

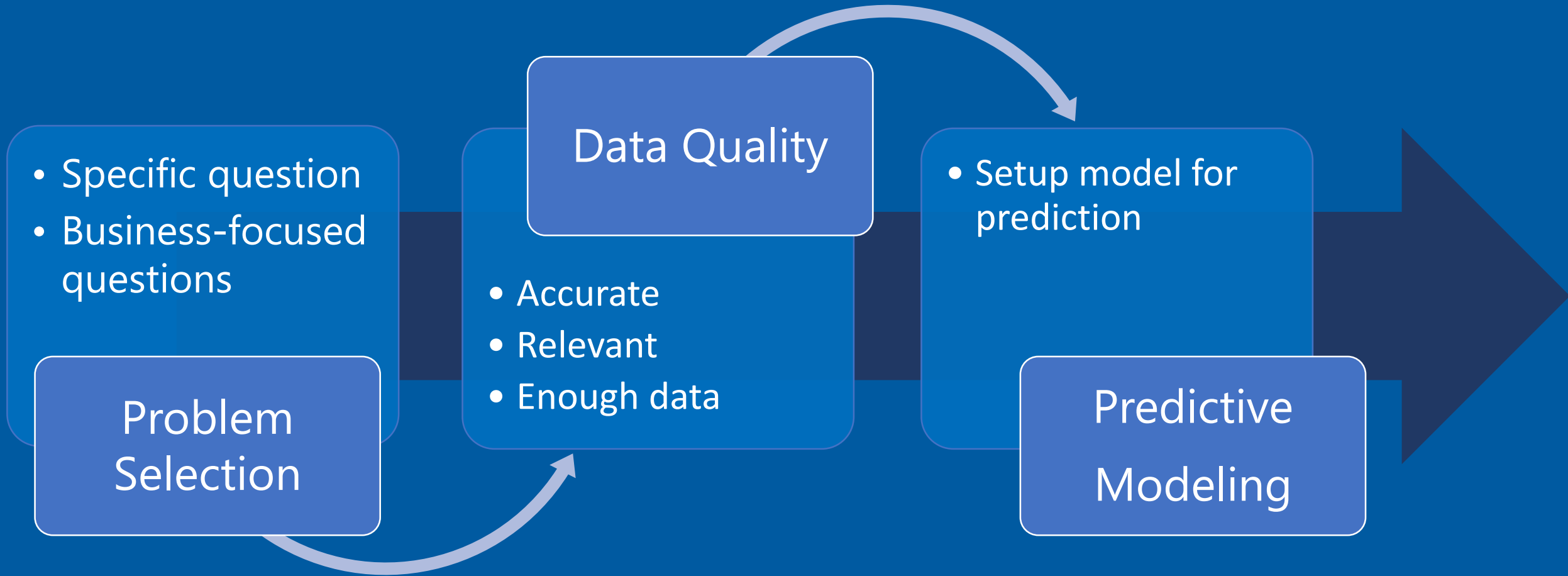
DevOps risk/drift prediction with artificial intelligence

using Cast Highlight and Microsoft Azure

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Data Science Process



DevOps Risk of failure

- We can assess risks of failure through several kinds of indicators
 - Prediction of application failure
 - Expected time before next failure
 - Prediction of application failure kind
 - Probability of specific kind of failure
 - Symptoms : performance, security, availability, ...
 - Prediction of failure severity
 - Application business classification (business critical, medium or low impact)
 - Long, medium or short time to recover
- Actionable
 - Root cause Identification
 - Recommendation of remediation

DevOps risk of shift

- Shift in delay (delivery date is shifted)
 - Prediction of delay on the delivery
- Shift on technical debt (delivery date is not shifted & code delivery is stressed)
 - Prediction of decrease in code quality after sprint scope unexpected change
- Shift on features (delivery date is not shifted & features are delayed)
 - Prediction of shifted sprint features percentage in next delivery

Clustering & Recommendation

Problem
Selection

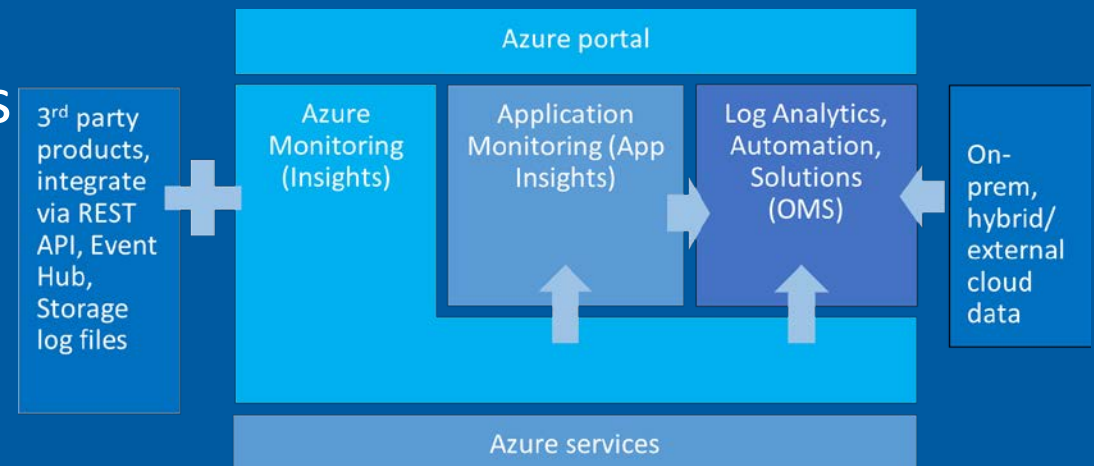
- Identification of project similarities
 - Code, framework, velocity, team, ...
 - Index of similarity (through clustering)
- Recommendation
 - Synergy in application teams
 - Developer mobility in team

Data origin

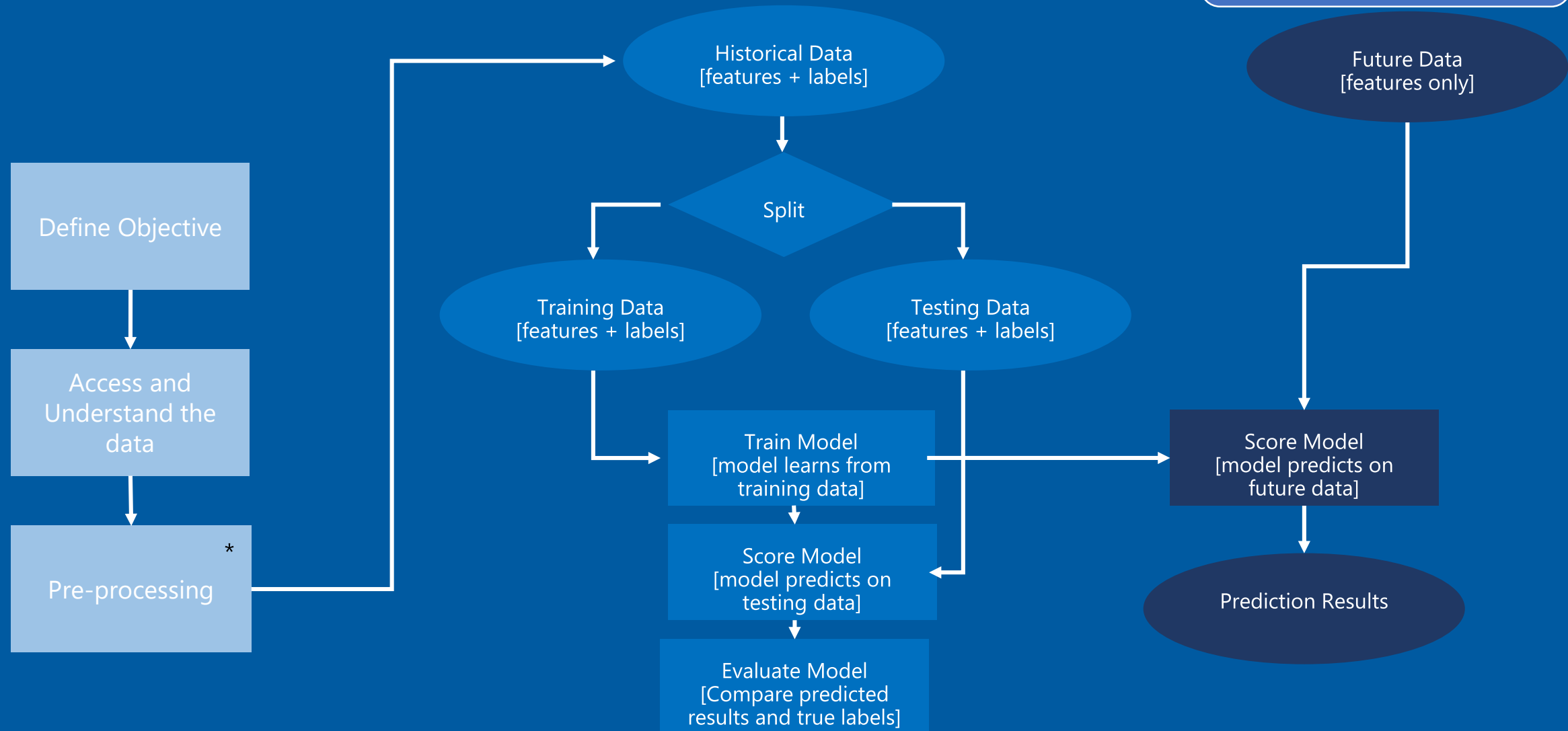
- Cast Highlight
 - Code static analytics : Code quality, code complexity, Agility, resilience, elegance, Cloud Readiness
 - Survey : Strategy alignment, internal/external users
- ALM factory (VSTS, TFS,...) sprint indicators
 - Code churn, Lead Time, Work-in-progress (WIP), Backlog change, Active bugs, Code coverage

- Telemetric Data from Monitoring Sources

- Azure Monitoring
- Application Insights
- OMS Log Analytics



Setup model for prediction



Modeling Techniques

Predictive
Modeling

BINARY CLASSIFICATION



Predict failures within a future period of time

REGRESSION or SURVIVAL ANALYSIS



Predict the amount of time before the next failure

MULTICLASS CLASSIFICATION



Predict failures with their causes within a future time period.
Predict remaining time before failure within ranges of future periods

ANOMALY DETECTION



Identify change in normal trends to find anomalies

