

# Protect brand value by synchronizing vehicle safety across the enterprise



With safety as a primary factor in vehicle buying decisions, the way an organization uses technology to respond to product safety issues can have a powerful impact on brand value. A consumer’s *perception* of a vehicle’s safety plays a central role in the purchase decision process, perhaps even more than a car’s *actual* safety. The past year has demonstrated how poor management of safety issues can impact manufacturers long after the logistical issues of a recall have been resolved.

For decades, automakers have steadily improved overall safety performance in vehicles through ongoing technology innovations. While that effort has greatly increased vehicle safety, recalls have dramatically risen, culminating in the most expensive year of automotive recalls in 2014 and affecting nearly 64 million vehicles. In the IBM Automotive 2025 study, over two-thirds of industry executives expected automated vehicle safety to be an ongoing differentiator with consumers over the next decade.<sup>1</sup>

There are two main reasons for this increase. First, while vehicles are safer and more reliable than ever, their complexity has increased tremendously through more sophisticated software. As a result, more problems can be detected more frequently.

Second, additional problems are being detected as a result of increased scrutiny from the National Highway Traffic Safety Administration (NHTSA), driven by stricter reporting guidelines and their own findings using deeper analytics capabilities (Figure 1). NHTSA has uncovered everything from mechanical issues such as faulty doors to problems caused by sophisticated software that may cause the vehicle to shut off, making all systems inoperable.

**Vehicles recalled (millions)**

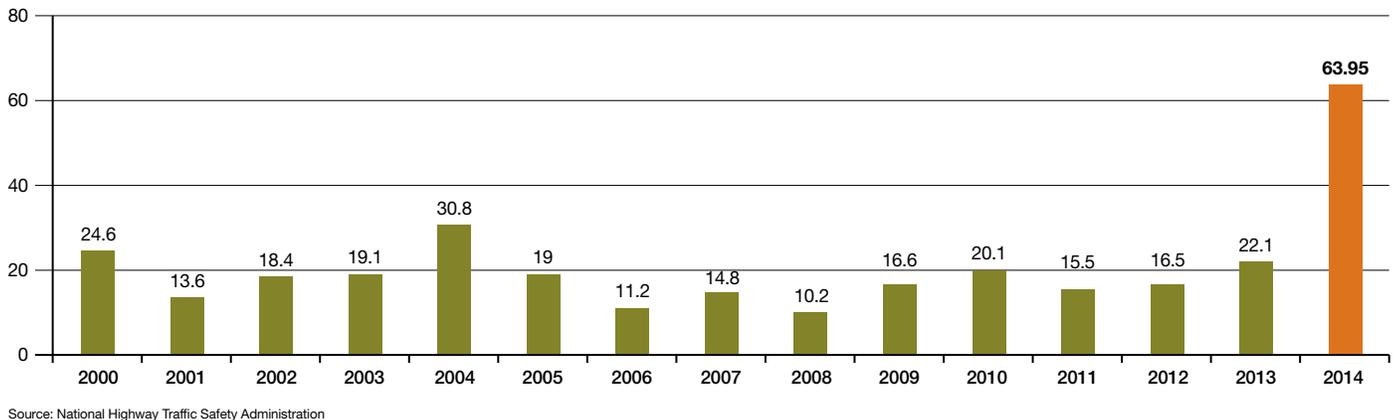


Figure 1. Software complexity and increased NHTSA scrutiny result in significantly more recalls.

As a result, many automakers are playing catch-up with the NHTSA or are busy responding to costly recalls. Disjointed safety analysis capabilities also make it difficult for automakers to deliver timely, effective solutions for safety issues as they arise. And without the ability to quickly use the abundance of data available from a variety of sources, automakers struggle to anticipate and resolve issues before impacting consumers—and the brand's reputation.

### Price of reactivity

Automotive enterprises know that safety-related vehicle issues can have a substantial direct and indirect impact on a business. At a fundamental level, safety problems go against company values and can uniquely break customer confidence. They can also result in lawsuits, government penalties, property damage and more importantly, injury to customers and others. The resulting costs, public embarrassment and reputation damage can have long-lasting effects on an organization.

The impact of a safety issue or recall can be intensified by other factors. Product lines often share common parts or contain dozens of closely related components and sub-assemblies called product variants—so slow or inaccurate diagnoses of problem root causes can impact entire platforms. The cost of diagnosing a defect, executing recalls in the field and associated litigation increases with time and with greater public visibility.

### Transforming to an integrated, proactive approach

For many organizations, becoming more responsive to safety and quality issues requires two interconnected initiatives. An analytics-driven safety transformation program<sup>2</sup> will enable automakers to transform the siloed suite of capabilities of their safety organization into an integrated and agile operation.

First, and most significant, is expanding the analytic capability to rapidly integrate massive amounts of information and use it effectively across the organization. By building analytic capability into a solid foundation using integrated analytics, organizations can lead a holistic approach to safety and quality.

Second, they should develop an organizational capability to connect service, manufacturing and product development by integrating personnel and streamlining processes to resolve safety quality issues across the product lifecycle. Ultimately, this must lead to responsive systems that automate warnings and identify likely causes for safety problems before they're otherwise identified.

A maturity model to develop organizational and analytical capabilities is summarized in Figure 2.

### Analytics leads the way

In large, complex organizations, it's often easiest to start with data. Traditional reporting, dashboards and statistical modeling will remain staples in the toolkit for assessing and understanding vehicle safety and quality issues. Safety teams also need to stretch across organizational boundaries to integrate data they may not have previously assembled. Analytics tools are now capable of ingesting many types of data. Diagnosis comes from analyzing data in its entirety, not just focusing on spot analysis of select information.

Data surrounding product safety or quality issues can now be expanded even further. This data focuses on two new areas that will be differentiators for automakers in diagnosing and mitigating issues faster: the emerging ability to process documents using natural language, and the increased capability to integrate and stream machine data from manufacturing assets and vehicles.

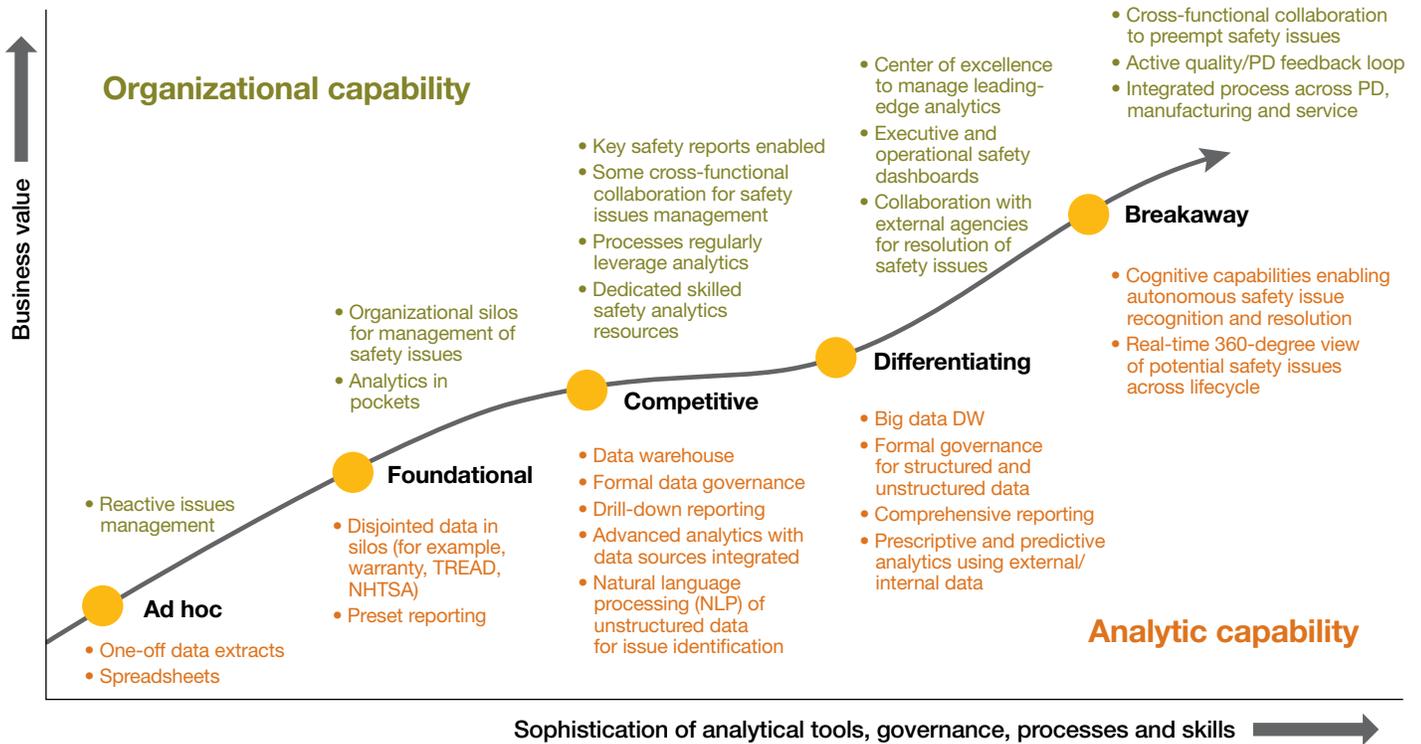


Figure 2. Safety analytics maturity curve shows the transformation from reactive, disjointed analysis to an integrated analytics program.

Just a few years ago, the volumes of information in Transportation Recall Enhancement, Accountability and Documentation (TREAD) reports—from consumer complaints to NHTSA, streaming social data and user comments on blogs—could be “analyzed” one way; by reading it. These documents are unstructured and were previously not even considered data by most. However, the ability to handle unstructured data through natural language processing (NLP) engines makes this information invaluable in the battle to improve product safety and quality.

Analytics tools such as IBM Watson™ Explorer have developed rapidly over the last few years. They can now read in documents of all kinds, integrate data with structured, categorical information and find new correlations and explanations to issues that were not apparent in just the structured data. The volume, variety and velocity of data is creating an unprecedented opportunity. 2.5 billion gigabytes of new data are generated every day, 80 percent of which is unstructured.<sup>3</sup>

Of course, by the time the root causes of product and safety issues make their way into unstructured data reports, the problem may have already been experienced in the field. Ultimately, the ability to collect and integrate machine data directly from factory equipment and vehicles will become the earliest indicator of issues and their causes.

For example, operations managers can use streaming data from connected materials and equipment on the plant floor to monitor production equipment and identify problems before a breakdown or failure occurs. With more detailed and accurate information about asset performance, they can now use this data to uncover quality issues before they cause expensive recalls and warranty issues in finished vehicles.

Another example is from connected vehicles, in which telematics can provide data in-motion such as vehicle speed, data relating to the transmission control system, engine conditions, braking and tire pressure as well as environmental conditions. Soon, this will be pooled with communication from other connected vehicles on the road. When integrated with enterprise data, predictive analytics can provide insight into such critical functions as safety, quality and warranty issues, inventory management, maintenance and product lifecycle management.

Expanding analytics through an increasing spectrum of data sources is vital to changing the ability to respond to safety issues.

For more information about automotive information sources, visit: <http://www.ibmbigdatahub.com/infographic/size-your-understanding-automotive-information-sources>

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### Automotive information sources

- **Unstructured data:** Internal and external text-based information. Examples: Engineering logs, mechanics' notes, comments through Twitter and Facebook, third-party sources such as NHTSA.
  - **Extended value chain:** Data from the value chain and other Business Partners. Examples: Supplier collaboration, dealer sales, government and regulatory data, third-party services.
  - **Systems of record:** Enterprise sales, execution and reporting data. Examples: Requirements and lifecycle management, ERP, manufacturing execution, asset management, warranty, TREAD-related data, sales and customer data.
  - **Vehicle systems:** Vehicle performance data. Examples: Vehicle sensors, embedded systems, connected services and location services.
  - **Driving infrastructure:** Data from the environment, traffic, infrastructure and surrounding vehicles. Examples: Vehicle-to-vehicle, vehicle-to-road infrastructure, traffic conditions, weather and road conditions.
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### Aligning safety capabilities across the enterprise

Automotive vehicle safety teams tend to operate in silos and have pockets of analytics capabilities spread across the enterprise. Analyzing disjointed data from many sources is time-consuming, making it difficult to identify and resolve safety issues rapidly and effectively before they have far-reaching effects. Also, invaluable data that could also be applied to drive product development and improve product quality often goes unused if it is not accessible across the organization. As a result, organizations can be slow to recognize safety issues or comply with regulations, leading to increased costs, brand erosion and poor customer experiences.

Organizations that successfully transform their safety programs must first adopt new processes, skills and governance paired with sophisticated analytical tools that help safety teams deliver smarter, more effective insights across the organization. End-to-end integration from product developers through dealer service technicians is required for a mature safety analytics program.

Regardless of the speed of detection and diagnosis, safety and quality issues will make their way into vehicles on the road. A critical part of an effective safety program includes the ability to identify and manage recall cases to conclusion in the field. To provide a great customer experience, organizations must manage the process effectively so each customer interaction has a positive outcome.

Case management is one of the top trends in enterprise content management today because it brings technology and data together in a way that leads to more valuable outcomes for both businesses and customers. It enhances business outcomes by empowering knowledge workers with process controls, analytics and timely access to the right information. Case management makes information useful by supporting business flows at the intersection of people, processes and information in new, dynamic and much more agile ways. It supports a 360-degree view of the customer, enabling organizations of all types to provide more comprehensive and individualized service.

Key building blocks for a successful program are early detection, fast investigation, rapid resolution and an effective feedback loop for continuous product improvement and to mitigate formal regulatory intervention. Demonstrating a proactive detection of issues and initiating the plan to respond can keep safety issues out of the news, which can lower brand value.

To achieve this, most manufacturers must make substantial organizational changes to strategically align people, process and technology (Figure 3).

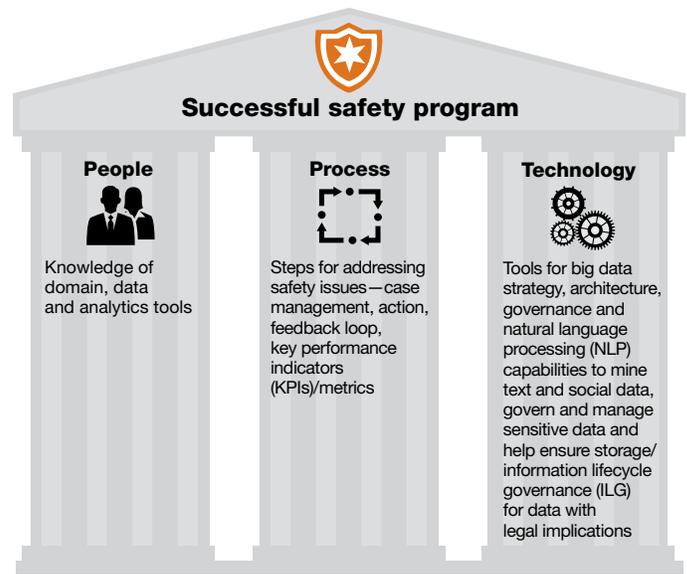


Figure 3. Organizations must strategically align people, process and technology.

### IBM helps synchronize safety capabilities across the enterprise

IBM® Big Data and Analytics tools can help automotive manufacturers protect brand value—and gain competitive advantage—by combining disjointed data silos and aligning pockets of analytics capabilities to develop into agile and analytics-driven organizations. By executing across all phases of issue resolution, manufacturers can:

- Minimize extended costs and brand erosion by identifying and reducing safety issues through early warning and proactive response
- Accurately and rapidly diagnose the root causes of issues and efficiently resolve them with customers

- Complete the loop by improving product quality with ongoing feedback to engineering and product development throughout the vehicle's lifecycle

Industry-leading safety programs start with early issue identification and fast response and conclude with closed feedback loops, ensuring the issue is resolved not only throughout the vehicle's lifecycle, but the entire platform's. IBM can help organizations synchronize safety capabilities from issue identification to feedback loop (Figure 4).

IBM Big Data and Analytics tools, along with enterprise content management, help synchronize safety capabilities throughout the organization. The IBM solution portfolio brings together and analyzes data across multiple internal and external data sources to anticipate problems or quickly identify and address issues as they arise. With these solutions, organizations will realize:

- New information management that makes data accessible anywhere
- An analytics approach that combines traditional data enabled with untapped unstructured data
- Fact-based insights from many sources that bring new value to customers
- Core business processes that are proactive and prescriptive
- Greater capability for analyzing data and focusing on safety, quality and customer care

### Why IBM?

IBM Content Analytics and case management capabilities give organizations a foundation to better optimize operational processes, improve product quality and safety, and organize customer and regulatory response as well as increase profit margins and gain critical competitive advantage.

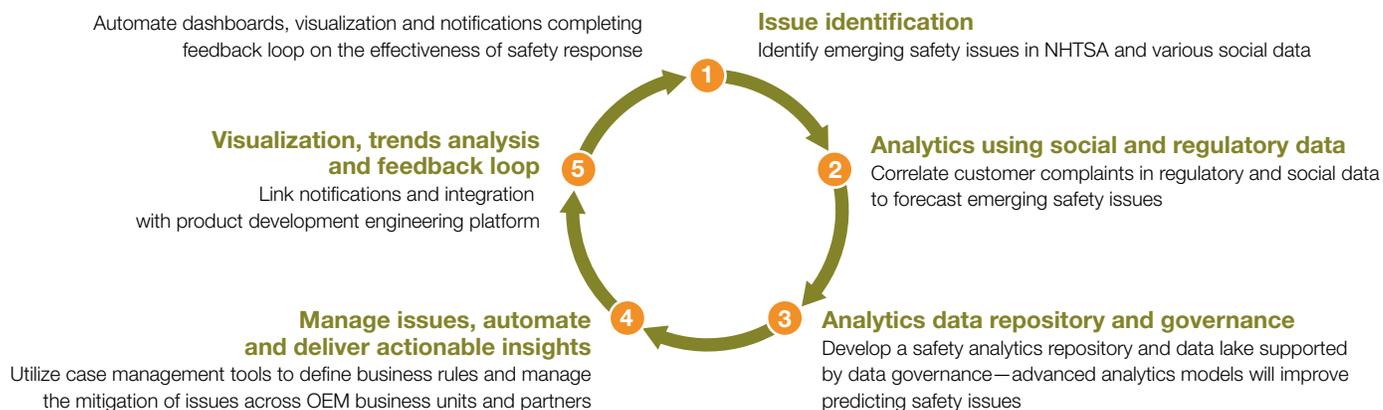


Figure 4. IBM Big Data and Analytics tools help synchronize safety capabilities from issue identification to feedback loop.

IBM Global Business Services® helps automakers define the safety analytics strategy, and develop the roadmap and a comprehensive approach for executing transformation. IBM offers extensive expertise for the automotive industry in analytics, safety and quality data as well as organizational change.

IBM software tools for supporting safety and quality solutions include:

- IBM Watson Explorer for natural language processing for unstructured data
- IBM Predictive Maintenance and Quality for processing machine data from plant equipment and vehicles
- IBM Cognos® for dashboards and summary reporting
- IBM SPSS® for sophisticated statistical modeling
- IBM Case Manager for resolving vehicle issues with customers

IBM has established the world's deepest portfolio of analytics solutions. IBM deploys approximately 9,000 business analytics consultants and 400 researchers, and has acquired more than 30 companies since 2005 to build targeted expertise in business analytics. IBM secures hundreds of patents a year in big data and analytics, and converts this deep intellectual capital into breakthrough capabilities, including cognitive systems such as IBM Watson. The company has established a global network of nine analytics solutions centers and has more than 27,000 IBM Business Partners.

### For more information

To learn more about IBM predictive analytics solutions for automotive, contact your IBM representative or IBM Business Partner, or visit: [ibm.com/analytics/us/en/industry/automotive/index.html](http://ibm.com/analytics/us/en/industry/automotive/index.html)

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<sup>1</sup> "Automotive 2025: Industry without borders," IBM Institute for Business Value executive report. [ibm.com/common/ssi/cgi-bin/ssialias?subtype=XB&infotype=PM&appname=GBSE\\_GB\\_TI\\_USEN&htmlfid=GBE03640USEN&attachment=GBE03640USEN.PDF#loaded](http://ibm.com/common/ssi/cgi-bin/ssialias?subtype=XB&infotype=PM&appname=GBSE_GB_TI_USEN&htmlfid=GBE03640USEN&attachment=GBE03640USEN.PDF#loaded)

<sup>2</sup> "Analytics helps win the automotive safety race," IBM infographic. [www.ibmbigdatahub.com/infographic/analytics-helps-win-automotive-safety-race](http://www.ibmbigdatahub.com/infographic/analytics-helps-win-automotive-safety-race)

<sup>3</sup> Adrian Bridgwater, "How can humans navigate 2.5 billion gigabytes of machine data a day?," ComputerWeekly.com, June 25, 2014. [www.computerweekly.com/blogs/cwdn/2014/06/how-can-humans-navigate-25-billion-gigabytes-of-machine-data-a-day.html](http://www.computerweekly.com/blogs/cwdn/2014/06/how-can-humans-navigate-25-billion-gigabytes-of-machine-data-a-day.html)



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