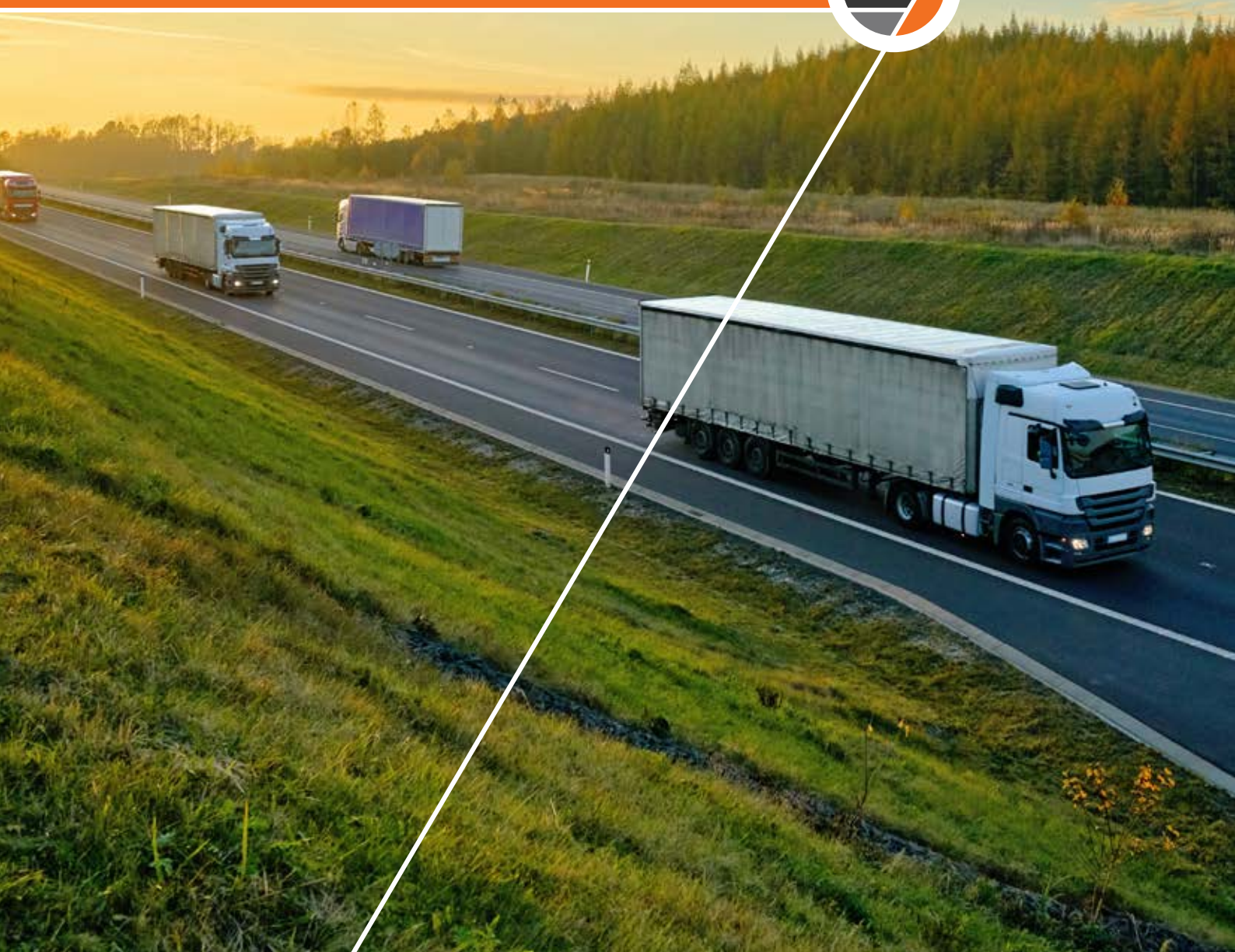


A NEW APPROACH TO AUTOMOTIVE INDUSTRY OPTIMIZATION

DATA DRIVEN BUSINESS ENHANCEMENT

BUSINESS ENHANCEMENT **AUTOMOTIVE INDUSTRY**

BE THE BENCHMARK



WHEN YOU NEED TO BE SURE

SGS

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ABSTRACT

The global automotive industry needs to find ways to respond effectively to increased competition while managing global supply chains and meeting different regions' regulatory requirements, demands for sustainability, trade policies, and more. In this white paper we look at harnessing the power of artificial intelligence (AI) and big data to devise solutions that make a real difference to the financial bottom line, are measurable and benchmarked.

EXECUTIVE SUMMARY

The global automotive industry needs to find ways to respond effectively to increased competition and transform business growth while meeting consumer demand for new technologies. Global markets also mean longer and more complex supply chains, placing increased strain on manufacturers as they must navigate different regions' regulatory requirements, demands for sustainability, trade policies, and so on.

This white paper examines how the industry is moving towards evidence-based decision making and harnessing the data analytics approach and automotive technical insights to devise effective solutions that not only make a real difference to the financial bottom line, but which also help organizations to achieve their goals and, ultimately, BE THE BENCHMARK.

EVIDENCE-BASED DECISION MAKING AND THE DATA ANALYTICS APPROACH

KEY CHALLENGES IN THE AUTOMOTIVE INDUSTRY

The global automotive industry is facing several challenges. Manufacturers need to find ways to respond effectively to increased competition in terms of price that has resulted from globalization and outsourcing. At the same time, consumers are seeking out new technologies.

Global markets have also meant manufacturers need to contend with the increased complications that result from longer supply chains. These can include the regulatory requirements of different regions, demands for sustainability, trade policies, and so on.

At the same time as these challenges are negatively affecting manufacturers, there have also been rising costs across the industry. These result not only from higher energy, raw material and labor costs, but also the added costs associated with recalls and fines resulting from noncompliance with regional and international standards.

One response adopted by manufacturers is increased automation along production lines. The full benefits of this investment can only be felt, however, if it is matched with investment to create an adaptable workforce. To create this workforce, the training must be specific, targeting the areas of deficiency in technical skills and knowledge.

To answer these challenges, manufacturers must take the right response to optimize their operations. This should involve:

LEADERSHIP

Determining the optimal strategy in management, operations, innovation, and customer service

GOVERNANCE

Companies must control their supply chains and fully understand the risks associated with uncertainty in the supply chain

EFFICIENCY

Optimizing resource management to create cost-effective solutions throughout the business. Risks in quality, safety and sustainability must be identified to avoid the negative consequences associated with recalls and regulatory noncompliance

TECHNOLOGICAL SOLUTIONS

Choosing the right solutions that work for the business. This must be married to the right training programs to create a workforce with the right skillset

DATA & DECISION-MAKING IN BUSINESS ENHANCEMENT

Decisions concerning investment, training, production, etc. have traditionally been made using tangible data – for example, adherence to a standard or the financial bottom line. This approach has its limitations and is often reflective of the past, utilizing information from events that have happened. It is not necessarily indicative of future developments in either the business or the industry.

By looking at data at this macro level, the solutions that have been developed are often generic. They reflect industry-wide experience and assessment, rather than the tailor-made approach an organization may require, based on an assessment of its own pain points and risks, to address its specific nonconformities.

In an environment where automotive businesses must optimize operations to remain competitive, the decision-making process now needs to consider auditing data at the micro level. A basic health-check of the organization isn't enough to drive a business forward to match its competition.

A NEW APPROACH

In today's data driven world, the automotive sector needs to think differently about how it uses the data created during audits. A more diagnostic approach needs to be applied to the analysis of the nonconformity data generated from audits. Data insights will expose organizational pain points that result in nonconformities at the root cause level. This will provide an indication of areas where potential risks exist and can be used to highlight where an organization can make improvements.

Improvements in technology and analytics mean large amounts of data can now be analyzed accurately and quickly. These technologies can now be used to evaluate all the data

generated during compliance audits, allowing assessment of individual clauses. Management is no longer restricted to looking at data on a macro level – standard compliance/noncompliance. Instead, they can review the data to identify individual nonconforming clauses within the standard.

Analyzing data in this way means organizations are able to identify areas where nonconformities exist, even if they are not directly impacting the business. Businesses cannot assume that just because a noncompliance is not affecting the business at that point, it will not affect future operations.

By identifying these nonconformities at an early stage, before they affect the business, management is able to instigate remedial practices. This will improve efficiencies and, by taking a proactive approach to risk mitigation, it can also reduce or negate the financial impact of a negative event.

**IN AN ENVIRONMENT WHERE
AUTOMOTIVE BUSINESSES
MUST OPTIMIZE OPERATIONS
TO REMAIN COMPETITIVE,
THE DECISION-MAKING
PROCESS NOW NEEDS TO
CONSIDER AUDITING DATA AT
THE MICRO LEVEL.**



SGS GLOBAL DATA OVERVIEW THE DATA EVOLUTION

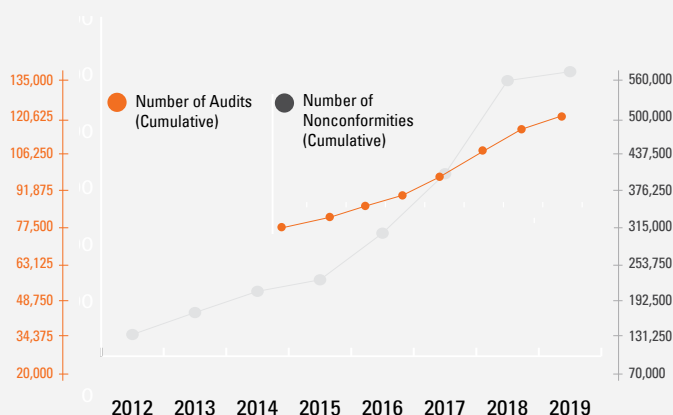
Data has always been a vital part of SGS's primary business strategy and a key operational focus. Since the 1980s, SGS has increasingly focused on the collection of more comprehensive data and ensuring its integrity. SGS has created a large database of information due to an increase in the number and range of standards available, and the expansion in SGS's global and industrial reach.

Today, SGS has access to a comprehensive body of nonconformity data relating to a wide variety of standards, industries and geographical regions. This data is drawn from 200,000+ audits, identifying over 500,000 nonconformities across 39 major industries.

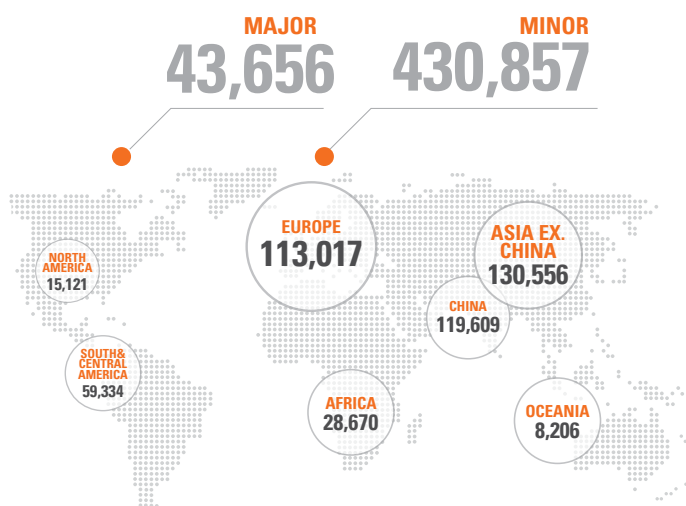
This unbiased proprietary data allows SGS to move away from the limited vendor/client relationship, to create true

partnerships. These partnerships will draw on SGS's global technical expertise to proactively identify nonconformities from audits. This data allows the development of tailored solutions to address any weaknesses identified within an organization. Companies that partner with SGS will find they are setting new standards for business excellence, helping them to BE THE BENCHMARK.

SGS DATA PROFILE:



NONCONFORMITIES BY REGION



SGS DATA DRIVEN METHODOLOGY

TURNING COMPLIANCE DATA INTO DIGITAL INTELLIGENCE

SGS has developed a high-level proprietary methodology that analyses customer-specific data and overall industry trends to provide clients with advanced analytics and insights. Indeed, SGS is able to turn this data into digital intelligence that can be used to optimize operations.

Key to the development of SGS's data driven methodology is the development of the BE Engine – an advanced business intelligence platform that incorporates insight driven processes, data analytics and AI algorithms. Audit data and information stored in SGS's database can be analyzed using the BE engine to identify main operational weaknesses for clients in relation to industry segment, standards and geographical location. The system also allows SGS to identify operational pain points and organizational exposure to various risks, linking these to economic drivers that will affect companies' top and bottom-line growth. The results from analyzing the data using the BE Engine can then be combined with SGS's expertise to create tailored business solutions.

SGS'S METHODOLOGY IS A THREE-STEP PROCESS:

1

ANALYTICS

Data relating to nonconformities is reviewed to provide a detailed health check for the organization. This will identify areas where a business is failing to conform to clauses within the standard and will provide insights into specific industries, such as the automotive sector.

SGS can review this data to create a variety of benchmarks relating to standards, clauses within the standards, geographical regions, industries, etc. This allows an individual business to be measured against its competition, using any of these criteria. It can also provide insights into the gap between competitors and the gap between current operations and the performance average.

Finally, analytical benchmarking can be used to see how individual assets within a company are operating against the organization's benchmark. For example, in a multinational, it is possible to see how efficiently one region's assets are performing in comparison to the benchmark or another region.

2

INTELLIGENCE

Once areas of nonconformity have been identified and the benchmarks created, SGS combines this data driven insight with technical expertise relating to industry and segment to diagnose operational pain points and identify issues at the root cause level.

This intelligence is used to evaluate a client's exposure to various risks and to identify adverse events/incidents that may take place if they are not properly addressed.

3

ACTIVATION

The final step of SGS's proprietary data driven methodology involves the identification of effective solutions that can help to eliminate operational and management pain points while also mitigating risk exposure in quality, environment and sustainability. Using SGS's Value Creation Model, our customers can directly identify the quantitative benefit of the solution to various parts of their organization's value-chain.

SGS offers a variety of solutions, including training, performance assessment, technical consulting and supplier verification. These various solutions can be tailored to meet the individual requirements of the business.

ANALYTICS

DESCRIPTIVE

- Review of Nonconformity data
- Obtain segment insights

INFORMATIVE

- Competitive Benchmarking
- Identifying gap from industry benchmark Internal benchmarking. Locate internal weak point

INTELLIGENCE

DIAGNOSTIC

- Pinpoint root cause
- Perform risk assessment

PREDICTIVE

- Predict potential risk events
- Evaluate damage to organizational value chain

ACTIVATION

PRESCRIPTIVE

- Solution recommendation
- Value Creation Model
- Training
- Technical Consulting
- Supply Chain Risk Management
- Performance Assessment

ASSESSMENT OF THE AUTOMOTIVE INDUSTRY

ANALYTICS

In the last three years SGS has performed over 9,000 audits against IATF 16949, visiting 5,000+ facilities around the world. This has generated a data set containing more than 40,000 nonconformities.

Analytical assessment of this nonconformity data has shown that manufacturers struggle to comply with are: leadership, organization and improvements.

KEY DATA POINTS

IATF 16949:2016	3 YEARS	40,656	9,255	5,389
Certification Standards Reviewed	Time Span	Total Nonconformities Analyzed	# of Audits	# of Facilities Visited

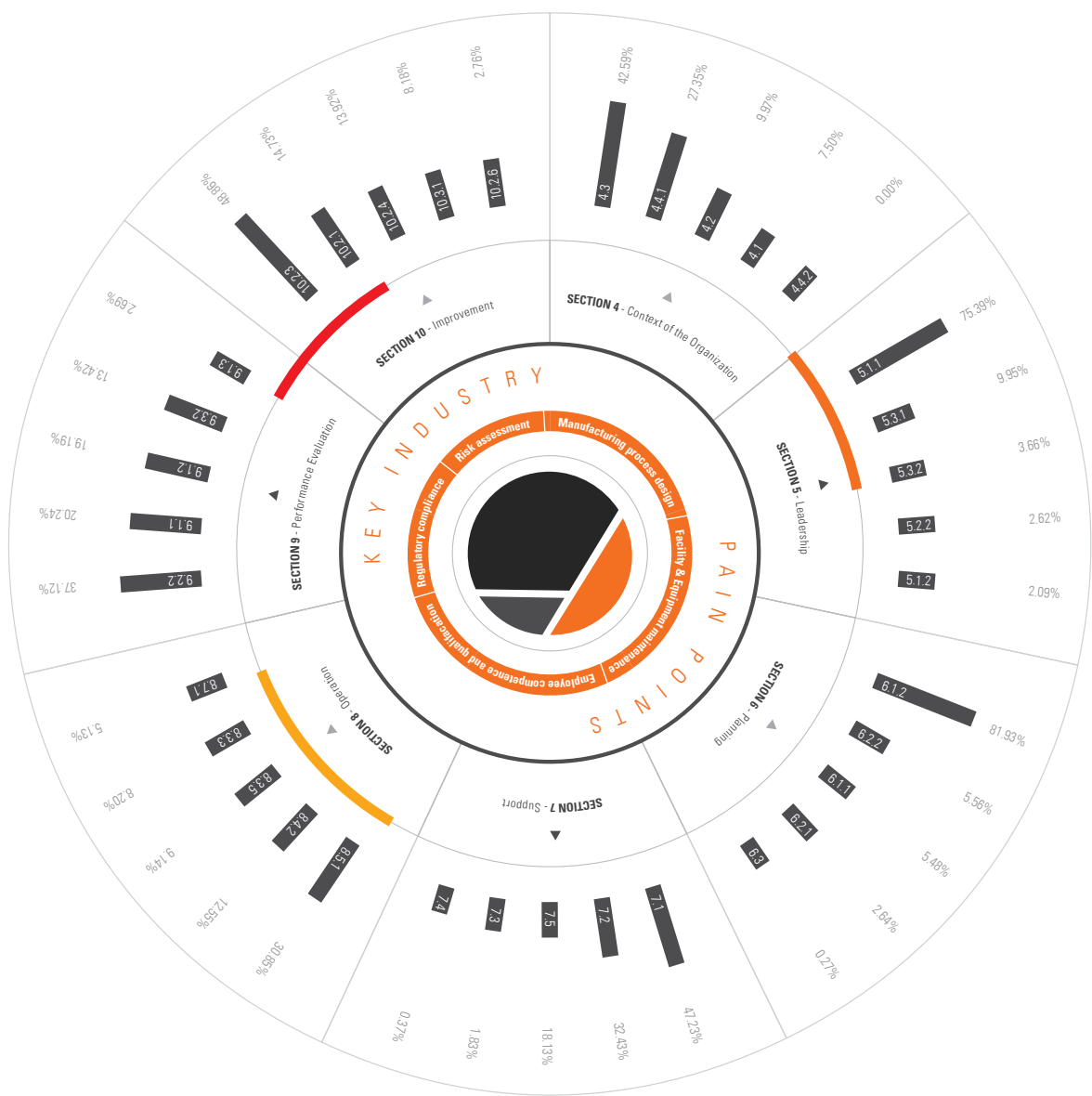


Figure 1. Automotive Assessment Graph

BENCHMARKING TO IATF 16949

With a large dataset relating to IATF 16949 audit performance, SGS has also been able to establish robust benchmarks across a wide range of functions for the automotive industry. Current data, collated over the last three years, shows an average rate of 4.34 nonconformities per audit, and an average of 7.54 nonconformities per facility throughout the entire audit cycle. SGS's partners can use these benchmarks to gauge their own performance against their competitors.

SGS also offers a customized drilldown feature that allows clients to look at specific product categories, sections/clauses, geographical regions, etc.

By looking at each section in a microscopic way and considering the results against a benchmark, the client can get a clear understanding of their position, compared to their competitors, and which aspects demand the most improvement.

HEATMAP

The heatmap below demonstrates the association between IATF 16949 standard requirement clauses and their corresponding pain points. The concentration of nonconformities by clause/pain points are shown by different color gradients from light (low concentration) to dark (high concentration).

4.1	4.2	4.3	4.4	5.1	5.2	5.3	6.1	6.2	6.3	7.1	7.2	7.3	7.4	7.5	8.1	8.2	8.3	8.4	8.5	8.6	8.7	9.1	9.2	9.3	10.1	10.2	10.3	TOTAL	RANK	PAIN POINTS
																												13707	1	Continual Improvement and CAPA
																												12891	2	Management of Resources
																												12382	3	Manufacturing Process Design and Verification
																												11836	4	Record Keeping and Document Control
																												7271	5	Performance monitoring and measurement
																												5601	6	Personnel Competence and Qualification
																												5596	7	Product Design and Validation
																												5465	8	Management Review
																												4700	9	Internal Audit
																												3984	10	Product Quality Control
																												3629	11	Supply Chain Management
																												2435	12	Employee Engagement
																												2330	13	Risk Analysis and Planning
																												1667	14	Product Planning
																												1380	15	Senior Management Commitment
																												735	16	Internal & External Communications

Table 1: IATF 16949 Heatmap

INTELLIGENCE

CLAUSES AND THEIR CORRESPONDING PAIN POINTS

SGS's proprietary diagnostic approach maps nonconformity data to pain points. This secondary summarization of the data provides the client with additional value from their audit results.

The five top common pain points for the automotive industry have been identified in this way as:

1. Continual improvements – corrective and preventive actions
2. Management of resources
3. Manufacturing process design and verification
4. Record keeping and document controls
5. Performance monitoring and measurement

LINKING PAIN POINTS TO RISK AREAS

Once pain points have been identified, they can be regrouped and linked to their respective risk areas. SGS experts draw on their considerable experience of working with the automotive industry, understanding its processes, regulations, standards, etc., to correctly identify the correct risk areas. They can then help clients to understand their exposure to these various risk areas.

Across the automotive industry, the top three risk areas have been identified as:



Cost effectiveness – overheads including labor rates, equipment and procurement are key factors affecting profitability



Operations control – how effective organizations are at establishing, implementing, and monitoring operational procedures. This has a significant effect on efficiency



Information integrity – data integrity is closely related to many compliance requirements and is key aspect of monitoring performance.

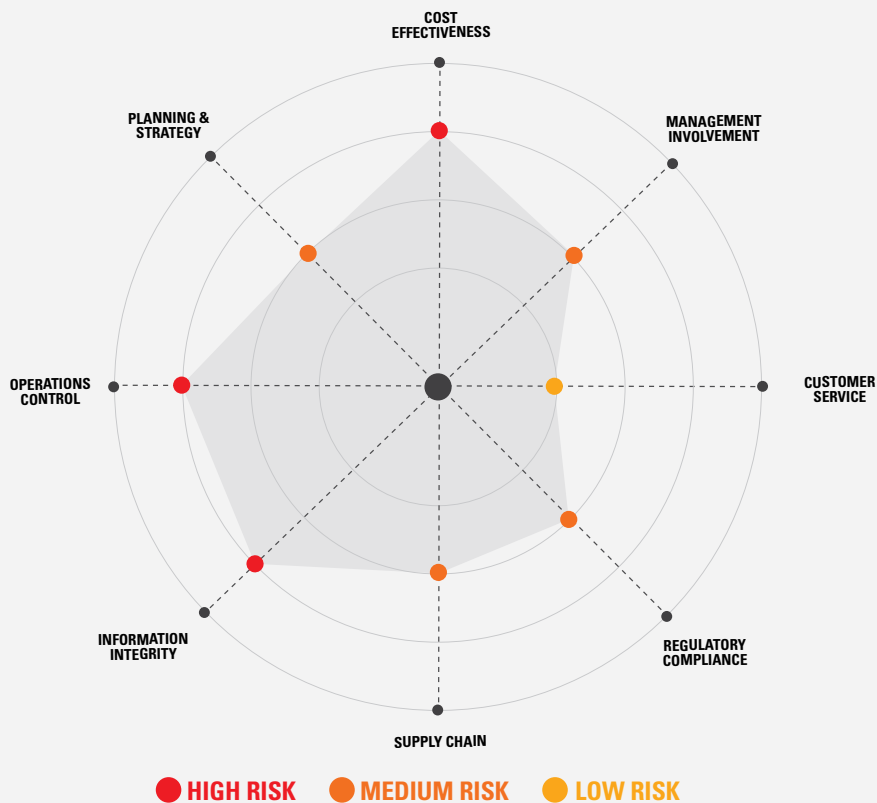


Figure 2. Automotive Linking Pain Points to Risk Areas

ACTIVATION – OUR SOLUTIONS

Following the identification of pain points and their relationship with risk areas, SGS works with its partners to identify effective, proactive solutions. Drawing on over 100 years of experience in helping to transform business growth SGS utilizes its comprehensive range of support services to create tailor-made solutions and help clients to BE the Benchmark.

TAILORED SOLUTIONS

SGS's approach allows a more strategic examination of the data to pinpoint risks and identify pain points specific to individual client. This allows customized solutions to be developed and implemented. Using a tailored approach means the individual issues, identified during the analysis, are addressed alongside the clients' broader business needs.

Figure maps those pain points identified through in-depth analysis of automotive nonconformance data to potential solutions. Falling within two categories, training and technical

consulting, the graphic also highlights the more detailed, pain point specific solution offered by SGS. Unlike traditional approaches, this method uses verifiable data and results can be measured effectively.

**SGS'S APPROACH ALLOWS
A MORE STRATEGIC
EXAMINATION OF THE DATA
TO PINPOINT RISKS AND
IDENTIFY PAIN POINTS
SPECIFIC TO INDIVIDUAL
CLIENT**

DEMONSTRATING VALUE

The effectiveness of a solution is intrinsically linked to the benefits its adoption will provide. SGS has developed a systematic approach to measuring return on investment (ROI) in a quantitative manner.

The whole operational structure of an organization can be broken down into several key parts, value component, the individual performance of which contributes to and dictates overall performance. Any change in one value component impacts those around it.

SGS begins by identifying the organizational value components to be included in the evaluation and then looks to understand the dynamics between them. Components affected by certification nonconformities are then highlighted.

Key performance indicators (KPIs), established for each value component before the initial evaluation, are then used to create a baseline. Continuous monitoring of the effectiveness of the solution is done by referring back to these KPIs at set intervals.

SGS's methodology ensures that KPIs are designed to be measured in monetary values. This allows performance changes in the value components to be assessed accurately, and the net financial impact of the solution to be determined.



TRAINING

IATF INTERNAL AUDIT

- Internal Audit
- Risk Analysis & Planning



TECHNICAL CONSULTING

INTELLIGENT MANUFACTURING SYSTEM OPTIMIZATION

- Manufacturing Process Design & Verification
- Management of Resources
- Record Keeping & Document Control
- Employee Engagement



TRAINING

QUALITY CONTROL TOOL & 6 SIGMA TRAINING

- Product Quality Control
- Personnel Competence & Qualification
- Continual Improvement and CAPA
- Performance Monitoring & Measurement



TRAINING

ISO 26262 AUTOMOTIVE FUNCTIONAL SAFETY


- Production Planning
- Product Design & Validation



TRAINING

ADVANCED PRODUCTS QUALITY PLANNING (APQP) EXECUTIVE OVERVIEW

- Internal & External Communications
- Management Review



TECHNICAL CONSULTING

SUPPLY CHAIN MANAGEMENT

- Supply Chain Management

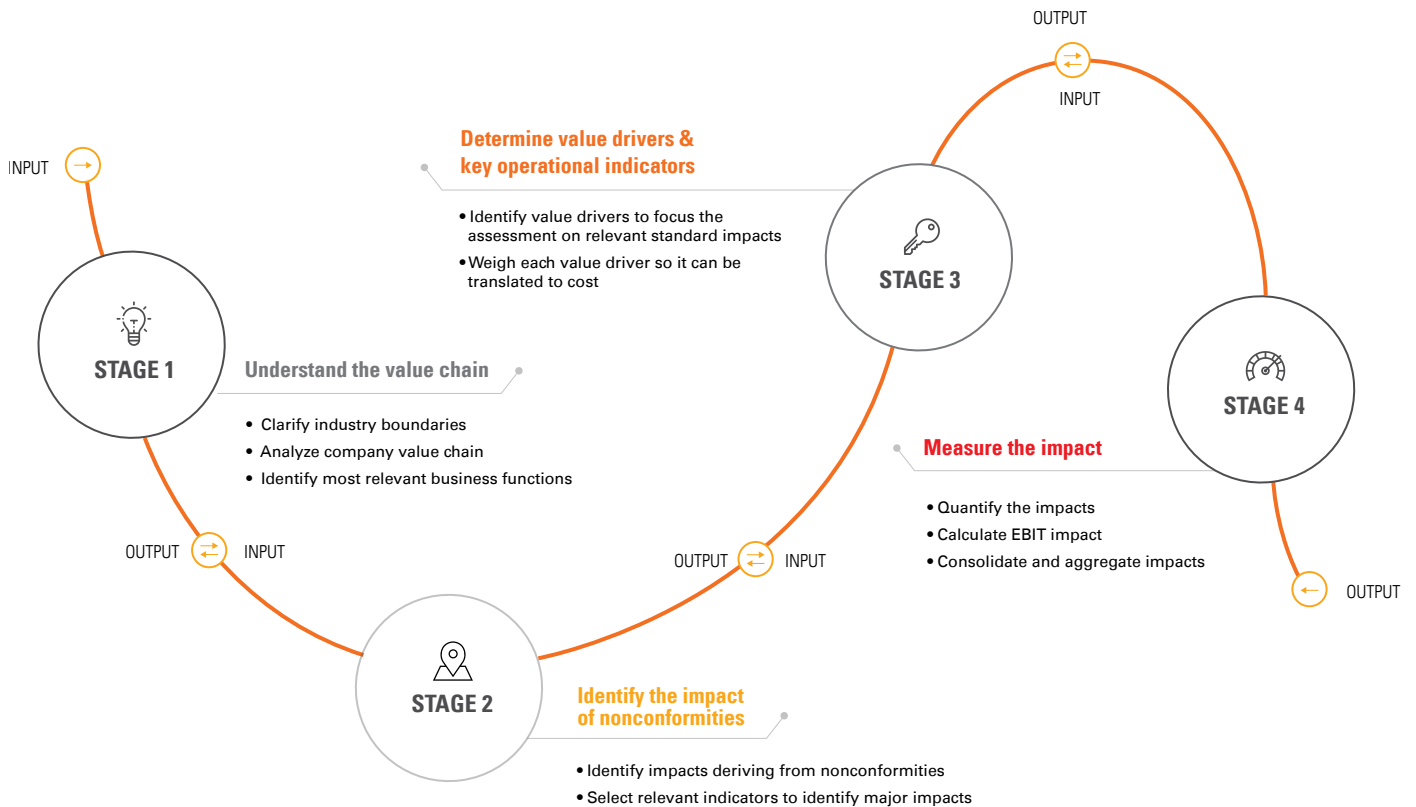


Figure 3. Automotive industry pain points and their solutions, based on SGS's analysis of nonconformance data

SGS has considerable experience in providing value added solutions to economic operators in the automotive industry. It uses this knowledge and understanding to ascribe values to the improvements that are engendered by adopting the various solutions.

Experience has shown that the benefits of this solution come from three areas:

MANAGEMENT & ADMINISTRATION - data driven business enhancement delivers significant increases in net profit margin, return on assets and customer satisfaction

PRODUCTION & OPERATIONS - workforce training improves compliance, and thereby reduces product defect rates

INBOUND & OUTBOUND LOGISTICS - improved supplier compliance has been shown to improve shipping and distribution (reducing delays) and cutting the cost of procurement

Following implementation of the SGS solution, organizations see improvements in performance across their activities. In combination, adopting the complete tailor-made bundle of solutions, an organization can expect to see a three to five percent increase in total annual revenue.

CONCLUSION

The modern business environment is governed by 'big data'. Traditional barometers of success no longer provide sufficient information to allow manager to make informed decisions about the future direction of a business.

In a time when automotive industry operatives need to optimize their businesses to remain competitive, utilizing the data from audits in an innovative way will allow decision-makers to make objective decisions. By identifying key areas of noncompliance, manufacturers will be able to engender true business enhancement built around continual improvements. Organizations embracing this approach are, on average, seeing returns of 3-5% of total annual revenue.

SGS offers an innovative analytical approach to transform and enhance business; providing benchmarked in-depth analysis of a business married to a comprehensive range of proactive solutions. Taking a holistic approach to industry pain points and offering fully costed solutions, tailored to the requirements of the organization, will help SGS's partners optimize their operations in an increasingly competitive world.

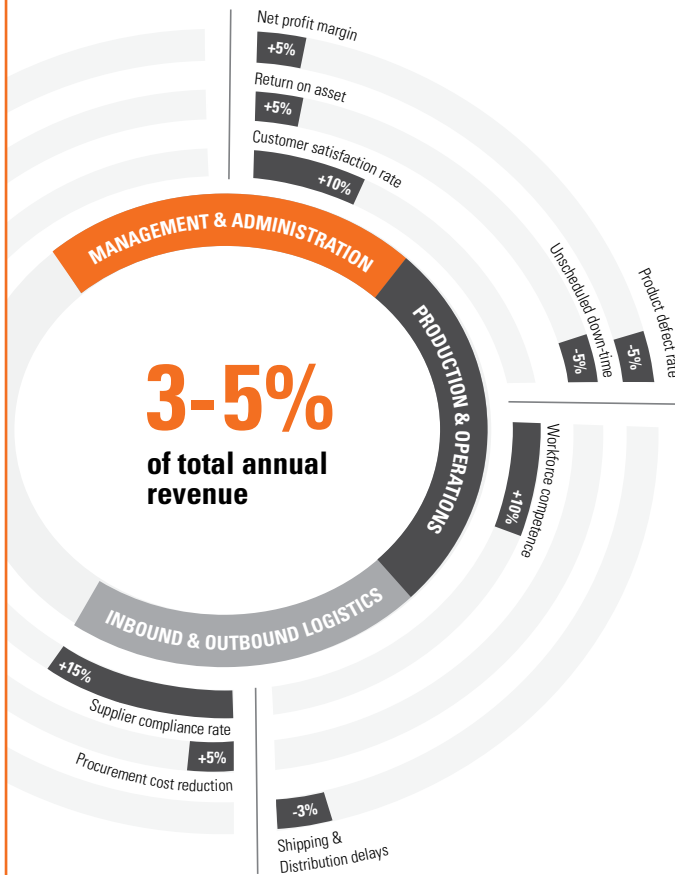


Figure 4. BE Automotive Benefits

ABOUT THE AUTHOR

SGS offers an innovative analytical approach to transform and enhance business; providing benchmarked in-depth analysis of a business married to a comprehensive range of proactive solutions.

ABOUT SGS

SGS is the world's leading inspection, verification, testing and certification company. SGS is recognized as the global benchmark for quality and integrity. With more than 97,000 employees, SGS operates a network of over 2,600 offices and laboratories around the world.

CONTACT US

To speak to an SGS representative about initiating your Business Enhancement journey, contact us today.



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