

Engineering Product Data Management Software: Selection, Requirements, and Workflow



Objective: select, specify, and operationalize PDM software for engineering data



Scope: PDM owns CAD data, BOMs, revisions, release control, change workflows, vaulting



Outcomes: defensible requirements, weighted scorecards, workflow designs, migration readiness



Decision framing: TCO, interoperability, scalability, compliance, openness, vendor lock-in

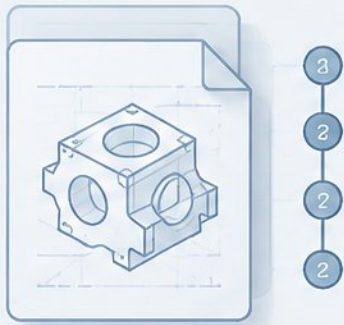


Roadmap: data model, requirements, selection, workflows, integration, migration, security, governance



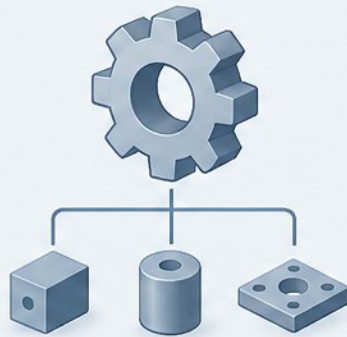
PDM, PLM, ERP, and MDM: Drawing the Boundaries

PDM



PDM controls engineering design data: CAD files, versions, revisions, assembly references, drawing release.

PLM



PLM manages the product across its lifecycle: items, BOMs, engineering changes, suppliers, cost.

MDM



MDM governs agreed master data (parts, suppliers, customers); ERP owns transactions, inventory, and purchasing.

ERP



EDM is the discipline that makes controlled objects trustworthy — a licensed suite with shadow folders is not a system.

CLARITY DRIVES
BETTER PRODUCTS

Core Data Model: Items, Revisions, Versions, and BOM Structure

1

Version: every save and check-in; infinite, messy, frequent

2

Revision: a formal approved change to the definition—A, B, C

3

Release state: WIP, In Review, Released, Obsolete is a system state

4

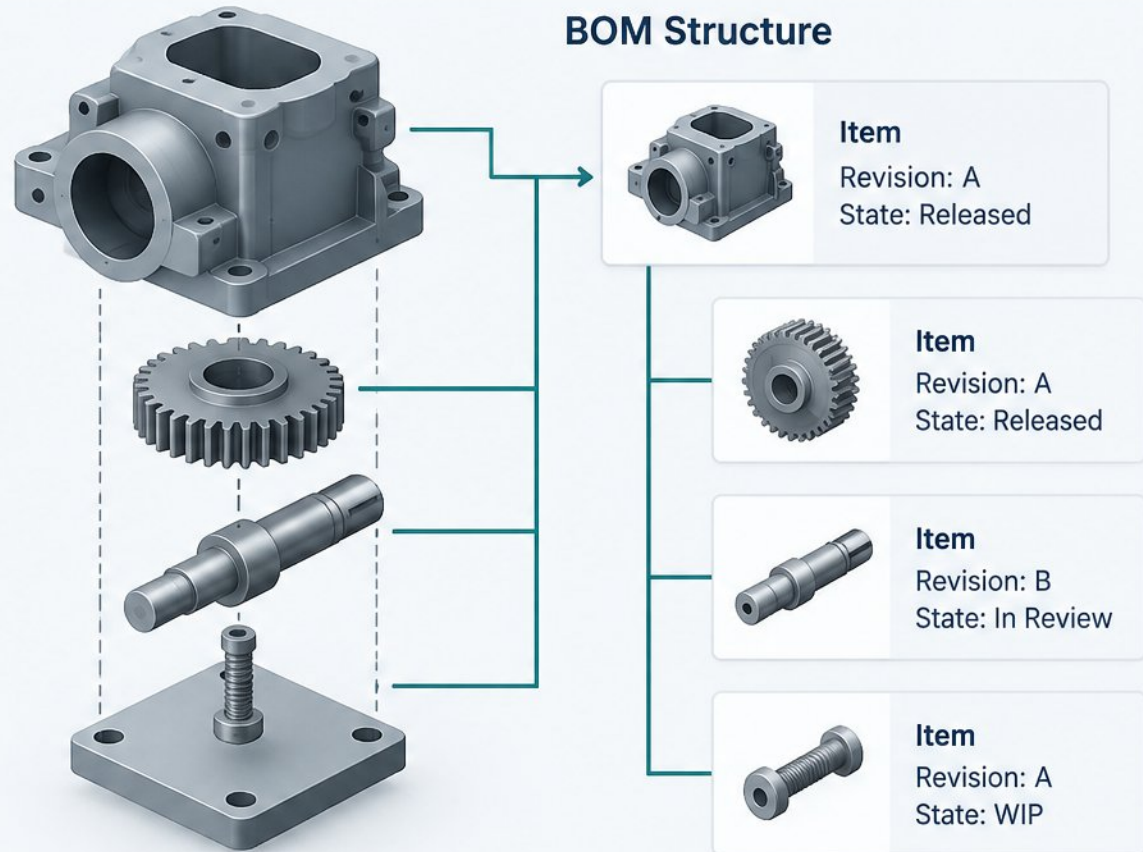
Item vs. instance: definition carries identity; instance carries context

5

Native files are the editable source; STEP and JT are exchange derivatives

6

One editor per file: no silent overwrite, full version history



Version History



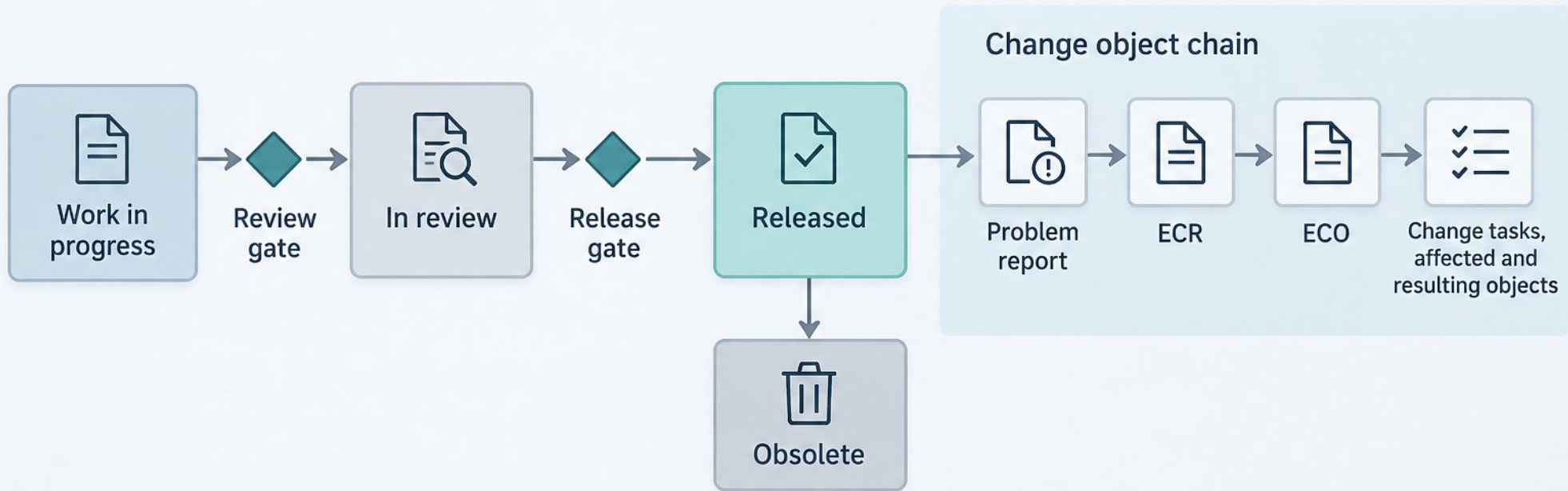
Controlled Files



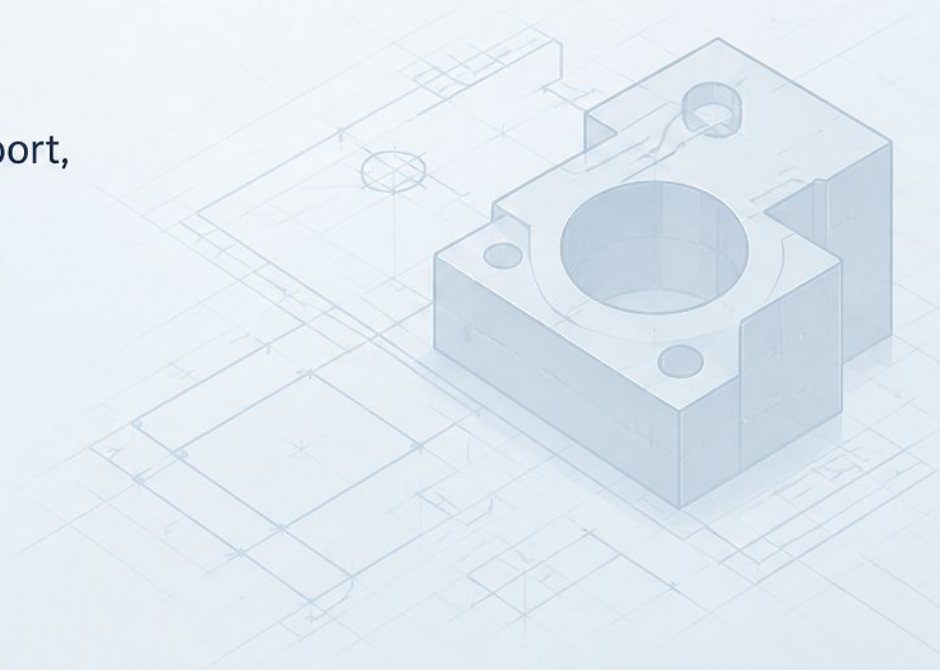
Check-out / Check-in



Lifecycle States, Release Gates, and Change Objects



- Lifecycle states: work in progress, in review, released, obsolete — “latest” is not a release state.
- Release packages: native model, drawing, neutral export, BOM row must share one approved revision.
- Change object chain: problem report → ECR → ECO → change tasks, affected and resulting objects.
- Effectivity (date, lot, serial) binds a change to a point in the production stream.
- Revise if interchangeable across form, fit, function; otherwise create a new part number.



Requirements Engineering:

Turning Business Problems into PDM Requirements



- Build a problem list, not a feature list
- Start with the five to ten issues costing money today
- Functional: CAD integration, BOM, change control, search, reporting, visualization
- Non-functional: performance at scale, uptime, backup, identity, security
- Compliance and governance: retention, export control, audit trails, ISO 9001, ISO 10303
- Integration traceability matrix: ERP, MES, CRM, PLM, CAD, identity providers
- Prioritize with MoSCoW or weighted scoring

Business Problems



PDM Requirements



Functional

CAD integration, BOM, change control, search, reporting, visualization



Non-functional

performance at scale, uptime, backup, identity, security



Compliance and governance

retention, export control, audit trails, ISO 9001, ISO 10303



Integration traceability matrix

ERP, MES, CRM, PLM, CAD, identity providers



Prioritize

with MoSCoW or weighted scoring

Evaluation and Selection Methodology



Build a cross-functional team: engineering, manufacturing, quality, IT



Define decision criteria and vendor scorecard before any demo



Shortlist three or four candidates from an aggressively screened landscape



Run hands-on trials with your own CAD files, BOMs, and revisions



Test failure paths and reference customers without a salesperson present

CROSS-FUNCTIONAL EVALUATION TEAM



VENDOR EVALUATION SCORECARD

Fit				
Integration				
Usability				
Scalability				

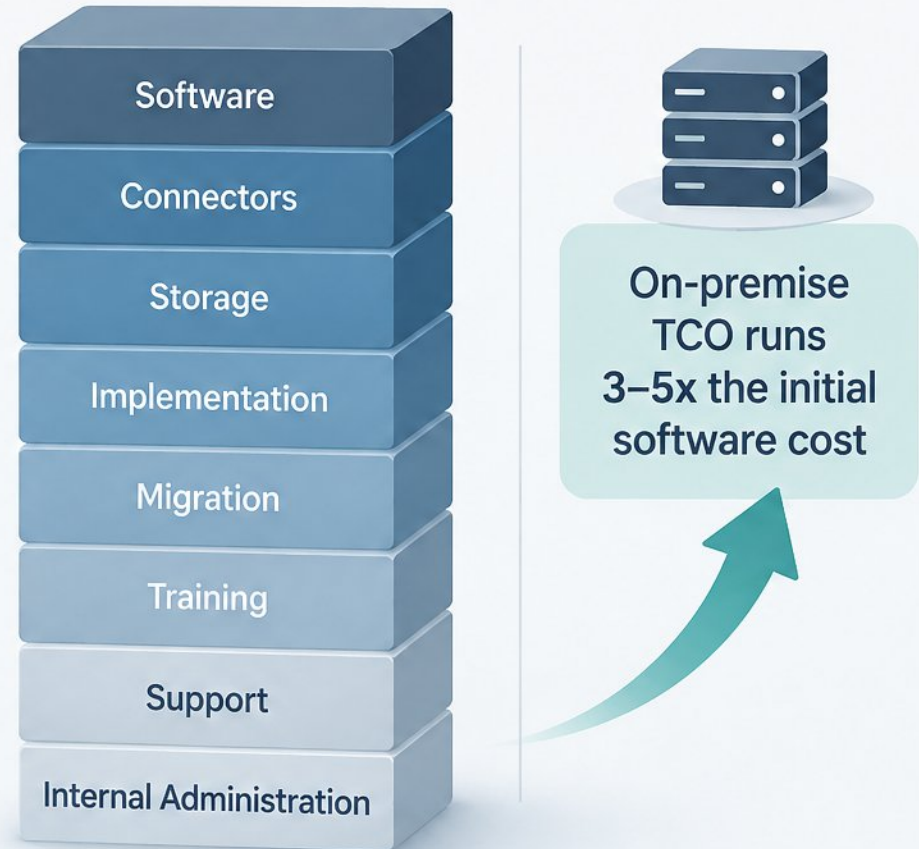
HANDS-ON EVALUATION PROCESS



TCO, Licensing, and Contracting Considerations

- Build a three-year TCO model, not a sticker-price comparison
- Cover paid users, read-only viewers, supplier access, connectors, API, storage
- Include implementation, migration, training, support, and internal admin
- On-premise TCO runs 3–5x the initial software cost
- Pricing shapes behavior: full-license BOM viewing keeps work in email
- Contract for data ownership, export path, SLA, upgrades, and exit

Three-Year TCO Model for PDM



Evaluate



Compare



Contract



Select

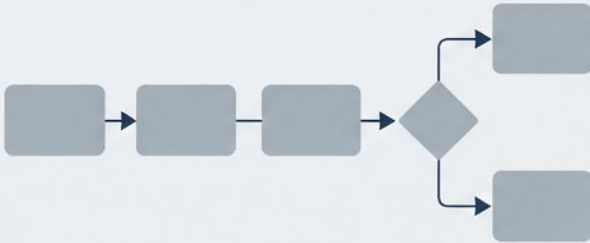
Workflow Design: Change, Release, and Approval Processes

- Map the current-state change and release process before automating anything
- Document how work actually flows, not how it should flow
- Keep lifecycle states lean: WIP, In Review, Released, Obsolete
- Tie revision bumps to lifecycle transitions, not to manual edits
- Separate ECR (request and impact analysis) from ECO (approval and implementation)
- Block release when metadata or BOM checks are incomplete



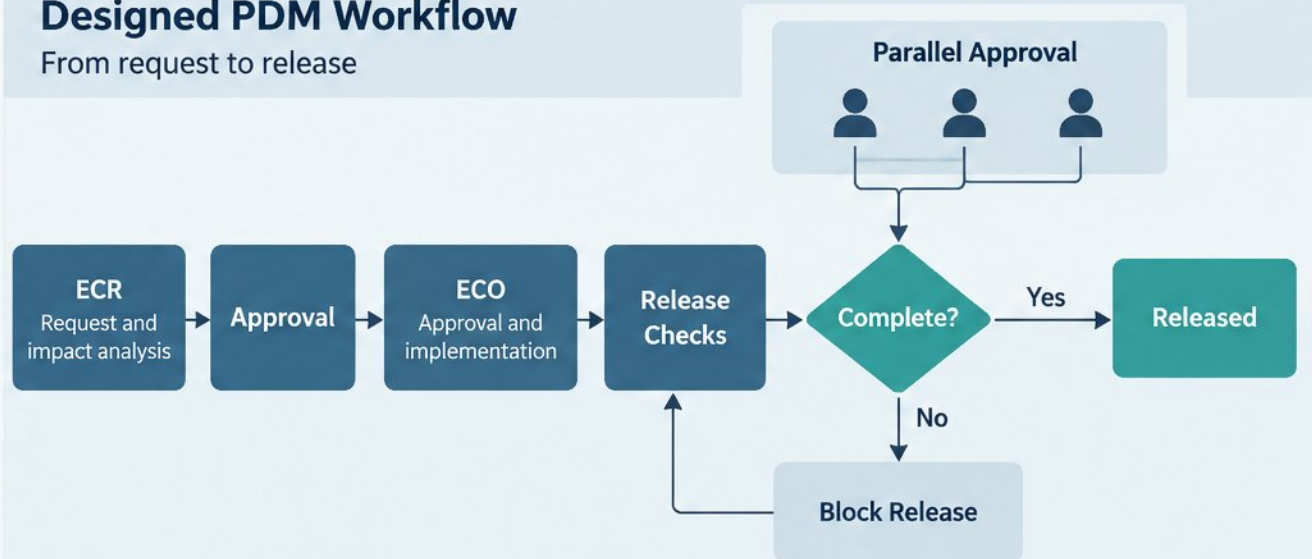
Current-State Process

Map and understand how work flows today



Designed PDM Workflow

From request to release



Lifecycle States (Keep Lean)

WIP

In Review

Released

Obsolete

CAD and Toolchain Integration in Multi-CAD Environments

DESIGN
MANAGE
COLLABORATE
DELIVER



Native connectors for SolidWorks, Creo, NX, CATIA, and Inventor



Check-in/check-out with reference tracking and automated neutral-format publishing



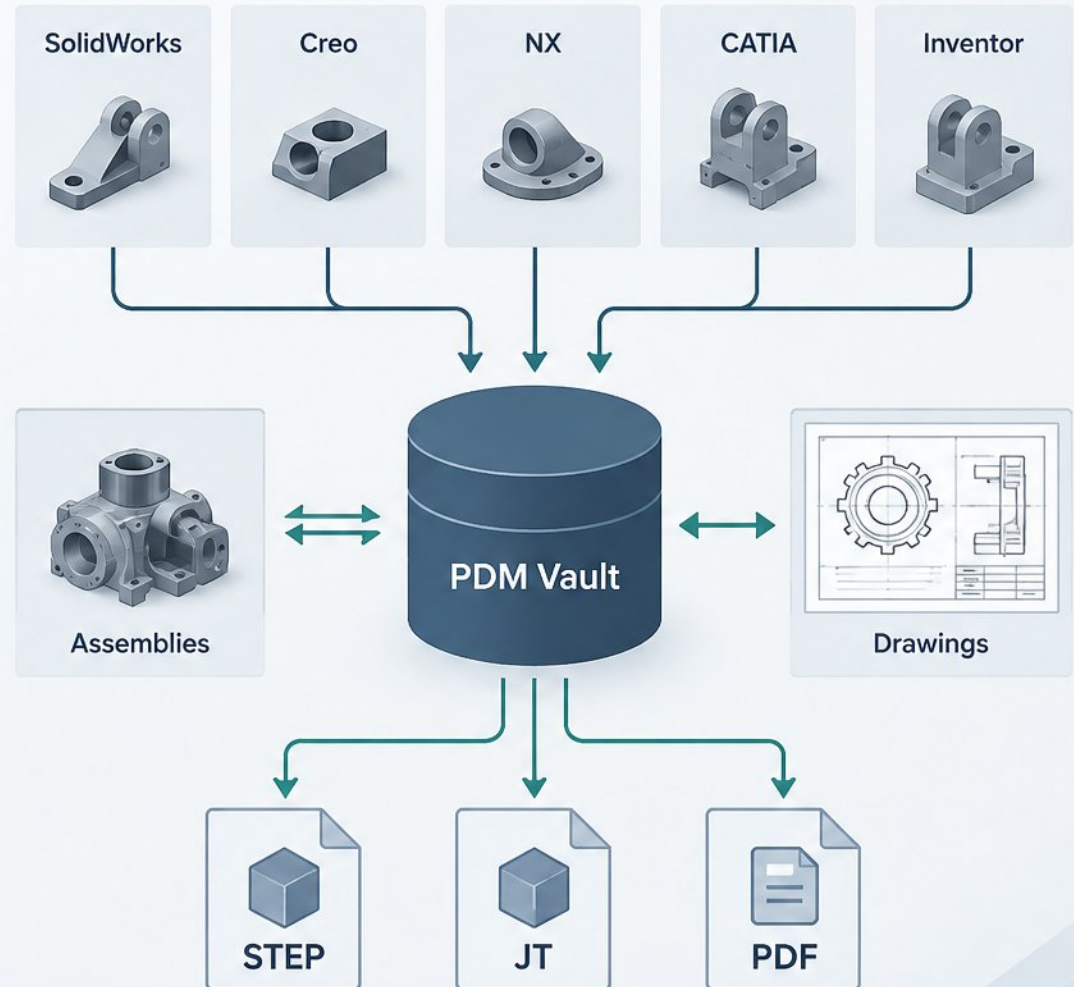
Multi-CAD translation, metadata preservation, and cross-platform reference resolution



Keep native files editable; use STEP, JT, and PDF for exchange

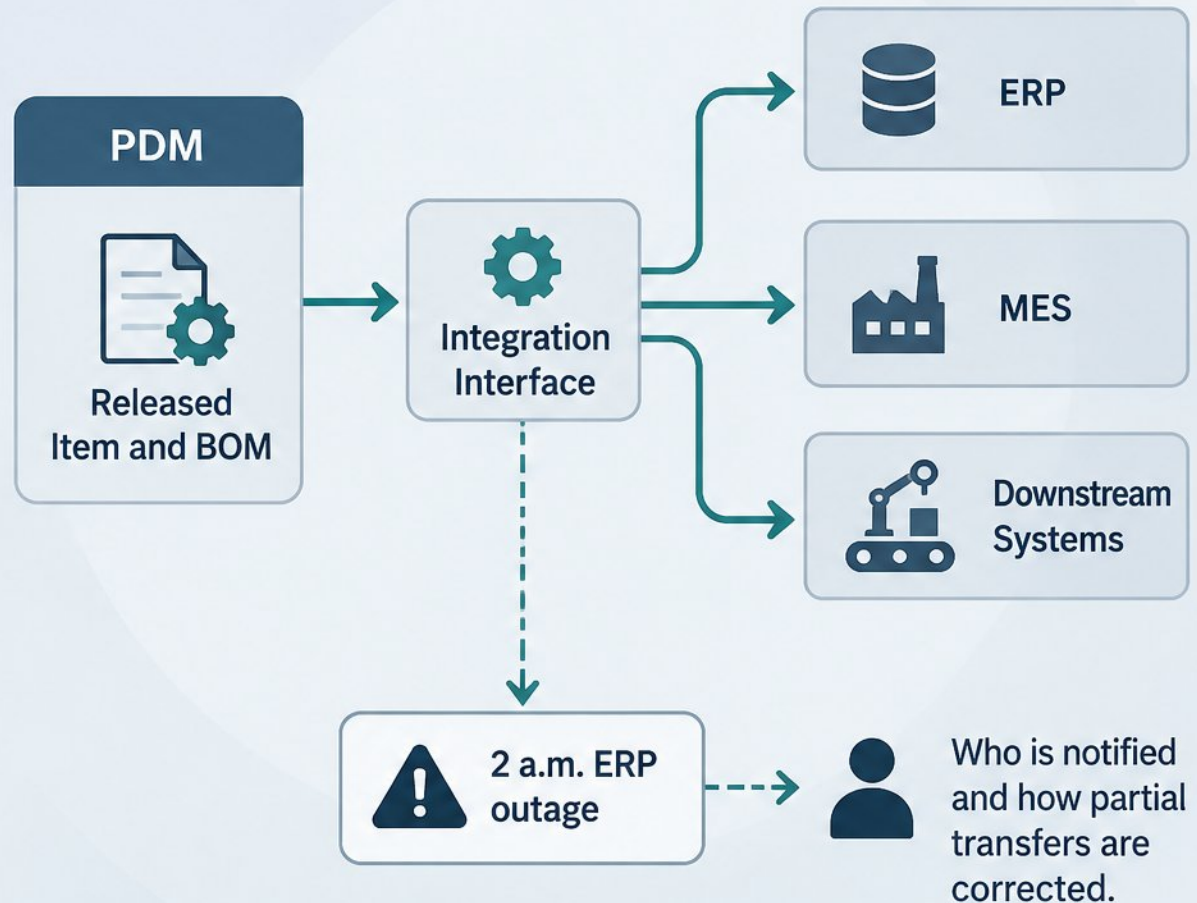


APIs, webhooks, and scripts enable custom integrations and release-safe upgrades



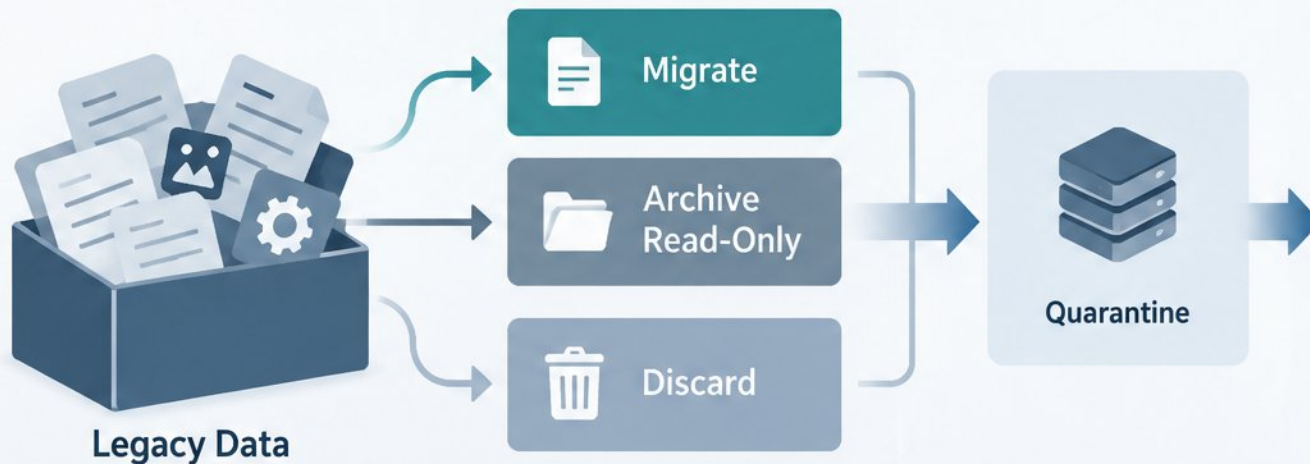
PDM-to-ERP, MES, and Downstream Integration

- 1 Assign ownership first: item numbers, engineering data, inventory and cost, MBOM.
- 2 Choose a pattern: point-to-point, API-based, or middleware; event-driven on "Released."
- 3 Automate item, BOM, and file sync to remove manufacturing's most error-prone handoff.
- 4 Connect MES to keep "as-designed" and "as-built" aligned and block outdated revisions.
- 5 Define failure behavior: 2 a.m. ERP outage, who is notified, how partial transfers are corrected.



Data Migration: Assessing, Cleansing, and Loading Legacy Data

- Audit data quality first: missing fields, duplicates, orphaned files, broken BOM links
- Triage scope: migrate active, archive legacy-active, discard test and duplicate data
- Map legacy metadata, lifecycle states, revisions, and naming standards to the new model
- Automated tooling with checksum verification and dependency-graph load sequencing
- Migrate in waves by product family; validate reference integrity and row counts before cutover



Data Object



Name
Metadata
Lifecycle State
Revision
Attached Files



Migrate in Waves by Product Family



Security, Access Control, and Compliance



Role-based access control and least privilege at workspace, project, and file levels



Three permission layers: workspace roles, project roles, and file-level guest sharing



External users stay outside the workspace; suppliers see only shared files



Encrypt data with AES-256 at rest and TLS 1.2+ in transit



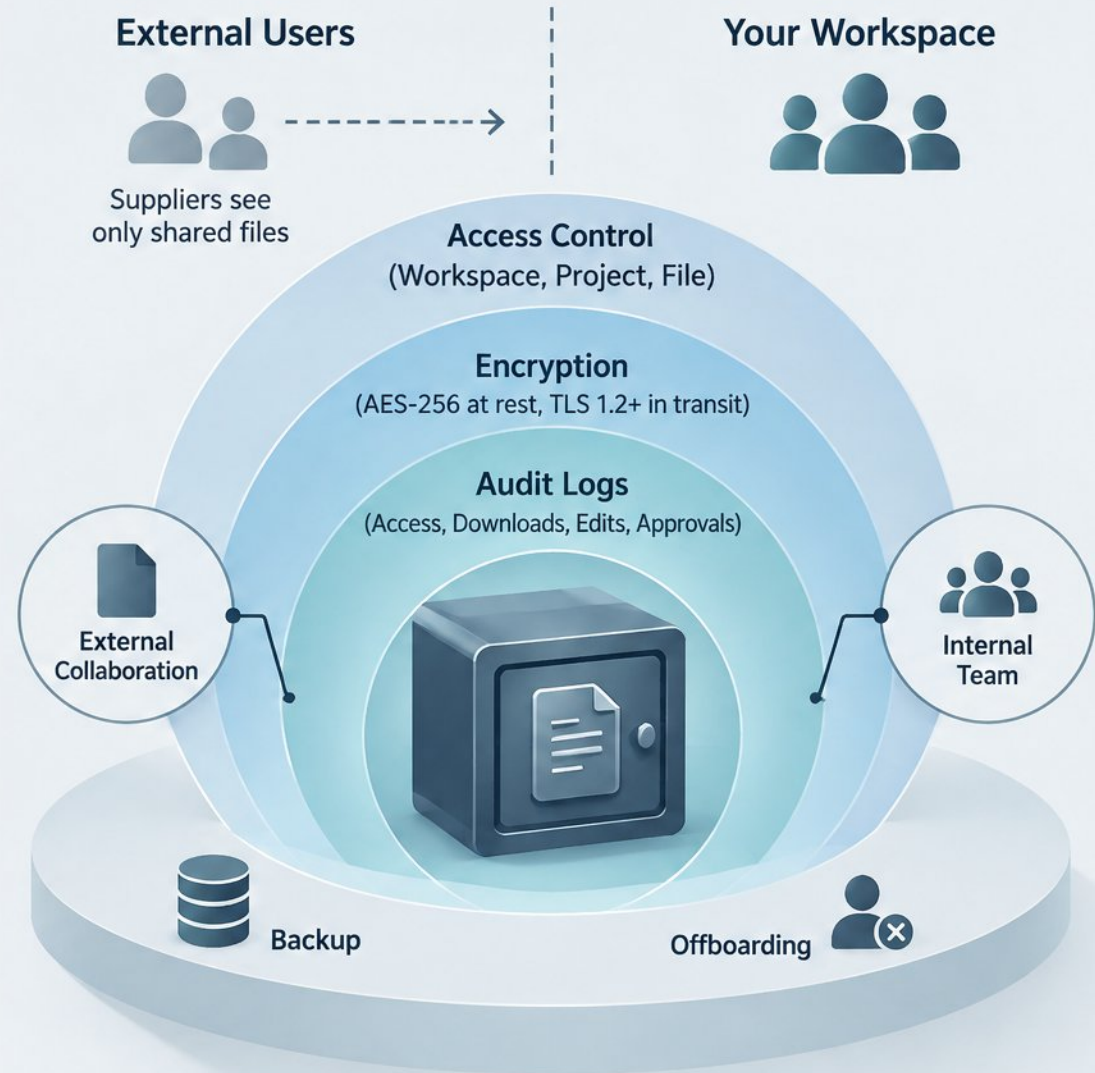
Verify ISO 27001, SOC 2 Type II, and GDPR support before shortlisting



Immutable audit logs for access, downloads, edits, approvals, and permission changes



Separate vendor responsibilities from what your team must govern internally



Adoption, Change Management, and Building the Business Case



Quantify the cost of doing nothing:
~7 hours per engineer, weekly



Version errors drive scrap, rework,
and audit exposure



Build the decision package: scores,
TCO, risks, contract terms



Adoption levers: role-based training,
pilots, local champions



Treat adoption as a primary
workstream, not an afterthought



Present roadmap, budget, and KPIs
to executive stakeholders

Decision Package



Cost of
Doing Nothing



Evaluation
Scores



TCO and
Risks



Contract
Terms



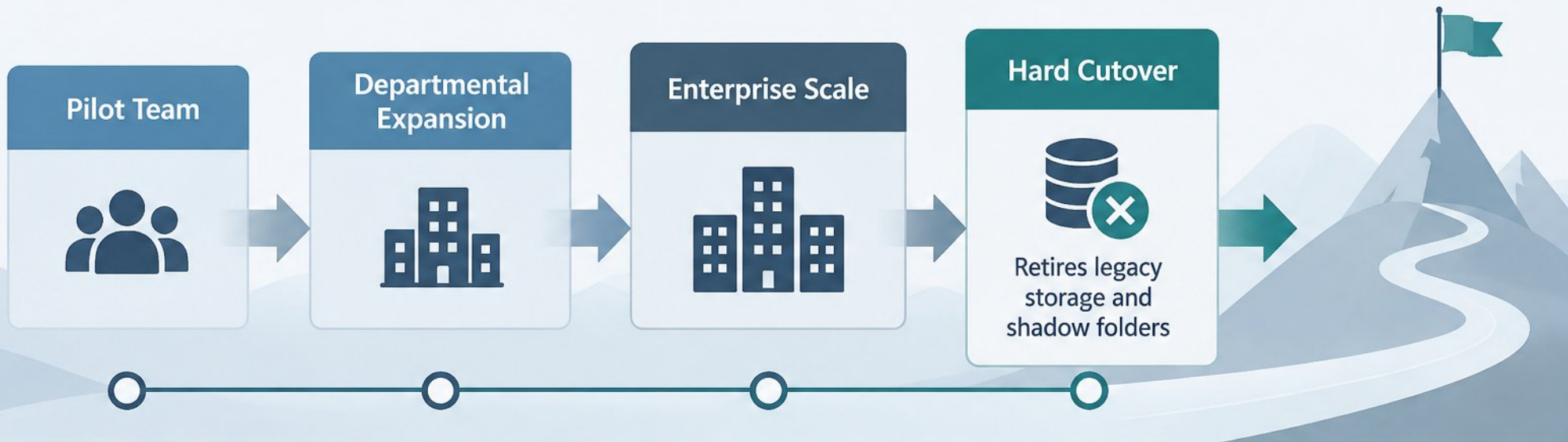
Adoption Levers



Executive Stakeholders



Implementation Roadmap, Governance, and Continuous Improvement



Governance



Named owners:
executive sponsor,
vault owner, technical
administrator

Implementation & Go-Live



Test UAT, performance,
and negative cases
before go-live



Go-live: support desk,
daily issue review,
change freeze

Continuous Improvement



Track KPIs:
search time,
ECO cycle,
EBOM/MBOM
consistency

PersonWise.

PersonWise • AI digital-human course platform



Scan the code or click anywhere to watch this course live, with voice Q&A

personwise.ai/t/9c443ce3/public