

SUCCESS CASE 59.2025

Smart Meter Deployment AI

FOR SAFETY AND QUALITY



CHALLENGE

One of the core objectives of the Smart Metering Programme in Ireland was to ensure the safety and quality of every smart meter installation. Due to the scale of the rollout, which at its peak installed more than 10 thousand smart meters per week across the country of Ireland, ESB Networks was presented with a significant challenge to meet this core objective. Furthermore, for the first time ESB Networks would utilise 3rd party contractors to assist in the installation of 2.4 million smart meters and so innovative technology was required.

SOLUTION

In order to verify the safety and quality of each installation, ESB Networks developed a bespoke application, Image Data Management System (IDM), which receives data from multiple sources to create a database of all metering assets—including smart meters, cut-outs, isolators, and more—using imagery captured by the installers during the exchange.

ESB Networks then applied AI functionality to; (1) analyse the assets, (2) confirm safety and quality checks where completed, (3) categorise the assets and (4) notify the Safety team of any non-adherence to safety standards.

The solution incorporated:

- The creation of a web-based asset repository (IDM) of smart meter installation images
- The creation of a bespoke smart metering audit and image capture iOS-based mobile apps to allow the Safety team capture 'In-Progress' and 'Post-Installation' audit information and return to IDM
- Desktop-based audit and reporting functionality in IDM to allow the Safety team audit the images
- AI functionality applied to the asset repository to conduct and optimise safety and quality checks for 100% of installations
- AI functionality to ensure the integrity of the data being returned to IDM

Artificial Intelligence Safety and Quality Checks

Optical Character Recognition (OCR)



Duplicate Match



Meter Type Match



8 Safety Checks

1. 2 seals for the meter have been included (time clock & RM)
2. Warning tag for the smart meter cover has been included
3. Warning tag for the Cut-out has been included
4. Warning tag for the isolator has been included
5. LV Commissioning sticker has been signed and affixed on the new Smart Meter Cover



Asset Identification and Cataloguing

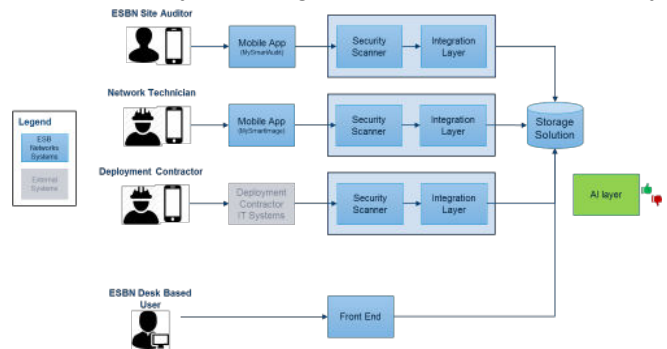


For more information about the project, please contact:

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IMPLEMENTATION

- The IDM is an ecosystem of tools that allows ESB Networks to effectively manage the installation process from a central portal
- It has a suite of secure analytical dashboards and live reporting tools allowing users to view near real-time activities in the field
- In collaboration with ESB's Mobile App team, two brand new iOS based mobile apps were developed to capture images and audit information from the field
- The IDM has built in audit tools and takes data from the IOS app 'MySmartAudit', which allows auditors to submit observations and communications from the field to the central hub
- Working with ESB's Data Analytics team, an AI layer was applied to the IDM to assist human auditors in ensuring the highest confidence and quality of work carried out in the field
- The IDM receives, transforms and loads installation data from multiple external and independent systems and presents it using an aesthetically pleasing UI/UX which allows Safety and Quality professional to audit images



ACHIEVEMENTS

- More than 10 million images captured by the ESB Networks asset base
- 30% of installations audited by a desktop-based audit team
- 100% of installations audited by AI
- 8% of installations identified by AI as having a safety or data integrity issue
- Enhanced data quality through AI Optical Character Recognition (OCR) for meter readings and serial numbers
- Duplicate images checks using AI to prevent redundancies in submissions and maintain the integrity of the asset database
- AI validation of 5 electrical safety checkpoints, improving overall safety compliance
- Customer billing disputes are easily resolved using closing read images

WAY FORWARD

- Building on the success of IDM within the Smart Metering Programme, its use is being expanded across ESB Networks to capture imagery for all types of works carried out by ESB Networks Technicians in the future.
- Going forward, ESB's own Networks Technicians will be able to carry out a site assessment before arriving at the job using images captured by the last Technician on site
- The AI functionality for cataloguing assets and optimising safety checks is currently being expanded to cover the rollout of the new 3 Phase Smart Meters in the latter half of 2025 and into 2026
- This will provide ESB Networks with assurance regarding the safety of a new smart meter installation type and a repository of new 3 Phase meter types and associated equipment such as cut-outs, further expanding the asset library