

Aerospace Quality & NDT Intelligence

Turning inspection records into a repeatable system for defect visibility, faster closure and continuous improvement.

NDT

QUALITY

POWER BI

PDCA

EVIDENCE STATUS

Source notes support the internship direction and proposed deliverables. The data model, charts, dashboard and target metrics are a transparent portfolio reconstruction - not a claim of confidential company results.

Case at a glance

01

The portfolio story

A safety-minded engineering case that connects hands-on inspection work to structured data, root-cause analysis and a reusable management tool.

PROBLEM

Signals without one view

Inspection findings, repeat indications, elapsed time, re-inspection and closure status can live in separate records. That makes recurring patterns and delay difficult to see early.

PROCESS

Evidence before action

Map the workflow, define a controlled data model, establish a baseline, rank losses, investigate causes, test corrective actions and monitor the new state.

SOLUTION

NDT intelligence loop

A defect database plus role-based dashboard, alert rules, corrective-action ownership and a validation routine that connects each visual back to an auditable record.

SOURCE-BACKED

Visible in supplied notes

ENGINEERED

Portfolio reconstruction

ILLUSTRATIVE

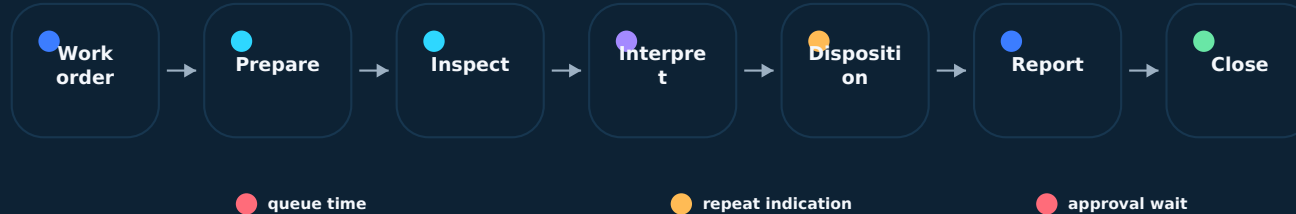
Synthetic data or target

SOURCE-BACKED SCOPE

- Support NDT inspection, analyze indications and prepare structured inspection reports.
- Create a defect/indication database; analyze inspection time, waiting time and re-inspection.
- Use Excel or Power BI, Pareto, 5 Why and PDCA; strengthen quality, traceability and Part-145 awareness.

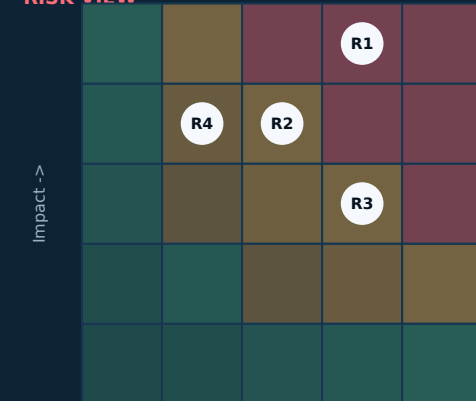
Where performance becomes invisible

CURRENT-STATE INSPECTION LOOP



The core issue is not inspection quality alone. It is the absence of one reliable chain from planned work to indication, decision, corrective action and verified closure.

RISK VIEW



R1 missed traceability R2 repeat defect
R3 late closure R4 data error

FAILURE MODES TO DESIGN OUT

01 Fragmented records

Identifiers and status may differ between work order, report and corrective-action log.

02 Weak taxonomy

Free text hides the difference between symptom, defect family, cause and disposition.

03 Unmeasured waiting

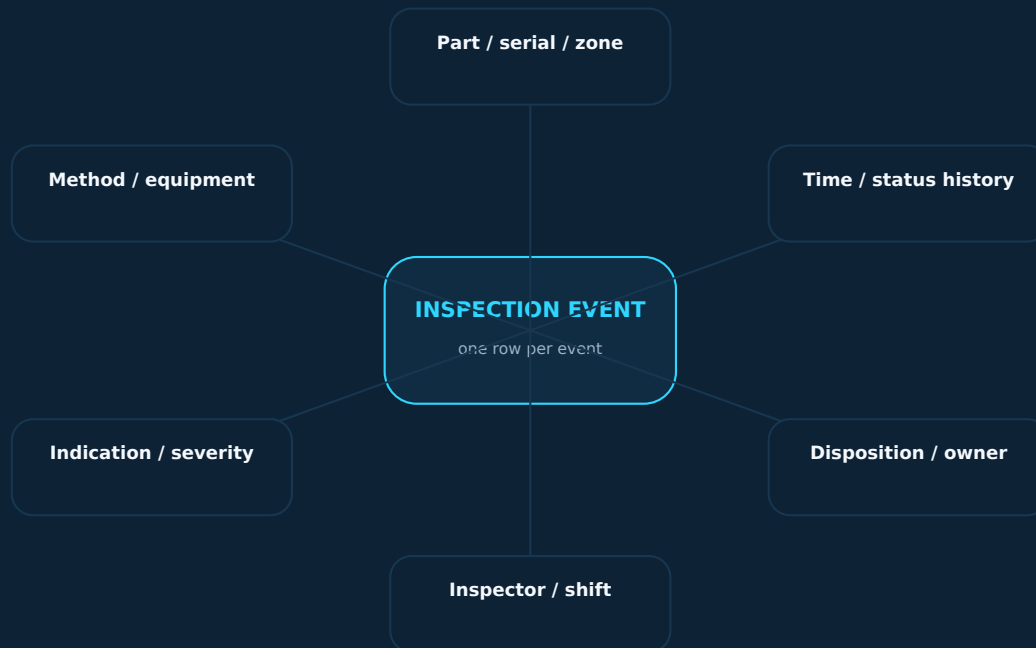
Inspection duration may be known while queue, approval and reporting time remain invisible.

04 Reactive learning

Teams solve the current indication but cannot easily detect recurrence by part, zone or method.

Build the evidence foundation

CONTROLLED DATA MODEL



One event key links the work order, finding, approval, report and corrective action. The dashboard never becomes the system of record; it is a governed view of the record.

MINIMUM EVENT FIELDS

- event_id, work_order_id, part_serial, zone
- method, technique, equipment_id, calibration_ref
- indication_family, location, severity, confidence
- inspection_start/end, queue and approval timestamps
- disposition, report_id, action_owner, close_date

DATA QUALITY GATES

- G1** Unique event key
- G2** Controlled defect list
- G3** Timestamp sequence
- G4** Record-to-report link
- G5** Role and approval check

Privacy and safety rule: the portfolio uses no part numbers, customer names, inspector identities, inspection images or real defect counts. Production deployment requires company approval and least-privilege access.

Measure, analyze, improve, control

PDCA + DMAIC HYBRID



WORK PACKAGES AND EXIT EVIDENCE

01	Frame	Problem charter, stakeholders, confidentiality boundary	Approved scope
02	Map	SIPOC, process walk, status definitions, handoffs	Signed current state
03	Measure	Data extract, quality checks, baseline KPI rules	Reconciled baseline
04	Analyze	Pareto, stratification, lead time and repeat families	Prioritized causes
05	Improve	Countermeasure test, owner, due date, risk review	Pilot evidence
06	Control	Dashboard release, alerts, audit sample, review rhythm	Sustained control

DECISION RULE

Do not automate a weak process. A visual is released only after event definitions, reconciliation and ownership are accepted. Corrective actions remain subject to approved engineering and quality procedures.

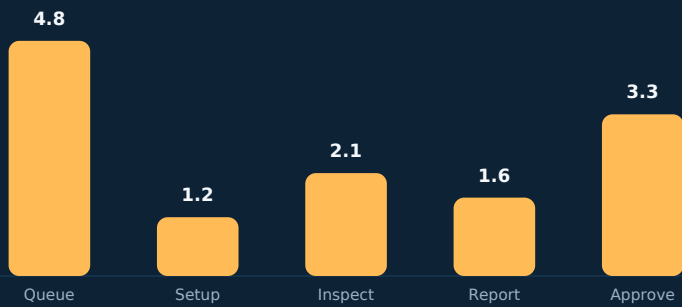
Reveal the vital few losses

PARETO OF INDICATION FAMILIES



● Synthetic portfolio data - replace with verified project records before publication.

LEAD-TIME DECOMPOSITION



● Synthetic portfolio data - replace with verified project records before publication.

ANALYTICAL QUESTIONS

FREQUENCY

Which indication families create most events?

Primary view: count and share

QUALITY

Which findings drive rejection or re-inspection?

Primary view: yield and rework

RECURRENCE

Which part/zone/method combinations repeat?

Primary view: repeat rate

CONTROL

Are actions closed and sustained?

Primary view: age and recurrence

FLOW

Where does elapsed time accumulate?

Primary view: queue vs touch time

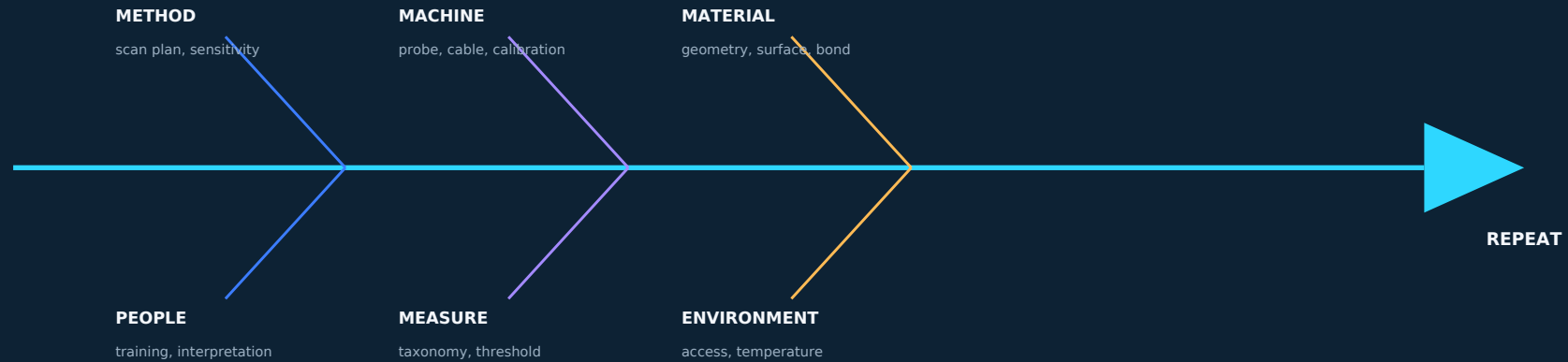
RELIABILITY

Can every chart point trace to an approved record?

Primary view: reconciliation

Move from indication to prevention

FISHBONE EXAMPLE | RECURRING ULTRASONIC INDICATION



5 WHY TRACE | ILLUSTRATIVE, NOT A TECHNICAL DISPOSITION

WHY 1

Why was the part re-inspected?

The first record was not decision-ready.

WHY 2

Why was it not decision-ready?

Required context and scan evidence were incomplete.

WHY 3

Why was context incomplete?

The report template allowed uncontrolled free text.

WHY 4

Why was free text uncontrolled?

No minimum-data gate was built into the workflow.

WHY 5

Why was the gate absent?

Process ownership focused on the report, not end-to-end closure.

COUNTERMEASURE HYPOTHESIS A controlled digital form with mandatory identifiers, technique context and validation gates can reduce avoidable re-inspection caused by incomplete information. Pilot, measure, and obtain the responsible technical approval before scaling.

The NDT intelligence cockpit

NDT PERFORMANCE & DEFECT ANALYSIS | DEMO

18

OPEN INSPECTIONS

Demo count

8.4%

RE-INSPECTION

Demo rate

11.2h

MEDIAN LEAD TIME

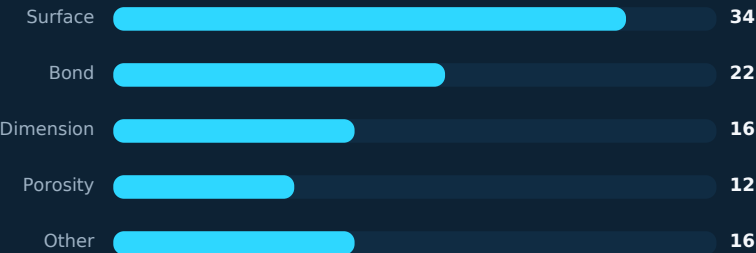
Demo elapsed time

4

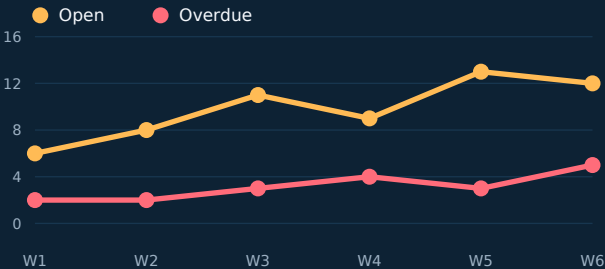
REPEAT FAMILIES

Demo flag count

INDICATION MIX



ACTION AGE



ALERT LOGIC

Repeat family above threshold -> review by part/zone/method. Missing report link -> data-quality queue. Action near due date -> owner alert. Post-action recurrence -> effectiveness review.

● Synthetic portfolio data - replace with verified project records before publication.

Safety, compliance and ownership

TRACEABLE EVIDENCE CHAIN



The dashboard is downstream of controlled inspection practice. It cannot authorize a method, certify personnel or replace technical disposition. It must preserve source links, status history and review ownership.

RACI SNAPSHOT

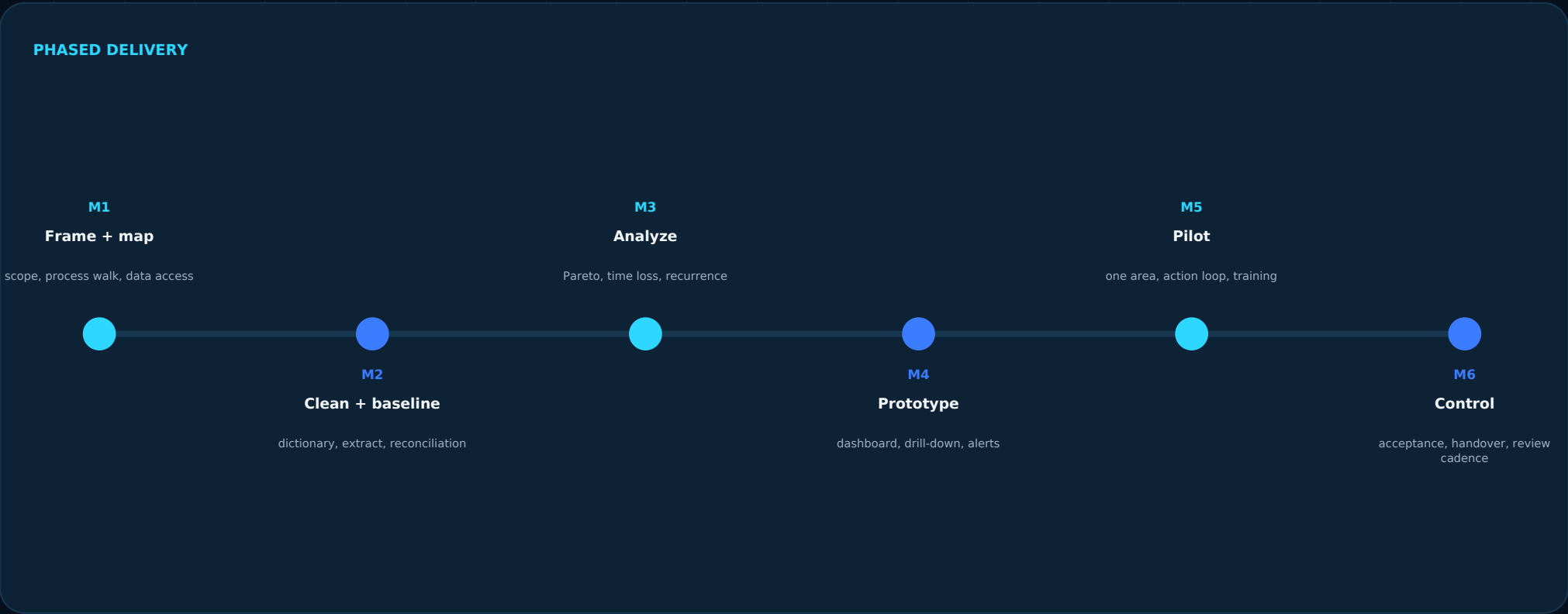
Data definition	Quality + NDT lead
Source validation	Process owner
Dashboard build	Engineer / analyst
Technical decision	Authorized personnel
Action closure	Named owner
Control review	Quality management

CONTROL CHECKLIST

- Role-based access and approved data retention
- Versioned KPI definitions and controlled taxonomy
- Reconciliation sample from dashboard to source record
- Calibration and qualification references remain in source system
- Alert acknowledgement, action owner and effectiveness check
- Change control for visuals, measures and data connections

Reference framework only: deployment must follow the actual organization's procedures and applicable regulatory basis.

A six-month implementation path



ACCEPTANCE CRITERIA			
DATA	100% of demo events pass required-field rules; source reconciliation sample is documented.	USE	A reviewer can move from KPI to event to report reference in three interactions or fewer.
ACTION	Each priority issue has owner, due date, status, evidence and effectiveness review.	CONTROL	Definitions, access, refresh, backup and handover are approved before release.

How success would be measured

MEASUREMENT PLAN | TARGETS, NOT CLAIMED RESULTS

MEASURE	DEFINITION	BASELINE	PILOT TARGET	GUARDRAIL
Inspection lead time	Close timestamp - request timestamp	To measure	-10% to -20%	No skipped gate
Re-inspection rate	Events reopened / completed events	To measure	Downward trend	No under-reporting
Repeat-family rate	Repeated family by part/zone window	To measure	Downward trend	Stable taxonomy
Report completeness	Records passing required-field rules	To measure	>= 98%	Manual audit
Action closure	On-time actions / actions due	To measure	>= 90%	Effectiveness check

CAPABILITIES DEMONSTRATED

- Process mapping and data definition
- NDT-aware quality thinking
- Power BI / Excel dashboard architecture
- Pareto, 5 Why, PDCA and action control
- Governance, traceability and handover

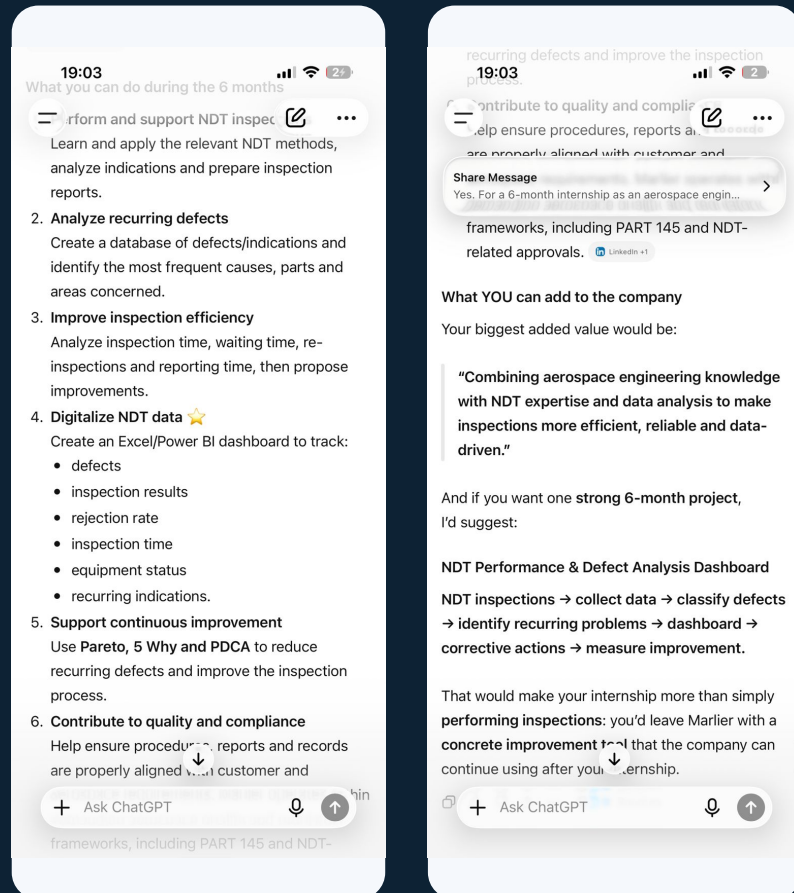
PORTFOLIO NARRATIVE

I would combine aerospace engineering knowledge, NDT process awareness and data analysis to make inspection performance more visible, reliable and reusable.

The strongest proof is not a dashboard screenshot; it is a controlled chain from evidence to decision to sustained improvement.

Source notes and reference framework

SUPPLIED SOURCE CAPTURES



Visible evidence: NDT support, defect database, timing, dashboard, Pareto / 5 Why / PDCA and compliance-aware reporting direction.

PRIMARY REFERENCES

- 01 EASA - Easy Access Rules for Continuing Airworthiness**
<https://www.easa.europa.eu/en/document-library/easy-access-rules/easy-access-rules-continuing-airworthiness>
- 02 ISO 9712:2021 - Qualification and certification of NDT personnel**
<https://www.iso.org/standard/75614.html>
- 03 ASNT - Standards and qualification framework**
<https://www.asnt.org/standards-publications/standards>
- 04 ASNT - SNT-TC-1A certification-practice advisory**
<https://www.asnt.org/me/26/0/advisory-on-snt-tc-1a-certification-practices-and-use-of-asnt-credentials>

PUBLICATION NOTE

This dossier is a portfolio reconstruction based on supplied briefing captures. It intentionally contains no confidential inspection results. Company name, dates, NDT methods, actual responsibilities and verified outcomes should be confirmed by Aymane before public release.