

Case Study:

Predicting Business Opportunities in Heavy Machinery Servicing

The Business Problem

- Service managers were struggling to predict which of the thousands of their customers' machines might be coming due for service each week.
- Customers were missing service intervals, risking their warranties and/or taking their business elsewhere at the last minute.
- Workshop pipelines were being managed *ad hoc*.



The Solution

Inputs

- Mainframe-generated invoice history and workshop tracking reports
- Sales history (SAP)
- Database of laboratory (engine oil and water) analysis
- Database of telemetry on machine operating conditions

Components

- Data warehouse and ETL created with Microsoft SQL Server, SQL Server Integration Services
- Application created in .NET
- Bespoke data cleaning, predictive analytics, and rules engine (C#)

The screenshot shows the SSIS Data Flow Task 'Import KOMTRAX data' with the following components: Source - CustomerMac..., Fuzzy Lookup, Match Models, Source 1 - EQPCare, Fuzzy Lookup 1, Match Models Split - EQPCare, MatchedModel, UnmatchedModel, Union All 1, Dest_EqpCare_Exceptions, Derive MachineCode, and Dest_Komtrax History. A text box above the task states: 'This package should be run daily to append to the [WPActiveJobs] and [WPInvoices] tables from the Merchand flat file sources.'

The 'Get Opportunities v1' application window shows the following settings:

- Context: Development
- Confidence Level: 90
- Branch Code: 25
- Aggressive Outlook:
- Forecast Method: Interval Averages (selected), Polynomial Extrapolation
- Buttons: Find Opportunities, Show Opportunities
- Show Messages:

The application is mining a database for opportunities. The results are displayed in a table:

Machines	Input Errors	Opportunities	Call-Backs
KOMTRAX: 94	KOMTRAX: 0	KOMTRAX: 16	Komtrax: n/a
EQPCare: -1	EQPCare: 0	EQPCare: 0	EQPCare: n/a
WIP: 3068	WIP: 0	WIP: 0	WIP: n/a
History: 413	History: 0	History: 33	History: 17
CMS: 3471	CMS: 0	CMS: 476	CMS: n/a
Sales: 0	Sales: 0	Sales: 0	Sales: n/a
All: 3977	All: 0	All: 0	17

Missed opportunities: 367

Benefits

- Prediction of next service interval at machine and fleet level
 - Error-tolerant forecasting engine makes best guess from conflicting inputs or missing data
 - Full transparency to user, with adjustable confidence interval and forecast horizon
 - Forecasting window allows for timely customer contact and efficient workshop scheduling
 - Automatic collation of CRM and fleet data provides full view of customer and asset history
 - Tracks missed opportunities as an indicator of potential ROI for optimal usage
- ↑ Workshop business, Customer confidence
- ↓ Workshop bottlenecks, Warranty lapses

