SOLUTION BRIEF

Automate Site Lifecycle Management
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Executive Summary

For any mobile operator, building out (and maintaining) effective mobile coverage for customers is a central concern. But approaches established during the 1G-3G era are rapidly becoming obsolete, for several reasons. First, 4G and 5G tend to increase the number of sites required for nationwide coverage. More sites means more labor—which adds to the cost burden. Second, in mature markets, operators attach a significant competitive advantage to being first in market with new technology; few mature operators today have the luxury of a five-year rollout window, so speed is vital for market advantage. Third, operational solutions that rely on the integration of disparate tools (such as program management, asset inventories, radio planning, document management…) are becoming more complex to maintain, actually preventing the kind of agility that operators really need (such as for implementing a vendor-swapout program).

In summary: for scalability, speed and agility, a new approach is now required. One that emphasizes automation, simplifies complexity, and recognizes that managing network expansion is not only about deploying assets efficiently, but also about laying the foundation for efficient operations and outstanding customer experiences across the entire network lifecycle.

Rakuten Symphony’s Site Management solution implements just such an approach. Ultimately, it delivers a major acceleration, and significant reduction in cost, of bringing new network online in both greenfield and brownfield contexts. Along the way, it also gives operators a migration path from their reliance on spreadsheets, complex and hard-to-maintain integrations, brittle workflows, and siloed information.

A key component of the solution is the use of a common platform of data and capabilities, supporting applications appropriate to each phase of the buildout process. This common platform is already based on the most modern of IT and cloud architectures, is proven at scale, and forms the basis for any operator’s strategic drive towards fully automated, intelligent, low TCO network operations.

Finally, Rakuten Symphony Site Management contains all the components and capabilities that are essential for smooth network expansion and operations during the transition to new, software-defined networks.

Accelerating 5G

The adoption of 5G has increased significantly due to the quick expansion of commercial deployments, and operators who want to compete aggressively in the global economy are speeding up their adoption. As they try to provide customers with 5G, mobile network operators face large-scale network rollout projects, variety in deployment, and more significant project acceleration than ever before. In addition, network deployments are typically complex from a technical and execution standpoint due to the labor-intensive work and coordination required to ensure a timely network service launch.

The site build process of building a telecom network includes various phases, from planning, acquisition, configuration, verification testing, handover to operations, and maintenance. In today’s world, telecom operators working in silos end up using multiple tools for these functions. A site-build process in any telecom network is a labor-centric task; it takes time and requires manual expenditure, paper trail maintenance, monitoring of project execution, and maintenance of sites before it is handed over to operations.

For any network deployment in the current landscape, communication service providers have to deal with multiple vendors’ equipment, manage multi-domain deployment, prepare site acquisitions agreements, coordinate field activities, identify the root cause of site deployment issues, and collect large amounts of project data and site performance testing across the network deployment lifecycle process. All these site activities are done manually, which convolutes the processes leading to project delays and increased capital expenditure.

Rakuten Symphony’s Site Management solution provides end-to-end management of all these business functions on top of a single platform.

The solution comprises the essential applications for taking a site from planning stage through to commissioning, validation and testing: Site Manager, Symconnect, and Sympulse. Together, these transform site deployment by
significantly decreasing deployment time from months to a few days. The overall solution is highly configurable, providing comprehensive site lifecycle management, and digitalizing all manual site operations, with automation simplifying the deployment of greenfield and brownfield sites.

The solution leverages the Symworld Platform, which provides workflow orchestration, AI/ML, database support, alert notifications, data integrity, analytics, security, identity, and access management, reducing dependency on third-party solutions or applications. It aims to provide data quality management with mobility in field operations, helping them orchestrate, manage, and monitor end-to-end business processes and workflows. By improving process speed, visibility, consistency, and agility while enhancing standardization, the solution delivers everything an operator needs to accelerate their network deployments and reduce time to market.

Engineered with a microservice-based architecture, Symworld Site Management can be deployed in any cloud infrastructure and offers easy integration with third-party applications.

**Challenges in the Site Management Lifecycle**

For telecom operators, rolling out such large-scale networks in a shorter period poses significant challenges with unprecedented levels of complexities such as:

- **No single solution for network rollout planning and management compels** operators to use multiple tools for each deployment process and offers limited ability to correlate data to build a coherent view of the network rollout process including project planning, field operations, document management, vendor-SLA performance tracking, compliance management, and workflow management.

- **Disparate solutions for multi-domain network deployment** lack a centralized solution for deploying radio sites, transport networks (fiber/microwave), data centres, and in-building sites. Each team uses multiple tools, making it hard to monitor the overall network deployment centrally.

- **Absence of centralized processes management system** causes lack of optimal control over the network deployment procedures and difficulty to adapt to any process change due to deployment dynamics, which results in confusions among teams, room for human error, delays in project completion, and duplication of effort, which ultimately puts additional strain on total CAPEX.

- **Inability of existing solutions to scale with high-volume rollout** causes a significant impact on network deployment activities; they do not offer the capability to handle the complexity and volumes to support large scale project rollout and management concurrent project centrally.

- **Lack of digitized record-keeping** causes trouble for operators while maintaining paper trails, increasing too many hard copies of site-specific and frequently used documents without any classification.

- **Primitive field force management** processes have an overdependence on manual task allocation, site allocation, sharing site information, maintaining spreadsheets for data entry, and job tracking, impacting the overall network deployment productivity causing delayed and high deployment expenditures.

- **Manual and tedious data collection** through paper-based processes leads to error-prone manual data entry by the field executives without validation at the point of input causing data errors, inefficiency, and compromised reporting and billing.

- **Ineffective communication among teams** due to lack of collaboration and visibility amongst teams. The field executives remain unaware of site issues until it is too late to rectify them leading to erroneous field task execution and project delays.

- **Inability to enforce SLA** causes low schedule adherence to project plans and customer expectations which leads to inaccurate tracking and project forecasting.

- **Traditional drive test process** requires the RF Engineer to select drive test scenarios manually, conduct the drive and perform post process and report creating dependency on tasks that limits their multiple executions in a day, causing delays in the deployment cycle.
These difficulties come on top of the problems posed by the traditional method of network deployment practice, which is spending a significant amount of time and resources coordinating a large-scale field deployment, rudimentary tracking systems, and uncorrelated inputs from multiple systems. All of these result in increased time to roll out the network and high deployment costs.

Managing large-scale deployment projects, facilities, locations, sites, assets, and teams requires a more mature approach for consistent growth of the telecom industry. Therefore, innovation and enhanced efficiency in daily operations are essential.

Rakuten Symphony brings its one-of-a-kind solutions to address all the pain points an operator faces when setting up the network.

### Digitalization of the Network Rollout Process

To automate the end-to-end deployment process, have effective planning, accelerate the pace of project execution, enhance collaboration between teams, reduce time to market, and decrease deployment costs, CSPs need a practical solution that targets all these obstacles in any network deployment, one that provides:

- **End-to-End site rollout automation** comprising site planning, designing, installation, commissioning, testing, and acceptance to manage site rollout and enable network swap, migration execution, and day-to-day site maintenance.

- **Multi-domain deployment management** allows CSPs to manage all kinds (radio-macro/small-cell, data-center, fiber, microwave) of network deployment centrally.

- **Centralized data and process management** to minimize data manipulation and inaccuracies with automated data capture, and end-to-end transparency to all stakeholders through up-to-date site information.

- **Real-time project intelligence** enables end-to-end project visibility by allowing views of deployment data, task status, and site information, improving project schedules’ monitoring and streamlining management from planning to field operations.

- **Scalable model for handling high volumes rollouts** that offers the ability to scale up to meet large-scale high-volume multi-technology network rollouts enabling improved visibility and control over concurrent projects and centralized handling of deployment bottlenecks to increase rollout success rate.

- **Ability for customization and configuration** to enable customization of tools to suit a variety of project requirements and to offer configuration to adapt to a specific deployment use case.

- **Specialized app for a field tech** to provide collaboration between project and field tech teams, and allow in-app task allocation, site navigation, task tracking through dashboards, timestamp recording of the field force, geofencing, and the ability to acquire field tasks easily to eliminate duplication.

- **In-app field data collection** to help eliminate the paper-based approach of data capturing and enable capturing first-hand digital information of sites and equipment through smart devices with support of various modes of data capture such as photo, video, QR, barcode scanning, etc.

- **Workflow based process control** enables centralized control over the network rollout processes, ensuring the easy adoption to process change with workflow orchestration. To define the sequence of steps to be completed in order and positively verified before moving on to the next task, enabling best practices in the overall network deployment.

- **Ability to Monitor and Manage SLA** to associate the system-defined SLA to the site work and vendor task for laying out metrics by which the site deployment service can be measured.

- **Access to Knowledge Base** to provide easy access to quick reference manuals and other documents for varying field related issues.
Automated drive testing with in-app drive to test task notification and execution capability enables field engineers to perform drive tests, capture drive data, and then upload it automatically to the post-processing server for the acceptance report generation.

The Site Build Process, End-to-End

An end-to-end network deployment process includes multiple phases, starting from network planning, site design, construction, network equipment installation, commissioning, testing, and handing over the site to operations. The process can differ in the case of brownfield network deployment with additional steps, including de-installation, a deployment feasibility check, equipment swap, and combined testing.

To make the complete process successful, the network deployment team must follow best practices and ensure that all resources and inputs are available to the stakeholders at every phase of any network deployment. They must also track and store all inputs to increase operational efficiency for greater visibility into a project as they plan, build, and operate the network.

To ensure that all stakeholders are involved during the deployment phase, they must develop a comprehensive deployment plan. For example, tailoring each team’s objectives, evaluating the necessary resources, tracking the project’s performance, anticipating potential problems to offer solutions, and using communication methodologies to ensure stakeholder engagement during different phases of the project lifecycle. All this ensures the network deployment’s successful inception, planning, design, execution, monitoring, control, and closing.

The Rakuten Symphony Site Management solution aims to transform and automate the whole network deployment strategy practiced by operators today to eliminate all bottlenecks and the need for multiple disparate systems. It leverages the digital transformation of network deployment processes to drive automation, collaboration, and engagement. In addition, it provides a centralized solution that correlates data for effective network rollout planning and offers validation to assess vendor performance and site health on the rollout, leading to project acceleration, reduced time to market, and low rollout costs.

Symphony Automated Site Lifecycle Management

Rakuten Symphony Site Management paves the way for operators to accelerate network deployment, reduce deployment costs, track deployment issues, and increase project insights through an off-the-shelf solution that can also handle future site maintenance activities. It offers a simple and cost-effective way to manage large-scale network rollouts efficiently with near real-time insights and centralized data governance.
Site Manager

Site Manager provides complete network lifecycle services, such as network design, planning, deployment and network operations, with end-to-end visibility and automation of all site-related tasks.

- **Unified Site Information View** allows the viewing of consolidated site information from a centralized location.
- **Template Builder** allows the creation of rack and site templates, making the process of designing new data-center facilities quick and easy.
- **Intuitive GIS Map** visualizes the geographically distributed network sites on the map. With advanced tools in the map view, users get better site visibility.
- **Workorder** manages and tracks rollout and maintenance activities for sites and data-center facilities.
- **Document Management** stores all-important site assets and provides a gallery to check pictures, videos, and work order attachments from one place.
Facility Designer allows users to perform CRUD operations on the facility and provides centralized tracking, management, and creation of facilities.

Program Management helps plan the site and facility work scope and offers an effective and transparent method of tracking forecasts and actual execution data, providing improved risk visibility and management.

SLA Configuration facilitates users to configure the SLA template and add SLA for each task.

Symconnect

A mobile app allowing site engineers to manage and report on site build activities, integrated with the overall solution to provide instant access to the latest knowledge, avoid potential conflicts, and ensure data accuracy across operations:

- **Field Service Mobility through** an easily configurable mobile application that enhances operators’ productivity and increases customer satisfaction.
- **Real-time Collaboration** with centralized access to a knowledge base that allows technicians to act proactively on issues, make error-free moves and resolve them within timelines.
- **In-app task notification** enables the work orders to be pushed to a mobile device, eliminating the need to return to the office to pick up paper-based forms.
- **Timestamp Recording** and Task visibility enable recording the check-in and check-out status of technicians to have end-to-end tasks’ visibility with instant information access, which helps to track the field tech productivity.
- **Offline Task Execution** allows field techs to do their jobs even in remote locations with fluctuating or no connectivity. It enables them to continue to execute tasks and capture site data.
- **In-App Navigation** and Geo-Tagging facilitate technicians to reach the site on time through intuitive GIS maps and increased visibility of the site periphery.
- **End-to-end Visibility** of future planned events so they can be reported and prepared accordingly. It mobilizes business processes, thereby increasing the field technician’s performance.

Sympulse

Automates stationary and drive-by testing activities to ensure the site is ready for live operations:

- **L3 Analytics** helps RF engineers to understand & analyze different Network KPIs and provides insights to improve wireless carrier network performance.
- **In-building Network Testing** facilitates RF engineers to conduct Mobile Network testing within the premises for evaluation, planning, design, deployment, and optimization of the mobile network with an advanced option for adding/building structure, and floor plan.
- **Stationary and Drive test** allows RF & Field Engineers to perform different field tests with the advanced Sympulse Engineering Mobile application that runs with pre-defined configurable test Scripts.
- **Pre-Defined Customized Field Test Scripts** help improve the productivity of engineers and the efficiency of testing processes. The drive test scenarios comprise multiple testing ingredients and run automated as part of network performance and functionality testing.
- **Auto Site Acceptance** facilitates auto report generation & acceptance based on customer-provided Network Performance KPIs & criteria.
- **Multi-Technology** supports advanced technologies like 5G SA, 5G NSA, LTE, VOLTE, NB-IoT, etc.
Post-Processing Engine facilitates auto-sync of the entire network statistics, allowing back-end data to combine to retrieve valuable insights.

The solution feature set, encompassing automation, flexibility, and centralization, is built on the Symworld platform.

Symworld Platform: Essential Data and Capabilities in One Place

Rakuten Symphony’s approach meets operator needs in solving their challenges with a solution that fits a solid and proven platform for network rollout automation.

The Symworld Platform comprises:

- **Workflow Orchestration** enables the automation of activities for dynamic workflow management and ensures that the operator’s processes are executed on time, which facilitates streamline communication, elimination of manual errors, and minimized costs.

- **Automated Business Rule Validation** allows the defining of the business rule and validation logic that is used to perform validation and control of information captured to ensure result accuracy.

- **Dynamic Forms and Views** provide the capability to create customized views for applications and dynamic forms for data collection to be associated with a task based on the business use case.

- **Reporting and Monitoring** allows the creation of customizable dashboards and dynamic widgets to offer end-to-end visualization to gain insights.

- **Data Platform** provides data integration with other Symworld products and data bus (Kafka) to implement the event-based architecture.

- **Notifications** services allow sending of the required emails and push notifications.

- **SLA** enables the creation of service expectation levels by laying out metrics for service measurement.

- **Identity and Access Management** offers centralized support for app-based permissions and role-based access control.

- **Security** provides safety measures designed to protect applications, data, and the underlying cloud-based infrastructure.

The solution provides CSPs with more control over their operations, enabling users to monitor, evaluate, and maintain tasks and processes in real-time. It transforms organizations into digital, data-driven businesses, and simplifies and streamlines processes with intelligent automation, artificial intelligence, and direct access to valuable enterprise information, no matter where it resides.

Cloud-Native, Scalable, Open

The solution is engineered to manage end-to-end site activities from planning to operations, catering to all standard capabilities and requirements of any network deployment and project execution that an operator expects. The solution is customizable and flexible to help operators manage their complete journey with ease and overcome all their challenges to expedite the site rollout in a cost-effective way.

The solution architecture supports modern and future-proof technology and is developed to support:

- **Cloud-native, microservice-based, agile architecture** to plan, build, and operate quickly and efficiently.

- **Cloud agnostic with the use of Kubernetes** as underlying PaaS (Platform as Service) that helps to deploy the product in any cloud (Public/Private).
- **Cloud observability** support to collect real-time (streamed) data telemetry for applications and infrastructure monitoring.

- **Highly scalable** to cater to the increasing number of users, transactions, and processing instances.

- **High Availability** to ensure that the solution remains up and running and accessible to users in the face of unforeseen circumstances.

- **High Performance** with domain-driven architecture where one service will be responsible for one task.

- **Openness** to seamlessly integrate with third-party applications with open API and event-based integration support.

**Outcomes, Delivered**

The Rakuten Symphony Site Management solution helps telecom operators achieve the following key business outcomes:

- Automate and accelerate the end-to-end site-build process from weeks to days through workflow automation and digitization of data collection.

- Eradicate costs for multiple tools to manage the rollout of radio sites, data-centers, backhaul, and passive infrastructure.

- Manage high-volume network rollouts with end-to-end visibility and automation.

- Reduce operational costs by deploying fewer field personnel and optimizing resource utilization.

- Change processes and workflows on the fly without impacting operations or derailing project schedules.

- Help field technicians and project managers go completely paperless for surveys, acceptance data, checklists, and compliance reports.

- Deploy on any cloud anywhere.

- Standardize processes by creating templates for workflows, reports, and dashboards.

- Achieve network performance goals by accurately measuring throughput, latency, and coverage.

**Conclusion**

The Rakuten Symphony Site Management solution can revolutionize existing business operations and future-proof them for a new generation of dynamic, software-defined networks. A powerful, agile, and secure solution that accelerates digital transformation by integrating, mobilizing, and automating business processes. It empowers businesses to automate their processes with the flexibility to adapt to the ever-changing business needs and evolve with minimum engineering efforts with a full array of features:

- Front-end configuration with dynamic forms and workflows allows users to adapt to dynamic business needs that too through a low code/no code solution.

- Templatization and process standardization allows the configuration of workflows, tasks, and views in the work order and job template, helping users to deploy processes faster.

- Advanced integration capabilities allow businesses to seamlessly integrate data and business processes, gaining competitive advantage, cost reduction, and speed to the market edge.

- Insightful business intelligence with integrated reporting and analytics framework for creating and scheduling reports.
- Advanced process modeler that empowers users to build process templates for workflow instances, streamlining manual processes.

- Device-native mobile application providing field data collection and enterprise collaboration.

- “Single source of truth”, providing end-to-end visibility in the site incubation process in near real-time.

For operators who want the benefits of accelerated buildout, increased competitive advantage, lower cost of operations, greater agility – as well as a strategic foundation for a software-defined network future – Symphony Site Management is an ideal place to begin.