



BUYER CASE STUDY

Honda Is Using IBM Watson to Drive Real Changes in Quality Assurance

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IDC OPINION

Cognitive systems are already augmenting human performance and their implementation is likely to accelerate as more organizations understand their potential. As with almost all previous technological innovations, how cognitive systems are implemented, and how humans adapt to them, will determine their success or failure. Organizations that adapt fastest to these new human-machine pairings will be best positioned for above-average performance. Specifically, organizations need to improve their capabilities to handle and deal with content coming from written reports, repair claims, and social media vendors. This unstructured information is a major component (i.e., >90%) of what IDC calls the digital universe. IDC has estimated that the digital universe is growing 40% per year into the next decade and, by 2020, the digital universe – the data we create and copy annually – will reach 44ZB, or 44 trillion gigabytes. A significant percentage of the digital universe is human-generated data in the form of patent filings, research papers, blog posts, and news articles as well as social media data such as Twitter, Facebook, Reddit, and other social commentary forums. Understanding and utilizing this human-generated data is a significant challenge for most organizations, and text analytics is the best approach to dealing with this type of data. Honda, a global automotive manufacturer, needed to extract and use this "unstructured information" as part of its quality assurance (QA) efforts and it tapped IBM Watson's capabilities to do so. The use of IBM Watson to extract, categorize, and understand information coming from its customers helped Honda mitigate parts quality issues more quickly while also increasing Honda's understanding of its customers, especially with regard to problem and repairs. While text analytics and entity extraction have been available for decades, organizations are increasingly using these technologies to build up knowledge bases and provide evidence for better analysis and decision making. Automakers are keenly interested in identifying potential parts or vehicle issues as early as possible, and turning to social data to capture this on an early basis is one of the priorities. IDC finds:

- In the case of Honda, visually organized information from text analytics helped Honda's QA-related divisions to decrease the time necessary to read free-form text by 80%. This allowed Honda's QA field staff to more quickly respond to information surfaced through the analytics and drastically expand the number of data sources that they monitor with the support of this solution.
- Overall, the use of the IBM solution by Honda shows how cognitive systems and technologies can improve and augment human capabilities as well as improve overall analysis and decision making. Organizations should be evaluating cognitive technologies in general and text analytics in particular to determine where, how, and when these can be applied to business processes, thereby improving performance, quality, and productivity.

IN THIS BUYER CASE STUDY

This IDC Buyer Case Study examines how an automaker, Honda, implemented a cognitive system using text analytics to help it respond faster to customer feedback. The solution included IBM's Watson Explorer Advanced Edition and has provided Honda a clearer understanding of customer feedback than had been achieved only by humans. Overall results have greatly exceeded expectations, as accelerated responses and deeper understanding of customers' issues have led to reduced costs because identifying warranty issues sooner helps establish technical guidance sooner.

SITUATION OVERVIEW

Organization Overview

Honda develops, manufactures, and sells a broad range of transportation equipment, including many types of consumer vehicles. It has about 200,000 employees and about \$200 billion in annual revenue. The lead actor in this effort has been Honda's QA division, which gathers quality-related data from dealers in Japan and overseas through service departments. Measures and policies for preventing quality issues are then developed based on the issues identified from this data and provided as feedback to R&D and production departments responsible for operations including product design, manufacture, and part supplier relations. One role of the QA division has been to make quality improvement plans. Takahiro Inagi, who is part of the QA division focusing on customer-first operations, does this by looking through customer feedback for issues or reported failures. Inagi pointed out that the automaker's founder, Soichiro Honda, said, "I believe failures help humans to grow." Honda's QA-related divisions live by this philosophy, to improve its products, leading to customer joy.

Challenges and Solution

Challenge 1

Sharing car parts across multiple Honda vehicle models around the globe delivers many benefits, including reduced costs and faster design-to-production timelines. However, when quality issues arise for a given part, this creates challenges on a global scale. Therefore, quickly identifying, containing, and correcting issues is more important than ever for OEMs to maintain the highest levels of quality assurance. Particularly in automotive, this relies on a vast network of parts suppliers, authorized dealers, and service centers to identify parts defect patterns, source replacement parts, and perform the work, which can increase complexity of the situation.

Challenge 2

Honda's process for gathering customer feedback about issues and classifying this information (e.g., whether similar symptoms have already been reported in the other data sources, whether the issues had already been solved by Honda, whether the issue is warranty related) was extremely time consuming as individuals had to read and classify each message, which averages about 310,000 message per month in Japan alone. Moreover, Honda's regional organizational structure meant each region was responsible for dealing with customer feedback from that region, which made it more difficult to aggregate input from multiple regions and search for global quality or part failure patterns. According to Honda, QA employees spent up to three hours per day reading and reviewing customer feedback, including warranty claims. Honda needed a way to automate all this manual work and effort.

Solution

Honda worked with IBM to implement a cognitive solution using IBM Watson Explorer to help extract and classify the incoming feedback. Ideally, the solution would use automation to read, extract, and organize the key pieces of information in the customer feedback and then provide visual dashboards and reports that highlighted the key information discovered from analyzing thousands of these customer feedback.

Selection

Honda's QA division evaluated an offering from SAS on a related project using social media before the effort with IBM. But after giving both organizations an identical sample data set and comparing the results, it believed IBM's tool was easier to understand. This time, Honda looked at a few vendors that could provide this type of solution, but ultimately chose IBM Watson Explorer as the technology, since Honda was already familiar with it and chose IBM Global Business Services (GBS) as its primary partner. In turn, IBM GBS selected Tokyo System Research Corp. to help it implement an IBM Watson Explorer Advanced Edition solution. To do this effectively, a detailed dictionary needed to be developed to help the system identify key information such as car parts, problem symptoms, and other automobile-related information.

This project was driven based on approval from both IT and QA divisions. Honda's QA division was informed by the IT division that IBM Watson Explorer was already implemented in Honda. That fact also helped Honda's QA division to select IBM because the prior installation and use at Honda meant that the QA division could implement with speed and cost advantages.

Solution Implementation

The solution took about one year to develop. IBM GBS in Japan was the lead implementer.

Task – Implementation of IBM Technology

IBM and its partner chose to use IBM Watson Explorer Advanced Edition, which provides enterprisewide information access and unified information applications capabilities across internal and external data sources and services. In addition, Advanced Edition includes advanced content analytics capabilities to enable organizations to adapt their information access solution to specific domains and to extract insights from unstructured information to help identify trends, patterns, and relationships in their data. The content analytics capabilities were key to Honda's requirement to be able to understand and extract the key phrases and concepts from their customer feedback and build that into a set of reports and dashboards that highlighted specific problems rather than having QA field personnel to manually read through thousands of documents.

Results

The solution reduced time required to interpret and classify incoming feedback by 80%. For example, reports about "abnormal noise from front damper" could be extracted and automatically associated with the phrase "front damper" from the parts dictionary, the "abnormal noise" identified with a symptom dictionary be used to find similar cases that connect the two. The solution included IBM Cognos Business Intelligence graphs and reports to summarize topics, categorize issues, and highlight trends. The comprehensive feedback analysis is now contributing to finding issues early, dealing with issues promptly, and providing feedback to parts analysts and designers.

The solution surfaced patterns in customer feedback that Honda had previously been unaware of (e.g., customers' complaints such as those related to fuel efficiency/economy, which are difficult to find only with warranty information, could be discovered). It's difficult to ascribe a precise numerical value to new insights, but clearly these have been an unexpected benefit.

Future Plans

Honda is evaluating several options including natural language conversation analysis. Beyond the QA-related divisions, there is a possibility to extend this solution into the other divisions. Now the product development division is interested in this analysis. Interestingly, IBM's role has evolved since release of the initial solution. Initially, Honda did all the planning, handing over implementation responsibilities to IBM, but in subsequent work, IBM has been drawn into the planning cycle related to next steps (e.g., natural language conversation analysis).

One of the most time-consuming aspects of this solution is the development and maintenance of auto-related dictionaries and taxonomies for items such as automobile parts and problem symptoms. Today, this updating process is done manually. Honda and IBM are investigating using Watson Developer Cloud Services to utilize automatic classification of feedback using machine learning and AI. Currently, this is still in a test phase and needs more improvement before going into production. However, the classification accuracy is about 85% at this time, meaning that 15% of feedback still requires human assistance to classify. Honda compared the classifications by humans with those made by Watson and found Watson could correlate more pairs of "same phenomena" comments than were identified by humans. In terms of the ranking judgements made by Watson, Honda discovered that Watson's performance improved when longer comments (e.g., those using run-on sentences) were broken down into simpler sentences. Surely, that finding will make language teachers all over the world smile.

ESSENTIAL GUIDANCE

This Buyer Case Study features an automobile manufacturer, but the following guidance derived from it is applicable to all organizations, regardless of size, across all industries:

- Make room for joint human and machine pairings. While this Buyer Case Study illustrates the truism about projects needing a joint IT and line-of-business approach to be successful, it more forcefully illustrates that humans should make room for joint human and machine pairings, in the form of cognitive systems, for increased performance. The faster your organization adapts by implementing cognitive systems, the more likely it is to survive and thrive. For example, accelerated responses and deeper understanding of customers' issues should lead to reduced costs by identifying warranty issues sooner, thereby containing potential recalls and launching mitigation efforts sooner.
- Consider cognitive solutions as augmentation to human effort, not a wholesale replacement. Prepare for redeployment of staff made redundant to higher-value tasks to send the message to employees that cognitive systems are less a threat than an opportunity for humans to become more valuable to their organizations.
- Prepare for the reality that while initial implementation of a cognitive solution may be fast, about one year in the case of Honda, there will be ongoing efforts to negotiate the continued use of various data sources controlled by different entities, as well as efforts to seek out and curate new data sources.

- Search for and document the unanticipated benefits and insights gained from the use of cognitive systems, and take credit for these as part of larger overall project economics.
- Educate your organization and your customers about the value of using simple declarative sentences when communicating. Honda's experience with Watson reminds us that simple, clear communication is not only beneficial between humans but also between humans and machines.

LEARN MORE

Related Research

- *i-ERP (Intelligent ERP): The New Backbone for Digital Transformation* (IDC #US41732516, September 2016)
- *Market Analysis Perspective: Worldwide Cognitive Systems and Content Analytics Software, 2016* (IDC #US40797116, September 2016)
- *Worldwide Cognitive Systems, Content Analytics, and Discovery Software Forecast, 2016-2020* (IDC #US40305316, June 2016)
- *Intelligent Personal Assistant Adoption for Work* (IDC #US41477816, June 2016)
- *IDC PlanScape: Implementation of Cognitive Systems* (IDC #US41477516, June 2016)
- *IDC Innovators: Machine Learning-Based Text Analytics, 2016* (IDC #US41312116, May 2016)
- *IDC PeerScape: Digital Transformation – Practices for Strategically Leveraging Cognitive Systems* (IDC #US41191916, April 2016)
- *IDC TechScape: Cognitive Systems Technologies, 2016* (IDC #US41005816, February 2016)

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