The **Implementation Process** (Stages 2-4) ends with a **formal Model Review & Governance Gate** that must be signed-off by **Architecture Review Board (ARB)** and **Dataiku Govern** *before* any artifact can move to **Production Deployment (Stage 5)** on **Automation Nodes**.

ML Lifecycle in Dataiku DSS – Delta Dental Enterprise Edition

Stage 2. Data Acquisition & Preparation in Dataiku DSS

(unchanged – see original)

Stage 3. Model Development in Dataiku DSS

(unchanged – see original)

Stage 4.5: Model Review & Governance Gate (Pre-Deployment Approval)

Mandatory before Stage 5

1. **Model Documentation & Artifacts**
    a. Export **Model Card** from Visual ML (includes performance, features, bias checks, data lineage).
    b. Attach **Experiment Summary Report** (auto-generated from Experiment Tracking).
    c. Save **Final Saved Model Version** with semantic tag: v1.0-prod-candidate.
2. **Architecture Review Board (ARB) Sign-Off**
    a. **Submit to ARB via Confluence + Dataiku Govern Blueprint**:
        i. Model purpose, business KPI alignment, scalability plan, rollback strategy.
        ii. Confirm **no PII leakage**, **HIPAA-compliant features only**.
    b. **ARB Checklist**:
        i. Model meets AUC > 0.90 (or business threshold)
        ii. No high-risk drift flags in evaluation store
        iii. Code environment uses approved Delta Dental base image
        iv. Rollback bundle prepared and tested
3. **Dataiku Govern Approval Workflow**

a. In **Govern Node**, create a **Model Qualification Process**:
    i. Assign reviewers: Data Steward, Security Lead, ML Engineer
    ii. Auto-checks:
        1. Bias metrics (disparate impact < 0.8)
        2. Data sensitivity tags (e.g., PHI, PCI)
        3. Audit trail completeness
b. **Status**: Pending → In Review → Approved/Rejected
c. **Only Approved models** are allowed to generate **production-ready bundles**.

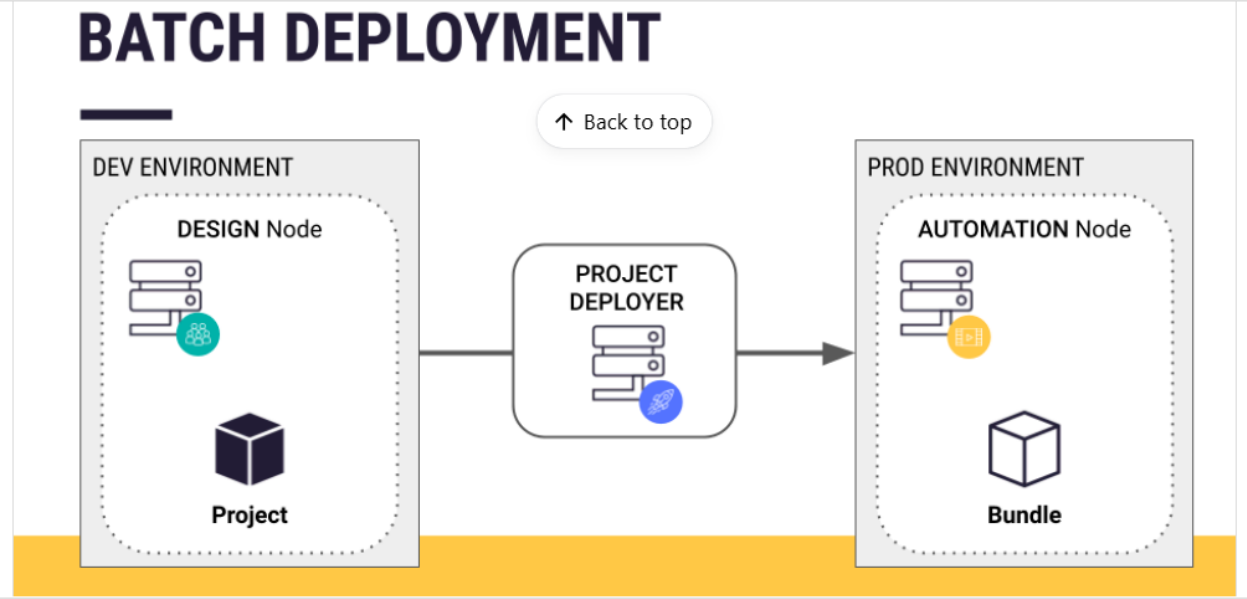
4. **Bundle Creation (Post-Approval)**
    a. From Design Node: **Project > Actions > Create Bundle**
    b. Tag bundle: fraud-detection-v1.0-approved-2025-10-27
    c. **Publish to Project Deployer** → visible only to Automation Node admins.

Governance Tip: Use **Govern API** to block bundle publishing if status ≠ Approved.

python
```
if govern_status != "APPROVED": raise Exception("Deployment blocked by Govern")
```

Production Deployment Process (Stage 5 & 6)

Only Approved Bundles from Stage 4.5



Stage 5: Production Deployment on Automation Nodes

1. **Bundle Deployment via Project Deployer**
    a. **Project Deployer** (central control plane) connects **Design → Automation Nodes**.
    b. Select **approved bundle** → **Deploy to Automation Node: PROD-ML-01**.
    c. DSS automatically:
        i. Validates schema consistency
        ii. Preloads **code environment** (e.g., python-3.11-deltadental)
        iii. Restarts **Scenarios** and **API services**
2. **Deployment Modes**

Mode	Use Case	Execution Node
Batch Scoring	Daily fraud risk batch	Automation Node (Spark)
Real-time API	Transaction-time scoring	API Node (REST endpoint)
Hybrid	External model fallback	External Model plugin

3. **API Service Activation**
    a. From Deployer: **Activate API Service fraud-predict-v1**
    b. Endpoint: POST https://api.deltadental.com/ml/fraud/predict
    c. SLA: < 100ms p95 latency
    d. Auto-scaling: 2–10 containers via **API Node pool config**
4. **Rollback & Versioning**
    a. Keep **last 3 bundles** in Deployer
    b. Rollback: Deploy previous version → zero-downtime switch

Governance Integration:

- **Govern Node** receives deployment event → logs **"Model Live in Prod"**
- Auto-creates **compliance artifact** for audit (SOX/HIPAA)

Stage 6: Production Monitoring & Continuous Governance

1. **Unified Monitoring on Automation Node**
    a. Dashboards:
        i. Model AUC trend (daily)
        ii. API latency & error rate
        iii. Data drift (KS test on transaction_freq, amount)

    b. Alert rules in **Scenarios**:
        i. AUC < 0.88 → Slack + PagerDuty
        ii. Drift > 0.15 → trigger retraining pipeline
2. **Model Evaluation Store (Prod)**
    a. Daily ground-truth ingestion (from claims system)
    b. Auto-log metrics:

python

```
eval_store.create_evaluation(date, {'auc': 0.91, 'drift_ks': 0.04, 'disparate_impact': 0.76})
```

3. **Automated Retraining Pipeline**
    a. Triggered by drift or performance drop
    b. Flow: Stage 2 → 3 → 4 → 4.5 (auto-ARB fast-track) → 5 (Deployer)
    c. **Canary Deployment**: 10% traffic → new model → full rollout if stable
4. **Govern Node Oversight**
    a. All prod models **publish status** to Govern every 6h
    b. Quarterly **Model Health Report** auto-generated
    c. **Decommission workflow**: archive model after 90 days inactivity

Key Features and Tools (Updated)

Feature/Tool	Description
Project Deployer	Central hub for **approved bundle promotion** from Design → Automation Nodes
Automation Node	Isolated production runtime for batch jobs, scoring, and monitoring
API Node	Scalable real-time inference endpoints with SLA enforcement
Dataiku Govern Node	**Single source of truth** for model approval, risk, and compliance across lifecycle
Model Evaluation Store	Time-series performance logging in production
ARB + Govern Workflow	Enforced **pre-deployment gate** with audit trail

Governance Tips Across Stages (Delta Dental)

Stage	Governance Action
4.5	**ARB + Govern sign-off required** before bundle creation

5	**Deployer blocks unapproved bundles**; Audit Trail logs deployment actor
6	**Govern auto-flags** models with AUC drop >5% or bias shift

The three reasons to use Dataiku Govern are:

- **To centralize projects from different Dataiku nodes:** Dataiku Govern acts as a central hub to bring together and view all data and AI projects, models, and bundles from various connected Dataiku instances. This provides a unified overview of all initiatives.
- **To track and manage the progress of your Dataiku projects:** Dataiku Govern enables the tracking and management of the status and lifecycle of AI projects and models. It offers workflows to monitor progress, attach contextual information, and ensure consistent documentation throughout the project's journey.
- **To control the deployment of model versions and bundles:** Dataiku Govern facilitates secure MLOps workflows by allowing for the control and approval of model and bundle deployments. It can act as a gateway to deployment infrastructure, requiring approval processes before packages are moved to production environments.

Notes

- The **Implementation Process (Stages 2–4.5)** is fully contained in the **Design Node**.
- The **Deployment & Operations Process (Stages 5–6)** runs exclusively on **Automation + API Nodes**, governed by **Project Deployer + Govern Node**.
- All **Delta Dental models** require **dual sign-off**:
  - **Architecture Review Board (ARB)** – technical & scalability
  - **Dataiku Govern** – compliance, bias, auditability

Documentation Links

- Model Governance Workflows

- Project Deployer & Automation Nodes
- HIPAA-Compliant ML Setup
- Dataiku Academy: *"Enterprise MLOps at Scale"* tutorial

This document reflects Dataiku DSS v14+ as of October 27, 2025 — verify updates.