Automotive Supply Chain and Logistics 2018
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The process of change within the automotive sector that had been so slow has quickened noticeably. The introduction of both electric vehicles and digital guidance systems almost appears imminent, with a timescale of roughly ten years for the transformation of the sector. The effect on both supply chain management and logistics will be profound.

The change is multifaceted. It concerns both markets and products:

- Powertrains are evolving rapidly. For the first time in a century there are serious alternatives to the internal combustion engine. All vehicle manufacturers are developing both:
  - Electric vehicles powered by batteries
  - Hybrid vehicles powered by a combination of batteries and internal combustion engines.

- The use of steel is beginning to decline as vehicle manufacturers look to reduce the weight of cars. This trend is uncertain though, as steel alloys offer considerable benefits in this area. However, Jaguar, Audi and Ford are already using aluminium extensively in their vehicles, whilst BMW is gradually introducing carbon fibre chassis technology

- Guidance is gradually becoming automated, with ‘active cruise control’ and ‘collision avoidance’ systems being used as the basis for wider capabilities in semi-autonomous vehicles. Such systems will be software-intensive, illustrating the trend towards an increased role for software in vehicles. This is also being reflected in driver interfaces, with extensive uses of touchscreen control systems in interiors.

Market developments are more commonly understood:

- Continued rapid expansion in emerging markets. If measured by numbers of cars sold, China is now the largest market. Despite what appears to be a markedly slowing economy, car sales in China are still buoyant, if volatile. India is also becoming a market of significance, albeit from a low base. Generally, markets across the emerging world are growing rapidly and changing the nature of the global market overall

- Sustained growth in developed markets. Although the recovery from the recession of 2007-12 has moderated, most developed markets continue to grow. However, the age of the ‘car park’ still remains elevated

- The aftermarket appears to be maturing structurally in developed economies, whilst growth is explosive in emerging markets. It is also unclear what effect technological change will have on the aftermarket. It is possible that it is threatened by a major contraction.

There is also change in the production technologies available to manufacturers:

- Automation is increasingly used at assembly plants. Whilst welding shops have been automated for several decades, automation is now increasingly used in in-plant logistics. Line feed is increasingly using automated guided vehicles, whilst consolidation operations are utilising automated racking and retrieval systems.

- The nature of assembly and production is likely to be transformed by the demands of new technology. Electric and electronic systems will require very different assembly systems, making less demands on capital equipment and the workforce. It is likely to resemble the electronics sector to a much greater degree.

01
Introduction
Implications for Logistics

- Over the medium to long term, the changed role of assembly plants and the changed geography of supply chains is likely to affect both the size and the physical location of assembly plants.

- Location of production in response to market growth in ‘new markets’ is resulting in a diversification in the locations of assembly plants. Vehicle manufacturers such as VW and GM now have a large proportion of their production capacity located in China, with other emerging markets growing in importance as well. India, for example, which was of negligible size as a location for global VMs production, is now experiencing substantial investment in new production capacity.

- Nature of the supply chain, as new types of engineering change the economics of the sector. A good example of this is carbon fibre, which will demand a radically different type of supply chain to steel. However, it will be in electronics that the greatest impact will be felt.

The direct effect on the automotive logistics sector will probably be significant. Already sectors such as automotive logistics in China are growing rapidly, with global VMs looking for high quality logistics provision, which Chinese LSPs cannot deliver. This sort of market opportunity is replicated across much of the world, from Brazil to India. However, the obstacles are significant as operating in such economies is often difficult. It is therefore likely that new LSPs will grow up to serve the global VMs in these economies, probably in the form of joint ventures between local and global LSPs. Anji-CEVA, in China, is a good example of this. That said, many of the larger LSPs have a strong incentive to enter these markets independently if they can, due to the growth prospects that they offer.

The implications for the logistics service providers serving this sector are enormous. Many face the need to rethink their business models. Not only will they have to deal with issues such as the changed pattern of globalisation, they will have to adapt to new operational activity by vehicle manufacturers and component suppliers. For example, the traditional road freight ‘milk run’ is increasingly old-fashioned and the road freight providers who specialise in it will already be under pressure. It might be suggested that large LSPs who specialise in ‘Transport Management Services’, can adapt in such an environment, however this is also questionable as the attraction of new web based ‘freight exchanges’ is only likely to increase especially if there is greater use of intercontinental air and sea freight.

Indeed, the impact of digital technology for the execution of logistics operations will be almost as significant as the impact on the automotive supply chain. The use of freight exchanges is one example of how the nature of LSPs themselves is changing. At the level of the tactical architecture of assembly plant and supply chain operations there will be very significant changes in IT architecture. Even the most advanced systems in place today are clumsy in terms of capturing customer demand data. The likelihood is that information ‘logistics platforms’ that combine greater customer data capture, artificial intelligence, and inventory management and enable deeper levels of automation will dominate logistics in the automotive sector. Many VMs are attempting to develop their own in-house capabilities, however ‘third party systems’, many of them derived from areas such as e-commerce (such as Ocado’s ‘Smart-Platform’) look to have a powerful competitive position here. If this does come to pass, then it would represent a fundamental change in the sector.

The issue of robotics, whilst important, is really an expression of this wider ‘digital’ change. The role of automation in in-plant logistics is being approached but is likely to go much further. Areas of consolidation, sequencing and line-feed which are often outsourced to LSPs, will become highly automated, squeezing out existing LSPs and replacing them with technology providers.

Ironically finished vehicles is an area that may see the least change. Although perhaps vehicles will become capable of self-loading on ships, trucks and rail cars, the need to move them from the assembly plant to the customer will remain. The question is, what will the patterns of this trade look like in geographical and retail terms? The geographical question is very hard to answer at present. It is unclear whether the flexibility of the new technology will enable vehicles to be assembled nearer the market or whether the flexibility of the technology will increase the range of products on offer, thus increasing the production centres resulting in greater movement of products around the world. Existing trends in e-commerce suggest the latter, but it is too early to tell. Either way it will have an enormous effect on car-carrier shipping, rail and road transport.

The issue of the retail inter-face is perhaps easier. It appears very likely that
the dealership structure that dominates automotive retail today will prove inadequate. It places too much of a gap between production and the customer. The likelihood is that the industry will need to create some form of digital interface with the customer. This will be more direct and thus the logistics between the assembly plant and the customer is likely to be more direct.

In summary:

- Inbound logistics is becoming dominated by technology
- LSPs who do not have access to technology solutions of the highest order will be replaced by those that do
- Information architecture will dominate even more than it does at present and this may be an area of outsourcing
- Customer interface data-capture will become central to logistics planning.
- The necessity of a global presence for LSPs will increase.
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CONTACT US

For further information please contact:

South East Asia
Carmel Perales, carmelp@logisticsexecutive.com

Greater China
Jay Han, jayh@logisticsexecutive.com

Australia/New Zealand/Middle East/Africa/Europe
Kim Winter, kimw@logisticsexecutive.com

All other enquires
Darryl Judd, darrylj@logisticsexecutive.com
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