











Technology Innovation: Advancement in Renewable Technologies

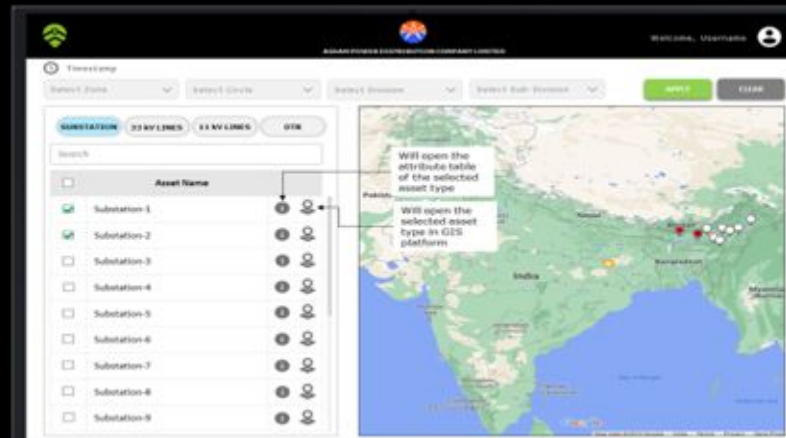
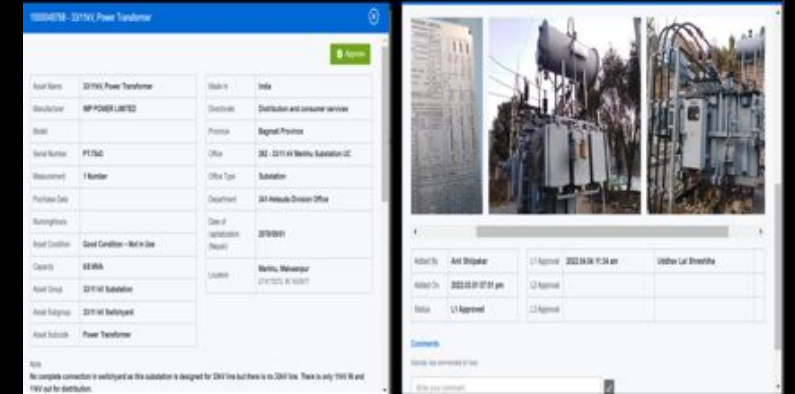
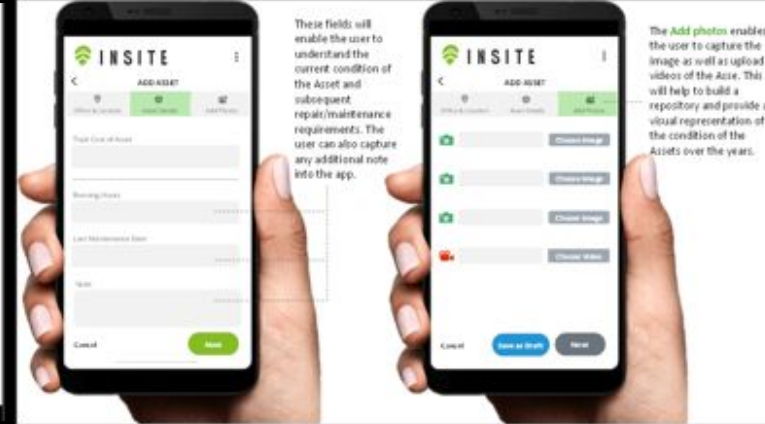
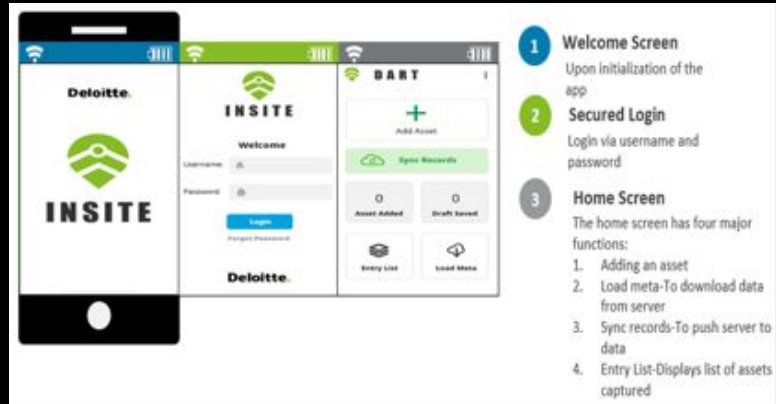
Samrat Roy, Director, Deloitte South Asia

Major challenges in RE asset management by Utilities in Power Sector

	Shortage of technical manpower	<i>Non-Availability of manpower to cover geographical spread of large utility</i>
	Dependence on third party vendors	<i>Over dependence on vendor and non-availability of internal monitoring capability</i>
	Non-maintenance of data records	<i>Utilities don't maintain records, and as a result, entire work has to be carried out through field survey, lack of technology</i>
	Delayed decisions at Utility side	<i>Fast adaptability of changing technology landscape</i>
	Costly software	<i>COTS product can be expensive, rely on newer technology</i>
	Lack of continual data updation	<i>In the absence of continual update, legacy data become unreliable or unusable.</i>
	Non-availability of vendor support	<i>Contractual issues post AMC –GIS and ERP</i>
	Integration of other Application	<i>Integration of COTS GIS and EAM with spatial databases, web mapping services, OT and real-time monitoring systems.</i>

Functioning of the Asset Tool

Tool helps to manage asset lifecycle, track assets, monitor and report. Operational and technical functionality are being added as POC



Transforming RE Resilience: From Prediction to Recovery

Leveraging the power of AI-ML and GIS to enable smarter prediction, decision-making, automation and recovery in the face of climate-induced disruptions

Pre-Disaster (Preparedness)



Risk Mapping and Vulnerability Analysis

Identify which assets are in high-risk cyclone/flood zones using geospatial overlays



Predictive Maintenance Asset Health Monitoring

Use IoT sensors + AI to detect weak/deteriorating assets before cyclone strike



Risk Zonation using Geo-AI Algorithms

Identify high-risk zones for cyclone damage using geospatial techniques



Cyclone Impact Prediction using AI/ML

Highly granular weather forecasts, enabling better anticipation and mitigation



Resilient Infrastructure Planning

Long-term planning to elevate, relocate, or reinforce assets vulnerable to climate risks.



Real-time Early Warning Integration

Integrate cyclone path forecasts with GPS-mapped assets for early shutdown/isolation

Post-Disaster (Recovery)



Drone/Satellite-based Damage Assessment

Automate detection of damaged poles, lines, and substations using computer vision models



Crew Dispatch and Route Optimization

Use GPS + AI to optimize field team deployment for faster recovery



Outage Impact Modelling

Analyze power loss patterns and estimate socio-economic impact using load + population data



Data-Driven Post-Mortem Analysis

Learn from cyclone event data to retrain ML models and improve future resilience planning



Automated Emergency Control

AI-driven switching or mobile substation activation during or immediately after impact



Resilience-Focused Investment Planning

Analyze cost of past damage to inform smarter capex allocation and future-proofing



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