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CASE STUDY · MARLUC SYNOPSIS

Fortescue autonomous haulage in the Pilbara

IMPLEMENTED 2012–2025 · MINING AND RESOURCES · AUSTRALIA · BAND B · CLAIMED ONLY

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Fortescue runs a fleet of driverless iron ore haul trucks from a control centre in Perth and in 2025 launched its own autonomous haulage system.

ABOUT THIS SYNOPSIS

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Facts and figures are as reported by the sources listed below, which may be incomplete, self-reported or out of date. Check the original source before relying on any figure.

The impact band, proof marker and SEAM view are MarLuc's opinion. The organisation is not a MarLuc client and has not reviewed or endorsed this synopsis. Names and trademarks belong to their owners.

NOTICE WORDING LAST UPDATED 16 NOVEMBER 2026

AT A GLANCE

AI and automation used: Autonomous haulage system (Caterpillar's, then Fortescue's own co-developed with Liebherr) run from a central operations centre. The haulage releases do not describe the system as AI; Fortescue's FY25 report says automation and AI are embedded across its operations.

Implemented: 2012–2025. Grade: band B, Operating model redesign, Claimed only.

Headline result, as reported: Fortescue reports a 30% productivity gain from autonomous haulage across 183 trucks, and in 2025 launched its own system with Liebherr

1 · The case

The facts, as reported by the 3 sources listed at the end. Where a source is silent, the field says "Not reported".

Organisation

Fortescue. Australian iron ore, energy and technology group with a workforce of over 16,000, per its FY25 annual report. Its mines are in the Pilbara region of Western Australia; the haul fleet is run from the Fortescue Hive operations centre in Perth. Canvas block: 4. Operations and process. Also 5. People and skills, 6. Data and technology.

Business challenge

The challenge. Fortescue says autonomy was adopted for productivity, efficiency and safety, reducing interaction between heavy equipment and people in mining areas.

Who implemented it

Caterpillar (Equipment or robot maker): Supplied the original autonomous haulage technology from 2012.
Liebherr (Equipment or robot maker): Co-developed Fortescue's own Autonomous Haulage System launched in 2025.
In-house (In-house): Operates the fleet from the Hive and develops its own system.

Technology (SEAM pillar E)

SEAM types: T9 AI in physical systems. Deployment: Not reported. Vendors and products: Caterpillar, Komatsu, Liebherr, Cat MineStar Command for hauling, Fortescue Autonomous Haulage Solution.

Where it was built in: Autonomous haul trucks and about 900 other assets integrated through Cat MineStar Command and operated from the Fortescue Hive; a Fortescue-built fleet management and haulage system followed in 2025.

What changed

Before: operator-driven trucks. After: 183 autonomous trucks (October 2020) run from Perth, with about 3,000 team members trained to work with autonomy and over 200 trained as Mine Controllers and system professionals. Fortescue's CEO reported no forced redundancies in 2019. Fortescue says the fleet delivered a 30% productivity increase and moved 1.5 billion tonnes since 2013. [1] [2] [3]

What it cost

Not reported

What it saved

Not reported in money terms. The 30% productivity figure is Fortescue's own. [1] [2] [3]

Governance and control

The FY25 Annual Report says Fortescue has established an AI governance framework aligned with NIST AI RMF, GDPR and ISO 42001; it does not link the framework to haulage. Accountable owner for the autonomous fleet: Not reported.

S2 · Accountable owner · Not reported
Not reported.

A1 · Safe use · Claimed
Fortescue says its AI governance framework guides AI deployment; link to haulage not stated. [3]

A2 · Human in the loop · Claimed
Mine Controllers and AHS system professionals oversee the fleet from the Hive, per Fortescue. [2]

A3 · Monitoring and assurance · Not reported
Not reported.

A4 · Vendor AI · Not reported
Vendor systems were Caterpillar's until Fortescue launched its own system in 2025; assessment of vendor AI is not reported. [3]

A5 · Agent controls · Not reported
Not reported.

A6 · Standards and regulation · Claimed
Fortescue says its AI governance framework is aligned with NIST AI RMF, GDPR and ISO 42001. [3]

What worked, what did not, what is unproven

WORKED

– Fortescue reports a 30% productivity gain from autonomous haulage.

– Fortescue says the transition came with training and redeployment and no forced redundancies (2019).

– Fortescue has moved from buying a system to developing its own, which it launched in 2025.

DID NOT

– Not reported: Fortescue's sources describe no failures. The reasons for replacing the off-the-shelf system are not given.

UNPROVEN

– The baseline and method behind the 30% productivity figure, and its split between autonomy and other changes.

– Whether the new Liebherr co-developed system matches the system it replaces.

– Safety record of the autonomous fleet beyond the company's statements.

Timeline

2012 Fortescue first deploys Caterpillar autonomous haulage commercially at its Solomon Hub [1]

Sept 2019 Autonomous trucks pass one billion tonnes moved; 137 trucks in operation [1]

Oct 2020 Chichester Hub conversion completed; fleet reaches 183 trucks, run from the Hive in Perth [2]

2025 Fortescue launches a new Autonomous Haulage System co-developed with Liebherr to replace its off-the-shelf system [3]

2 · Grade and SEAM assessment

MarLuc's opinion, made on the evidence above. How cases are graded: marluc.co.uk/case-studies/how-we-rate

Level of change and impact

Claimed: Not applicable. Grade: B, Operating model redesign. Proof: Claimed only. Level of change: Operating model.

Operating model change (Level 3, band B), by Fortescue's account. The haul fleet was converted to autonomy and run from a central operations centre, staff were retrained and redeployed into new roles such as Mine Controllers, and in 2025 the company replaced its bought system with one it co-developed. Results are Fortescue's own.

The SEAM view and lessons learnt

Fortescue combined a fleet conversion, a central control room and a retraining programme, so the 30% figure cannot be assigned to autonomy alone. The sources do not say why Fortescue replaced the off-the-shelf system in 2025 or what the change cost. Before copying the approach, a leadership team should ask who owns the safety case when the vendor system is replaced, and how productivity is measured against a baseline.

1. Convert in stages and report results at each stage.
2. Train and redeploy staff before roles change.
3. Decide early whether to buy the system or own it.

Evidence

Score 1 of 4. Self-reported: Fortescue's own releases and annual report; multiple years of consistent reporting but no independent evaluation.

Evaluation method. Self-reported company figures: before-and-after statements by Fortescue's CEO and COO. Caterpillar's president is quoted in the 2020 release but does not independently verify the figure.

Sources disagree. Not reported

Status. Ongoing: new Fortescue and Liebherr system launched in FY25.

3 · Original sources

Read these in full. To challenge a fact or a grade, use the contact form at marluc.co.uk or the link on https://marluc.co.uk/case-studies/fortescue-autonomous-haulage-pilbara

[1] Fortescue: Fortescue's autonomous truck fleet surpasses one billion tonne milestone
https://www.fortescue.com/en/articles/fortescuesautonomoustruckfleetsurpassesonebilliontonnemilestone20190913

[2] Fortescue: Fortescue completes world leading autonomous haulage project
https://www.fortescue.com/en/articles/fortescue-completes-world-leading-autonomous-haulage-project-2020-10-28

[3] Fortescue: FY25 Annual Report (ASX release, 26 August 2025)
https://announcements.asx.com.au/asxpdf/20250826/pdf/06nb2wg528z4fy.pdf

Fortescue website: https://www.fortescue.com

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