

Sisag delivers faster insights, better customer experiences for ski resorts with Azure IoT

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A smooth, reliable cable car is central to keeping skiers happy at the world's biggest ski resorts. Resort managers and engineers at more than 650 sites rely on Sisag to provide control and monitoring tools for their cable cars and ski lifts – but there's always scope for more up-to-date, detailed insights. So, Sisag worked with bbv Software Services to build the SisControl Cockpit using Microsoft Azure IoT Edge, Azure IoT Hub, Azure Service Bus, Azure Table Storage, and Azure SQL Database. The tool offers resorts both real-time data and historical analysis, which they use to help reduce downtime, improve maintenance, and enhance customer experiences.

Quote from Michael Arnold: SisControl Product Owner, SISAG:

"It's so much easier to maintain SisControl in Azure than it was on-premises. We developed it quickly, and we can support our customers faster, too — there's huge business value in this solution."

Almost perfect, or not

Some days in the high mountains are almost perfect. They start with white spires covered in new snow, bluebird skies, and you above the treeline, stringing hard, fast turns through soft powder. Throw in posh digs, iconic resorts, and stray movie star sightings down in the village, and skiing is about as much fun as it looks. Unfortunately, nothing wrecks near-perfection like closed lifts, interminable lines, understaffed lodges, or when the warming chalet up top is out of your favorite ale.

Sisag helps resorts consistently deliver delightful days on the mountain for their guests. The company provides electrical control, automation, and information systems for cable cars, gondolas, and chairlifts at more than 650 ski resorts worldwide. Onsite teams use Sisag tools to operate, monitor, and manage their cableway installations for efficiency and safety.

Ski resorts keep a lead technical engineer onsite at all times to maintain safe and reliable cableway service. As the industry has grown, however, resorts have expanded their lift installations and cableway technology has gotten more complex—while the technical expertise available in the industry has actually shrunk.

“In the past, operators had the specialist engineers they needed to react immediately if something went wrong,” says Michael Arnold, SisControl Product Owner at Sisag. “Nowadays, it’s much harder to find enough expertise.”

To help its customers automate control, centralize data, reduce maintenance complexity, optimize costs, and deliver new, innovative experiences for skiers, Sisag used infrastructure and platform services in Microsoft Azure to support its SisControl Cockpit cableway operations platform. The company wanted to replace heavily customized on-premises solutions installed at the resorts with a standardized cloud platform that would deliver real-time, comprehensive, and detailed overviews of ski lift and other cableway installations.

Real-time insights in less than four months

Sisag worked with bbv Software Services, a member of the Microsoft Partner Network with Cloud Platform and other Gold competencies. Together, they built a working SisControl Cockpit prototype on Azure in less than four weeks. They then expanded that into a fully functioning minimum viable product (MVP) in time to present the platform at the 2019 INTERALPIN, a leading international trade fair for alpine technologies, less than four months later.

“We wouldn’t have met our goal with any other public cloud platform,” says Britta Labud, Senior Software Architect at [bbv Software Services](#). “With Azure, we could work very fast.”

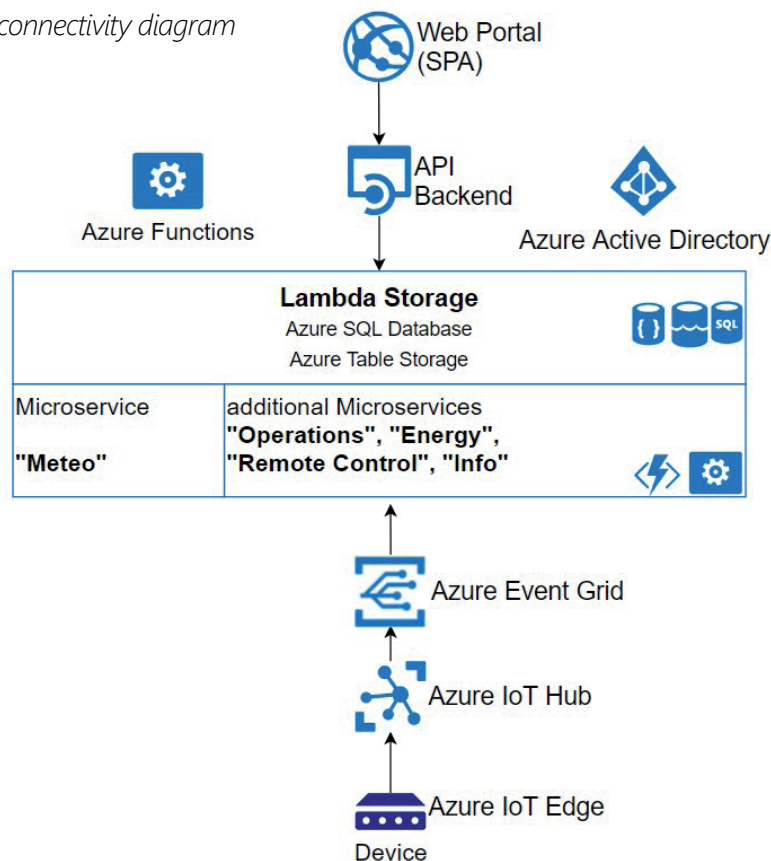
Sisag credits bbv Software Services with helping to get its product up and running quickly. “We wouldn’t have met our goal with any other partner,” says Arnold. “We have shared values with bbv. And with their expertise both in the Azure platform and in the agile software development process, we were able to reach our goal.”

By the end of 2020, fifteen customers in Switzerland and Germany were using SisControl Cockpit, and Sisag expects to double that by the end of 2021. The cableway technical leads and their staffs at these resorts now have up-to-the-minute insight into their entire installations. That helps them keep their mechanical infrastructure running safely and effectively, so skiers can spend less time waiting in lines and more time carving stylish turns on the chutes, slopes, and trails that suit them.

A complete, detailed picture

With sensors, cameras, and other Internet of Things (IoT) devices installed on the cableway infrastructure and connected to SisControl Cockpit, ski resort staff collect real-time data about skier volumes, queues, cable speeds, weather and wind conditions, and other factors that affect operations. The data is gathered from the devices with Azure IoT Edge and sent to Azure IoT Hub, where it's rapidly structured, categorized, and distributed for processing with Azure Service Bus. Using SisControl Cockpit and Azure, cableway operators process simultaneous inputs from dozens to hundreds of different IoT devices, all feeding into a complete, detailed picture of how the site and its installations are functioning.

Figure 1. Sisag device connectivity diagram



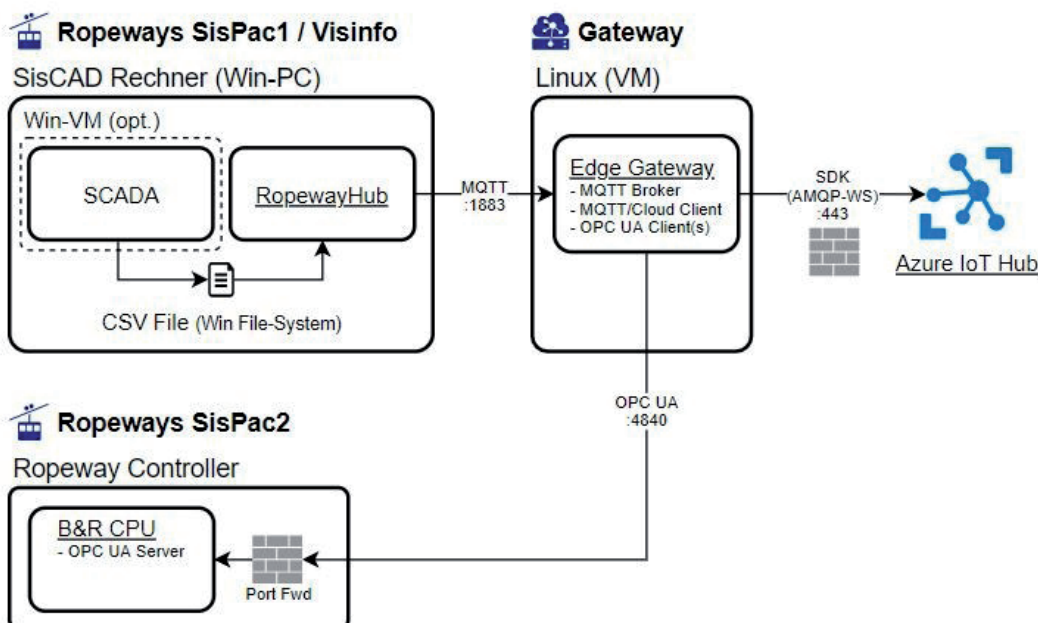
“Some customers have small installations with about 20 sensors,” says Arnold. “But bigger operators have as many as 200 sensors reporting to Azure IoT Edge, and that number is always increasing.” Processing data from IoT devices at the edge means faster computing and the ability to operate offline if there’s an interruption in cloud connectivity—ideal for remote resorts. And IoT Edge is deployed from a single point, which simplifies maintenance for the customers’ infrastructure.

Cost-optimized data storage

With a lambda architecture, Sisag manages, stores, and processes high volumes of data more efficiently and cost-effectively than with some traditional data architectures because it provides continuous access to up-to-date information, faster querying, and higher data integrity. SisControl Cockpit uses Azure Table Storage for dedicated storage to segregate “hot” data, which resort staff want right away for real-time insights into cableway performance and environmental conditions, from “warm” data, which covers the past 48 hours of operation.

After 48 hours, all telemetry data is automatically transferred into Azure SQL Database to create a highly secure master dataset. Sisag uses this dataset to produce long-term insights on cableway performance, weather trends, capacity requirements, and business innovation for its customers.

Figure 2. SisControl Cockpit architecture connectivity diagram

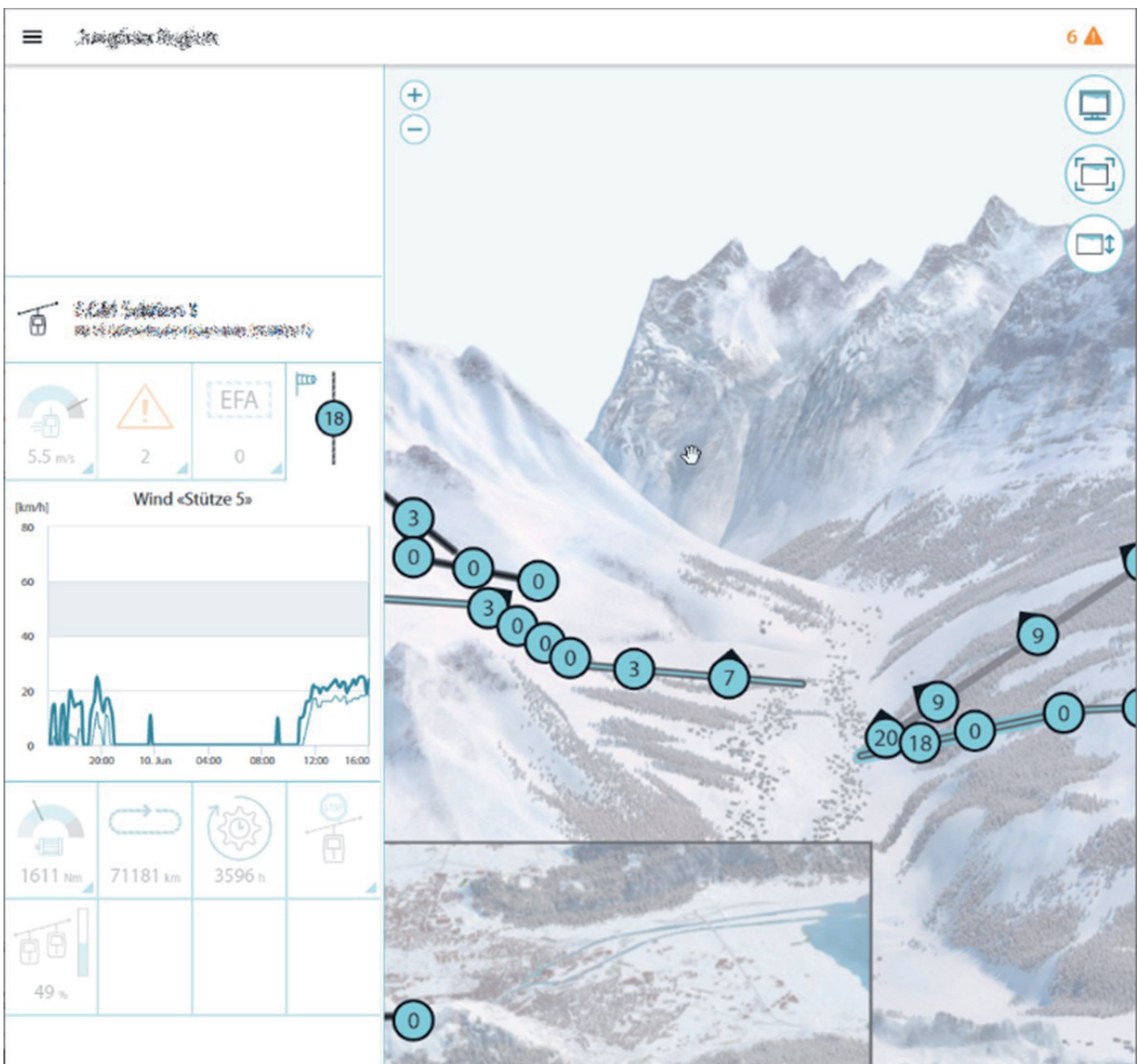


“We need to store huge amounts of data and access it quickly when necessary,” says Labud. “With Azure, we have the scalability we wanted, and we can optimize our costs by directing datasets into appropriate data stores.”

Mobile alerts, data-informed decisions

Access to the data through the SisControl Cockpit web app gives technical engineers instant insight into how their installations are operating. They can set up the app to automatically alert them if sensors pick up unusual activity.

Figure 3. SisControl Cockpit web app screenshot



“Engineers get notifications about changes in cable speeds, wind conditions, and other operational parameters,” says Arnold. “They can get as granular as monitoring the vibrations of an individual component. If it vibrates too much, the app alerts the engineer.”

With reliable, detailed, real-time views into conditions and performance, resorts can make more informed decisions about things like cable speeds or whether and when to shut down lifts when winds pick up or snowstorms roll in.

“When resort managers only had general forecasts to work from, they often had to shut down early and deal with long downtimes because they couldn’t risk running cableways if the weather got too bad,” says Arnold. “But now they can decide based on the current conditions, and their guests don’t have to sit and wait needlessly.”

A versatile system

Sisag plans to use Azure AI resources plus the data that it stores in SQL Database to help its customers delve deep into their cable car performance, using historical trends to establish predictive maintenance. “If we can tell our customers which parts are likely to break down next, they can replace components proactively with less downtime,” says Arnold. “Then guests won’t be left sitting on a stationary cable car or chairlift when unexpected breakdowns occur.”

Britta Labud: Senior Software Architect, bbv Software Services:

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Sisag is considering other use cases for its IoT platform to help its customers make sure that their lodges, chalets, warming huts, and other hospitality facilities are always appropriately staffed and stocked so that guests never want for any amenity—even during holidays, outstanding snow conditions, or other peak periods. The company is already exploring workloads such as supply chain tracking, attendance and capacity forecasting, predictive staffing, hospitality optimization, and IoT-assisted and AI-assisted alpine rescue services.

There are applications to consider beyond the slopes, too. For example, the same app that onsite engineers use to monitor installations could be used to support self-service municipal cable cars or funiculars. This could be a huge advantage for small mountain towns, where access is currently limited by the need to have an operator present.

“Our opportunities are plentiful,” says Arnold. “We see so much we can achieve with Azure IoT services.”

As Sisag continues to expand and refine the SisControl Cockpit, the company will help set the pace for digital transformation in the skiing industry, while its customers optimize their operations—and deliver skiing experiences as smooth as untracked powder.

Find out more about Sisag on LinkedIn.

Britta Labud: Senior Software Architect, bbv Software Services:

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