



# AI-METRIX

CLOUD BASED MANAGEMENT OF  
OPTICAL SPECTROMETERS



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**BY INFOMETRIX, INC.**

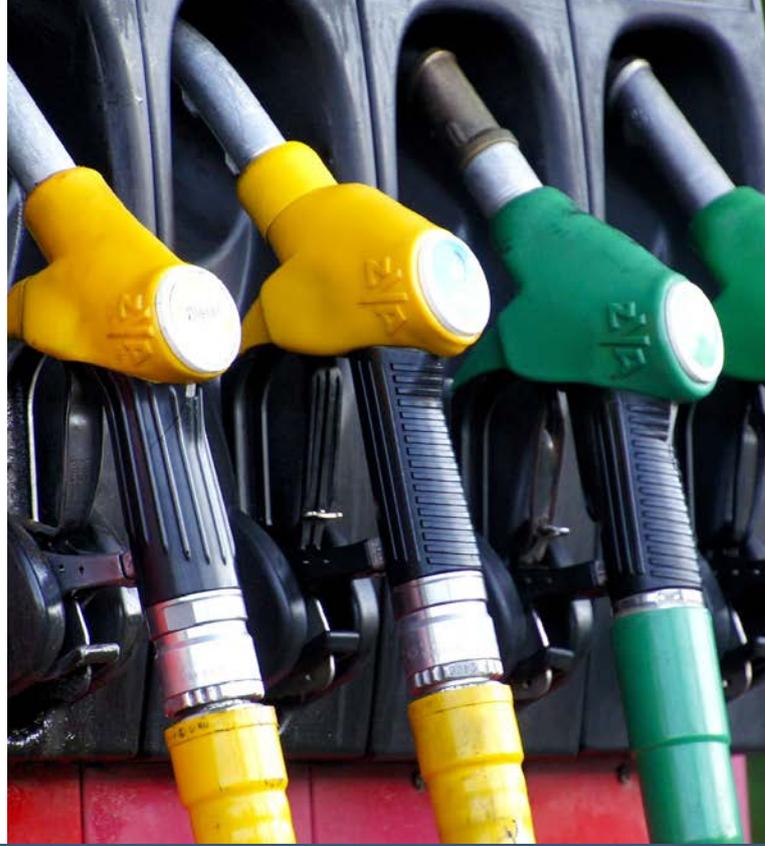
# AUTOMATING OPTICAL CALIBRATIONS

with *Ai-Metrix*

The purpose of a service like Ai-Metrix is to provide automated processing to save time, to insure uniformity and high-quality assessments of a chemical process.

Ai-Metrix is a database solution built on amalgamation of experience from 17 refinery optimizations and a lot of R&D effort over the last 8 years to ease and automate processing and maintaining of fragmented data, allowing for better chemometrics, more experimentation, more frequent model updates, and optimized use of personnel.

Compare and see the difference.



## COMPETITIVE WITH EXPERT ANALYSIS

Ai-Metrix outperforms experts with more than 25 years experience doing calibrations for commercial purposes.

## 100 TIMES FASTER PROCESSING TIME

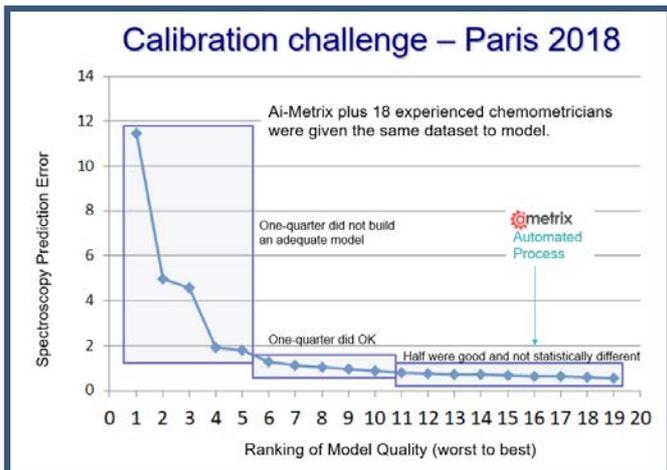
Speed of processing is considerably faster making the approach more reactive to process changes at 20% of the cost.

## REPEATABILITY AND CONSISTENCY

Organized workflow delivering the highest quality models automatically and consistently.

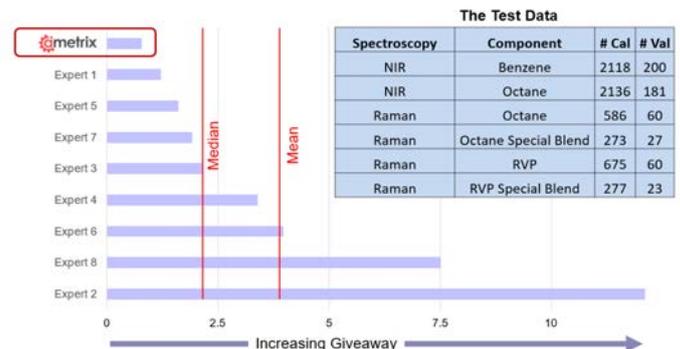
## Automated Calibration vs Experts

How does automated calibration compare to the experts? Graph below shows quality of models created by 18 experienced chemometricians compared to Ai-Metrix automated processing at a Paris Conference in 2018.



The Ai-Metrix process performed consistently with the best experienced chemometricians.

For further comparison, six datasets were sent to eight world-class experts for analysis with only the calibration samples and rank to be determined. These experts average over 25 years of experience doing this type of calibration for commercial purposes. Ai-Metrix scored the highest with the least giveaway.



# BENEFITS OF AI-METRIX

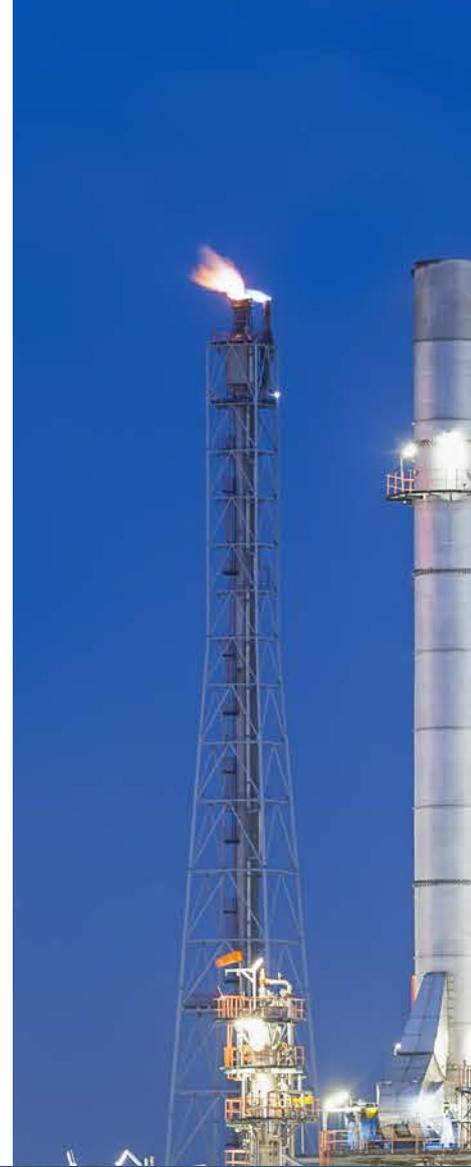
## Great return on investment

Assuming estimates of giveaway for octane and RVP due to inefficiencies in production, are: \$1.50/bbl for octane and \$1.25/bbl for RVP for a 100,000 bbl/day capacity refinery, the giveaways or estimated savings with Ai-Metrix would be a significant amount. With Ai-Metrix, the return on the annual investment can be demonstrated within a few months.

### By the Numbers



- \$250,000 giveaway per year with Expert #1 (best score)
- \$3.7 million per year total from the average of 8 experts and can reach over \$10 million per year even for a small, 100,000 bbl/day refinery.



## \$5 BILLION

Nearly \$5 billion giveaways every year by refineries in the United States

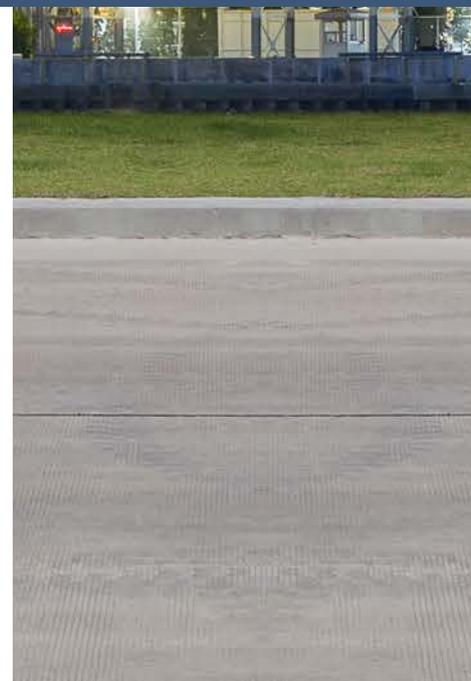
## \$500,000

\$500,000 per month of profit is lost in recoverable giveaway for an average refinery.

## Plant Benefits

With the universal utility of the Ai-Metrix service, we are able to define a solution to meet the individual needs for all levels of expertise and disciplines in petroleum and chemical product QC/QA. Ai-Metrix service:

- Improves calibration quality, reduces giveaway
- Manages data organization and improves communication
- Simplifies training and adapts to personnel turnover
- Speeds delivery of models
- Manages all legacy systems
- Optimized calibration for any product (e.g. gasoline, diesel)
- Eliminates the need to force hardware or software standards
- Lowers cost



# HOW DOES AI-METRIX WORK?

Preserves all Legacy, Instrument and Software

## Software Components for the Workflow

The following components make up the Ai-Metrix service, to organize, share, process, optimize, manage and document data information.

- Ai-Metrix conductor
- Tableau database system
- Dropbox sharing
- Excel request
- SQL Server
- Multivariate analysis software



The purpose of Ai-Metrix is to save time and to insure uniform, high-quality assessments of a chemical process.

Interactive tool for creating spectral database request files

Selections		Property	Low	High	Request File Name	
Customer	International	RON			Request File Name	Gas-Regular-Winter
Project		MON				
User	Jerome	IBP				
		T10				
All Properties?	No	T20			Sample Dates	
	OR	T30				to
Mogas	Blend	T50				
		T70			Purpose	Calibrate
		T90				
Octane Class	Regular	FBP				
Season	Winter	RVP				
Stream	REFORMAT	Benzene	✓			
		Aromatics	✓			
		Olefins				
		API				
		Sulfur				
		TVL				

[ExperimentName] CalValPredict  
[PropertyName] Aromatics  
[PropertyName] Benzene  
[Grade] 10\_RB\_13.5S  
[Grade] 10\_RB\_15.0  
[SampleDate] LT 2018-06-06  
MyName=(Michael)  
AllColumns=(Yes)  
Files=(Yes)

The request is made through an Excel workbook that is prepopulated with customer-specific properties, categories, and date ranges.

## User Interface in Excel

Regardless of the instrument control software, all calibrations are handled in an Excel GUI which:

- Is context sensitive to the application;
- Enables the recalibration to be performed anywhere in the world
- Manages calibrations of any type of instrument running any brand of software; and
- Facilitates training.

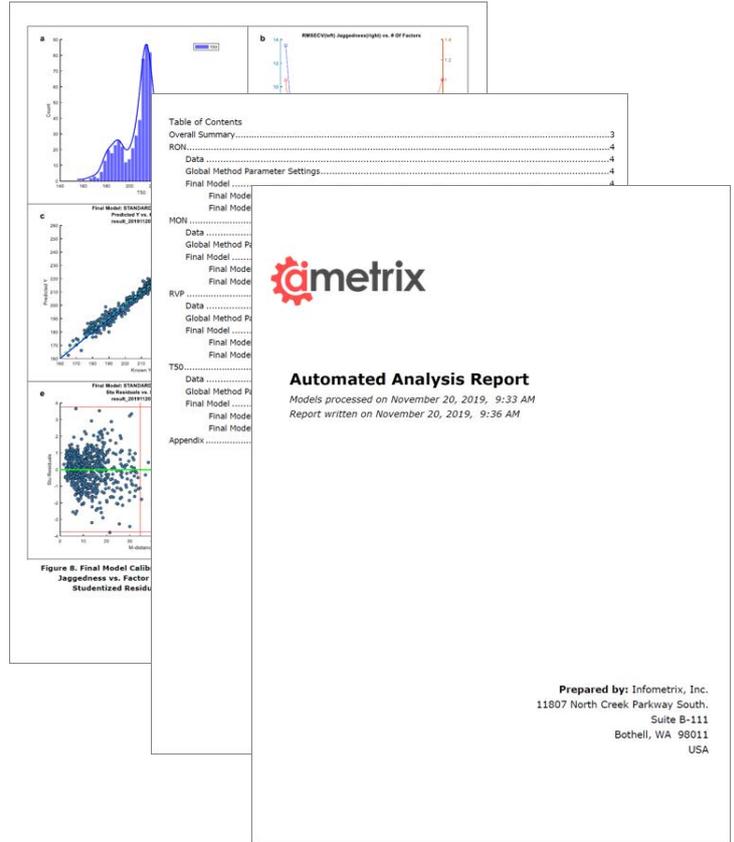
# AUTOMATED ANALYSIS REPORT

with Ai-Metrix

Reports in PDF with complete documentation of the model creation and quality control are generated automatically as part of every process, providing:

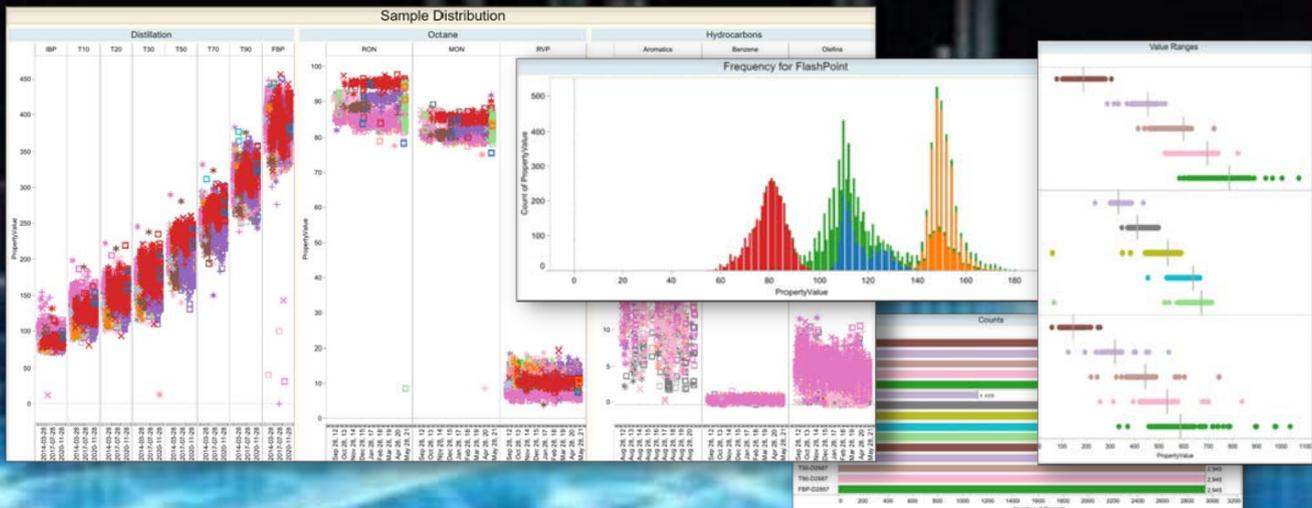
- Objective technical detail of the quality of the calibration models
- A full evaluation of the instrument performance
- Consistent evaluation across products and manufacturing location

Documents span calibration, validation, and prediction. There are no limits to the number of laboratory values being assessed, nor are there limits to how many times the modeling process is triggered. The system is available 24/7/365 and responds to a new modeling task within minutes. Reports are consistent for Raman and for dispersive or Fourier transform NIR and IR. This enables comparison across time and location for all analyzer technologies.



Comprehensive, yet easy to use solutions for all levels of expertise and disciplines in petroleum and chemical product QC/QA

## ONLINE INTERACTIVE DASHBOARD



Ai-Metrix Services

# STAYING COMPETITIVE AND GETTING AHEAD

Featuring:

## TABLEAU INTERACTIVE DATABASE

Ai-Metrix Tableau database matches values to spectra and outputs a custom on-line dashboard allowing for database organization, comparative

visualizations updated in real time and query abilities to organize many years' worth of data for comparisons, which is a huge time saver.



## DATABASE ORGANIZATION

Using an evaluative process that provides a database with search and matching capability and a dashboard interface allowing a user to visualize trends and comparisons of the data through a graphical output; the matching of such data being essential to calibration studies and future predictive models used in laboratory and process environments.

The service includes customized graphical displays that allows the user to spot inconsistencies and plot trends for any range of dates.

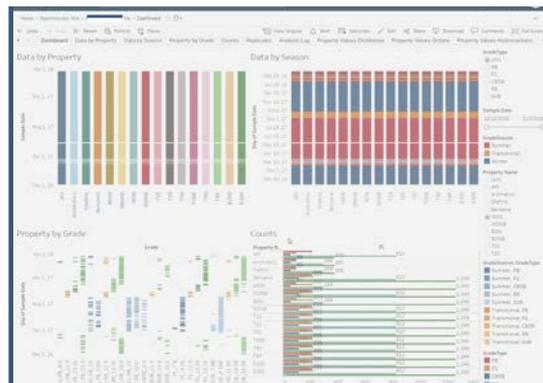
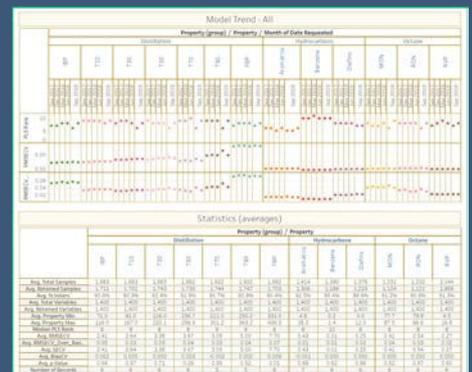


Tableau customizable dashboard

## COMPARATIVE VISUALIZATION

Visualization is performed through a customizable dashboard where years worth of archived and current data can be compared for all collected measurements of quality, physical property, and grades of fuels. The system is highly interactive allowing the user to investigate and understand product quality.



Tracking model over time

The visualization and the ability to easily select for better model building results in greater quality control, reduced product giveaways, and greater profits.



**A FUTURE-PROOF CALIBRATION ENGINE  
FOR OPTICAL SPECTROSCOPY**

## **CONTACT US**

**For evaluation, quotation, presentation or additional information**

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