Automated RAN Data Migration & Optimization for Scalable 4G/5G Networks

CASE STUDY: RF Planning Database Migration & Automation

At A Glance:

A cloud-enabled database migration and automation project for Rakuten Mobile's 4G/5G network, transitioning planning operations from Atoll to Infovista Planet Microservices while integrating advanced analytics and automated RF model tuning.

Locations:

Tokyo, Japan

Sector:

Telecommunications / RF Planning & Automation

Services Provided:

End-to-end database migration (Atoll → Infovista Planet Desktop & Microservices) 4G/5G RF model validation, tuning, and transformation. Cloud-based software development for automated daily updates. Intelligent model selection and geolocation correctionBig data analytics for network optimization

PROJECT OVERVIEW

Project Background & Challenges

Rakuten's large-scale 4G/5G rollout required a modernized, cloud-integrated planning infrastructure. The legacy Atoll environment had to be migrated to Infovista Planet Microservices with zero disruption, while optimizing propagation model usage and ensuring precise network parameter management across Japan's complex topology.

Our Solution / Approach

A modular cloud-based software was developed to handle national-scale data processing, daily synchronization, and advanced geospatial analytics. RF model tuning covered both raytracing and P3M models, with intelligent logic applied to assign model types dynamically. End-to-end automation pipelines were deployed, minimizing manual operations.

SbySoft successfully overcame large-scale data migration, automation, and modeling challenges to deliver a 100% accurate transition from Atoll to Planet Microservices, enabling Rakuten's dynamic 4G/5G Open RAN rollout with over 90% reduction in manual effort and enhanced network planning precision.

Key steps Included

Full migration of 190,000+ cells from Atoll to Planet Microservices in Azure

Development of 20+ algorithms for parameter extraction, mapping, and conversion

Automated MS SQL Server workflows for 250,000+ cells across 100,000+ sites

Geolocation-based verification to correct province-level coordinate mismatches

Daily operational support: RF validation, fault checks, parameter audits

TECHNICAL OVERVIEW

Technical Highlights

- Propagation model selection engine based on environment, clutter, and tech layer
- Indoor/outdoor-aware algorithms for accurate model fitting
- Cloud-integrated transformation workflows and error-resilient architecture
- Traffic heatmap analysis from 20GB+ of customer data
- Full support for Infovista Planet Microservices APIs and formats

Specialist Skills & Team Approach

The project combined expertise in RF engineering, cloud architecture, data science, and software engineering. Domain knowledge in Infovista platforms and Japan's mobile planning intricacies ensured precision. Agile collaboration with Rakuten's planning and performance teams enabled fast iteration and deployment.

The project was delivered with minimal manpower thanks to the strategic use of AI-assisted processes and automated workflows. Most targets were met ahead of schedule due to effective planning, smart resource allocation, and close collaboration with contracted partners.

The resulting models were delivered with three highly detailed and clear reports: Executive summary reports were clear, concise, and focused on key results.

A detailed report for the technical team, split into two parts: one with visual materials for presentation, and the other containing statistical test results and data analysis.

CHALLENGES & RESULTS

CHALLENGES

Managing vast, inconsistent planning data at national scale

Ensuring seamless Atoll → Planet migration without losing RF integrity

Balancing raytracing model complexity with real-time automation needs

Building resilient automation under changing microservices specifications

RESULTS

100% migration of 4G/5G planning data into Planet Microservices

Model tuning accuracy significantly improved with dynamic assignment

Daily automation achieved, reducing manual work by over 90%

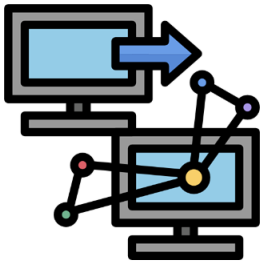
Enhanced coverage planning and capacity design with advanced insights

Successful transition enabled continued rollout and support of Rakuten’s Open RAN network

IDEAL SCENARIOS

National RF Database Migration Projects

Open RAN Rollout Support



Multi-Technology (4G/5G) Propagation Model Tuning

Automated Daily Planning Workflows

REPORT DATA

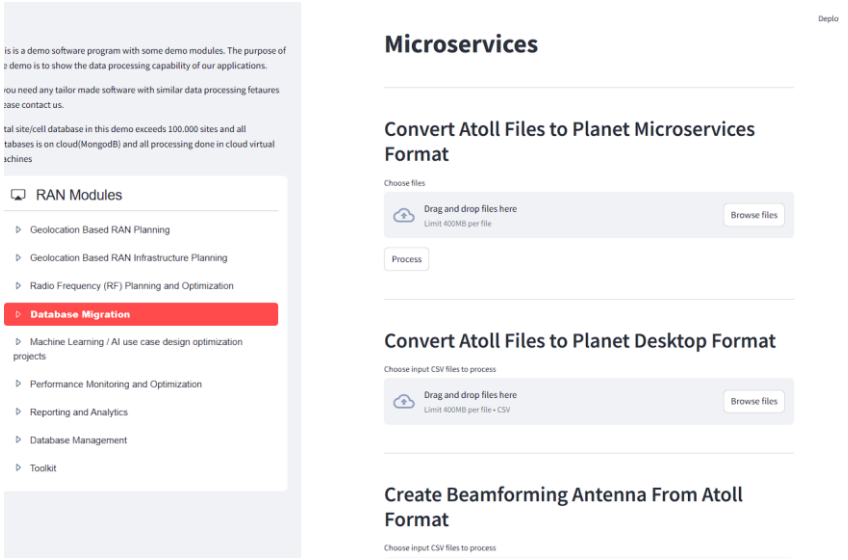


Figure 1: Screenshot of custom automation software — It streamlines data preprocessing and ensures high-quality inputs for RF planning tools like Planet, significantly reducing manual effort.

TESTIMONIALS

"SbySoft's team delivered beyond expectations during our nationwide database migration. Their automation-first approach not only streamlined the transition from Atoll to Planet Microservices, but also ensured complete consistency across over 250,000 cells. Their intelligent propagation model selection system was especially impactful, helping us maintain modeling accuracy while scaling to 5G. It's rare to see this level of precision, innovation, and ownership in a project of this size."

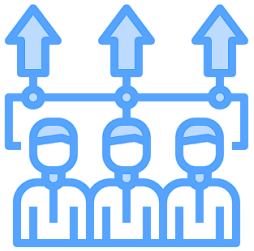
Global Key Account Director, Infovista Japan

"What impressed us most about SbySoft was their ability to design a custom, cloud-based solution that could analyze and convert large datasets from Japan's national RF planning database. Their work enabled real-time automation, model validation, and region-specific corrections at scale. This project set a new benchmark for how we handle 4G/5G planning data in both Japan and Europe. It was strategic, efficient, and highly technical—all at once."

Divisional Director, Tangent International. UK

WHY SBYSOFT ?

Access to highly specialized consultants with hands-on delivery experience.

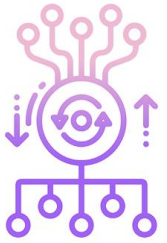


The ability to scale up teams quickly for regional or multi-country projects.

A practical, data led approach grounded in real-world network behaviors.

Fast, fully remote delivery with deep expertise and consistency

Smart, cost-effective RF solutions tailored to each project’s goals.



A data-driven approach that reduces costs, shortens timelines, and improves accuracy.

CONTACT

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Specializing in Cloud-Based RAN Technologies, Microservices, ML/AI Automation, and Cross-Disciplinary Solutions

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