TRACE3

All possibilities live in technology

Proposal Overview

IT OPS DATA PREDICTIVE ANALYTICS REFERENCE IMPLEMENTATION

July 17, 2020

Goals & Objectives

IT OPS DATA PREDICTIVE ANALYTICS REFERENCE IMPLEMENTATION

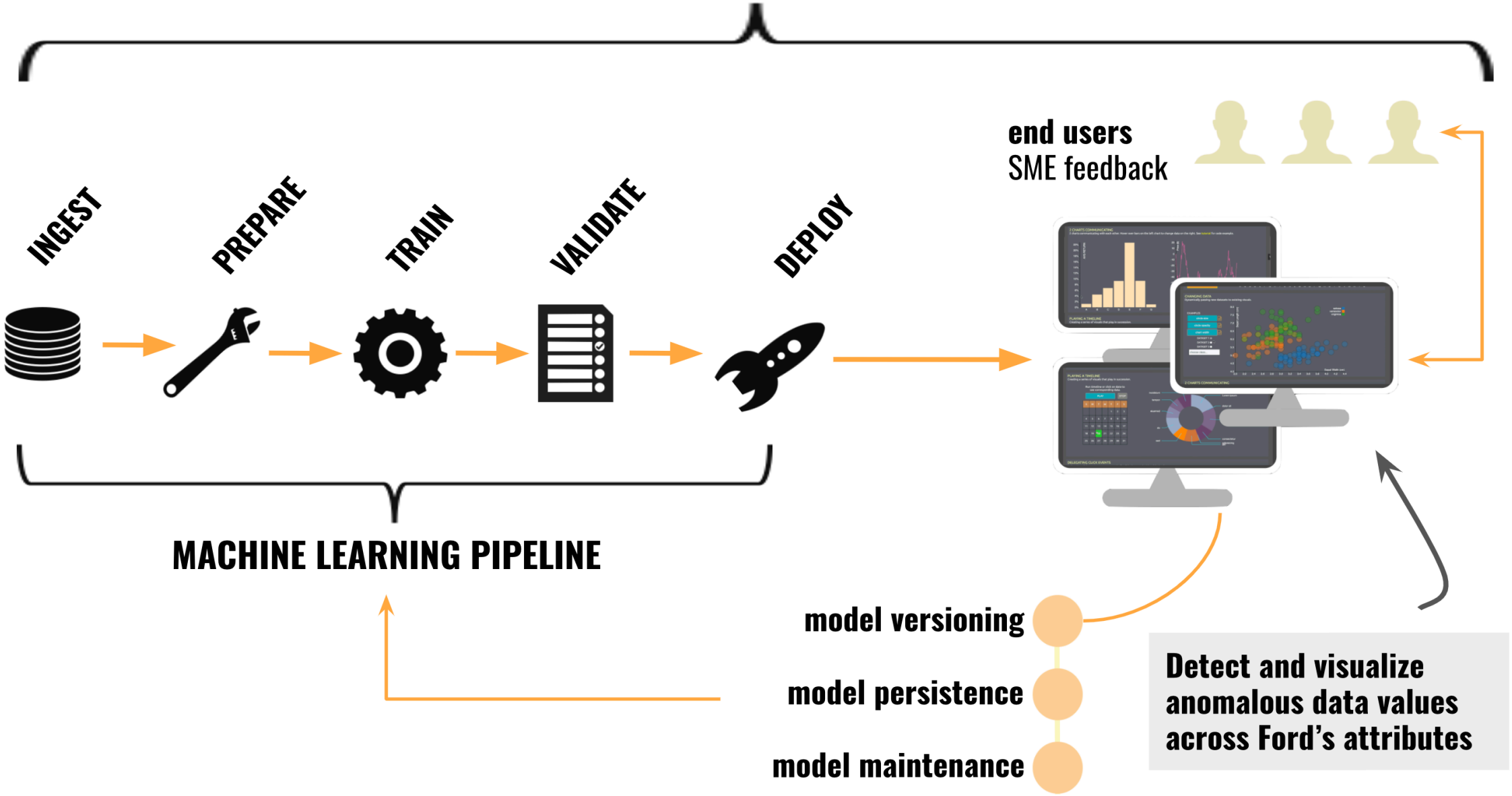
Objective:

Engage with the Ford IT Operations team to construct a practical ML pipeline **MVP** to demonstrate consumption and mutation of systems telemetry and change/incident event data to train a model and score/infer against it for subsequent refinement and exposure of actionable insights

Goals:

- Demonstrate consumption of multiple data sources as landed and available in Data Lake
- Demonstrate data preparation techniques as dictated by specific modeling approach
- Implement model training/validation/scoring example
  - Unsupervised approaches preferred
  - Open to both “traditional” ML techniques as well as Deep Learning (likely requires GPU)
- Demonstrate interactions with other Ford systems/tooling (e.g. visualization) where relevant
- Expose Ford personnel to best practices and approach for future model development

ANOMALY DETECTION FRAMEWORK



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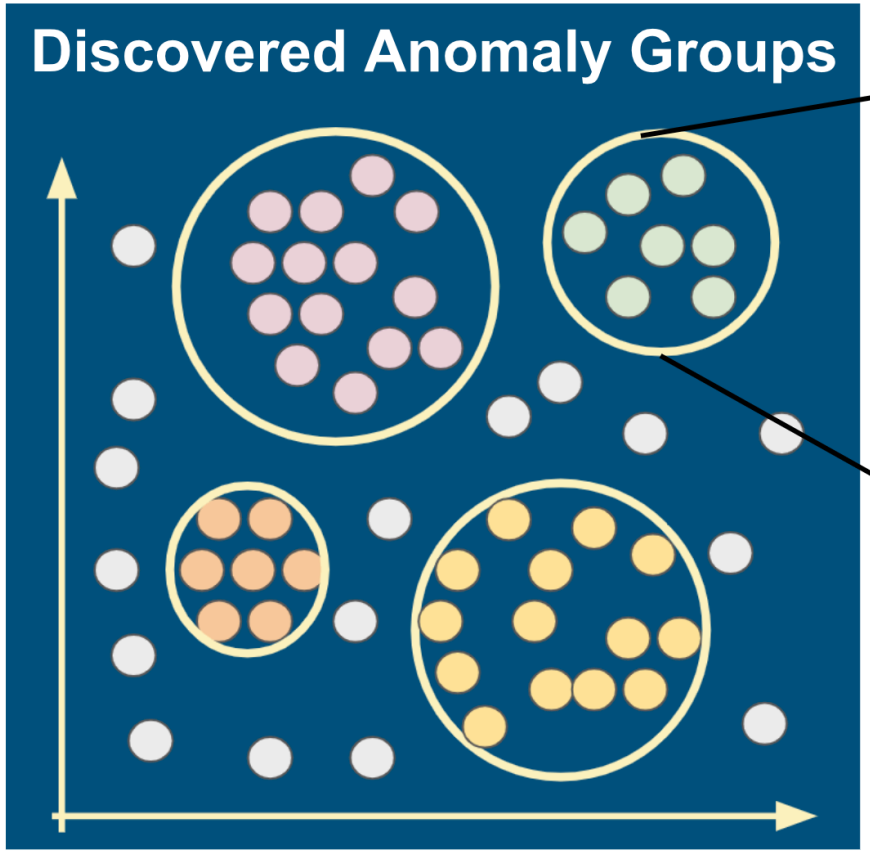
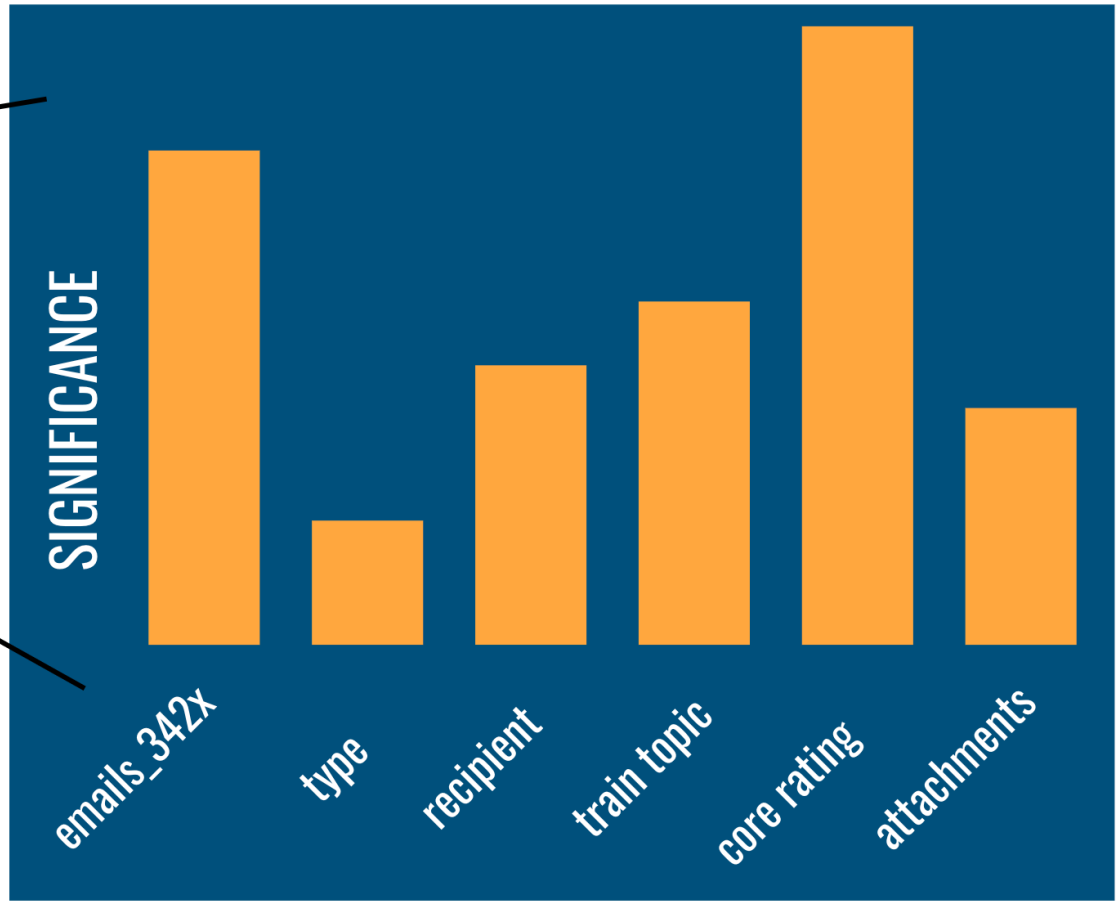
SOLUTION PROPOSAL

APPROACH

Attributes that deviate from normal behavior are exposed.



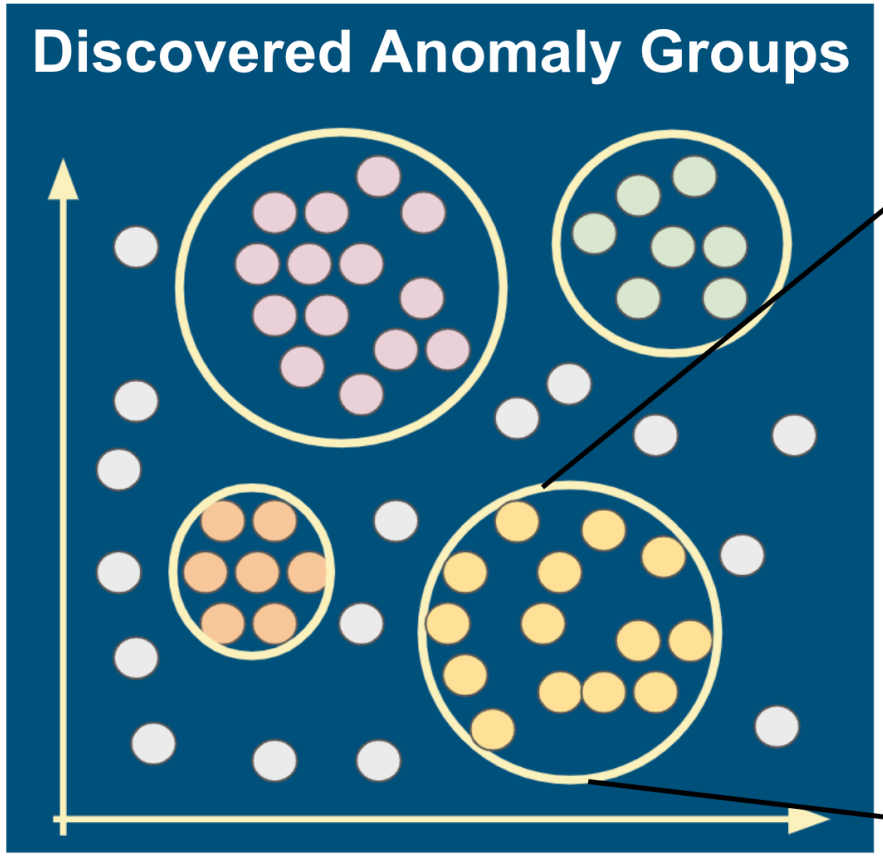


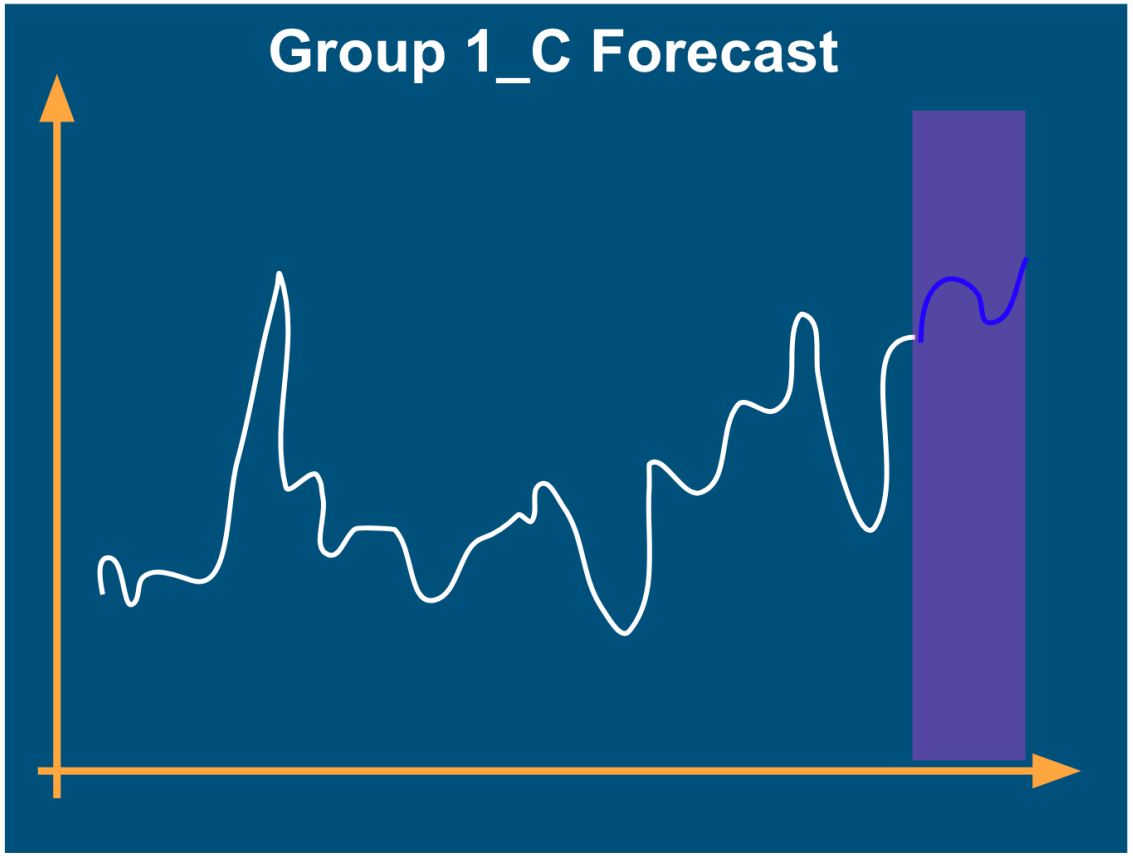
SOLUTION PROPOSAL

APPROACH

Anomaly groups share characteristics that can be used for prediction.

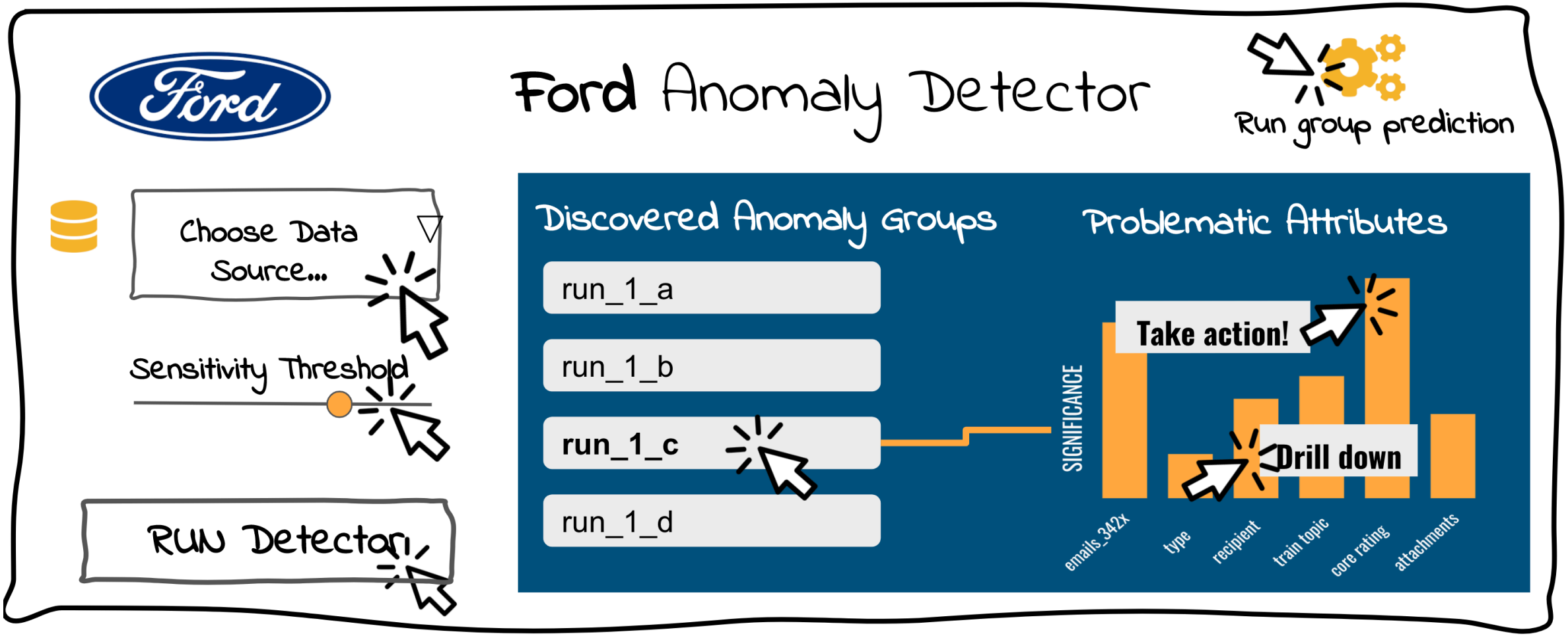
ANOMALY GROUP PREDICTION





SOLUTION PROPOSAL

FRONT-END MOCKUP



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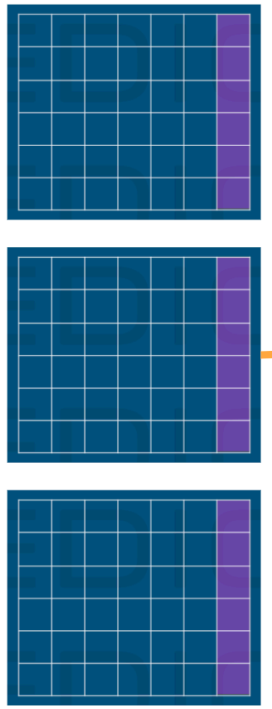
SOLUTION PROPOSAL

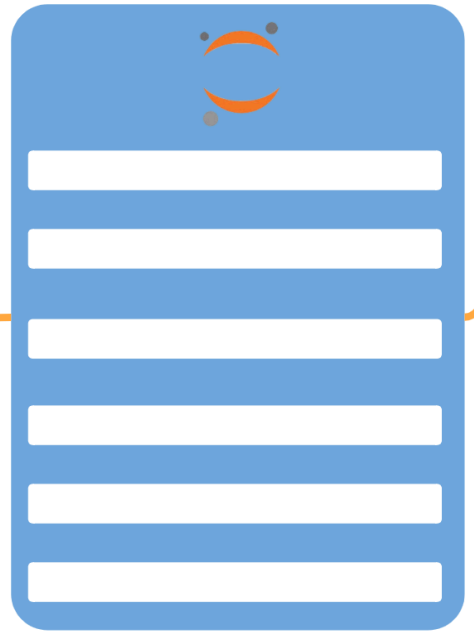
REPEATABLE ANOMALY DETECTION SOLUTION

DELIVERABLES

SOURCE DATA



INTERACTIVE NOTEBOOK



Easily modify and extend trained models interactively.

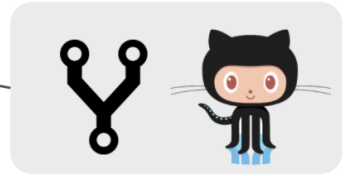
SCRIPTS

- Data Ingestion
- Data Preparation
- Model Training
- Model Validation

REST API

FRONT-END

CONTAINERIZED APPLICATION



REPO

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SOLUTION PROPOSAL

OPEN SOURCE TOOLING

Python environment (Python 3)

Data Processing | Model Training / Validation | Development Env | Deployment | Custom Front-End

HTML/Javascript

All possibilities live in technology

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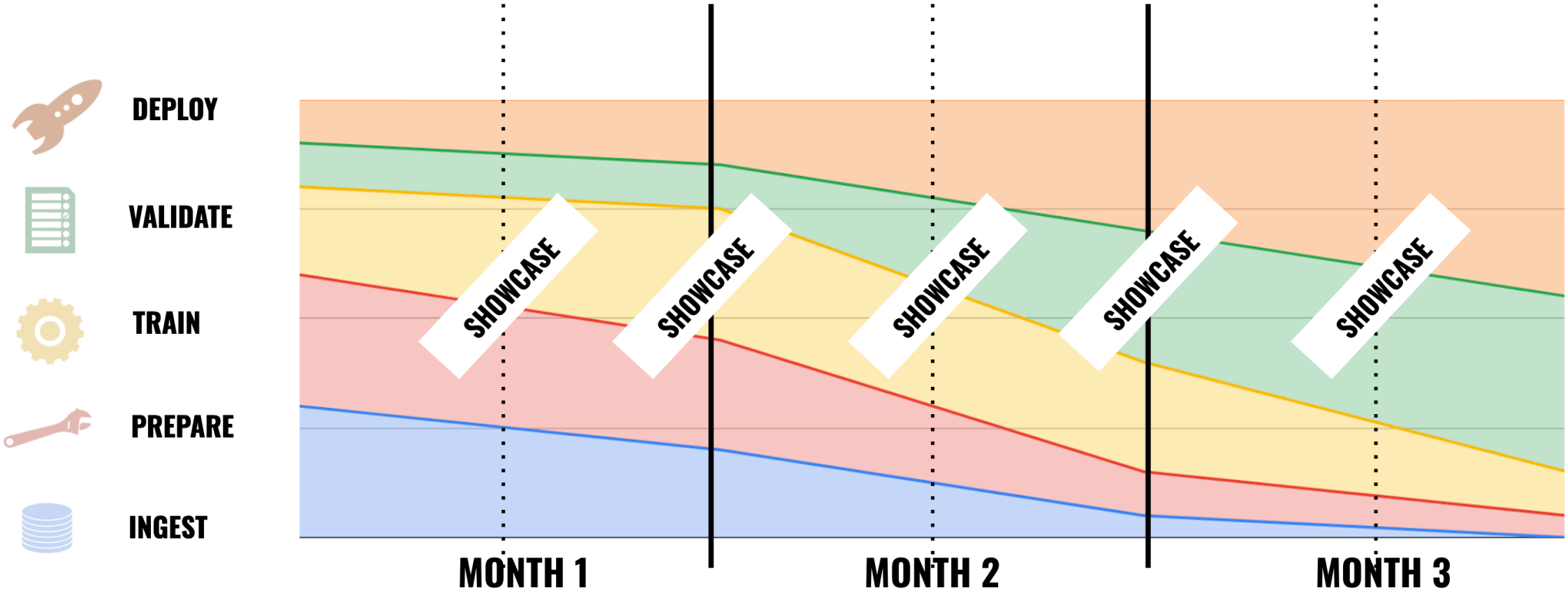
SOLUTION PROPOSAL

TIMELINE & WORKFLOW



Outcomes

IT OPS DATA PREDICTIVE ANALYTICS REFERENCE IMPLEMENTATION

- Deliver a reference project to be consumed, refactored, and iterated upon for related future projects
- Provide expertise and thought leadership in the areas of ML/DL, Data Engineering, and the design, construction, and management of related platforms
- Uplevel Ford personnel as relates to current leading/bleeding-edge techniques, technologies, and processes
- Establish ongoing partnership between Ford and Trace3+Kedion