

How PLN boosts efficiency and accuracy with GeoAI

As PLN advanced its digital journey, improving asset management and distribution networks became a priority. One step was adopting Geographic Information System (GIS) to achieve cohesive spatial data.

The challenge

GIS initially improved how PLN mapped electricity assets, replacing less efficient tabular methods. Yet a bigger challenge remained: the lack of a predictive system to detect disruptions early. Many grid disruptions were caused by factors such as overgrown vegetation, tree canopies, and nearby obstacles. Nearly 50% of outages were linked to vegetation, making it a critical operational priority. Without an automated and predictive approach, identifying high-risk areas required manual effort and reactive maintenance which limited response time.

SmartDVM solution

Using satellite imagery and geospatial artificial intelligence (GeoAI), PLN worked with Esri Indonesia to develop Smart Distribution Vegetation Management (SmartDVM). SmartDVM is a vegetation detection solution that automatically predicts areas most likely to disrupt the network. These insights are visualized through an ArcGIS dashboard, providing a clear, spatial view of potential risks. The solution enables PLN to monitor vulnerable areas in real time, while field teams can verify conditions and carry out targeted pruning based on AI-driven priorities.

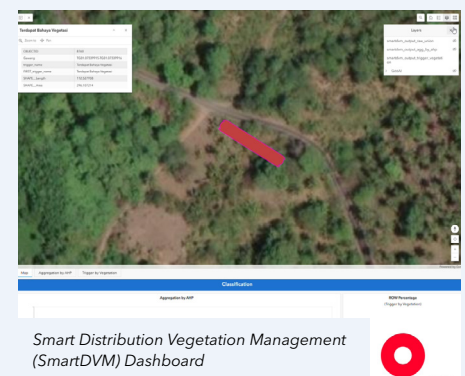
What's next

With extensive data assets, PLN has strong potential to further maximize GeoAI, including the use of digital twins and optimization of complex networks through modern utility network technology. The ongoing collaboration with Esri Indonesia opens up new opportunities for advanced digital transformation, supporting a more resilient and sustainable national energy system.

The outcomes

SmartDVM enabled PLN to:

- **Improve** vegetation and high-risk area detection accuracy by **up to 85%**.
- **Reduce** analysis time by up to **five times** compared to manual methods.
- **Proactively identify** and visualize potential disruption areas through a **GeoAI dashboard**.
- **Improve collaboration** between analytics and field teams, using shared, integrated insights.



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