

AutomotiveConnect: Heavy Equipment

Driving Performance in the Digital World



People matter, results count.

Manufacturers of heavy equipment are re-examining the way they do business to address market disruptions and changing customer expectations. From working with a range of these manufacturers, Capgemini understands the challenges and has developed an approach, AutomotiveConnect, that offers solutions to help with every stage of the product lifecycle. This model is an evolution of our well-received AutomotiveConnect concept for the industry as a whole.

Heavy equipment manufacturers need to deal with market disruptions

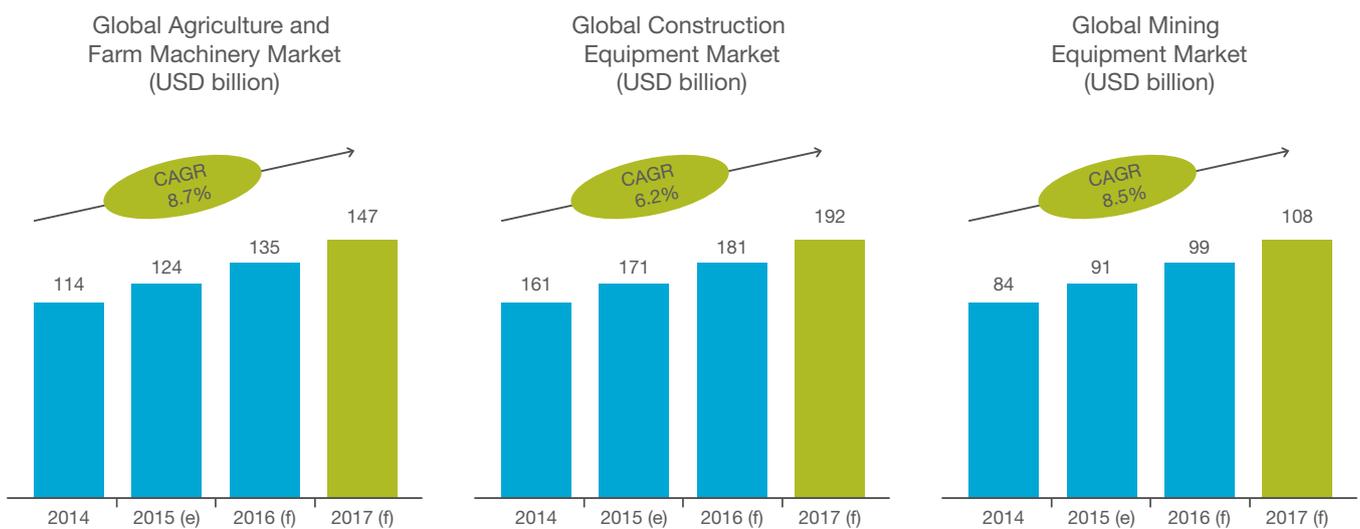
The heavy equipment business currently looks healthy, with sales expected to increase across all segments. Global compound annual growth rate (CAGR) is currently estimated to be 6.2% for construction equipment, 8.7% for agriculture and farm machinery, and 8.5% for mining equipment, though growth rates vary considerably between markets (figure 1).

Despite the buoyancy of the industry, manufacturers face disruptive change. For example, they are being forced to consider new business models, with the focus shifting away from core equipment and towards platform services and value services. Alternatives to purchasing such as leasing by the hour are also becoming important to customers.

The structure of the market is also changing, with dealers playing an increasingly crucial role – not only by virtue of their knowledge of customers in their area, but increasingly because they supply complementary products and services or tailor those provided by the manufacturer.

The introduction of digital technologies brings issues of its own. Services and products from manufacturers often need to be integrated with those offered by large dealers and third parties. Security is an extremely important aspect of applying digital technology to heavy equipment, particularly given the dangers that can arise from improper handling of minerals or foods.

Figure 1: Heavy Equipment Market Development



Source: IHS

Opportunities and challenges

Manufacturers in the heavy equipment market need to review their whole way of doing business to respond to current opportunities and challenges.

Customer expectations are evolving rapidly in all market segments. Customers expect digital sales and service processes, and a more digital, interactive relationship with their dealer and the equipment manufacturer. Looking slightly further ahead, operators of large farms, mines or construction sites may want their managers and supervisors to sit in something like a NASA mission control room. This scenario will integrate and build on today's dashboard-style screens so management can see at a glance who is where, which equipment needs service to avoid downtime, and at what rate fuel and materials are being used.

The main enabler of these expectations is more "intelligent" and communications-enabled vehicles and equipment. Telematics will be key; it's been suggested that these capabilities can reduce operating costs by 66-75%¹, mainly through elimination of labor costs. Other revolutionary advantages of autonomous driving include optimized fuel efficiency through stabilization of fleet speeds, fewer accidents, lower insurance costs, and faster delivery, since regular rest breaks won't be needed.

Heavy equipment manufacturers need to improve their ability to combine information about equipment and customers to produce insights that can be acted on, particularly in terms of predictive maintenance to avoid expensive breakdowns. Providing these insights requires software that can quickly combine telematics and other equipment data with customer information. Manufacturers themselves need more insights too in order to gain competitive advantage. They must combine customer, equipment, sales and other data to answer key questions – for example, to predict when a customer will be looking to upgrade or change equipment, and what models they will want to buy. These insights will in many cases need to be produced in conjunction with dealers, and in turn shared with the dealers.

Another group of challenges relates to operations, and the need to make use of digital manufacturing to go to market faster and with better products. Revolutions in digital manufacturing are improving product quality and uptime of assembly lines. New technologies such as additive manufacturing are making complex parts much easier to manufacture, resulting in overall cost reductions. However, realizing these savings can be hard. Many companies have spent several years designing and implementing new processes and systems, yet have never managed to roll them out beyond a few of their manufacturing sites. The challenge is to gain the efficiencies of standardization without sacrificing the responsiveness demanded by customers today.

So the industry faces a lot of disruption, but this can provide opportunities as well as headaches. Capgemini's research with the Massachusetts Institute of Technology (MIT) over several years, together with our collaborations with companies in sectors such as retail, demonstrate the enormous advantages available to organizations that embrace the digital economy and restructure around the customer. This is equally true for the heavy equipment industry. Disruptive change opens up business opportunities to add value for customers and increase profitability for manufacturers.



In the future, OEMs can sell performance rather than just equipment."

Riku Pulli, Sandvik

A practical response to the challenges and opportunities

We believe the industry's response is best planned around the four areas of activity identified above: customer, vehicle, insights and operations. Capgemini has established four corresponding focus areas within its automotive practice under the heading of AutomotiveConnect for Heavy Equipment:

Connected Customer

Vendors need to appreciate the business situations of their customers and why they need all the help they can get with maximizing uptime and return on investment. They also need to understand how customer situations differ depending on size and the exact nature of the business. Then they need to put these requirements at the heart of their own business and develop the services needed to meet them, either in-house or in collaboration with third parties.



¹ Tillemann, L., and McCormick, C., "This could be the biggest hurdle for driverless cars", in Fortune, February 15, 2016 <http://fortune.com/2016/02/15/driverless-cars-google-lyft/>

For large customers, they must support the “mission control room” vision by providing the right tools and data streams to enable constant, and highly automated, monitoring of equipment and driver data. Doing this depends heavily on the next two AutomotiveConnect elements, Connected Vehicle and Connected Insights.

Connected Vehicle

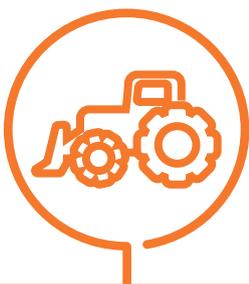
Each piece of equipment should have the telematics capabilities to relay information about where it is, what it is currently doing, and what condition it’s in to the “mission control room”. On-board systems can transmit data to a dashboard that enables a supervisor to instruct operators to adjust their behavior in such a way as to improve safety or accuracy, or to reduce fuel consumption and use of other materials, for example agricultural fertilizers. With the increasing use of autonomous driving and robotics, this type of data will be used to adjust on-board software without the need for human intervention.

Changes like these will necessitate high levels of security and, of course, problem-free internet access.



Technology is vital to heavy equipment efficiency. Machine technology advancements are critical to keeping margins lean. Our CAT machine uses Product Link to communicate fuel burn whether machines are being used or not.”

John Clark, CB Constructions



We want to empower our customers with the insight necessary to shift from a reactive ‘repair after failure’ mode to a proactive ‘repair before failure’ stance.”

Doug Oberhelman, Caterpillar



Connected Insights

Companies can gain competitive advantage by applying analytics to customer and equipment data, producing insights to enable the features and services discussed above. Obviously it is important to have the right telematics services installed in order to collect the right data. A key insight is “What is about to break?” since knowing that your tractor is running out of oil can minimize the time out of action, as well as allowing timely generation of safety warnings. With Connected Insights, real-time adjustment of the equipment itself becomes possible – for example, a truck hauling minerals in a mine can automatically adjust its engine configuration to provide the horsepower needed to get up a particularly steep slope.

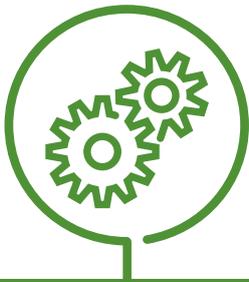
Connected Operations

To achieve the visions for the Connected Customer, Vehicle and Insights, manufacturers need to build heavy equipment in more sophisticated ways. We advocate a Connected Operations approach that takes advantage of newer techniques such as 3D printing, additive manufacturing, manufacturing intelligence, and predictive maintenance. These approaches help companies maximize their agility in every aspect of manufacturing, so they strengthen their ability to bring new products to market quickly and in accordance with customers’

preferences – including those products that need to be tailored to local requirements.

To do this, it's necessary to industrialize – i.e. standardize on best practice processes across the business – which must involve overcoming individual plants' resistance to standardization. Templates and other tools can accelerate and de-risk the process, making it possible to industrialize while safeguarding the organization's agility. Manufacturers also need to find ways to work more closely with dealers, both to understand customer requirements better and to ensure that the dealers are equipped to provide the necessary support.

Capgemini offers many solutions to help manufacturers across the heavy equipment industry to address the four interconnected elements of the AutomotiveConnect approach and better meet the changing expectations of their customers.



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Customers want information about the machines they purchase and they're relying on manufacturers to supply that information to their dealers, who use machine data to provide a better service experience.”

Al Cervero, Association of Equipment Manufacturers

Next steps

The changes discussed above have huge potential to benefit both manufacturers and customers in construction, agriculture and mining. Successfully achieved, they can create brand loyalty even among hard-to-please customers.

However, the changes involve enormous and potentially risky change. Our heavy equipment clients are finding that the model described above helps them approach those changes in a structured and low-risk way.

Manufacturers, customers and dealers all have a role to play in making the vision a reality. Manufacturers must provide working solutions, dealers need to make sure that the right options are available for each market, and customers have to be willing to adopt digital technology at whatever level and pace is appropriate for their business.

For more information please contact:

Vaibhav Mahajan
CHROME (Automotive & Manufacturing CoE)
vaibhav.mahajan@capgemini.com

Nick Gill
Chairman, Automotive Council
nick.gill@capgemini.com



About Capgemini

With more than 180,000 people in over 40 countries, Capgemini is one of the world's foremost providers of consulting, technology and outsourcing services. The Group reported 2015 global revenues of EUR 11.9 billion. Together with its clients, Capgemini creates and delivers business, technology and digital solutions that fit their needs, enabling them to achieve innovation and competitiveness. A deeply multicultural organization, Capgemini has developed its own way of working, the Collaborative Business Experience™, and draws on Rightshore®, its worldwide delivery model.

About Capgemini's Automotive practice

Capgemini's Automotive practice works with most of the leading automotive companies in the world. More than 7,500 specialists generate value for our clients every day through global delivery capabilities and industry-specific service offerings across the value chain, with a particular focus on our AutomotiveConnect propositions for OEMs, suppliers and retailers.

For more information: www.capgemini.com/automotive

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