A major african Telco transformed their Cell Site Management operations

Case Study

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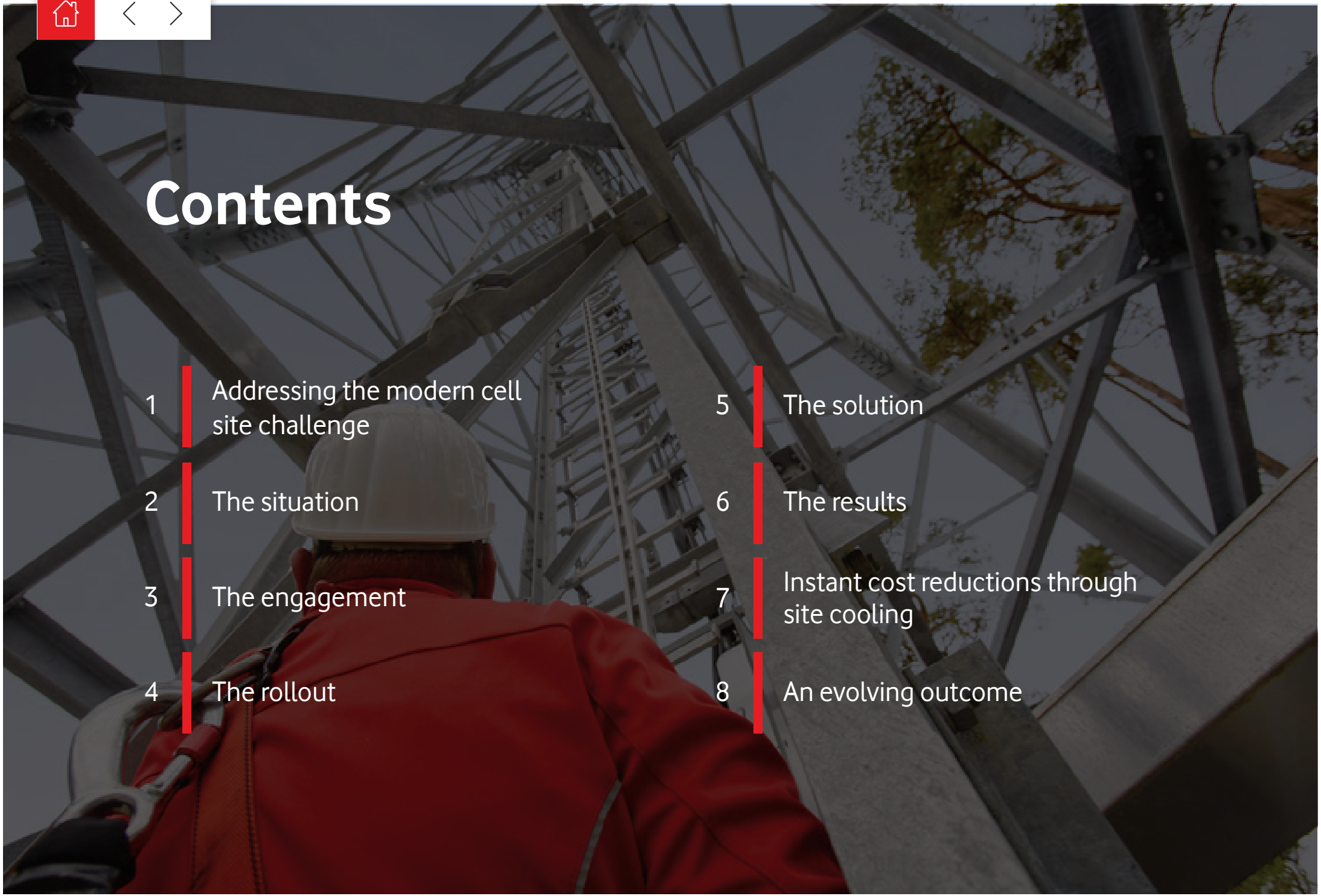

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1. Addressing the modern cell site challenge

Today's unprecedented demand for mobile services have seen cell towers take on new importance. Users expect high quality connectivity everywhere at all times of day and their expectation levels continue to rise. The need to ensure ubiquitous coverage and constant availability has never been higher, but operators need to meet financial and environmental goals too. That means greater cell density, capital intensive technology upgrades and a step-change in operational efficiency.

Mobile network operators (MNOs) face many challenges: the most advanced cellular networks are often built on ageing infrastructure, and it's now harder to generate profitable revenue growth from cell sites. Cell sites are often viewed as CAPEX and OPEX vacuums that grow ever more expensive over time as maintenance costs spiral, assets needs to be upgraded or replaced and energy costs increase.

Operators need to address three key aspects of cell site management: energy costs and CO2 emissions, operational efficiency of field services, and of course, safety and security. The Telco, sought to address these challenges and turned to IoT.nxt for a tailored IoT solution they could build together. This in turn, would transform how they manage cell sites, and drive their operations to be more sustainable and cost-effective, through their tower estate.

"We needed to get smarter about the way we managed our base stations. Energy costs, grid reliability, site visits and theft were all getting out of hand."

– Managing Executive, Network Programme Management

2. The situation

This major african Telco faced many common, industry-wide cell site challenges plus others specific to its territory like huge geographical spread of sites and the sheer distances to sites making maintenance visits from engineers a challenge. Furthermore, many cell sites in Southern Africa are not on the electricity grid and rely on generators for power, adding cost and complexity to operations. Theft is another factor: due to high levels of crime across developing African countries, it is common for copper cables to be stolen from cell sites, as well as backup batteries and diesel from on-site generators.

In addition to local challenges, this Telco was unable to harness data from the various systems deployed throughout its cell site. Furthermore, it lacked control and management of cell site energy consumption, which ranks top of the list of critical issues and cost drivers in cell sites.

This Telco's sites were replete with aged, disparate systems from various manufacturers presenting a significant obstacle to the digital transformation that the business wished to achieve. Inefficient configurations and the lack of data integration between heating, ventilation and air conditioning (HVAC), asset management, and security systems resulted in repeat site visits by engineers to perform resets, repairs and maintenance.

"IoT.nxt brought us a solution that makes it easy to connect to everything in our cell sites giving us both visibility and control. This capability enabled us to dramatically reduce our costs and transform our field operations processes."

– Managing Executive, Network Programme Management

3. The engagement

Prior to engaging with IoT.nxt, this Telco giant was only able to extract data from its various cell site management systems on a site-by-site basis. Consequently, they were unable to employ the data analytics they needed to drive the improvements required. The business approached IoT.nxt, a leading South African developer of IoT technologies, to deliver a CSM solution that could facilitate genuine transformational change. IoT.nxt had the capabilities to provide a CSM solution that could address all of the challenges of legacy asset integration, real-time remote monitoring, data analytics etc. and, best of all, the solution could be retrofitted without the need to rip and replace existing systems.

This Telco and IoT.nxt worked closely together on a business case for the solution via a series of discovery workshops. Together, they profiled the sites, defined the pain points and reviewed the business' operational costs, systems and processes. Key use cases were identified, and potential savings were quantified.

The solution modelled with IoT.nxt would give this Telco greater visibility into the passive infrastructure in its cell sites and the overall operating environment. This Telco also wanted to gain greater control of its passive infrastructure and automate certain aspects of cell site operations, eliminate unnecessary site visits and improve uptime. Data analytics capabilities would enable the business to switch to a predictive maintenance regime that would significantly reduce unproductive maintenance visits, increase asset life, reduce unplanned outages and reduce working capital tied up in excessive spares holding.

4. The rollout

This Telco giant faced a challenging situation: costs were going up, margins were in decline. IoT.nxt offered a new, modular and configurable solution that could help them address both these issues and deliver greater visibility while significantly reducing energy costs and providing overall efficiency improvements.

An initial proof of concept deployment was agreed, covering 100 cell sites. Following outstanding early results, the business quickly decided to drive forward with an accelerated plan to deploy the CSM solution to many of its most important sites. The savings potential was simply too good not to move rapidly ahead with a large-scale implementation as soon as possible; they agreed to expand the rollout immediately to around 7,000 sites. Early outcomes of the project included increased visibility of sites that were not operational, and insights into field operations that had previously not been available. The data that this Telco gathered using the IoT.nxt solution immediately enabled significantly improved decision-making, resource allocation and workforce optimization. Additional use cases were identified, tested and applied as the project evolved.

The IoT.nxt solution was installed and brought online in the business' cell sites in a few hours per site, and the rollout was soon expanded to the entire network. Sites are now being brought online in batches of around 1,200, and this Telco has gained visibility of a significant percentage of its most critical cell sites. The solution complements existing systems and gives the network operations center (NOC) a full picture of the network in real time.

"Before working with IoT.nxt, we outsourced the maintenance of our cell sites, and we experienced all kinds of problems. We had sites with broken doors, the aircon not working, and we wanted to reduce power usage and cut costs. At that time even buying replacement keys for sites was costly and time-consuming."

– Managing Executive, Network Programme Management

5. The solution

IoT.nxt developed a custom-fit solution using a set of standardized building blocks to address all the challenges of the Telco's cell site management. One key building block of the system is the advanced edge computing-enabled IoT gateway, which sits in the cell site and connects to all pieces of equipment, no matter its manufacturer or age. The solution is technology- and vendor-agnostic, making it retrofittable to all legacy equipment and systems in the company's cell sites.

The IoT.nxt solution is more powerful than other IoT-based CSM solutions on the market because it leverages the power of edge computing. Edge computing enables the solution to harness the huge volumes of data generated by cell sites and underpins powerful features such as cell site automation, intelligent fault finding, digital twins and remote intervention. Furthermore, the IoT.nxt solution features machine learning (ML), meaning every Telco can now automate business rules and policies to regulate and reduce CO_2 emissions, control site access and much more.

Visibility of overall cell site operations is enhanced by contextualization of data in real-time and sending it to a centralized platform that gives the business a full 360-degree view of site systems and their operating environment. This visibility enables more accurate decision-making and the ability to prevent problems before they arise proactively. For example, this Telco can now use environmental temperature inside and outside a cell site building to optimize cooling system resources inside it.

Key elements of the IoT.nxt CSM solution

- Retrofittable: it can be retrofitted onto practically any device - analog- or IP-based - currently in a cell site.
- Rapid installation: just 2 to 6 hours depending on use cases deployed. It fits on top of existing systems, ensuring minimal disruption to business operations.
- Use Cases: a growing library of field-proven cell site use cases that can be rapidly applied to suit client needs.
- Edge Computing: Uses the power of Edge Computing to tame the vast amounts of data produced by cell sites and to execute locally without the cost or delay of networks and cloud-computing.
- Enhanced visibility: real-time data and monitoring deliver enhanced visibility and context of what is happening in your cell sites straight to the network operations center (NOC).
- Machine learning: diagnose and direct alarms to the appropriate teams.

6. The results

This Telco giant saw multiple benefits across a range of metrics. These varied by site configuration and the use cases deployed.

- Payback periods of between 8 and 18-months per site
- **15-25%** savings on energy costs
- **5-10%** savings on maintenance costs
- **20-40%** longer asset life

This Telco's approach to managing cell sites has been changed comprehensively. Today, this business can draw actionable insights from cell site data thanks to the solution's built-in geographic information system (GIS), wizard-based digital twins and visualization tools. In addition, the payback period for the solution is between 8 and 18 months per site, depending on use cases.

Site alarms are now allocated to the most appropriate response teams thanks to the IoT.nxt CSM solution data analytics. Previously, when individual alerts occurred in a cell site, they would trigger a cascade of alerts that snowballed and became an exponentially larger problem. Hundreds of alerts arrived in the NOC and the operator had to establish the initial root cause: it was hugely time-consuming and complex. Now, the IoT.nxt CSM solution eliminates all work, avoids missed or ignored alerts, identifies root causes and includes a recommended solution to the trouble ticket. This means the operator can send the right team to the site with the right tools to resolve the issue, removing the need for repeat site visits. As such, the business has been able to reduce site visits dramatically.

The Telco now enjoys enhanced visibility of its network of sites. The IoT.nxt solution offers a highly intuitive graphical display that lets the Telco company see the status of thousands of sites on one single screen. Visibility, control, cost savings and a positive impact on the environment: the IoT.nxt CSM solution has completely transformed cell site management at the Telco giant.

"Access to accurate, real-time data across the whole estate gave us the ability to dramatically reduce energy consumption, drive down costs and improve overall operational efficiency."

– Managing Executive, Network Programme Management

7. Instant cost reductions through site cooling

As soon as this Telco installed and activated the IoT.nxt cell site management solution, the Raptor unit went to work. The Raptor device was connected to the business' cooling systems and to internal and external temperature sensors. The system was then able to take control of the air-conditioning and fans using carefully balanced algorithms to device the optimal cooling strategy. This enabled us to reduce air conditioning use by up to 50% in many cases.

The business was able to reduce cooling by a quarter which cut energy expenditure in sites dramatically. This in turn meant an extended lifespan for site cooling equipment and reduced maintenance costs. The IoT.nxt connectivity and real-time energy consumption monitoring capability enabled the Telco to accurately measure energy usage and better support energy bill reconciliation.

8. An evolving outcome

This Major Telco was so pleased with the results delivered by the CSM solution that it acquired a majority stake in IoT.nxt after a successful role out across the business's tower landscape. The insights and benefits generated by the CSM solution have continued to grow and the solution has matured and evolved over time. Subsequently the Telco began rolling out the solution with its OpCos across continental Africa, and the Telco company is now bringing the solution to the market for other operators and Tower Companies globally.

> *"We were so convinced by the IoT.nxt technology and so impressed with the company, that we bought a stake"*
> **– Chief Technical Officer**

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