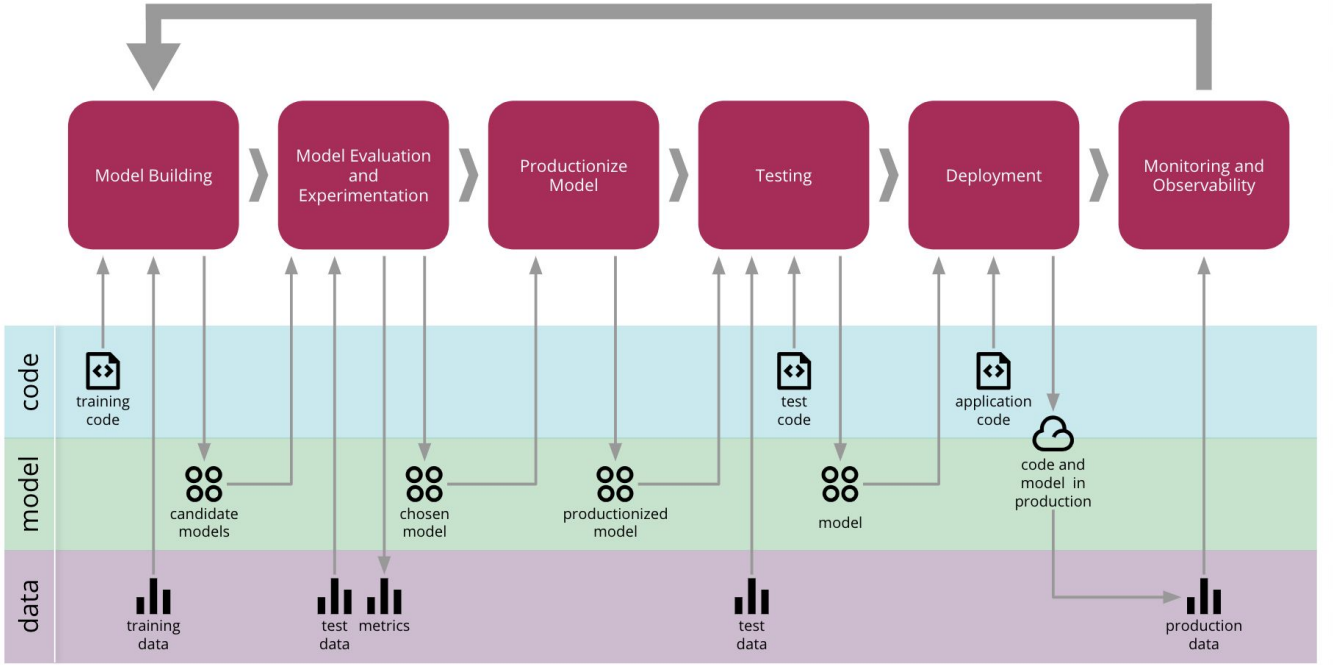
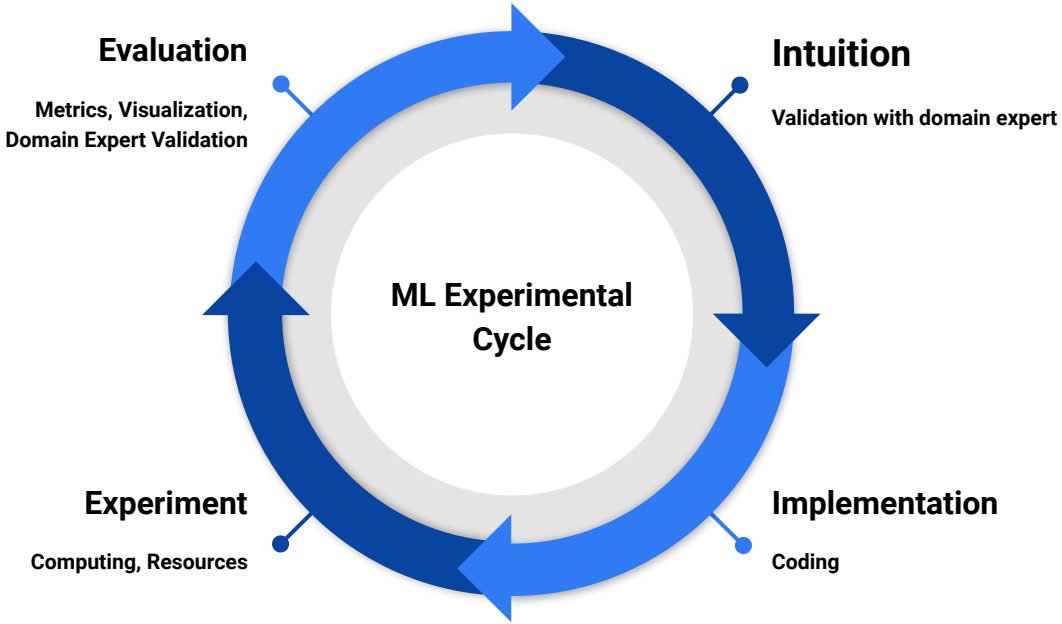
Managing ML processes in the organization

ML models life cycle

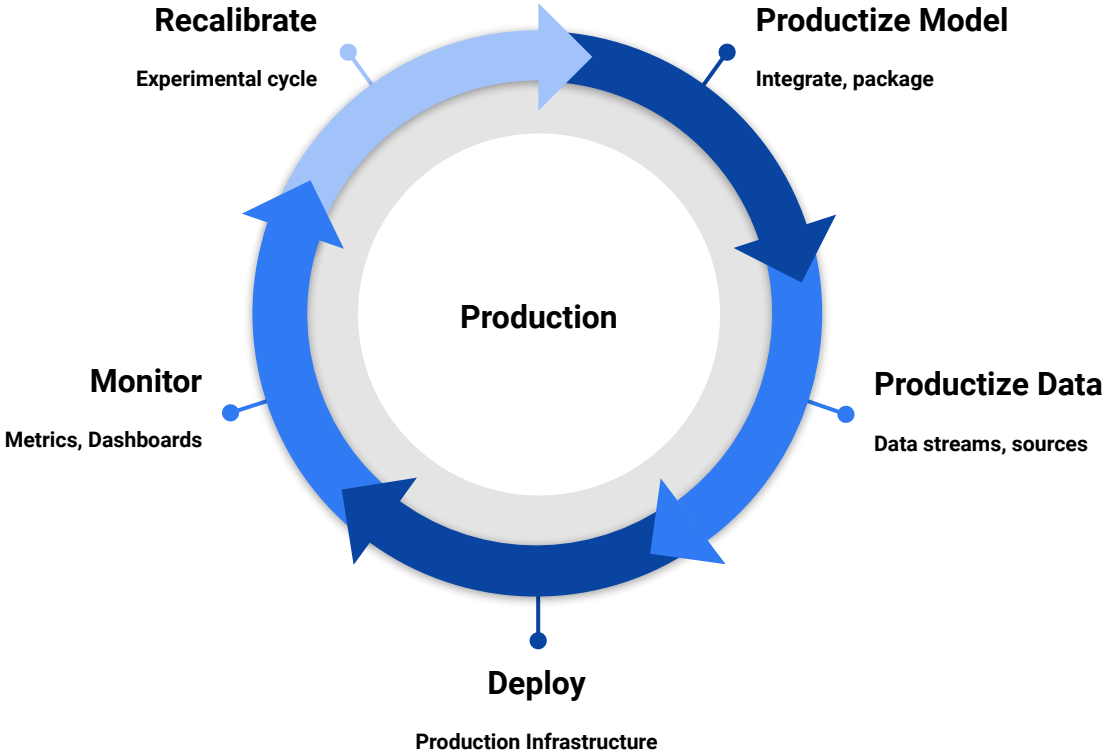
sources: https://martinfowler.com/articles/cd4ml.html and
https://christophergs.com/machine%20learning/2020/03/14/how-to-monitor-machine-learning-models/



Agility on the Experimental Cycle

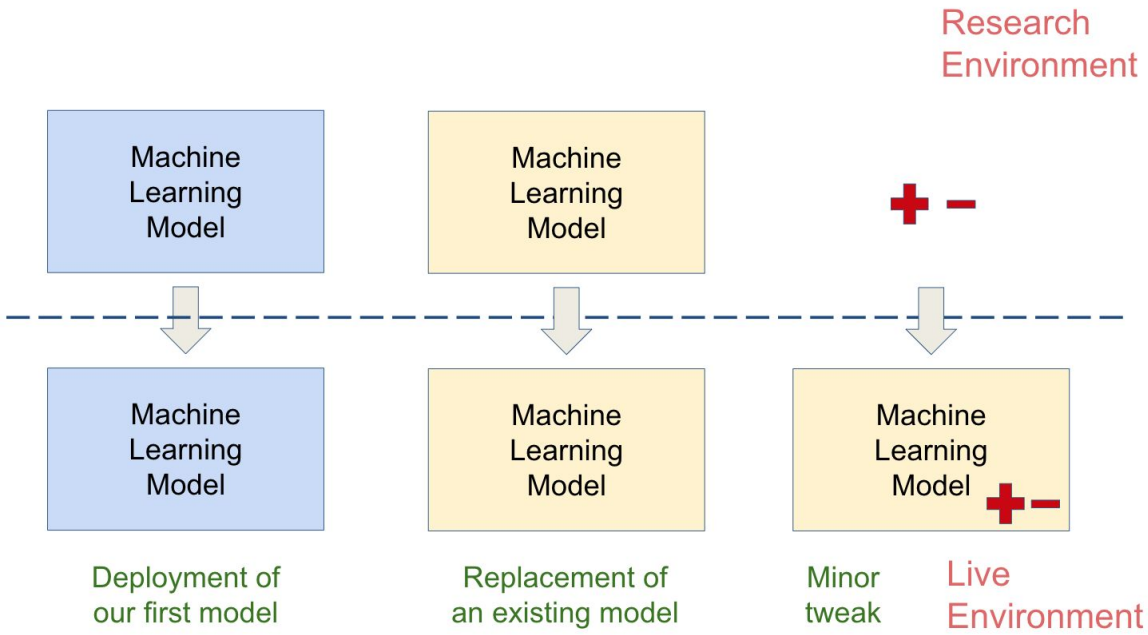


Robustness on the Production Cycle



Maintainability

sources: https://martinfowler.com/articles/cd4ml.html and
https://christophergs.com/machine%20learning/2020/03/14/how-to-monitor-machine-learning-models/

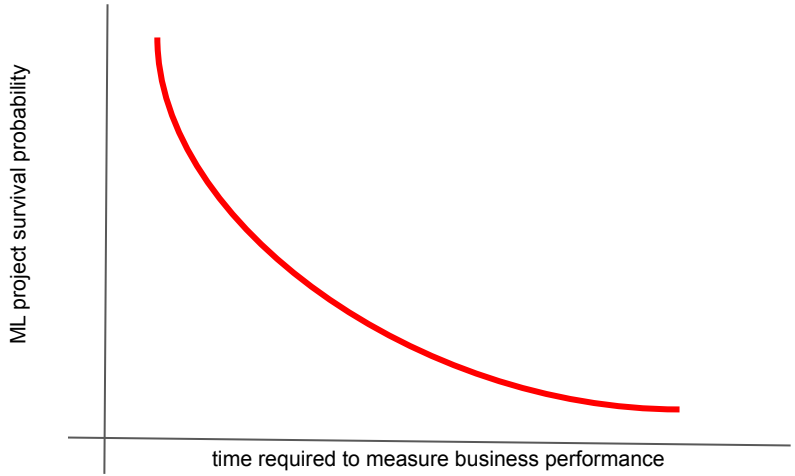


Model performance alerts

ML Metric (accuracy, RMSE, etc.)
Business metric (PNL, RoI, etc.) → Monitoring dashboards

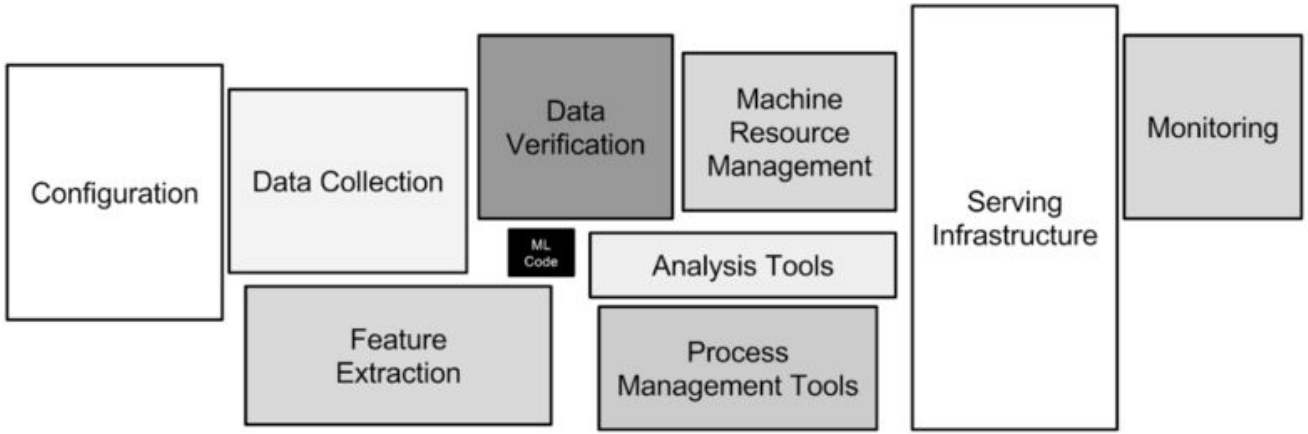
Performance measuring time vs. impact time

- What if I cannot measure a model has degraded business performance before the losses are too high?



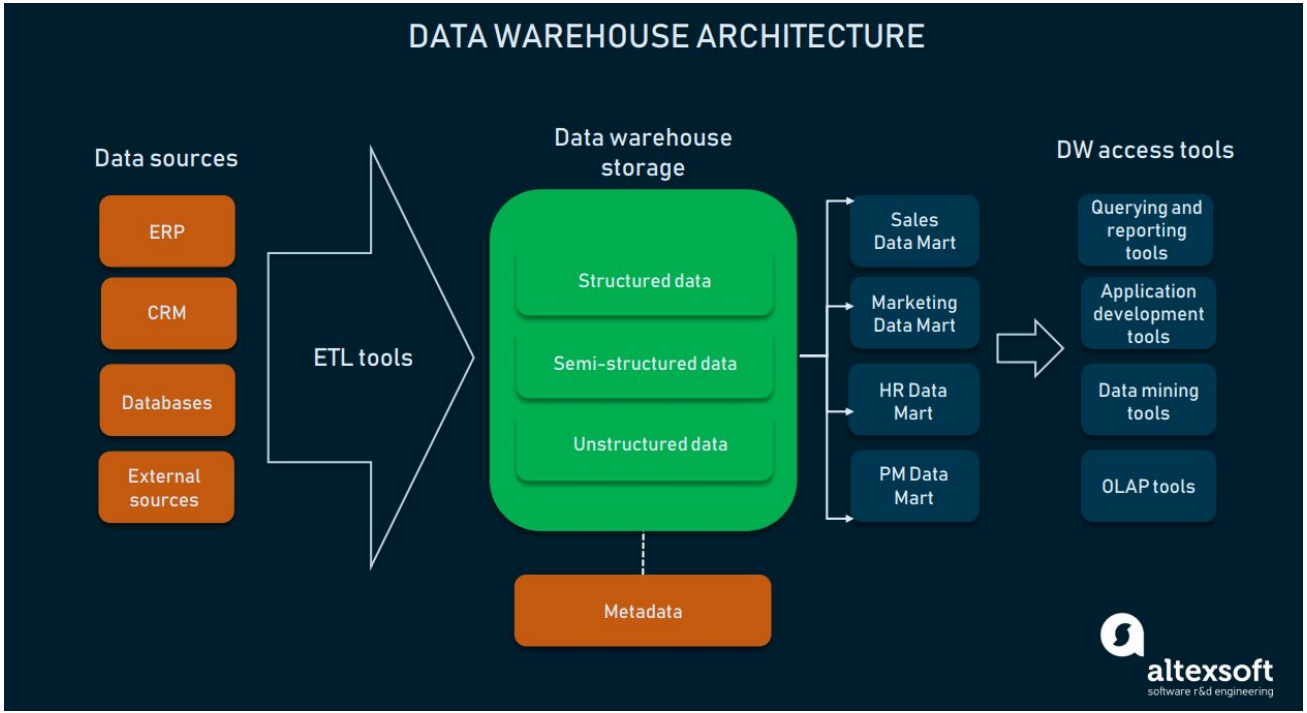
Pipeline maintenance

sources: https://martinfowler.com/articles/cd4ml.html and
https://christophergs.com/machine%20learning/2020/03/14/how-to-monitor-machine-learning-models/



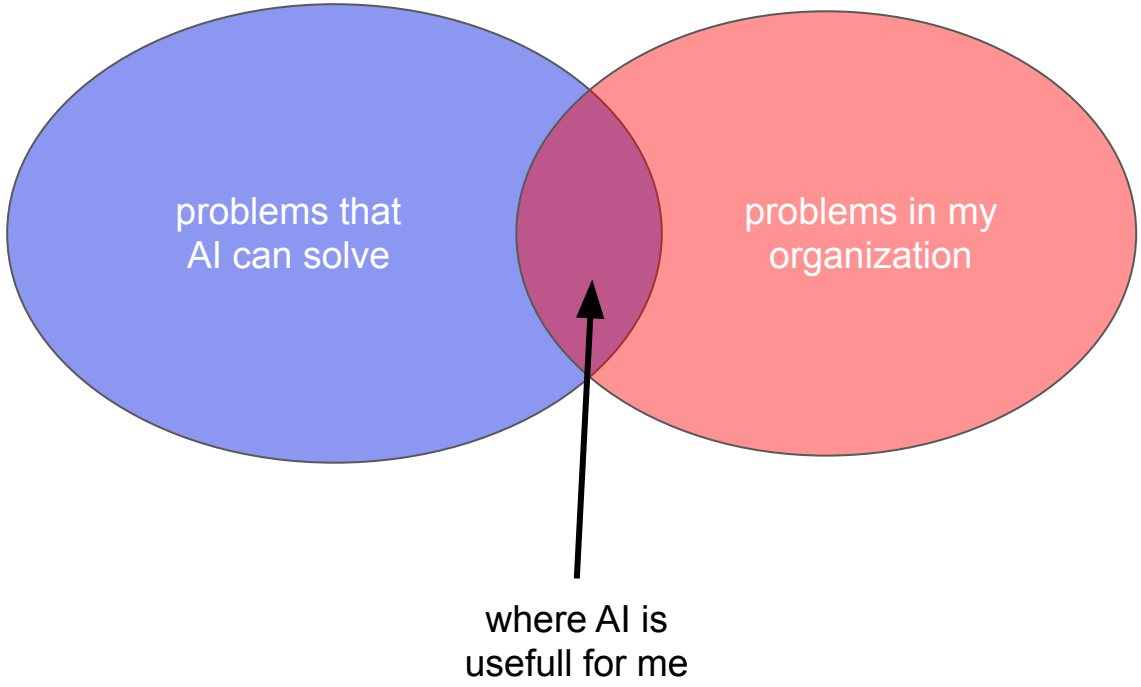
Data management

source: https://www.altexsoft.com/blog/datascience/what-is-data-engineering-explaining-data-pipeline-data-warehouse-and-data-engineer-role/



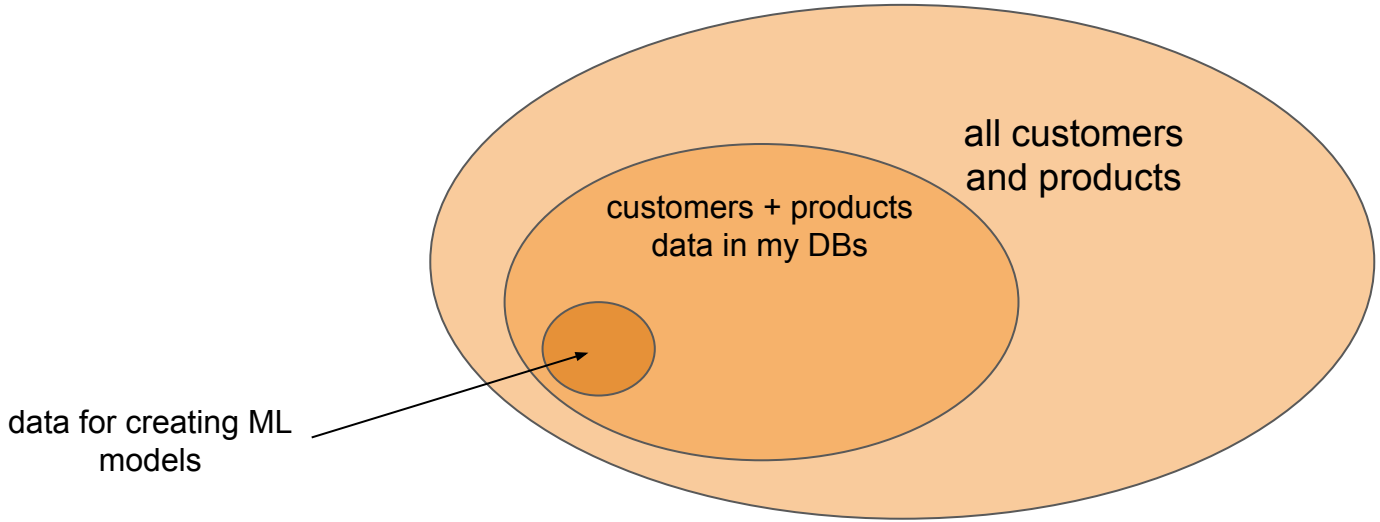
Is ML/AI really useful?

be smart selecting what ML really used for within my context



Data representativity

how **portable** are models?



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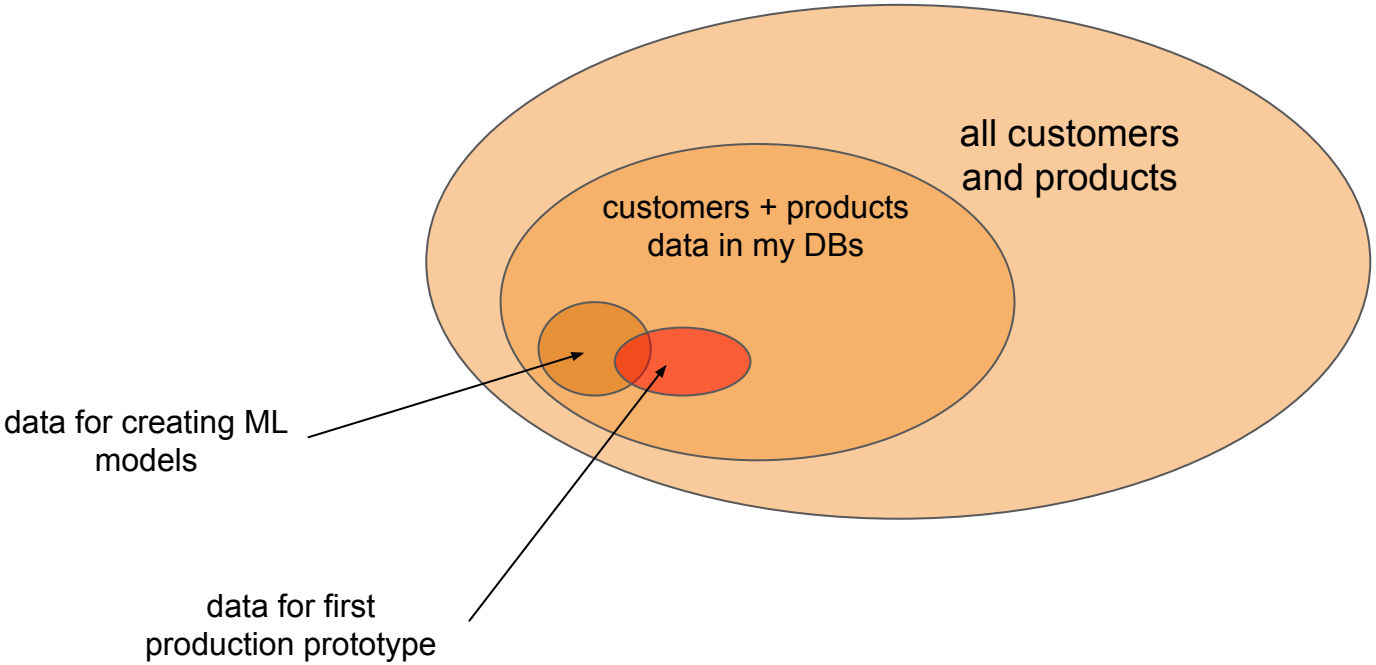

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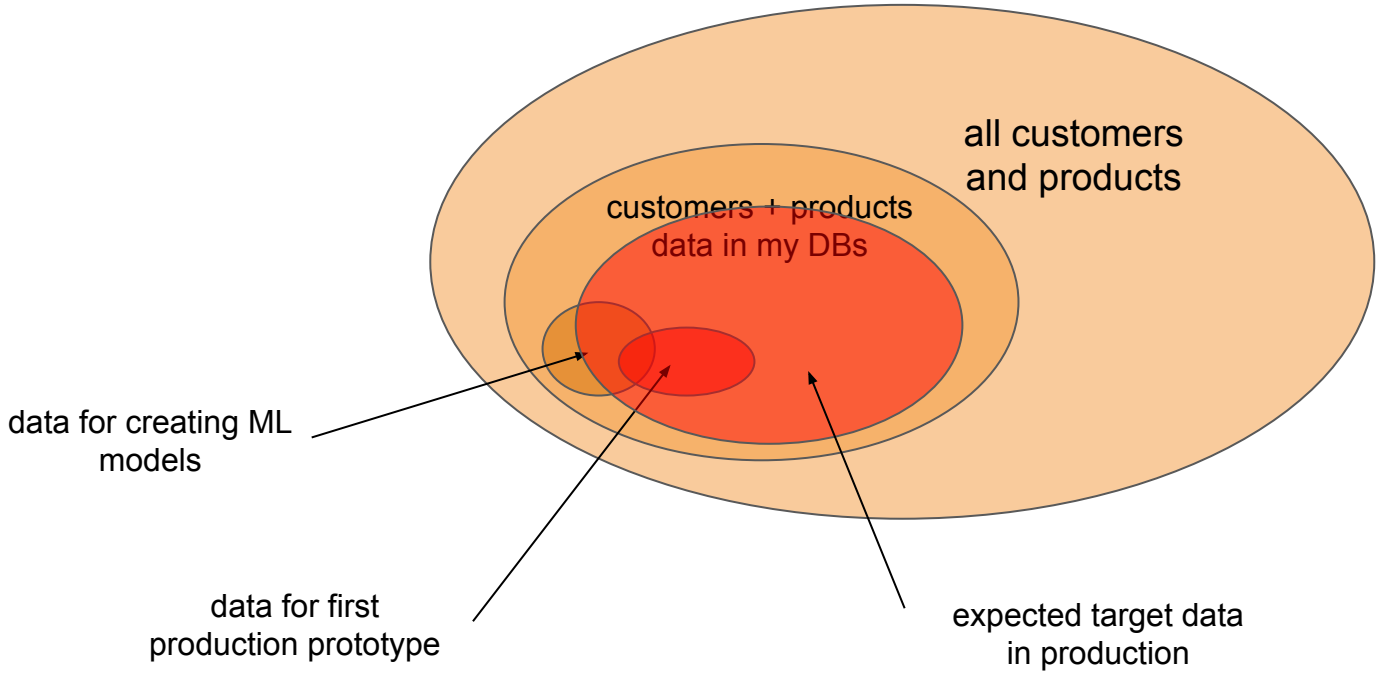

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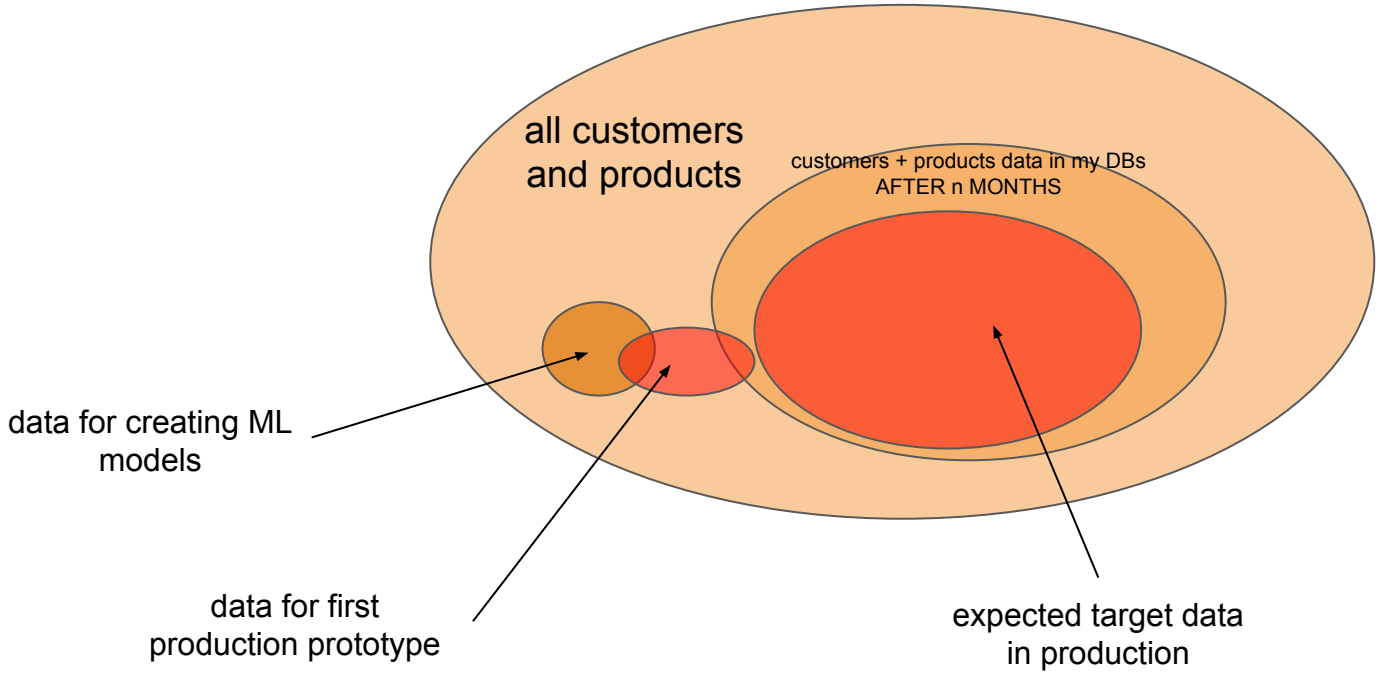
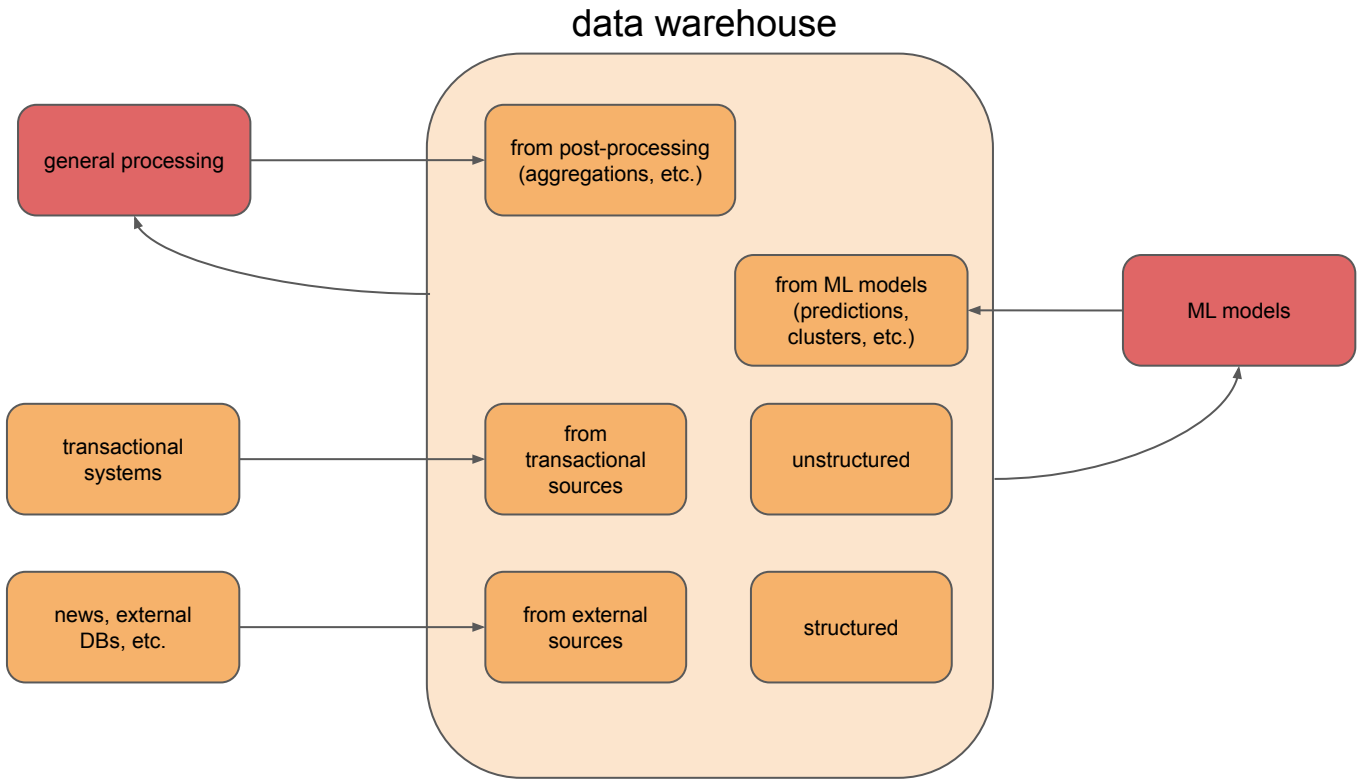


Data representativity

Examples

- Commodities time series, short range predictions too good due to sampling artifacts
- Defect detection deployment in factory: lighting conditions, requires periodic cleaning, etc.
- Energy time series: time to create predictive models
- Transportation: deployment of recalibrated to IoT devices with random connectivity.

Data lifecycle and maturity



Data lifecycle and maturity

How confident am I from a predictive model trained with data existing in the warehouse?

I run some analytics process (model, etc.) to make a report for management decision making, how can I be sure that:

- Source data was OK ?
- Analytics code is OK ?
- I can run the same process next month?

Datasets

What is it needed to build confidence in data products:

- Dataset Versioning
- Dataset Authoring
- Dataset Reproducibility
- Notebook/Script repository
- Libraries freeze (docker?)

ML Experiments reporting

- See MLFLOW demo

Team roles

adapted from: https://martinfowler.com/articles/cd4ml.html