

Deloitte.

Big data and analytics
in the automotive industry

Automotive analytics
thought piece



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Introduction

Opportunities for analytics in the automotive industry

The automotive industry continues to face a dynamic set of challenges. For those with the right ambition it represents an exciting time with opportunities to differentiate and stand out from the crowd. One area that has the opportunity to deliver significant competitive advantage is analytics.

Shifting marketing conditions, globalisation, increased competition, cost pressure and volatility are leading to a change in the market landscape. The rate of technology change continues at an astonishing pace, irreversibly transforming how businesses operate. With autonomous or self-driving vehicles, changing ownership and usage models and heightened customer expectations; the automotive industry is on the brink of a revolution.

As the automobile is being transformed by technologies, applications and services grounded in advances in everything from sensors to artificial intelligence to big data analysis; the ecosystem is witnessing a steady influx of new players and the continued evolution of the roles played by key stakeholders and the balance of power among them. Of particular interest is the evolving relationship between automakers and software providers.

Analytics allows this data to be merged regardless of the format which could consist of "machine-readable" datasets or unstructured data such as videos, sound recordings, or texts. Done right – the results are impressive.

In automotive it has been embraced from a distance, inconsistently and has not always been well understood. The sheer scale of the data now available can appear intimidating but with the possibilities it affords it can no longer be ignored.

- The ability to harness data is enabling masses of data to be utilised to form actionable customer segments and individualised offers and incentives to boost sales and improve customer retention;
- Applying statistical models to a mass of historical data from a range of sources can help to identify the impact of fixed and variable marketing investments and support automakers with a more precise and effective approach to quantity and composition of marketing spend;

- Supply chain data can reveal which links in a chain could weaken thereby allowing for proactive and timely countermeasures before a real problem manifests; and
- Predictive analytics is developing into a powerful tool for generating an enormous boost in forecasting efficiency as well as operations and performance.

Deloitte blends deep business understanding with a powerful set of tools and methodologies for embedding analysis, data and reasoning into an organisation's DNA. From strategy and 'art of the possible'; through to implementation; and managed analytics services. Deloitte approaches analytics with a clear focus on business issues, articulating the vision and value and then developing solutions to deliver trusted insights.

In this short document we are going to outline our perspectives on some of the major opportunities for automakers to benefit from analytics to help drive greater profitability, market share and risk avoidance. In an increasingly competitive market where small interventions can become key drivers to increasing market share, the time to act is now.



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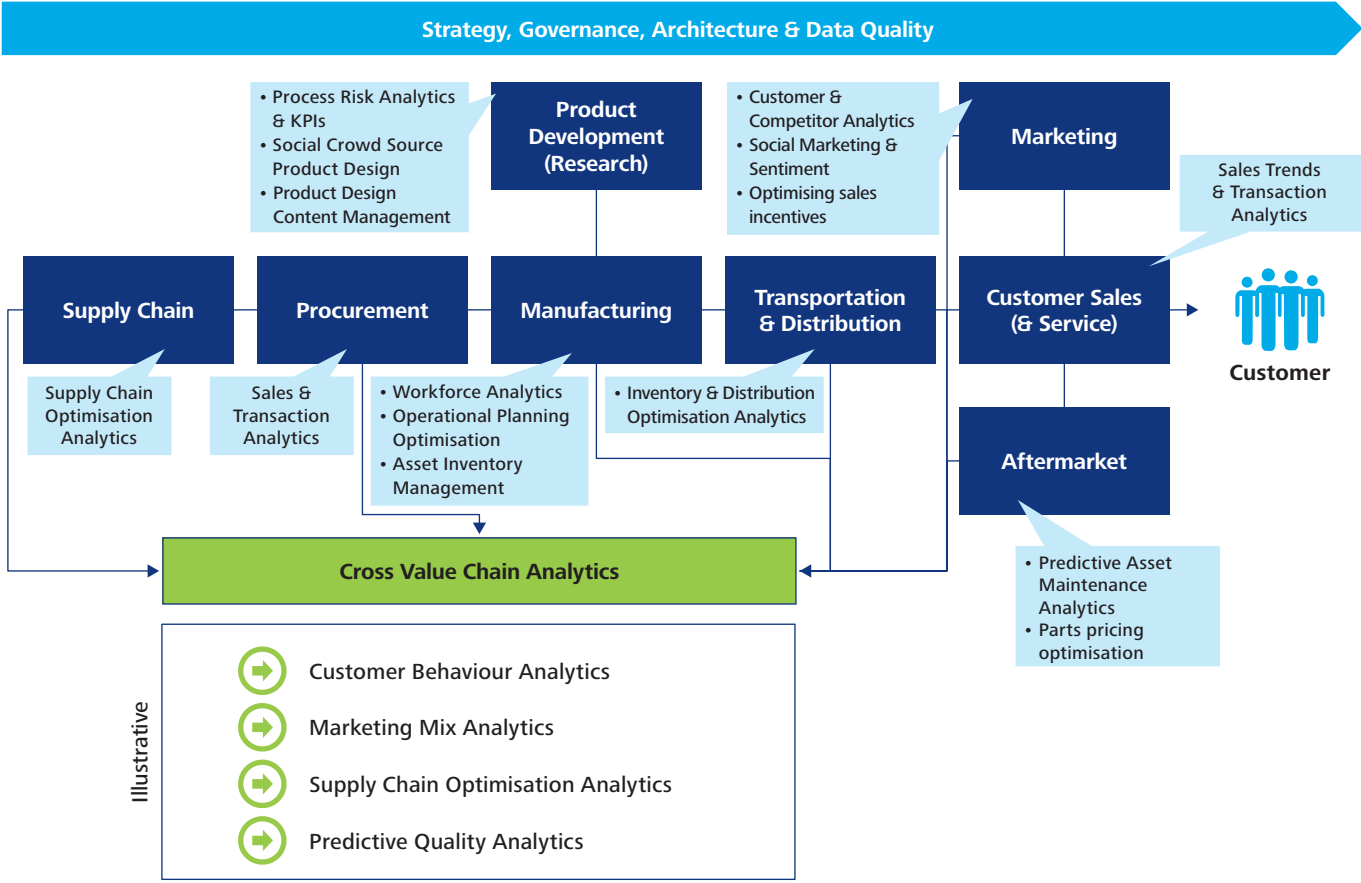


Manufacturing analytics value chain

Applying advanced analytics across the manufacturing value chain will generate exponential value

Analytics is a powerful tool. However, applying analytics effectively requires knowledge beyond statistics, operations, or information technology. In order to fully benefit from analytics requires a comprehensive set of capabilities that intersect and integrate with multiple functions and teams across the organisation.

We can improve insights across each component of the value chain.



Customer behaviour analytics

Customers have come to expect a consistent personalised experience across their access channels

The power of digital is revolutionising the way in which customers research, purchase and manage the upkeep of their vehicles.

Inner city mobility:

Pay for use customer mobility solutions, covering central city locations, offering ease, speed and flexibility of commute.

Urban lifestyle

convenience: Taking the retailing and servicing business to the consumer – lifestyle tailored, familiar retailing experience.

Regional retailing:

Providing the complete digitised brand experience through existing dealers.

Automakers are having to respond by offering 24/7 connectivity, an expansion in the number of access channels and reliance on social media and the internet as a research and communication tool. Furthermore, the role of the traditional dealer is being questioned and innovative new sales processes are being trialled by some automakers keen to exploit opportunities to differentiate and complement existing retail experiences on offer.

There is a multitude of data available to support automakers in understanding their customers but the magnitude and complexity of this data limits their ability to collect, analyse and act on it. Automakers do not yet have full control over all 'insight' from external sources such as social media through to internal data and it is often spread in silos across different areas of the organisation.

To succeed automakers will need to fully understand customer needs and behaviours in order to develop a single view of the customer and thereby build compelling, differentiated offers throughout the sale and ownership cycle which are relevant in today's digital environment. For example, a powerful combination of online retailing and physical stores placed in high footfall areas, to build brand awareness, attract new target customer segments and provide a transformational retailing experience for shopping anytime, anywhere.

Finally, customer retention needs to be placed high on the agenda and with that comes the increasing importance of understanding and influencing customer experience across the lifecycle and journey, not just during the purchase phase.

Potential for Analytics

Analytics and information management present a significant opportunity for automakers to use quantitative techniques to support the planning of interventions across the customer lifecycle including but not limited to:

- Understanding the potential value of different customer segments;
- Using that knowledge to strategically target new customers whilst maintaining the loyalty of existing customers; and
- Improving customer experience to drive retention.

Customer data integration, breaking silos across the organisation and the desire to create a single integrated view of the customer is the key to unlocking the richness and maturity of the dataset. This will involve the aggregation of a range of internal and external sources including CRM, dealer management systems, demographics, sales and marketing databases to name a few.

A critical next step in making customer data useful is to use it to create actionable and meaningful customer segments that allow the development of a differentiated product offering and value proposition for each segment at each stage of the lifecycle. This could lead for example to the formulation of a new innovative retail model such as a pop up store to drive awareness and/or more targeted campaigns of special service bundles beyond normal warranty to reduce customer leakage and aid retention.

Impact

With the ever increasing volume and variety of data, analytics in customer acquisition and retention strategies can be the differentiation between players. Building a solid analytics platform is a requirement if automakers want to build a leaner, more profitable, data driven business environment that is able to produce actionable insights.

If done correctly, using analytics to improve the customer experience, starting with customer data integration and segmentation can lead to more effective marketing and customer engagement campaigns, more targeted one-to-one offers and can help automakers better understand their cost to serve by segment, helping them to make informed decisions and increase profitability.

Post purchase, the ability to better understand customer behaviour and what drives customer leakage will enable automakers to plan interventions that aid retention, maximise aftermarket penetration and reduce overall marketing spend.

Marketing spend management

Configuring the optimal marketing mix for a targeted group of customers

Bringing together the different internal and external information sources relating to fixed and variable marketing spend enables automakers to better understand what's working and what isn't and develop a more nuanced approach on which lever to pull in a specific situation.



The growth in touch points and information available on customers is increasing allowing automakers and dealers to focus on specific groups of customers with targeted messages and offers. This, together with the increasing volume and frequency of data available to track customer behaviour, offers an opportunity for a more precise approach to configure the optimal marketing and incentives mix for a targeted group of customers. However, the variety of data sources makes it difficult to collate and interpret the available information to understand the impact of different offers in a timely manner.

Those automakers that are able to effectively manage and target their fixed and variable marketing spend to improve engagement and the appeal of their offers, have a fantastic opportunity to improve customer engagement and drive sales through more targeted, informed and controlled marketing interventions.

The amount of data available to automakers can be daunting and they need to find a way of collating and analysing it so data driven decisions can be made. Marketing analytics has the potential to significantly improve the decision making of automakers and returns they can deliver, by collating and analysing marketing information and customer behaviours in a consistent and seamless environment. Having done this, automakers can then begin to leverage historical data to gain some insight into which levers are best applied in which situations.

However, there are a number of challenges that must be overcome to do this, including:

- Lack of available information on the sales transaction for internal and competitor brands;
- Poor understanding of competitor marketing and incentive strategies, and their impact;
- Differences in customer behaviours across different regions and customer segments; and
- Limited ability to understand the impact of more general trends and announcements on market sentiment and buying behaviours.

Potential for Analytics

Marketing Mix Analytics quantifies the contribution of marketing activities on sales by evaluating sales, marketing and macro trends over a period of time and different geographies using statistical modelling methods. Over time this can be used to power scenario-based marketing planning; portfolio budget allocation; performance forecasting; and media optimisation.

It is therefore important to set expectations and align any solution to business maturity, needs and available data.

Depending on the maturity of the automaker, an initial step will likely involve creating a performance dashboard that's able to display a range of data sources in an easily digestible format and allows better choices to be made on marketing spend focus. Once that's embedded the statistical modelling and scenario-based planning can be considered as the organisation develops its analytics capability.

Deloitte have been working closely with selected automakers to develop this capability and have developed a number of prototype tools and methodologies that are being applied and refined in the market.

We are also using trends from other industries such as the clothing retail industry where we provide a service to major high street retailers to compare pricing of products on a daily basis under our Retail Pricing Analytics offering. This allows us to better understand how analytics can be applied to the automotive industry specifically to car prices, discounts, offers and aftermarket parts prices.

Impact

Compared to other industries such as retail and banking, automakers are playing catch up when it comes to using analytics to gain insight into their customers and into effective management of marketing budgets. If done right however analytics has the potential to inform automakers of the impact of incentives on a specific model, in a specific geography for a specific customer type. Combining this with suitable dashboards and planning tools will enable OEMs to better plan and make data driven decisions on allocation of finite marketing spend.

With global spend on incentives and advertising in the industry already exceeding £100bn,¹ there is a huge opportunity for automakers. As two key elements of demand generation, if they can get their advertising and incentives right there is the opportunity to drive both increased sales performance and profitability.

A 1 to 2 percent reduction for the same yield could have a £1bn to £2bn margin impact for global automakers.

Global supply chain management

Using data analytics to manage risk and drive growth

Powerful forces are having a profound impact on the ability of automakers to effectively manage their supply chains.

Globalising operations to take advantage of high-growth markets, driving innovative operational strategies that seek to optimise the manufacturing process, and managing regulatory environments around the world are only a few of the forces that are exerting immense pressure on supply chain management capabilities. Get it right and automakers and suppliers have tremendous opportunity to gain a competitive advantage and drive growth. Get it wrong and automakers can quickly find themselves in difficult scenarios ranging from parts shortages, government scrutiny, or lost growth opportunities.

The good news is that in the midst of these intense and complex challenges, vast quantities of data are being stockpiled that can help automakers crack the code on managing global supply chain risk. Following recent product recalls, natural disasters, and supply chain shortages, many are now starting to take a closer look at the data they have at their fingertips to try and mitigate similar supply chain risks in the future.

Potential for Analytics

Advanced supply chain analytics represents an operational shift away from reactive management models. Emerging capabilities in this area introduce a proactive management model, equipping automakers with the ability to continually sense and respond as the industry changes around them. Moreover, advanced supply chain analytics can help automakers analyse increasingly larger sets of data using proven analytical and mathematical techniques, including regression analysis, stochastic modelling, and linear and non-linear optimisation. Essentially, the ability to blend discrete data sources and use powerful big data tools to help drive actionable insights has improved significantly in recent years.

An example of this in its simplest form is highlighted through the use of product configuration and other web interactions which allow automakers to get early identification of new emerging trends such as a move to a certain option like an automatic gear box or a particular colour allowing automakers to forecast demand to a greater level of granularity.

These methods and tools can allow automakers to identify patterns and correlations that may have been less visible and possibly missed in the past, further enabling automakers and suppliers to look at the business and the broader supply chain in new, previously unimagined ways.

For the UK, the implications with its manufacturing base and significance as a major sales market for global manufacturers are clear; connectedness to customers and their vehicles can directly impact the supply chain. With more direct demand signals coming from the users, and the cars themselves, agile market participants will increasingly be in a position to use data to shape, build and deliver but also become increasingly more proactive in managing customer experience in the aftermarket.

Impact

Advanced supply chain analytics is increasingly providing opportunities for the global automotive industry to move from historical point-in-time snapshots to real-time data access that pushes analysis and visibility to stakeholders within an organisation and across the supply chain. Making use of cloud infrastructure and Big Data platforms will increasingly become the norm.

One thing is certain however, the use of advanced analytics in the supply chain will likely increase by orders of magnitude as the number of individual data elements and records continue to increase. Focus will shift from internal cross-functional sharing of data to greater coordination and shared understanding of the data flows across value chain partners. Individual silos within the supply chain, suppliers, procurement, operations, sales, and consumer will be torn down. Instead a more visible, broader supply chain will emerge – one that is better connected and more prepared to sense, react to fact based analysis, and proactively manage supply chain risk by simulating alternative responses.

Predictive analytics

Using advanced analytics for product quality and recall management

A quality management team within an automaker moves within a challenging sphere of tension between customer satisfaction, regulation and cost control.

The good news is that predictive quality analytics capabilities available today allow quality issues to be detected and decisive action taken early on or prevented from happening altogether. This in turn provides an improved ability for quality management teams to better manage both customer satisfaction and cost control concerns.

Innovation, variety, and growing product complexity increase the potential for faulty products to be released into the market. 2015 has already seen a record number of recall announcements in the UK with over 1.45 million vehicles recalled,² demonstrating that the issue of product quality and recall management is not going away anytime soon, particularly as vehicle content becomes increasingly complex. The successful automakers are taking action to be quicker and more proactive in detecting and responding to product quality and safety issues. And if a recall is required, regulators, customers, and other stakeholders are expecting automakers to more effectively manage the event.

Potential for Analytics

The good news for automakers is that proactive and predictive quality analytics offers a solution. Mature analytics systems can today process large quantities of data and offer various analysis methods, thus identifying potential faults in advance and provide opportunities to develop suitable counteractive actions through early signal detection as well as managing the data better.

For example, work being undertaken for our clients today is combining data from multiple data sources structured and unstructured, internally as well as externally to better understand what is happening in the aftermarket. Social media, customer service call centre data and parts sales and shipping data is being used to build a view for manufacturers of which parts are failing and when it is likely they will need to issue and manage a recall. Adding comprehensive forecast models that can help to identify the likelihood of a product recall within a specific timeframe is putting manufacturers in position to act before regulatory authorities impose action and sanction. This has positive implications for their customer experience teams, as they can also predict the effect of certain demographic customer characteristics and associated customer behaviours in response to a recall.

Depending on the parameters flowing into the model, defects occurring immediately after purchase can be detected, as well as defects that might result in a warranty claim later on in the purchasing cycle. Analytics models also help identify part defects among suppliers in advance. With these possibilities of analysis, predictive quality analytics is particularly useful in the development of prototypes, quality management, supply chain optimisation, and recall management.

With the increasing scale and number of recalls the industry can also utilise blended internal and external data sources to manage recall programmes already in play, identify resource constraints and predict run-time to completion of recall cycles.

Impact

The great significance of quality management among automakers is illustrated by recent product recalls. Increasing regulation is exacerbating the situation, and thanks to modern communication, such as social media channels, news of a recall spreads around the world in minutes. These factors increase the impact of automotive recalls. Apart from the high repair and admin costs, automakers also pay a premium in the form of damage to their brand's reputation and impact on sales as well as run the risk of significant litigation costs. As a result, it should be no surprise that leading manufacturers are investing large sums in recall management and applying analytics solutions in particular to protect themselves.



How Deloitte can help

Successful businesses run on insight. They are passionate about analytics and able to translate data into intelligence that fuels decision making. However, there is a difference between selectively using insights to inform decisions and becoming an insight-driven organisation – one that generates and acts upon insights everywhere across the business, making smart, collaborative and transparent decisions that generate value and create competitive advantage.

Deloitte has a market leading analytics practice which has deep insight into the issues faced by automakers and the complex environment in which they must operate.

Analytics can allow you to see the unseen and discover insights in all areas of your business. We are able to draw upon a wide range of in-depth industry expertise and can help you make smart decisions that drive strategy, provide you with operational improvement and competitive differentiation.

We can help businesses using a powerful set of integrative methodologies, frameworks and toolsets designed for embedding analysis, data and reasoning into an organisation's DNA. This includes:

- Helping an organisation understand what it takes to embed data, analysis and reasoning into decision making – everywhere, every day;
- Sitting between the business and technology, focusing on the business problem and creating the vision for analytics – aligning it to corporate objectives and making analytics a core competency;

- Applying advanced analytical and machine learning processes to support more efficient decision-making processes;
- Developing a scalable, repeatable process that generates trusted insights; and
- Incorporating visualisation techniques to make data accessible in ways humans understand.

Introducing the Deloitte team

Please contact a member of the team to discuss the opportunities available to your organisation



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Endnotes

1. The source for total marketing spend is a combination of IHS Automotive Data, 2014 (variable) and Advertising age estimates 2014 (fixed)

2. Source: DVSA 2015

Notes

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