DATA SCIENCE CASE STUDIES
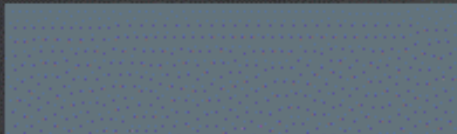
OCTOBER 2015

Data Science ACM XXXX Summary

XXX Recommendation coverage **95%**	• XXXXXX's models and rules engine in XXXX will replace functionality within XXX that accounts for 95% of all historical recommendations made • XXXXXX's data science helps to increase user efficiency by prioritizing assets (*Health Score*), electronic data, and fluid samples (*Fluids Model*) that require action • Higher level of model accuracy reduces number of false positives without any negative impact on outcomes
Beyond XXX	• The ability to associate multiple conditions, events, malfunctions, etc. to specific issues and recommended action to improve accuracy of predictions • Models that recommend knowledge articles and/or other procedural documents for problems identified by the analytics (*Recommended Action Model*) • Further analytics to find cases where events can be deprioritized to reduce unnecessary noise • Continuous learning to understand user interaction and feedback to further enhance analytics models

Fluids Model

Inputs

Caterpillar analyzes fluids (e.g., oil) in customers' machines. The analysis measures particulate levels in the fluids (e.g., iron, nickel, etc.). The results of this analysis are inputs to the model.

Future Inputs

Weather data, Soil conditions, Site data, Geographic locations and mapping of site (e.g., to find bad roads), Usage data (i.e., what is the job the machine is completing?)

Output

The analyst is alerted if a given fluid sample requires a maintenance order. High or low particulate values that lead to a maintenance prediction are also given to an analyst for more consideration and interpretation.

Value

For high priority cases, this model will reduce the amount of time the analyst spends reviewing irrelevant cases by ~90%.

Case Study: Using the Fluids Model
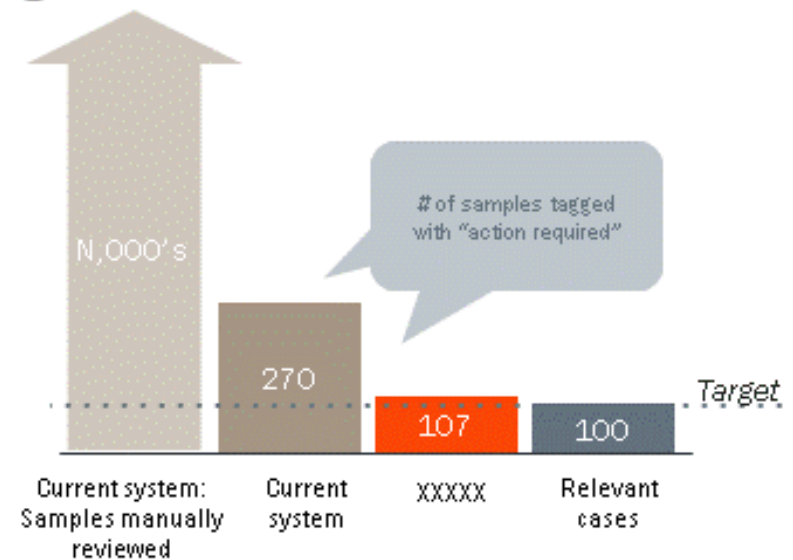
1 Situation

Maintaining equipment is crucial to ensure that construction operations run smoothly, on-time and on-budget. To determine when machines need servicing, regular testing of fluids from those machines is necessary.

2 Problem

N,OOO's of SOS

Currently, analysts examine and sort through thousands of fluid samples to identify equipment requiring immediate attention. This is a manual, repetitive process that drains labor and slows down proactive maintenance.

3 Results

N,OOO's

# of samples tagged with "action required"

270

107

100

Target

| Current system: Samples manually reviewed | Current system | XXXXX | Relevant cases |

XXXXXX created a model that more accurately tags high-risk samples and at-risk equipment, dramatically increasing analyst efficiency by >90%. This will decrease machine downtime, saving customers millions and increasing loyalty to the Cat brand.