

# Vehicle manufacturer uses IBM SPSS to consolidate its competitive position

*Data mining helps to optimise the quality of premium cars*

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## Overview

### Challenge

The challenge facing the BMW Group consisted of the need to manage and efficiently analyse vast quantities of data, from sources such as vehicle error memories, dealer feedback and repair reports, to obtain meaningful data to feed the improvement process.

### Why IBM?

Customers all over the world trust IBM Business Analytics and in particular SPSS to improve their corporate performance.

### Solution

Thanks to IBM SPSS data and text mining software, the BMW Group has a user-friendly solution that is capable of quickly and efficiently analysing data and combining the results. The results are then available to a wide circle of users, with no need for direct access or SPSS knowledge.

### Benefits

The combined examination of analysis results is helping to provide far more meaningful data. Evaluations are fed into a continuous improvement process for products and services, and are helping to consolidate the group's position as the most successful vehicle manufacturer.

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The BMW group is using IBM SPSS Business Analytics data and text mining software to analyse a wealth of information. This special software allows data on vehicles and repairs, vehicle error memories and dealer feedback to be structured and analysed in detail in combination with other information. What sets this solution apart is the fact that data is no longer considered in isolation, but in combination, providing completely new insights. The results of the analyses are immediately channelled back into BMW's working processes, helping to reduce error rates and save costs. This continuous improvement of products and services is also increasing customer satisfaction and helping the vehicle manufacturer to consolidate its position as one of the most successful players in its market.

As a premium manufacturer, BMW aims to win customers over with innovative, original designs and quality, so it is essential to continually evaluate and assess its products and services and take customers' opinions on board. BMW collects a wide range of vehicle and repair data from the vehicle error memory and from customer and dealer feedback in order to run specific analyses. The findings are then used to improve products and services. The result is a continuous process of evaluation, analysis and improvement.

## Effectively analysed data becomes a "lifeline"

Data is sometimes described as a company's "life blood". In global operations such as the BMW group, this information fills gigabytes of storage space every day. Managing these vast quantities of data is a challenge. Storage takes place in databases. In its raw form, this data is not particularly meaningful, but with the right analysis tools it quickly develops from the company's "life blood" to an essential "lifeline".

Employees from the quality department can use standard tools to run analyses, such as error frequency rates for a specific vehicle, and create summary tables. One important quality indicator is the number of faults within a vehicle's warranty period. Reducing this number lowers the cost of rectifying faults and improves the products, resulting in an increase in customer satisfaction.



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*“In general, it’s about making various processes transparent. Success can then be measured wherever data is generated. The longer term goal is, of course, to improve BMW’s performance in all areas and thus further consolidate its success,”*

– explains Michael Unger, Key Account Manager Predictive Analytics at IBM SPSS in Germany.

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However, classical business intelligence methods only allow for the creation of simple analyses, such as identifying and assessing selected vehicle component failures. Growing volumes of data make it increasingly difficult to manually filter out the anomalies and identify all potential trends. In addition, standard tools do not allow data to be networked – it can only be considered in isolation. At more than 30 million possible combinations, classic BI tools reach their limit in terms of identifying trends and correlations.

By implementing IBM SPSS data and text mining software, the BMW group now has a solution that not only produces fast and efficient analyses and combines the results, but is also easy to use. The solution is capable of handling several thousand queries within a short period, which allows specific analyses to be run on large volumes of data. Pattern recognition, as well as statistical and mathematical processes, are used to identify new correlations and trends.

### **Internal platform saves time**

The creation of a generic analytics platform, based on a Service Oriented Architecture (SOA), has opened up these data mining services to other areas of the company. Users throughout BMW can access the IBM SPSS Data Mining tools under the name AVAQS (Advanced Quality System). The main advantage of this approach is the ability to transparently embed complex analytical flows within other applications. The results are then available to a wide group of recipients, even if these individuals do not have direct access to SPSS or any knowledge of how to use it. Processes can be accelerated by a matter of days, without forcing users to learn a new application environment.

In total, around 1,000 employees use the AVAQS platform for a range of tasks including ad hoc analyses. To meet complex or unusual analytical requirements, BMW has also set up an Analysis Services team, whose experts create predefined analyses of specific issues which users can then access as required via AVAQS.

### Scope of the data mining process

There are numerous examples of the analyses that can be run on the platform. For instance, repair services are a key area for all automotive manufacturers, as customer satisfaction decreases with every repeat visit to a repair shop. It is therefore important for the manufacturer to identify any potential service improvements in repeat repair business. In addition to the servicing and customer management processes, vehicle diagnosis is a core element for repair shop employees all over the world. Computer-assisted repair is extremely important in this context. Analyses of repeat data – information about the kind of repairs that cause customers to visit workshops most frequently – provide BMW with new insights which it can use in its research and production. This analysis helps to bring about a significant improvement in repeat repair rates.

A further possible application of the data mining process is to analyse fuel consumption data. The information is gathered by a vehicle's cockpit instruments, and can also be viewed by the driver of the vehicle. In the case of internal test and pre-production vehicles, the data is then recorded and stored for future use in analyses of fuel consumption in different countries.

The IBM SPSS analysis tools are also helping a foundry in Landshut – a production site for BMW parts – to make improvements. During the casting process, the thermal element provides the information about each individual component for quality control purposes. A matrix code can also be used at a later stage to track the production of each cast component. The resulting large volumes of production and quality data, as well as parameters, are then analysed via AVAQS. The findings are used to create statistical models and make deductions. The aim is to quickly identify any errors in the production process and implement the appropriate corrective actions. This process of revealing hidden information helps to identify improvements, and thus increase product quality.

## About IBM Business Analytics

IBM Business Analytics delivers comprehensive, standardised and accurate information which decision-makers rely on to improve the performance of their businesses. A comprehensive portfolio of business advantages, advanced analytics, financial benefits and strategy management, as well as analytical applications, bring immediate clear and practical insights into your current performance and the ability to forecast future results. As part of this portfolio, IBM SPSS Predictive Analytics helps organisations to predict future results and use these findings to proactively improve business outcomes. All over the world, customers from the world of business, public authorities and education are relying on IBM SPSS technology as a competitive advantage to win new customers, build loyalty and increase turnover while reducing fraud and risk. Incorporating IBM SPSS software in their daily operations turns companies into Predictive Enterprises – able to steer and automate decisions to meet business goals and achieve a measurable competitive advantage. For further information, please visit [www.ibm.com/spss/de](http://www.ibm.com/spss/de).



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