SAS® Field Quality Analytics 6.2
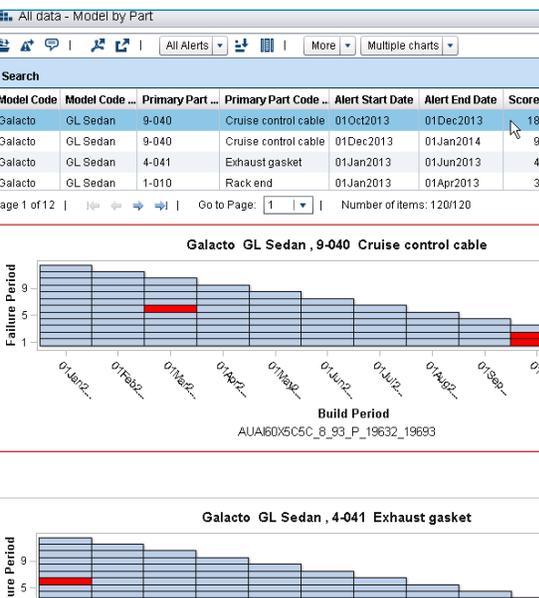
Improve quality performance, increase customer satisfaction and protect brand equity

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What does SAS® Field Quality Analytics do?

It detects early warnings of quality problems to reduce the cost of poor quality and help minimize campaigns and recalls. It integrates all the relevant field quality data and automatically detects emerging issues before they have a significant impact on performance.

Why is SAS® Field Quality Analytics important?

While you put great effort into ensuring that the design, development and manufacture of your products meets the highest standards, issues still arise in the field. In today's social media driven culture, even small issues can cause a lot of unwanted publicity. It is more critical than ever to identify issues and address them before they escalate and cause irreparable harm to your brand image and significant cost to contain.

For whom is SAS® Field Quality Analytics designed?

Anyone who wants to improve product quality, customer service and brand equity while reducing costs. It is designed primarily for engineering, operations, marketing and financial analysts to identify emerging issues sooner and identify root-cause factors quicker. Executive leaders also find it beneficial for forecasting and strategic planning.

Product performance in the field has become hugely important in this age of a connected society. Not only is it strategic to the bottom line, it also affects customer satisfaction and brand reputation. Brand reputation for safety and reliability takes years to create but much longer to recover, even if consumer confidence is undermined by only one issue.

Manufacturers used to get away with the basic reporting and simplified analytics included in their warranty management systems. Historical reports, spreadsheets, and basic statistics are no longer sufficient to identify, rank, and prioritize issues. This reactive approach is manually intensive and slow to respond to emerging trends. It has a limited view into the customer and financial impact, as well as the causal factors leading to suboptimal results.

Instead, we use predictive analytics to find emerging issues much sooner. SAS Field Quality Analytics starts by integrating all relevant data, structured and unstructured, to gain the most complete view of your field quality. Patented, analytic models then detect hidden patterns and trends in the data to alert you to new issues before they escalate. Data mining, reporting and modeling tools help engineers mitigate risk by prioritizing issues and efficiently identifying the root cause.

SAS Field Quality Analytics is a custom-built solution focused on improving customer experience and protecting brand reputation while lowering warranty and service costs. It is part of the SAS Quality Analytic Suite, which provides an enterprise view of quality performance to help you manage the cost of quality, achieve quality excellence and increase customer satisfaction.

Key benefits

- **Provide early warning**. Patented analytic models detect emerging trends much faster and more accurately than traditional early warning techniques. Users typically shave months off of issue detection time, resulting in substantial savings in both repair costs and customer loyalty by limiting the number of affected products and customers.

- **Reduce detection-to-correction time**. Starting with an integrated view of warranty, product, manufacturing, and customer data enables engineers to effectively isolate failure modes and efficiently get to the true root cause. Getting to the right problem faster allows you to make informed corrective action decisions.

- **Minimize risk**. The overall effect of detecting issues early and defining the root cause quickly means issues exist in the field for much shorter periods and affect fewer customers. Therefore, the risk of large, expensive campaigns and recalls or negative publicity through traditional and social media is greatly reduced. Financial goals, customer satisfaction and brand reputation are preserved.

- **Lower warranty costs**. Earlier issue detection and shorter correction cycles mean you can significantly reduce resolution time. It also helps reduce shipment of faulty products, recalls and warranty costs.

Solution overview

SAS Field Quality Analytics assesses data from warranty, customer service, product and other relevant sources to detect emerging issues sooner and more reliably than other methods. Its automated workflow separates special cause from normal variation and alerts analysts of emerging issues. This focuses resources on the highest-priority issues.

Data integration

Valuable field-quality data often reside in disparate databases like warranty claims, sales, contact center and more. We integrate these sources to create a holistic view and enable efficient, accurate tracking, analysis and reporting.

- **Standard, extensible data model**. Consolidating data from various sources of structured and unstructured data provides a comprehensive view of field issues and helps you gain a better understanding of product performance.

- **Flexible database support**. Data models can be stored in SAS or in third-party databases, including SAP HANA and Hadoop.

Early-warning analytics

Conditional rules and thresholds for identifying new issues in the field are no longer sufficient in today's hyper-competitive and hyper-connected social environment. You need to detect issues as early as possible, before they become trending topics on social media.

- **Integrated warranty business rules**. Address the complexities of warranty data by applying business rules and algorithms such as sales lag profiles, usage distributions, maturity calculations and seasonality adjustments.

- **Emerging issues**. Automatically detect anomalies based on violations of analytically driven critical values or manually input thresholds. The solution simultaneously monitors production period, usage and claim period, automatically identifying a wide range of different failure modes.

- **Alerts and notifications**. Early-warning alerts are prioritized and sent to appropriate parties for investigation.

Issue analysis and prioritization

Detecting issues earlier is only good if you can act on them. With limited resources, you need solutions to help prioritize issues and efficiently find their root cause.

- **Drill down on emerging issues**. The interactive interface allows you to easily drill into more detail for one or multiple data points to speed the issue investigation process.

- **Analyze by alert**. After drilling into an emerging issue, a new alert variable is created. It can be used to compare events from time periods with alerts to those without alerts.

- **Ad hoc analysis**. Prioritize and define issues using 14 standard analysis types chosen for their applicability to field quality data, including Pareto charts, control charts, decision trees, text clustering and sequence analysis. Users then can interact with the output, selecting
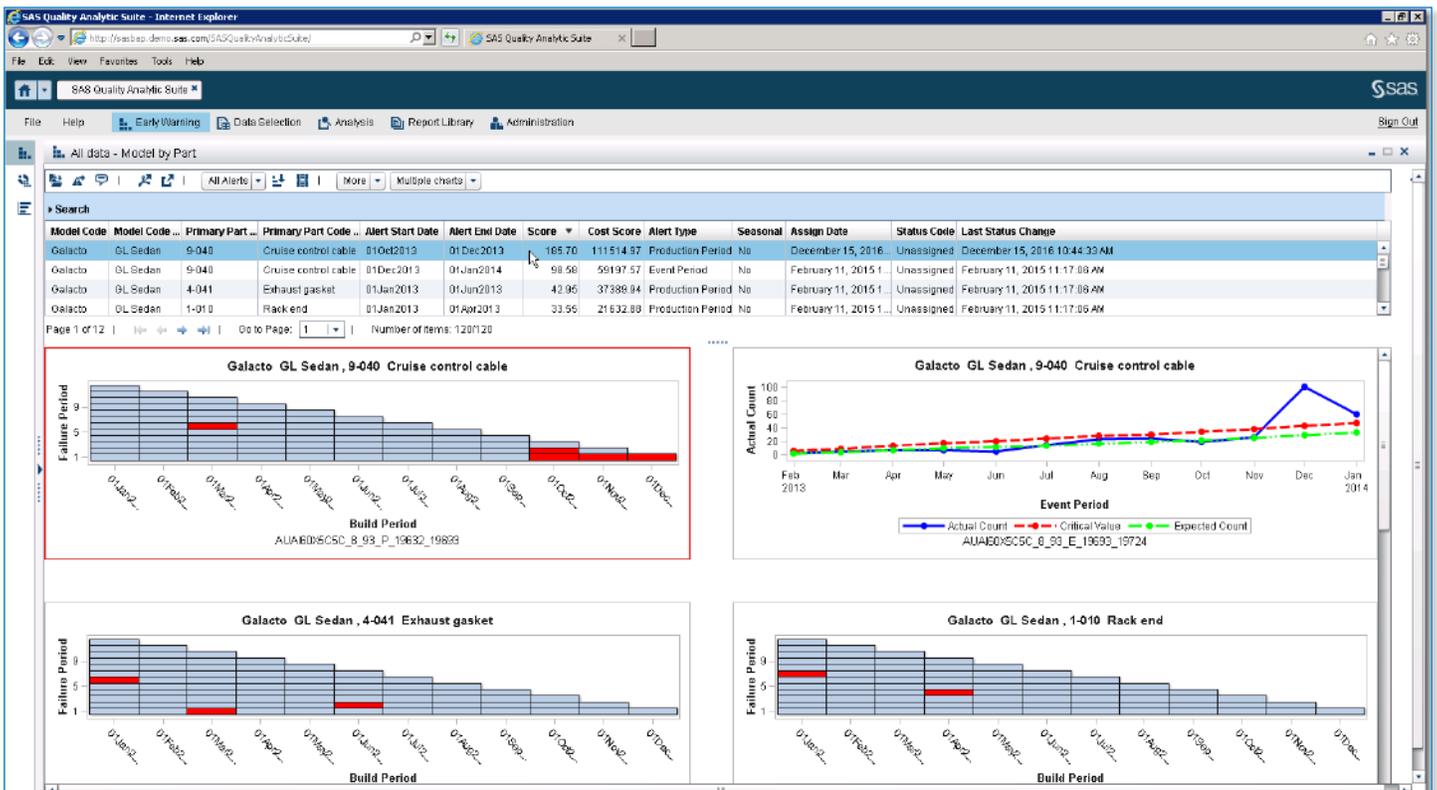

Figure 1: The Early Warning Workspace automatically generates alerts on statistically significant changes. Alerts can be drilled into for further analysis.

which data to display, drilling into charts and easily exporting graphics and tables to PDF, Excel, PowerPoint and other applications.

- **Advanced warranty analysis**. Unlock additional knowledge from the data by allowing advanced users to choose from hundreds of powerful analytic techniques, all within an environment that does not require programming knowledge.

Integrated text analysis

Unstructured – aka text-based – data contains a wealth of context and details about specific events. We present this data in a meaningful format ready for data exploration, clustering and statistical modeling. You can extract and categorize essential information from large volumes of unstructured data, combine it with structured data and analyze it to gain valuable knowledge about critical service and product issues.

- **Pattern recognition**. Find patterns in customer comments and technician notes, isolating multiple failure modes within a set of claims and records.

- **Find related claims**. Identify records with similar text content, accelerating claims review and significantly reducing problem-solving time.

- **Synonym-word search**. Text data is prone to variations; we can associate synonyms and related words (common misspellings, acronyms, etc.) into your keyword search to ensure that you get the most complete search results. The solution can even automatically generate the synonym taxonomy, in addition to input by subject matter experts.

Self-service reporting

You can easily create reports using simple selection filters to define data sets and other criteria, making it immediately available for analysis and reporting. This allows you to expand the value of an out of the box solution and combine it with the flexibility of a custom solution.

Key Features

Data integration
- Standard, extensible data model.
- Multiple databases supported, including SAP HANA.

Early-warning analytics
- Automatically determines analytically driven critical values.
- Enables entry of manual thresholds for safety and regulatory issues.
- Simultaneously monitors changes across production period, usage and event period.
- Generates automated alerts and notifies relevant issue owners.
- Attach comments so current status is easily ascertained.
- Drill into alerts to conduct further analysis.

Issue analysis and prioritization
- Ad hoc warranty analysis, including Pareto charts, control charts, exposure charts, reliability analysis, decision trees and sequence analysis.
    - Drill into results to conduct further analysis.
    - Review raw event data.
- Advanced analysis with hundreds of analyses and charting options, including descriptive analysis, table analysis, ANOVA, regression, multivariate, survival analysis, capability analysis, control charts and graphs.

Integrated text analysis
- Analytic models to recognize patterns in text.
- Ability to identify similar comments.
- Word search that includes synonyms, misspellings and other related words.

Easy reporting capabilities
- Project-oriented interface for creating both simple and complex reports:
    - Workflow mirrors the warranty analysis processes.
    - Powerful filters for easily subsetting and combining data.
    - Group analyses by project.
- Report library:
    - Searchable repository of information.
    - Content can include special studies, documents posted by users and automatically generated standard reports.

Seamless integration with the full SAS Quality Analytic Suite 6.2, including SAS Asset Performance Analytics and SAS Production Quality Analytics.
- Integrated analysis across the quality spectrum. Follow the root-cause path from field data through the production process and the heavy assets that manufacture your products.
    - Ability to deploy models to identify issues before they make it to the field.
    - SAS Event Stream Processing to monitor data in real time and alert as issues occur.

- **Warranty dashboard**. Any stakeholder can readily access the latest information on key field performance indicators, drill down to performance trends and disseminate strategic objectives and information across the organization.

- **Report library**. Make interactive reports available across the enterprise or limit them to specific users or groups. Provide automated reports that focus on specific areas for executives, dealers, suppliers and others.

- **Email subscriptions and alerts**. Users can subscribe to specific analytic watch lists, threshold watch lists or a specific subset of automated emerging-issues runs (for example, an electrical subsystem alert on a particular model). Personalized alerts with optional email notification enable rapid filtering of emerging issues of interest to each user.

- **Custom analyses can be easily added by advanced users and shared with others as templates**. This allows you to build on the out of the box solution, to include analyses that are unique to your organization.

- **Data can be seamlessly launched into SAS Visual Analytics, SAS® Enterprise Guide®, SAS® Enterprise Miner™, and JMP®**. This allows advanced users to integrate other data sources, utilize hundreds of analyses, and create personalized output to share across the organization.
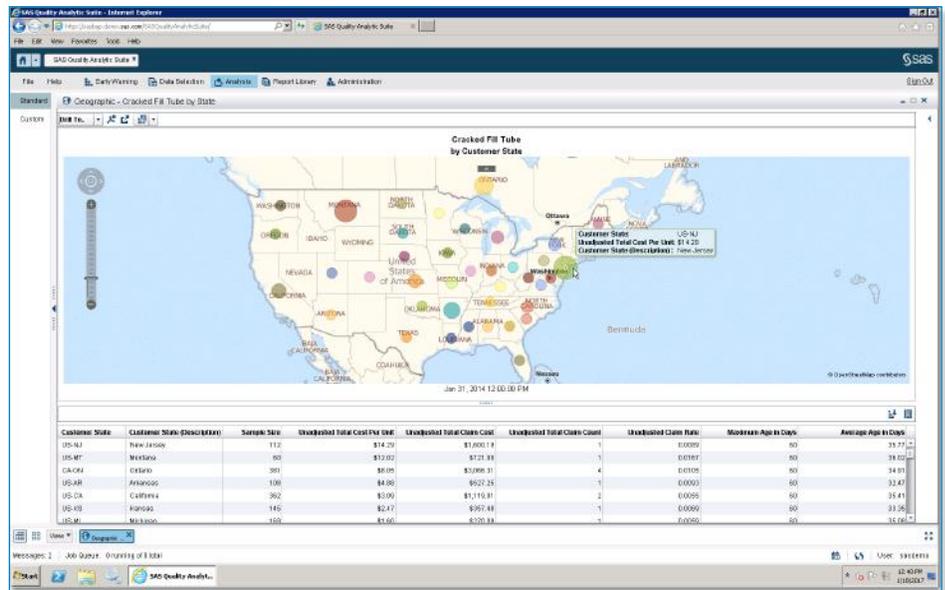

Figure 2. The Analysis Workspace accelerates prioritization and root-cause analysis. Descriptive reports, like geographic, Pareto and exposure, quickly focus analysts.
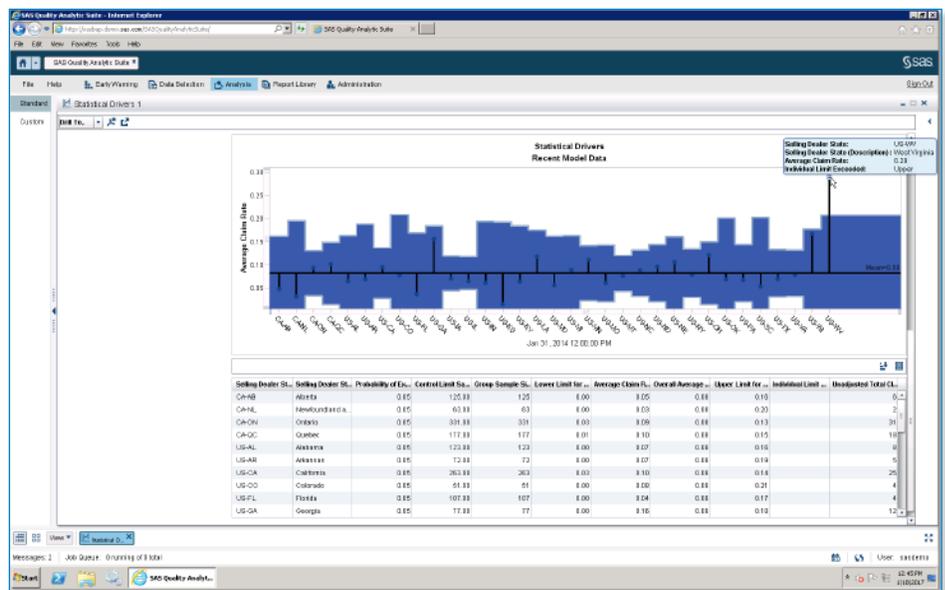

Figure 3: More advanced analytics, such as statistical drivers, decision trees and text mining, identify statistically significant patterns within the data.

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