Root Cause Prediction Tool

TeraCrunch Socratez™ Platform & Methodology

DATA PREPARATION

Identifying fields for the model, conversion of categorical data types to numeric types, featurization of text data, and joining of relevant tables in a relational database. Data imputation for missing values

FEATURE ENGINEERING

Feature engineering is the process of using knowledge of the data to create features that make machine learning algorithms work. Coming up with features is difficult, time-consuming, requires expert knowledge.

MODEL TRAINING

Explores & identifies best options from a range of machine learning models (generalized linear models, decision trees, random forests, gradient boosted decision trees and neural networks).

TEST & SIMULATION

Explores changes in predictions if inputs are changed. This allows exploration of the underlying causal effects in the model.

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Case study

When products coming off an assembly line fail routine tests, manufacturers often employ highly skilled workers to determine the root cause of the failure. These individuals are difficult to train, and therefore are difficult to replace if they leave. As such there is a great opportunity for machine learning models to facilitate and accelerate the discovery of the root causes of failures, easing the burden of discovery on technicians in response to a test failure.

The Client

Major manufacturing firm

TeraCrunch Solution

Using a large number of historical records detailing product attributes and the root causes of test failures, TeraCrunch developed predictive models for determining root causes, including the specific part that failed and its physical location in the product. Each of the models achieved accuracies above 95% on validation data before they were deployed.
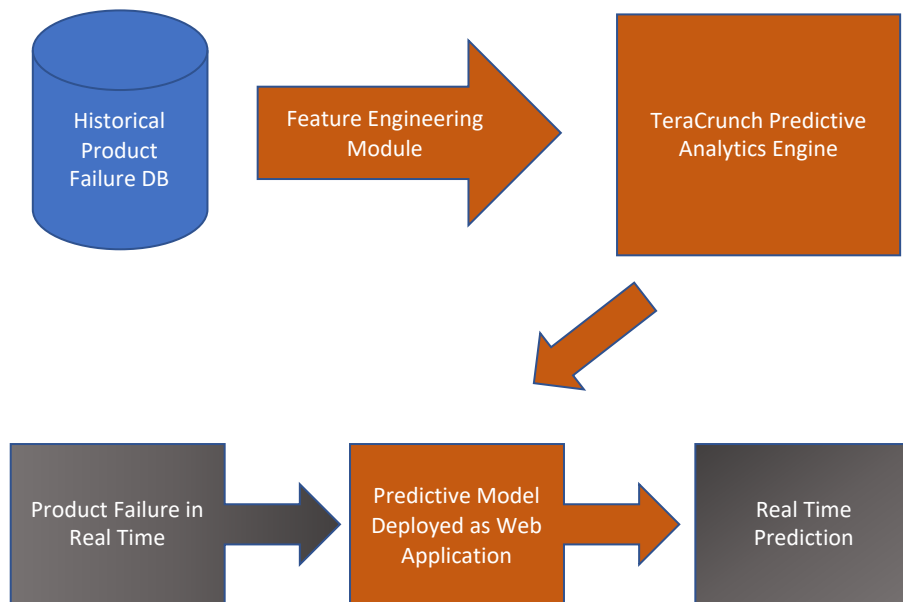
TeraCrunch hosts the solution and provides access to the client through a secure web interface (Tool). In practice, when a product fails a test on the floor, a technician simply provides input to three fields on the web interface tool and receives in return predictions regarding the part that failed and its location in the device.

The predictive models are retrained at regular intervals to capture new products and the failures that are associated with those new products.

Impact on the business

TeraCrunch tool reduces significant costs as our tool reduces the need to employ highly skilled workers and/or train new workers with this specific skill set.

TeraCrunch