Data Science Deep Dive

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.

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**Data Science Deep Dive**

**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**
   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,000’s: 270
   - Red: 107
   - Green: 100
   - Target: 0
   - # of samples tagged with “action required”

   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.

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