From Data Chaos to Operational Readiness

How Governance and AI Improve Asset Data Quality

AusIMM Tech Forum | Ruben Sen

November 2026

Speakers



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Information Quality by SGS

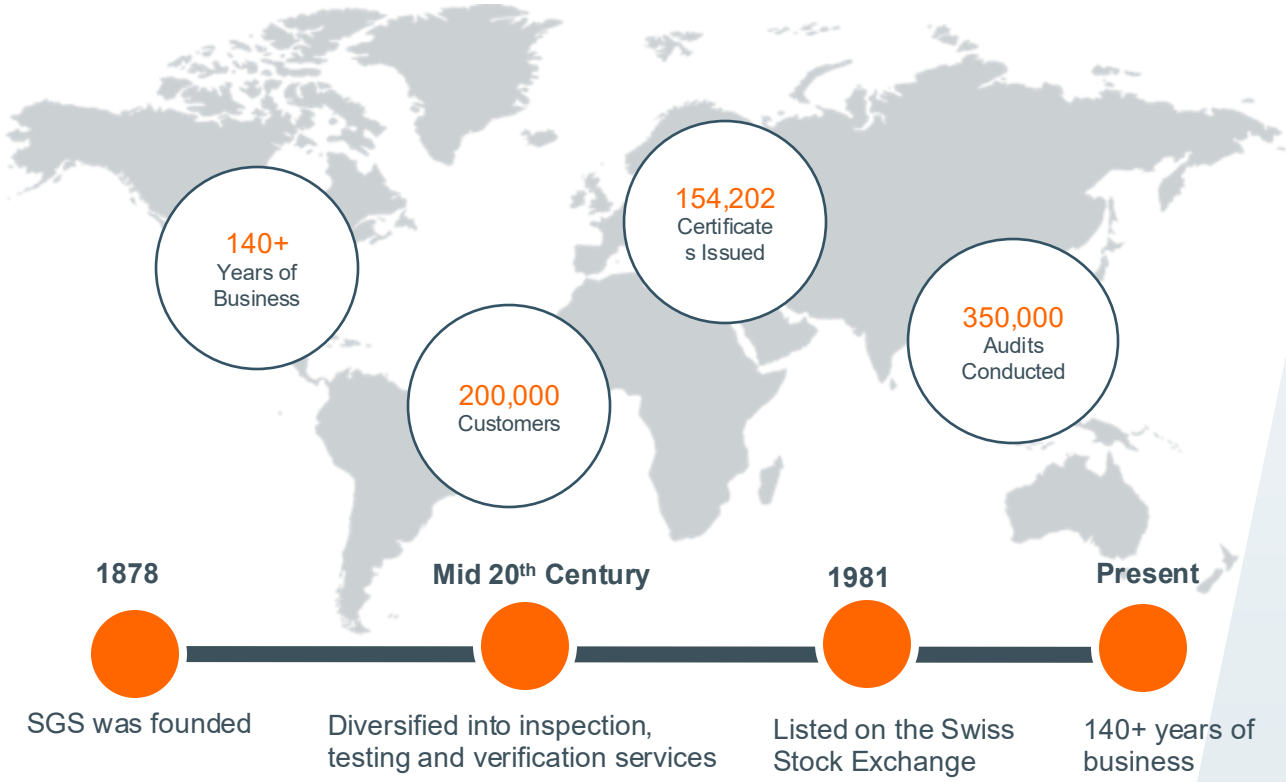
Ruben brings more than 20 years of experience in asset management, manufacturing and consulting, helping organisations optimise performance and drive business improvement.

SGS in Brief

The world's leading Testing, Inspection and Certification company

For mining, we help clients connect asset information, improve visibility and make better decisions across the asset lifecycle.

Supporting organisations across mining, energy, manufacturing and infrastructure with trusted inspection, testing, certification and digital solutions.



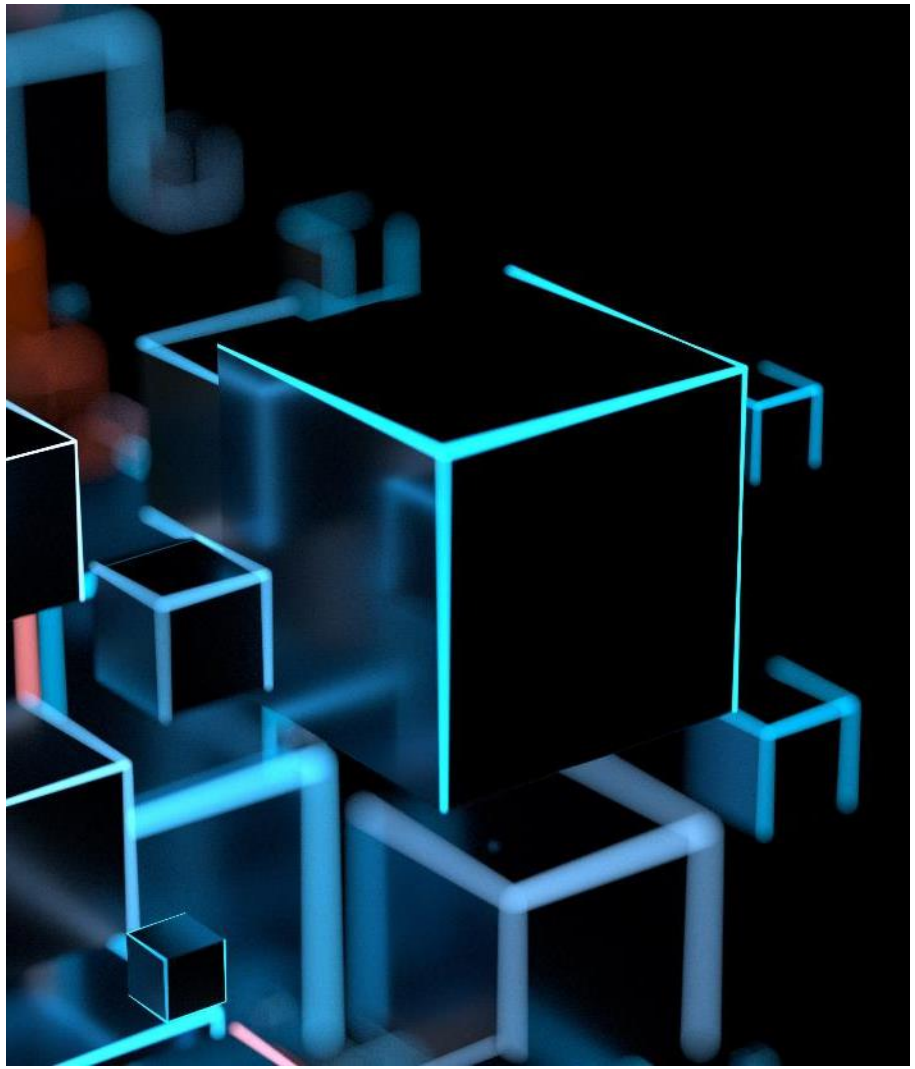
Information Quality by SGS

Helping organisations build trusted and reliable data to manage, govern and maximise the value of engineering and asset information.

- Digital engineering & information management
- Asset management & reliability services
- Commissioning and operational readiness
- Data governance, compliance & assurance

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Agenda

- Safety Moment: What is an Inspection Test Record (ITR), and why is it important
- Extracting key data from the Inspection Test Record (ITR) to enrich Asset and Operations Readiness using Agentic AI



Safety Moment: What is an Inspection Test Record (ITR), and why is it important

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Safety Moment

Non-compliant equipment installed in Hazardous Area uncovered by data validation

Several incorrect and potentially dangerous Ex installations were discovered and rectified on a recent project by comparing site captured data to engineering data. The following is one example of the issues found;

Issue

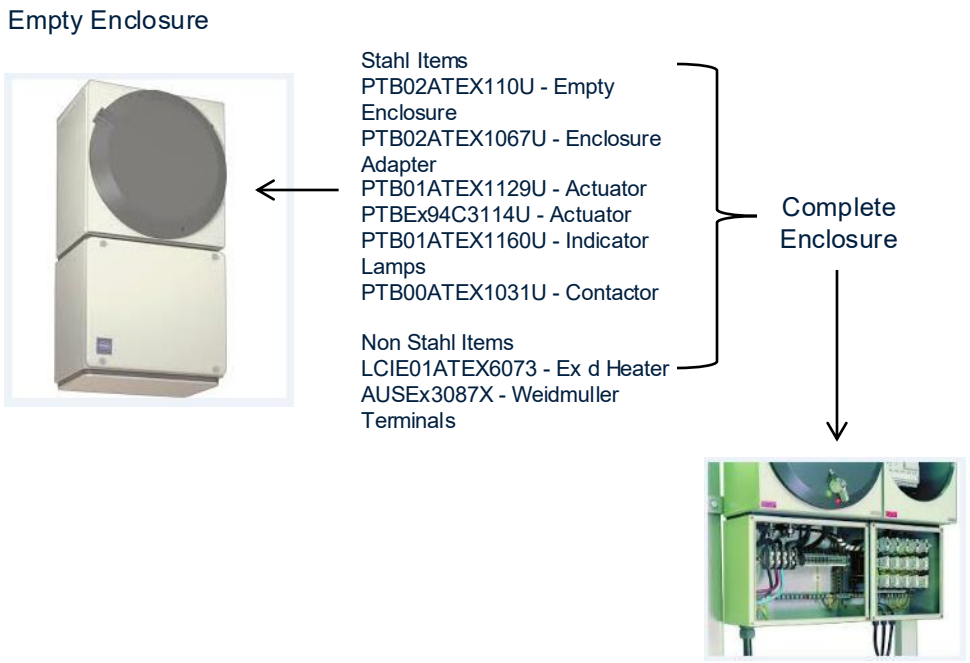
- Ex certification in commissioning database different to electrical database
- Engineering review of data found that installed certificates were not valid (“U” Suffix)
- Start-up less than 6 weeks away

Impact

- Compliant certification required before start-up
- Certified Authority was engaged to provide a certificate of conformity.
- Further analysis found that anti-condensation heaters installed would raise surface temperature of enclosure and needed to be removed.

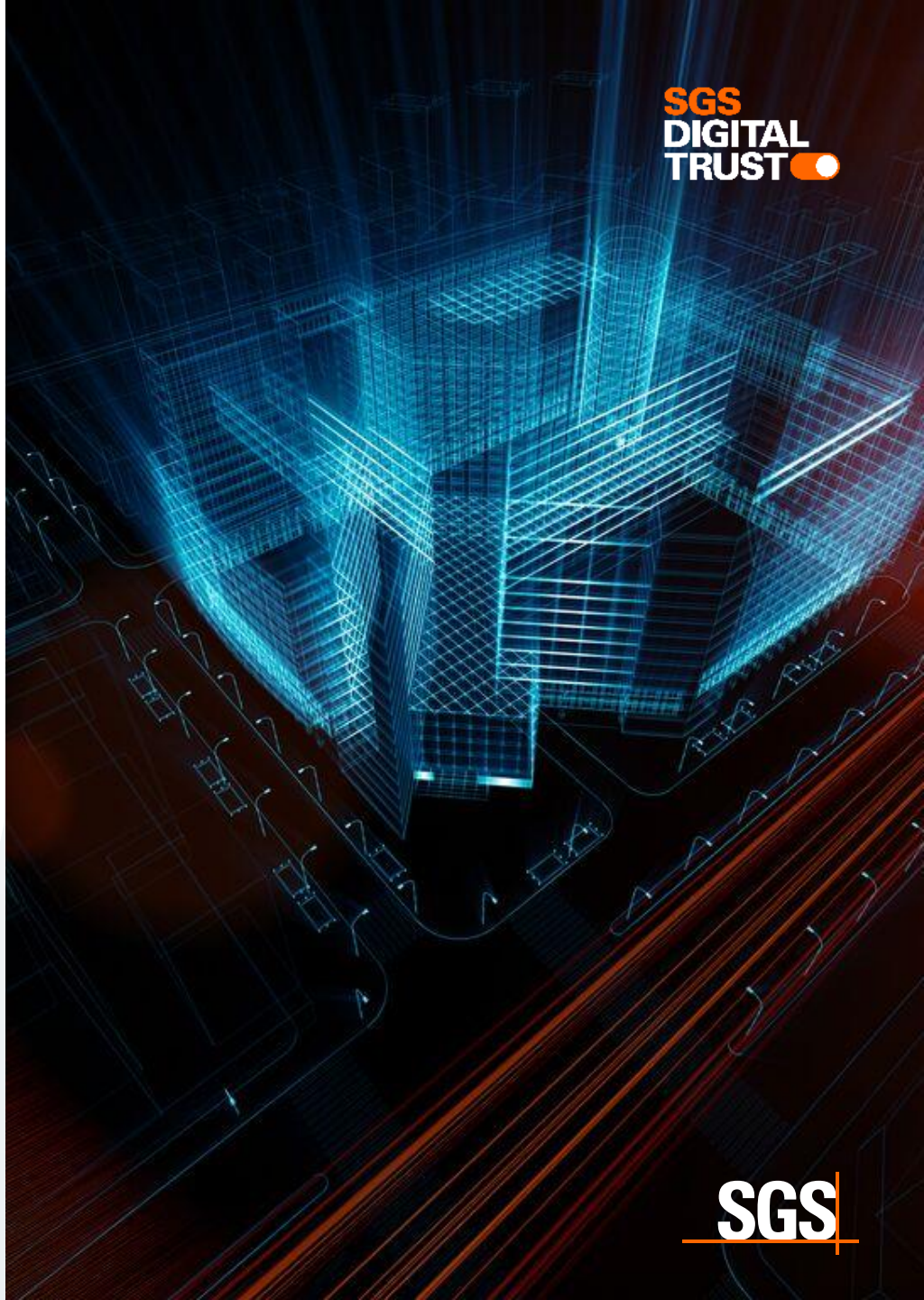
Resolution

- Heaters were removed the equipment reinspected and a certificate of conformance issued.
- Hazardous Area Dossier updates and Commissioning and Electrical Databases aligned.
- Correct data and certification provided to Maintenance team for incorporation to SAP



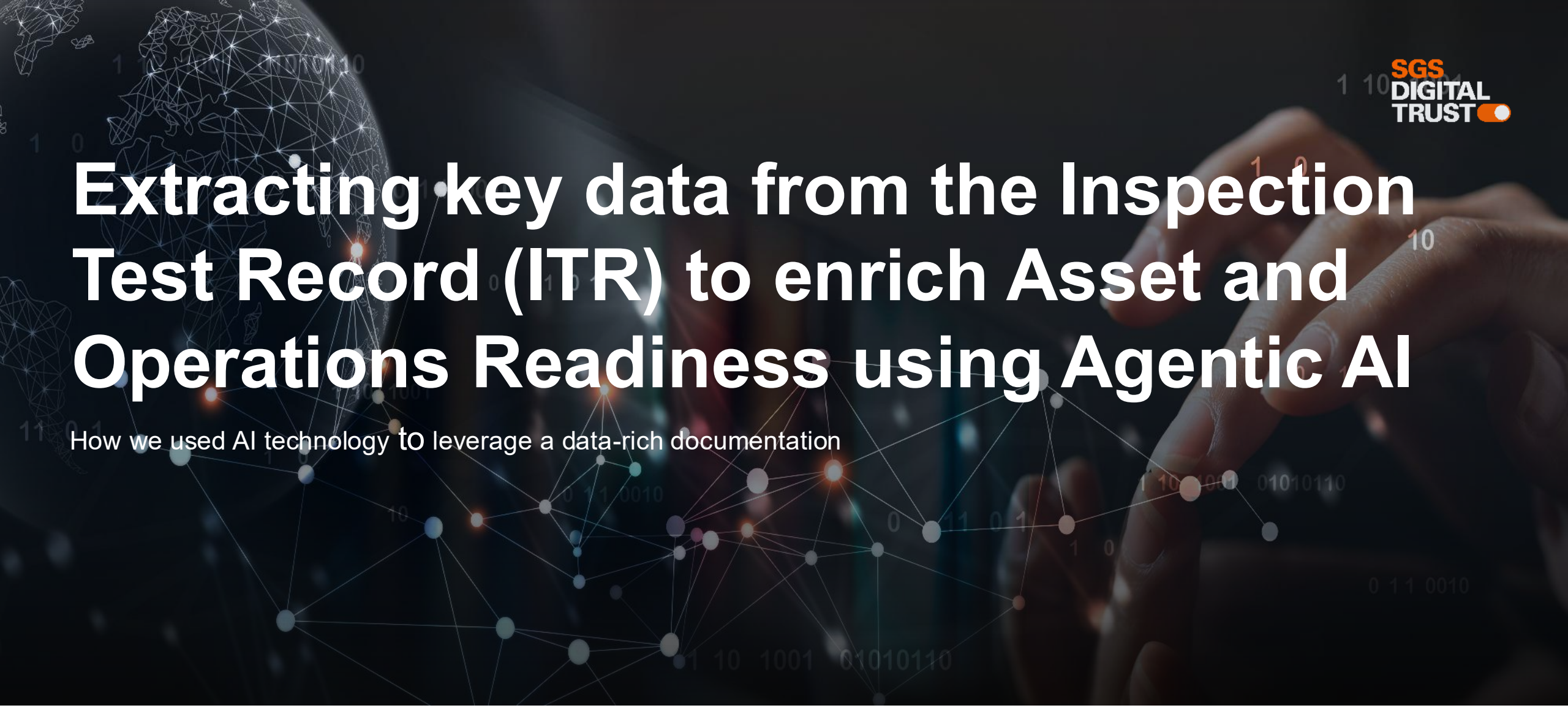
Safety Moment – Recommendations

- Pre-populate Commissioning Database and ITR templates from engineering data.
- Back populate changes to ITR’s in the Commissioning System.
- Compare data between commissioning system and engineering systems to indicate discrepancies.
- Enable Engineering to review discrepancies so that potential issues can be identified and resolved.
- Update source systems and maintenance system to retain consistency and integrity of information.



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Extracting key data from the Inspection Test Record (ITR) to enrich Asset and Operations Readiness using Agentic AI

How we used AI technology to leverage a data-rich documentation

Given: 32,806 hand-filled ITRs, 38,000 tags

Iron ore mining project | client details withheld

Validating 38,000 ITR-linked tags (of 48,000) against 32,806 hand-filled field ITRs

5
Contractors
54 engineering key lists

2
Databases
AEng and Smart Completions

38,000
Tags being validated
Associated to ITRs (79%)

48,000
Total tags
Across 54 key lists

32,806
ITRs
Completed by hand in the field

76,562
ITR pages
To be processed

2.2
Pages per ITR forecast
Planning assumption

3.48
Pages per ITR measured

Only AI extraction could read 32,806 ITRs

Contractor data quality

Contractor key list data is inconsistent. With the owner carrying out commissioning and as-building, its own field data is the most reliable basis for the key lists.

Verify nameplate data

Nameplate data recorded on field ITRs is reconciled against design data in the engineering key lists, confirming the as-built record matches what is installed.

Close the data loop

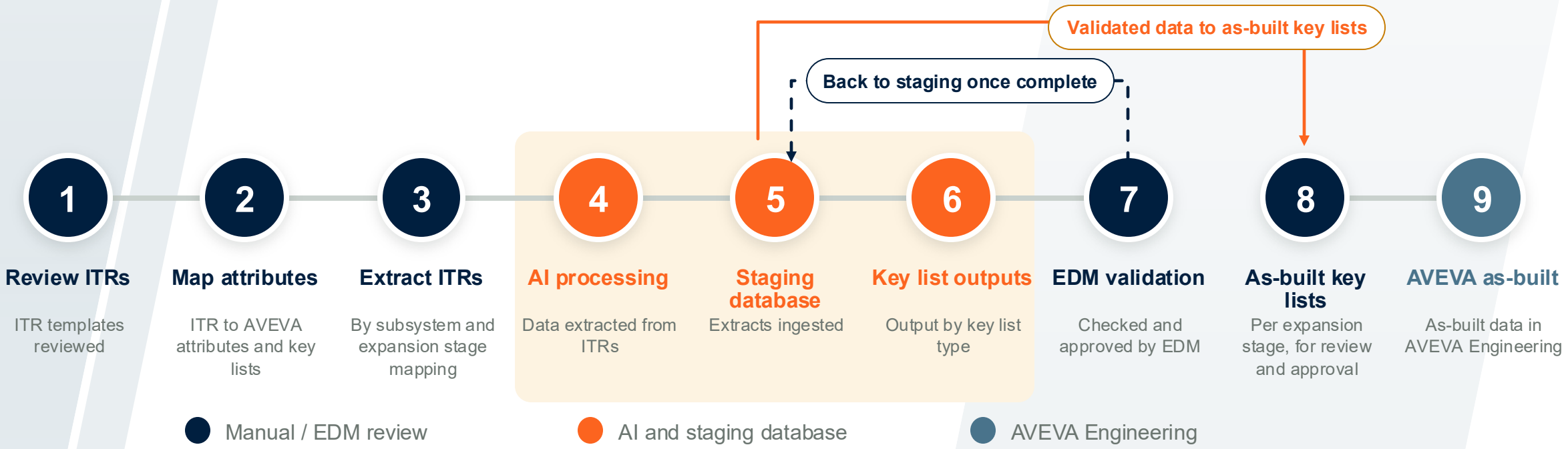
ITRs are completed manually in the field, and their data is never returned to the engineering database. We capture it and feed it back.

The only viable approach

Due to time, budget and resource constraints, it was not viable to extract data from 32,806 ITRs manually. AI extraction was the only practical option.

Turning field records into a trusted as-built dataset

AI extracts, EDM validates, AVEVA holds as-built



AI-assisted extraction, validated by EDM, as-built in AVEVA delivered over a 6-7 week timeline

5,400 of 5,464 ITRs fully extracted

What we are doing

Reading scanned Inspection and Test Record (ITR) PDFs and extracting their fields into structured records.

Why

As scans, ITRs cannot be searched, checked or loaded into asset systems. As structured records, they can.

Six disciplines

- **J** Instrument
- **E** Electrical
- **M** Mechanical
- **T** Telecomms
- **P** Piping
- **H** Fire & Gas

Outcome

5,464

ITRs in the full corpus

Project figure

5,400

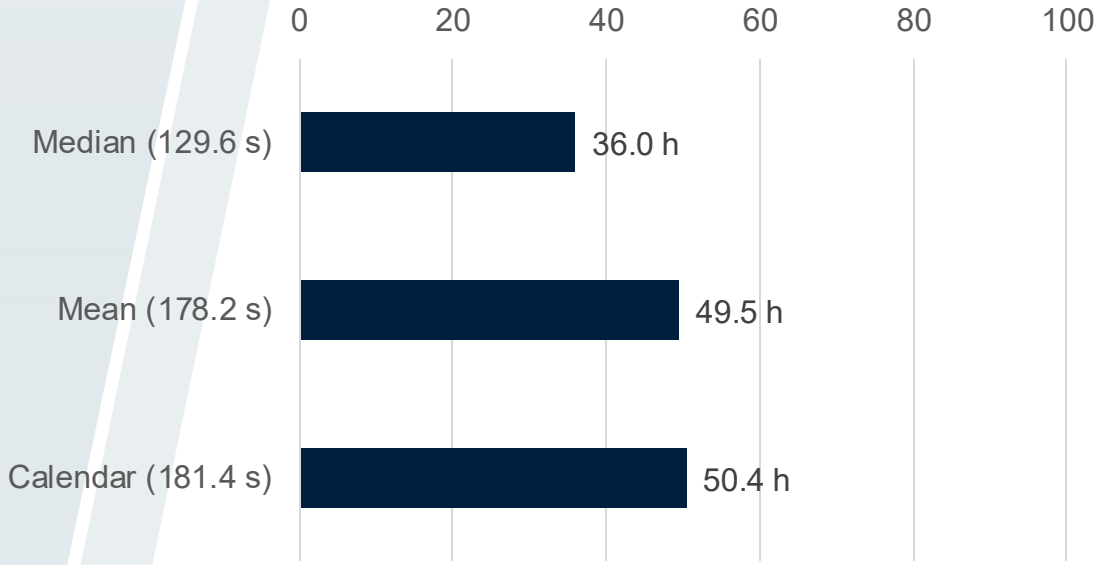
unique ITRs fully extracted

64 partially extracted and manually completed

About 270 hours to process the 5,464-ITR corpus

Mean and calendar time from the 2,800-ITR sample, scaled to the 5,464-ITR corpus

Hours per 1,000 ITRs, headline run, by basis



~270 h

processing time for the 5,464-ITR corpus

178.2 s mean x 5,464 = 270.5 h, at the 2,800-ITR run mix

167.9M tokens

backend, Oct 4-16

93.8M prompt, 74.1M completion; gateway excluded

178.2 s
mean wall time per ITR (2,800-ITR run)

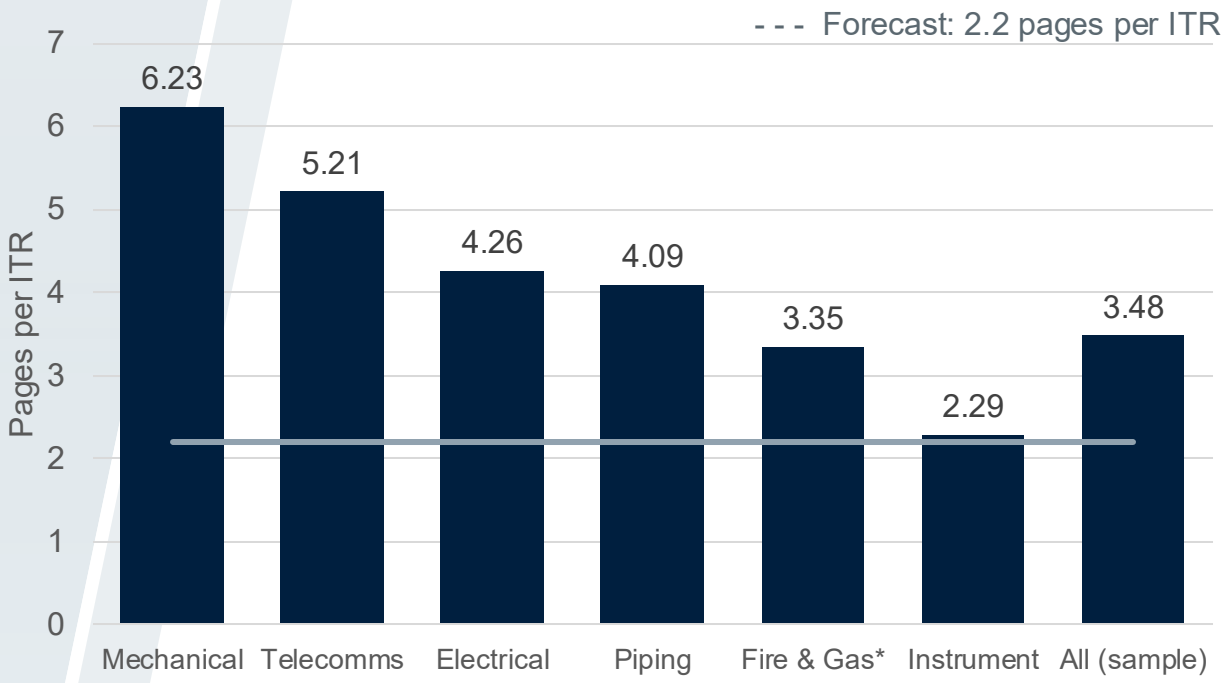
50.4 h
calendar per 1,000 ITRs: 141.1 h for the 2,800-ITR run

2.2 → 3.48
pages per ITR, predicted vs real (2,800-ITR run)

33.1%
of ITRs rerun: at least one full-PDF retry

Every discipline runs above the 2.2-page forecast

Real pages per ITR vs the 2.2 forecast, 2,800-ITR sample; Mechanical runs at almost 3×



Discipline	ITRs (n)	Pages / ITR	vs 2.2 forecast	Retry %
Mechanical	245	**6.23**	+4.03 (+183%)	**58.4%**
Telecomms	189	**5.21**	+3.01 (+137%)	20.1%
Electrical	777	**4.26**	+2.06 (+94%)	39.6%
Piping	129	**4.09**	+1.89 (+86%)	20.2%
Fire & Gas*	46	**3.35**	+1.15 (+52%)	**87.0%**
Instrument	1,409	**2.29**	+0.09 (+4%)	26.3%
All disciplines	**2,795**	**3.48**	**+1.28 (+58%)**	**33.1%**

2.33

pages per ITR across the whole project

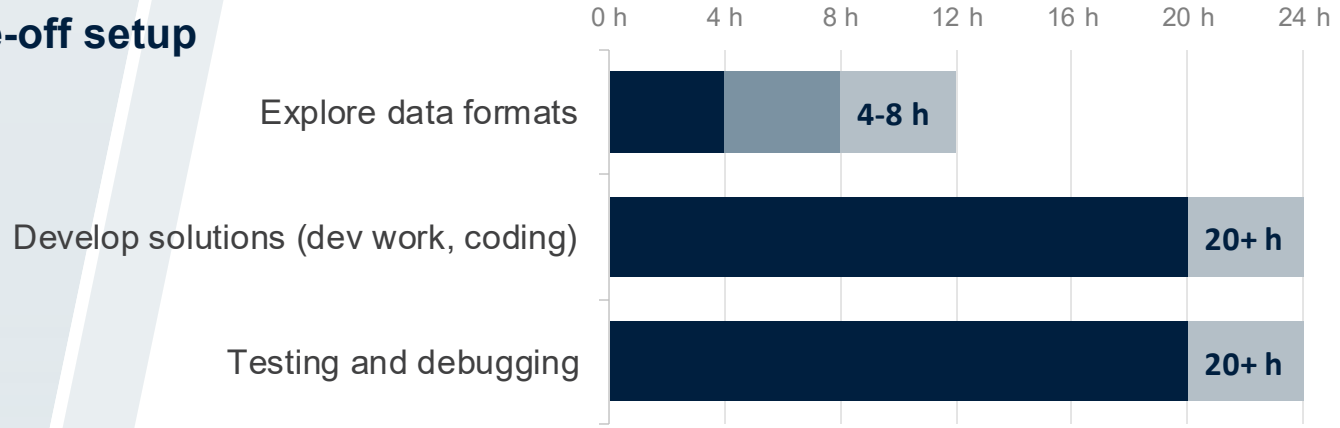
76,562 pages / 32,806 ITRs (slide 2): 6% above

*Sample: run 20260920T104642Z_n2800, 2,795 timed PDFs (one PDF = one ITR). Discipline = ITR code letter in the file name (E, H, J, M, P, T); pages = the pages column. Retry % = share of ITRs with at least one full-PDF retry (none had more than one). *Fire & Gas: n = 46, a small sample.*

Setup takes ~45+ hours; each run adds 4-8

Hours to set up and configure the data: low to high estimate per task

One-off setup

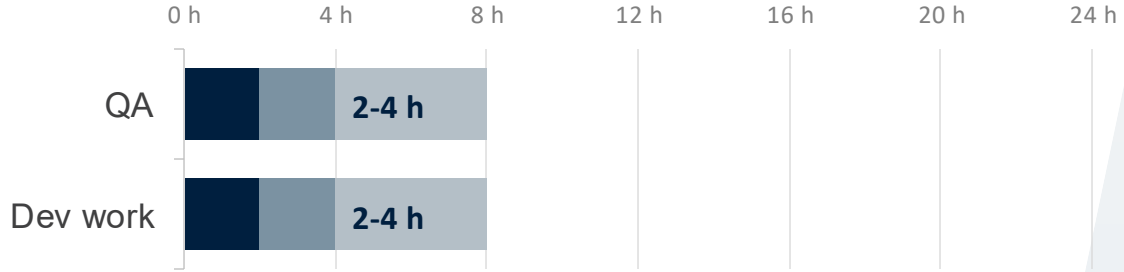


~45+ h

one-off, before the first run

4-8 h exploring + 20+ h development + 20+ h testing. Open-ended: both 20+ items have no upper estimate

Every run, at the end of the run



4-8 h

added to every run

QA 2-4 h + dev work 2-4 h at the end of each run

Team estimates. Solid bar = low estimate; the fade runs to the high estimate. The 20+ h items have no upper estimate.

ITR quality and project context set accuracy

Hours to set up and configure the data: low to high estimate per task

Early observations

Data is only as good as the ITR

Scan quality and technicians' handwriting directly affect extraction accuracy.

Illegible records

Where an ITR is illegible or ambiguous, even a human reviewer struggles to make the call.

Context is essential

Interpreting the data needs background knowledge of the project, not just extraction.

Recommendations

Involve a project data expert

Use someone intimately familiar with the project and its data to guide mapping and resolve queries.

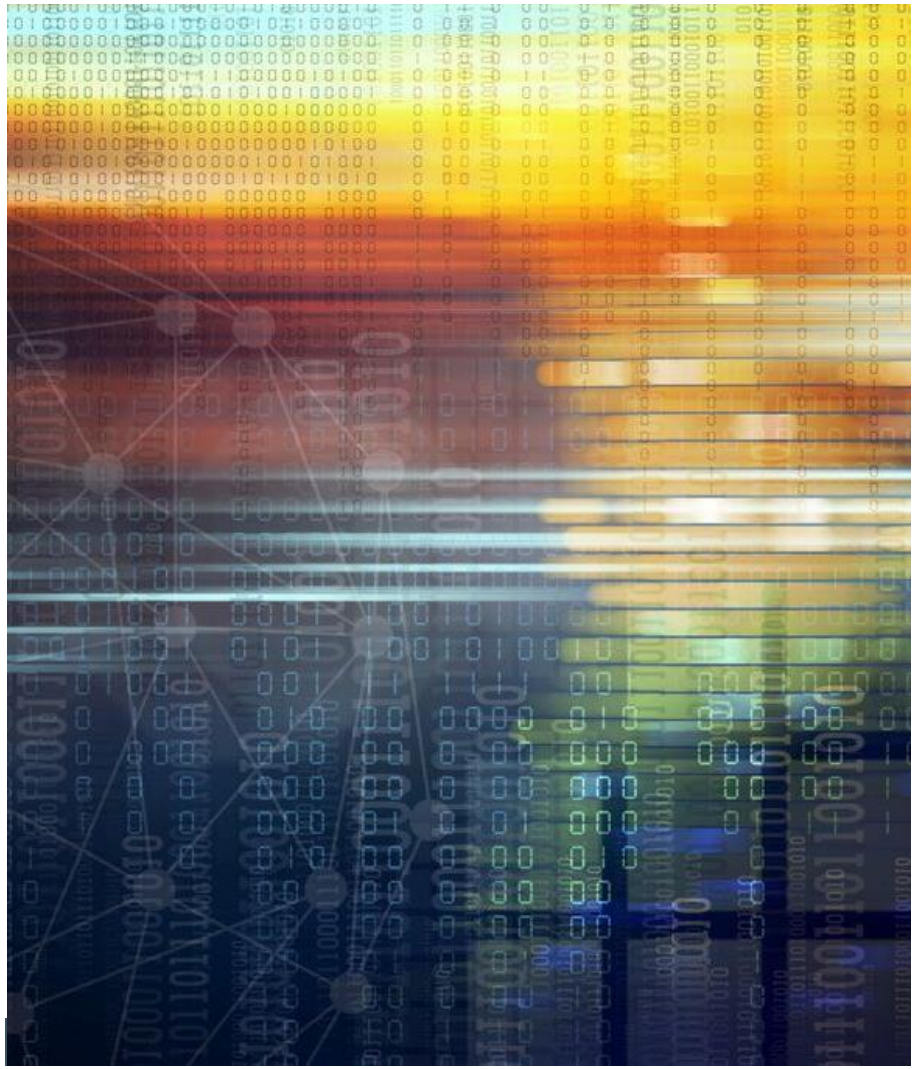
Set ITR capture standards early

Agree minimum scan quality and legibility requirements before ITRs are scanned.

Plan for exceptions

Route illegible or ambiguous ITRs to a defined review process rather than forcing a value.

Quality in, quality out



Do you have any questions?

For further inquiries, please contact:

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When you need to be sure

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