates system performance data with environmental factors such as site outdoor and indoor temperature when aircon is switched on. This enables further potential cost saving opportunities through fine-tuning systems plus identification of root causes

"Managing and maintaining a growing number of cell sites across an entire country requires significant expenditure. This solution harnesses the latest IoT technology to drive operational efficiency as part of a broader digital transformation strategy."
– Stephan Klink, VP Commercial Strategy and Global Expansion for Vodafone



The Vodafone CSM solution has already been deployed at scale by operators in some of the world's most challenging operating environments. It's a proven solution that is adaptable to any context without bespoke software development.



Vodafone CSM delivers value fast!

A retrofittable CSM solution that starts working for you immediately

The Vodafone CSM solution can be retrofitted onto almost any devices, analog- or IP-based, that are installed in your cell site. This means benefits across the board for you.

Our CSM solution can be installed in rapid time – just 2 to 6 hours depending on the use cases deployed – on top of your existing systems, meaning minimal disruption to your business processes and daily operations. This ease of installation keeps your implementation and training costs to a minimum and also lessens the need for enterprise-wide change management.

Because our CSM solution is both device and protocol-agnostic and IoT-based, you can leverage the power of edge computing and overcome the complexity that arises from multiple point-solutions. You're able to implement cost reduction and execute security policies locally in your cell sites without the added expense or delay of backhauling data to a central location to be processed.

Our cloud-native software platform and V-Raptor tools perform data collection, processing, orchestration and storage for you, taming the vast volumes of data generated and enabling the transition to data-driven operations. Our Raptor intelligent edge gateway is able to execute policies locally to reduce energy consumption autonomously, enhance safety, improve security and enable more efficient maintenance regimes.

Vodafone CSM uses protocol libraries, wizard-based templates and modular components which means that costly and risky software development can be avoided. Overall, your network operations center (NOC) will enjoy the visibility provided by the digital twins, digital overlays and data visualisation tools that will enable them to monitor hyper-contextualised data from many thousands of sites within a few carefully designed screens.

Instant cost reductions: an essential business case

As soon as the Vodafone Business CSM Solution's Raptor unit is installed and activated, it begins working for you. For example, when our Raptor device is plugged in and connected to site cooling systems, it controls switching on the fan, monitors the site for environmental data, then utilizing a cooling algorithm, decides on the next actions. This intelligence can reduce your site cooling costs by up to 50%.

By reducing cooling by half, you reduce your energy costs by half. This means two peripheral benefits: if you run your aircon half as much, it lasts twice as long, meaning you extend its lifespan and reduce maintenance costs. The Raptor's IoT connectivity and real-time energy consumption monitoring capability also means you can now accurately measure energy usage to better support energy bill reconciliation or to enable energy recharging.





Why Vodafone? The Vodacom and IoT.nxt story

In 2018, Vodacom, one of Africa's leading mobile network operators, identified a need to dramatically improve the efficiency and effectiveness of its cell sites. It reasoned that it could reduce operating costs and site downtime with a better cell site management (CSM) approach.

After an exacting selection process, Vodacom opted to work with South African Internet of Things specialist IoT.nxt, who had pioneered the use of edge computing in IoT-based CSM solutions. The solution had the ability to connect with any legacy equipment in cell sites, integrate any new and legacy edge devices, and, significantly, deploy and begin delivering ROI rapidly. The IoT.nxt solution was rolled out to as many as 100 Vodacom cell sites per day, and as sites were deployed and activated in the field, they immediately appeared on screen in the NOC. Results were instantaneous: major savings in energy and site maintenance costs, asset lifespans extended, and dramatic reductions in site false alarms and thefts.

The engagement was such a success that Vodacom acquired a majority stake in IoT.nxt in 2019. Since then, the CSM solution has gone from strength to strength, and global adoption of the IoT platform has accelerated. Many other companies in the Vodafone Group now enjoy the benefits of the CSM solution in their own cell site operations.





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