



## Improve Expert Systems with Datawatch Predictive Maintenance analytics and machine learning

Whether it be scheduled or unscheduled, the cost of downtime in manufacturing environments can be extremely costly to the business, often to the tune of millions of dollars annually. Unexpected downtime can significantly impact tangible and intangible operating costs. To mitigate risk associated with downtime, manufacturing operations often develop equipment maintenance calendars, servicing equipment regardless of whether it is needed, leading to higher than necessary overhead expenses.

“Unplanned downtime costs industrial manufacturers an estimated \$50 billion annually. Equipment failure is the cause of 42 percent of this unplanned downtime. Unplanned outages result in excessive maintenance, repair and equipment replacement.”

WALL STREET JOURNAL

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[altair.com/knowledgeworks](http://altair.com/knowledgeworks)

This doesn't have to be the case. Advances in technology have enabled organizations to collect real-time data about how their equipment is operating. This data contains hidden indicators of future equipment failure. Using predictive analytics manufacturers can extract these hidden insights so they can choose to do maintenance when the risk becomes high. The result is avoidance of costly or dangerous unplanned downtime and more efficient scheduling of repair and maintenance personnel and resources.

Datawatch predictive analytics and machine learning platform helps manufacturers perform preventative or corrective actions using insight found in data generated directly from their equipment. Data science teams can deliver optimized maintenance routines that will minimize unexpected downtime and add efficiencies to regular operations, without the need to manually create sophisticated algorithms from scratch, even when experience in advanced analytics programming is limited. Being pointed and precise in the identification of risks

and failures on equipment assets enhances the ability to be responsive to the unique characteristics of each piece of equipment. As a result, each machine receives the maintenance that it needs when it needs it and is kept running and operating in the best condition for the longest period possible.

With insight derived from an open, flexible platform that allows analytics teams to use their preferred algorithms, manufacturers can:

- Mitigate expensive costs related to unplanned outages
- Reduce Operating Costs and avoid unnecessary planned downtime
- Benefit from early fault detection and equipment diagnosis
- Detect warning signs of expensive failures before they occur and predict when failures are likely to happen
- Classify whether failure will occur over a given time period, whether failure will occur over several time periods, or whether a failure will be of a certain type

Datawatch capabilities to automate and repeat common data science processes, using a rich visual interface allows data scientists and citizen data scientists / business analysts in manufacturing to better plan for scheduled downtime, implement cost-efficient maintenance routines, and avoid risk related to unplanned downtime.

Datawatch's predictive analytics and machine learning solutions remove complexity inherent to analytics and data science projects and enable organizations to simplify the monetization of data. The Datawatch analytics solutions provide:

- Intuitive, interactive workflows for simplifying the building, displaying, refreshing, and reuse of analytic models
- The ability to build sophisticated statistical models without having to create code
- An open and flexible approach that places no constraints on data science approaches. This allows data science teams to use preferred algorithms, leverage existing scripts created in R, Python, PMML and other industry standard programming languages; the ability to generate code from workflows that can be embedded into other 3rd party routines
- Separate workflows for data preparation, modeling validation, optimization and similar can be linked together

Datawatch enables organizations to act confidently from their data, delivering consistency and trust expected from the application of data science. We understand analytics is more than just building a predictive model. Datawatch helps manufacturers architect a complete end-to-end analytic process pipeline that supports the components of a modernized analytics architectures. The simplicity of the predictive analytics platform allows people of different skillsets and disciplines to collaborate on models and explore new ideas from insight found in data.

**Connect (To, From)**

- CSV
- Excel
- ODBC
- SAS
- XML/PMML
- R, Python
- SPSS
- Altair

**Manipulate**

- Aggregate
- Append
- Dedupe
- Filter
- Join
- Partition
- Segment
- VariableTransformation
- Weight of Evidence

**Model**

- Decision Tree
- Strategy Tree
- Bagging
- Boosting
- Cluster Analysis
- Regression
- Market BasketAnalysis
- Random Forest
- Scorecard
- many more models...

**Visualize At Every Step**

- Explore Data
- Assess Quality
- Detect Patterns & Trends
- Intuitive
- Easy to Learn
- Efficient

**Profile**

- Graphs and Charts
- Segment Viewer
- Chaid
- CART
- Qlik, Tableau

**Variable Selection**

- Measures of Predictive Power
- Correlation Analysis
- Segmentation Views
- Variable Select
- PCA Analysis
- Partition (single or multiple; random or stratified)

**Auto-Code**

- Python
- SAS
- SQL
- R
- Reusable Workspaces

