

SKILLNAVORA · AI PRODUCT MANAGEMENT & GENAI
LAUNCHPAD

Machine Learning Products for PMs

Manage traditional ML products: problem types, data and labelling, metrics, working with data scientists, recommendation and personalisation, the model lifecycle and MLOps monitoring.

Edition 2026 · skillnavora.in

How to use this guide

Each class has goals, concepts with Indian examples, key takeaways and a practice exercise, from basic to advanced. Finish with the final project to build something you can show in interviews.

	Class	Level
Class 1	ML problem types	Basic
Class 2	Data and labelling	Basic
Class 3	Metrics and trade-offs	Intermediate
Class 4	Recommendations and personalisation	Intermediate
Class 5	Model lifecycle and MLOps	Advanced
Class 6	Working with data scientists and final project	Advanced
Toolkit: templates, cheat sheet, glossary, 5 interview questions, further reading		

ML problem types

Recognise which ML problem you're solving.

Type	Question	Example
Classification	Which category?	Fraud / not fraud, spam
Regression	How much?	Delivery time, price
Ranking / recommendation	What order?	Feed, search results, products
Clustering	What groups exist?	Customer segments
Forecasting	What next?	Demand, inventory
Anomaly detection	What's unusual?	Payment spikes, outages

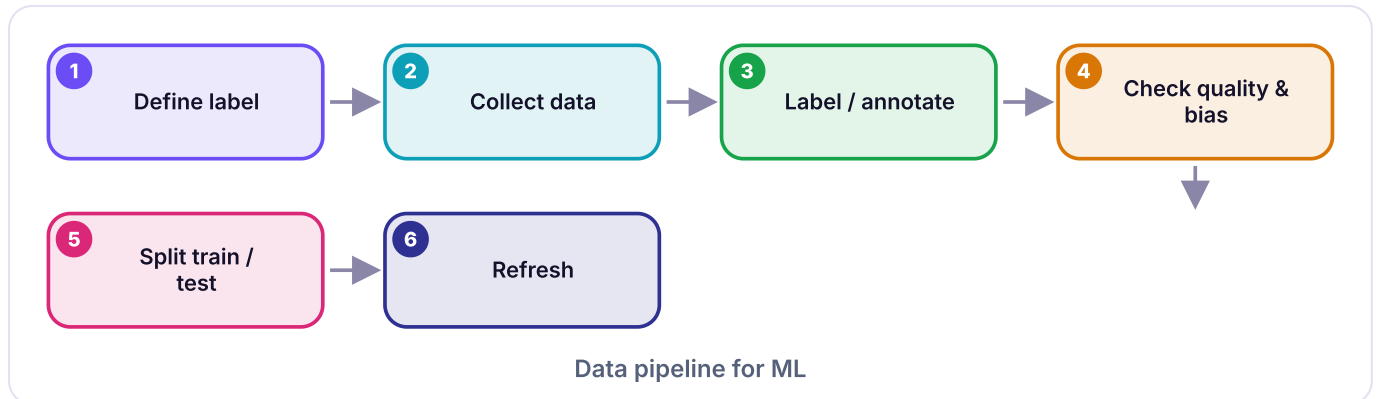
Key takeaways

- Name the problem type first.
- Each type has different metrics.
- Many products combine types.

Practice exercise: Name the ML problem type for 8 features in apps you use.

Data and labelling

Get the data an ML product needs.



- Labels from outcomes (did the user default?), humans (annotators), or rules.
- Watch leakage (using future information), class imbalance (rare fraud), and bias.
- Labelling tools and vendors; clear guidelines and agreement checks.

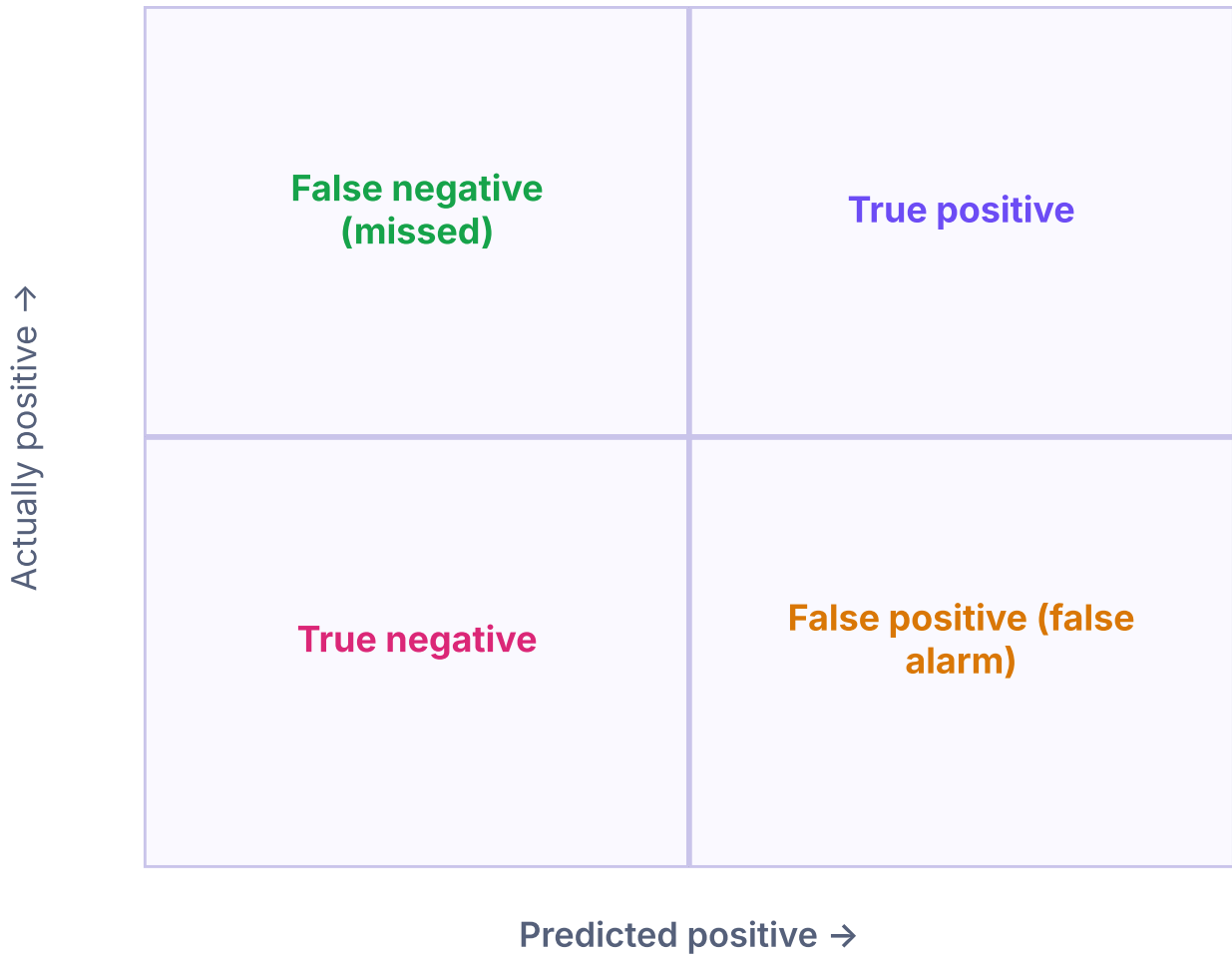
Key takeaways

- Data quality decides model quality.
- Write labelling guidelines.
- Check leakage, imbalance and bias.

Practice exercise: Write labelling guidelines for classifying support tickets into 6 categories.

Metrics and trade-offs

Choose model metrics that match business costs.



Confusion matrix (simplified)

- Precision = of flagged, how many were right; recall = of all positives, how many we caught.
- Choose thresholds by business cost: missing fraud vs annoying good customers.
- Link model metrics to product metrics (approval rate, losses, CSAT) with A/B tests.

Key takeaways

- Precision vs recall is a business decision.
- Set thresholds by cost of errors.
- Validate with online experiments.

Practice exercise: For a loan-default model, decide which error is worse and how you'd set the threshold.

Recommendations and personalisation

Understand how recommenders work and are measured.

- Approaches: popularity, collaborative filtering (people like you), content-based (similar items), and hybrid/deep models.
- Cold start for new users/items: onboarding questions, popular items, content features.
- Metrics: CTR, conversion, watch time, diversity, novelty, long-term retention.
- Guardrails: filter bubbles, fairness to sellers/creators, safety.

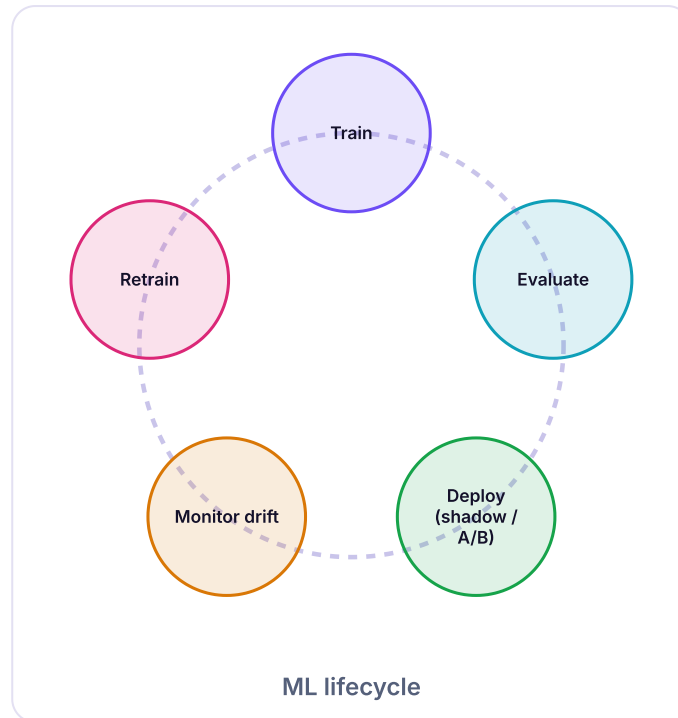
Key takeaways

- Hybrid recommenders are common.
- Plan for cold start.
- Balance engagement with diversity and long-term value.

Practice exercise: Design recommendations for a regional-language news app.

Model lifecycle and MLOps

Keep models working after launch.



- Shadow mode and gradual rollout before full launch.
- Monitor data drift, prediction drift and business metrics; alert on drops.
- Model registry and versioning; rollback plans.
- Model cards documenting purpose, data, limits.

Key takeaways

- Launch is the start of the lifecycle.
- Monitor drift and business impact.
- Always have a rollback.

Practice exercise: Write a monitoring plan for a delivery-ETA model.

Working with data scientists and final project

Collaborate well and ship an ML feature.

- PM brings: problem, users, business costs of errors, constraints, success metric.
- DS brings: feasibility, data needs, model choice, offline metrics.
- Agree early: baseline (simple rules), target metric, timeline for experiments.

Final project

Write an ML PRD for a fraud or recommendation feature: problem type, labels and data, metrics and threshold logic, A/B plan, monitoring, model card.

Key takeaways

- Start from a simple baseline.
- Agree metrics and costs of errors early.
- Document with a model card.

Practice exercise: Complete the ML PRD.

Templates

ML PRD extras

Field	Fill in
Problem type	
Label definition & source	
Baseline	
Offline metric & target	
Threshold logic (cost of errors)	
Online A/B metric	
Monitoring & drift alerts	
Rollback plan	
Model card link	

Cheat sheet

Term / tool	Meaning / use
Precision	$TP \div (TP + FP)$
Recall	$TP \div (TP + FN)$
Threshold	Score cut-off for a decision
Drift	Data or behaviour changing over time
Shadow mode	Model runs without affecting users
Cold start	No history for new users/items

Glossary

Label	The correct answer used for training
Leakage	Training on information unavailable at prediction time

5 interview questions with answers

Q1. How is ML PM different from regular PM?

Probabilistic outputs, data dependency, metric trade-offs, experimentation and ongoing monitoring/retraining.

Q2. Precision vs recall trade-off?

Choose based on the cost of false positives vs false negatives; set thresholds accordingly and validate online.

Q3. How do you handle cold start?

Onboarding preferences, popular/trending items, content-based features, and exploration.

Q4. What is drift?

Change in input data or relationships over time that degrades model quality; detect via monitoring and retrain.

Q5. What goes in an ML PRD?

Problem type, labels/data, metrics and thresholds, baseline, experiment plan, monitoring, rollback, model card.

Further reading and tools

- Google: Rules of ML: <https://developers.google.com/machine-learning/guides/rules-of-ml>
- Google ML Crash Course: <https://developers.google.com/machine-learning/crash-course>
- Model cards paper (Google): <https://modelcards.withgoogle.com/about>
- SkillNavora Statistics & ML track: <https://www.skillnavora.in/data-science/index.html>

© SkillNavora · skillnavora.in · Part of the AI Product Management and GenAI Launchpad programs. Practise with the free AI Tutor, AI PM Toolkit and Practice Lab on skillnavora.in.