Digitizing wind turbine inspections using Smart Glass

Industry
Energy & Utilities

Company
Energie Burgenland AG

Project Timeline
5 Months

Services
Transformation & Modernization

Engagement Model
Global delivery

**Build a Smart Glass and mobile
appbased inspection solution
to digitize and expedite tedious
inspection processes with improved
accuracy and collaboration.**

About Energie Burgenland AG

Energie Burgenland AG (EB) is an Austrian energy service company involved in the generation, distribution and sale of electricity, natural gas, heating, and integrated energy solutions. With an installed capacity of 522 MW spread across 15 wind farms, EB is now the largest wind power producer in Austria, generating 1 TWh annually with CO_2 equivalent savings of 690,000 tonnes each year.

Energie Burgenland plays a leading role in the climate and energy strategy 2050 of the province of Burgenland. By 2050, the state wants to be energy-autonomous by covering the entire energy demand from renewable sources. By 2050, greenhouse gas emissions are to be reduced by 90 percent. Since 2018, Energie Burgenland has been collaborating with top technology and research partners in Austria and internationally in the Green Energy Lab innovation laboratory in order to jointly bring the best solutions for a 100 percent sustainable energy system quickly to its customers. The strategic focus on the expansion of renewable energies was further strengthened. Around 420 million euros are being invested in the expansion of green energy and innovation projects until 2025.

The challenge

Eliminating time-consuming and error-prone inspection process

EB has around 200+ wind turbines from various manufactures. These turbines need to be inspected periodically, approximately every 2 months and also on need basis. For instance, in the event of a storm, a hurricane, or when the turbine stops working.

An inspection team consists of 2 inspectors who check the turbine manually, using a paper checklist of 150+ questions. These checklists are specific to the turbine's make and model. During inspection, the inspectors are required to take notes, and capture photos, if any damage is found. The inspection's findings are then digitized on a computer and a report is sent to the relevant stakeholders.

This tedious and manual inspection process created the following challenges for the inspection personnel in their day-to-day work:

- Ineffective manual coordination between clerks and inspectors
- Paper-based wind turbine inspection requires additional effort to digitize the report
- Juggling between multiple things like paper, pen, camera, etc
- Manual mapping of images with incidents from a pool of 150+ images captured throughout the day

The solution

Defect recognition with a smart solution

Nagarro helped the client develop a Smart Glass and a companion Mobile app-based inspection solution or the inspectors, integrated with a web based system for the clerk to create and update the work orders. This enabled the inspectors to choose the job for the day and perform inspections collaboratively, in offline mode. Inspectors can divide the checklist among themselves and take audio notes or photos as a proof of evidence for any defect. This solution enables the inspectors to synchronize their field devices once they are online and collate their findings into a final report. The salient features of the inspection solution are as follows:

- Fully automated workflows for work-order creation and assignment through a web-based application

- Step-by-step instructions for inspectors through the Smart Glass or a mobile app

- Inspectors work hands-free using Smart Glass maximizing security of the workforce, which also leads to high acceptance rate among workers

- Ability to record audio notes and speech to text conversion (98% accuracy), enabling automatic protocol creation

- Noise cancellation microphones ensure good quality recordings even in high windspeeds

- Entire acceptance workflow can be performed offline

- One touch sync with the web application, once online

The benefit

Impact to business

- Up to 30% reduction in inspection time for each wind turbine
- Reduced error rate through quality gates
- Quick and easy creation of inspection report
- Improved co-ordination between multiple personas (stakeholders)
- Easier tracking and management with digitized solution

Client Testimonials

"Since operating a high number of wind-turbines is a huge undertaking and very time-consuming, we were looking for a solution to not only streamline the turbine inspection but improve our workforce worker safety as well. We are very happy that the implemented solution is a vast improvement and finds high acceptance within our workforce. "

Michael Haider
Chief Technician,
Energie Burgenland Windkraft

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In a changing and evolving world, challenges are ever more unique and complex. Nagarro helps to transform, adapt, and build new ways into the future through a forward thinking, agile and caring mindset. We excel at digital product engineering and deliver on our promise of thinking breakthroughs. Today, we are 8,400 experts across 25 countries, forming a Nation of Nagarrians, ready to help our customers succeed. www.nagarro.com