

European Automotive Newsletter

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March 2023

Realizing efficiency gains in the automotive value chain by applying Digital Twin Techniques

Digital technologies are essential to enable automotive suppliers to maintain competitiveness.

Digital technology has been established as a key enabler of essential parts of the automotive value chain for decades. The strong and consistent uptake of digital technology is an indicator of the value that can be delivered through the focused application of technology in an area where the value case is clear and achievable.

The next opportunity for the automotive industry around digital is to establish digital integration across enterprise platforms by connecting the supply chain from Tier 2 via Tier 1 to OEM.

This end-to-end integration of business processes, also known as Digital Twin Concept will enable further gain of efficiencies in the integrated automotive value chain.

Demand sensing for improved sales & operations planning (S&OP)

S&OP is an area that stands to benefit significantly in this next opportunity. Supply Chain Digital Twin constructs are enabled by ERP and cloud storage technology, and integrate across the entire value chain. They link fundamental business process backbones from production all the way to the customer.

The Supply Chain Digital Twin is inherently the computerized representation of the different components and processes of the supply chain from the physical plant, equipment and warehouses to the manufacturing and transactional processes that enable the value chain to function. The data flow across this ecosystem brings the Digital Twin to life.



Digital Twin Techniques

Realizing efficiency gains in the automotive value chain by applying Digital Twin Techniques

The foundations to expand gains from digitalization are there

After having set the building blocks by implementing ERP, MES and process controls in the 90's and 00's, the automotive industry has been in the forefront of delivering the promise from Industry 4.0 for some time now.

Key I4.0 enablers such as Industrial Internet of Things (IIoT) backbone, AR/VR, Additive Manufacturing, Computer Vision and Machine Learning/AI make up the suite of digital tools. Tier 1 suppliers and OEMs can now draw from these tools to develop performance advantage in the core process areas outlined above (e.g., Production Planning, Quality, etc.)

Looking at Production Planning and Execution for a few examples:

- BMW applying additive manufacturing at an industrial scale as part of the R&D and Production Manufacturing process. BMW additive manufacturing output has approximately doubled in the past 5 years now reaching an annual rate of over 300,000 parts.¹
- Nissan is applying Machine Learning/AI technology provided by Senseye to predict the maintenance need resulting in the material reduction in unplanned downtime across more than 10,000 pieces of production equipment.²
- Autoliv has implemented an IIoT backbone enabling real-time production performance monitoring and control through the application of OEE dashboards and Statistical Process Control (SPC) capability for production cells.³

Building to cross enterprise integrated planning

With this foundation of process and manufacturing execution in place, we now see an opportunity for the further enablement of the S&OP process within a Tier 1 supplier and into Tier 2 partners and the OEM. This can ultimately set the stage for Cross Enterprise Integrated Planning (Tier 2 to Tier 1 and Tier 1 to OEM as a start). The key elements to have in place are:

- A strong S&OP process (both at executive and aggregate level);
- Application of Demand Sensing capability enabled through Machine Learning/AI; and
- Strong systems integration from order to fulfilment between parties.

Benefits to each trading partner come in reducing unplanned change overs, smoothening production flow', leading to reduction in unit cost. Another effect will be the improved balancing of inventories releasing more cash into the business and by this improving liquidity. We estimate a potential of 5% to 15% improvement depending on the company's starting performance base. Other areas of improvement can also come in quality, potential to react to supply chain disruptions and tighter traceability.

Demand sensing as an accelerator

The Machine Learning/AI tool set has now evolved to a level where this capability can be applied to the demand profiling activity of the S&OP process. Demand sensing tools apply Machine Learning/AI to recognize new customer buying frequencies, macro-economic events, promotional and other indirect effects – important inputs to the S&OP process. This enables a greater range of view of demand signals, rapid understanding of the relationship between demand in different periods across a multi-variant environment and helps to remove human bias developed through the demand estimating process.

Digital Twin Techniques

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We believe the integration of the S&OP improvement process with the creation of the demand sensing capability delivers a strong result. As the Executive or Aggregate S&OP process is implemented and begins to flow, the demand sensing capability can then be incorporated into the process, boosting the effectiveness of the method. Rapid deployment of this capability comes in the following key steps:



Measurable results with A&Mplify

As we strongly believe in the growing importance of digitalization to conquer the ongoing need of efficiency improvement to remain competitive, A&Mplify (<u>https://a-mplify.com/</u>) was established. With digital services bundled under this brand, we support our customers in benefiting from technological opportunities.

The results achieved in the past prove the value of this service. As an example, for an industrial manufacturing company experiencing raw and semi-finished inventory imbalances across its network of factories, A&Mplify's Demand Sensing tool was applied to better forecast the demand for the input materials for production. The application of the tool improved the prediction accuracy by 11% and 21% for low and medium volatility materials as compared to a moving average method. An important factor when looking for reliability in the front end of the S&OP process.

Questions? Please contact our digital experts: John Woods, Martin Zamora or Nick Greenway





In January 2023, Götz Klink joined A&M as co-head of the firm's Industrial Practice in Europe. Given his strong automotive background, we invited him to discuss his view of the current environment in the industry, challenges faced by OEMs and suppliers, and ways to overcome them:

While the Automotive Industry has always been a tough field, in the last 4-5 years, it seems that the whole industry is in a never-ending crisis mode.

Indeed, the industry is facing many challenges. In my view the underlying technological transformation is prevailing, especially electrification, autonomous and digitalization requiring a substantial shift in business models and significant investments. Currently, these long-term challenges are aggravated by additional medium-term challenges namely the Corona pandemic, that triggered the chip-crisis with massive increase in logistic costs, and the war in Ukraine, which caused increasing energy costs and sparked inflation. But complaining does not help. It is the task of the companies and their management to adapt to these changes and develop corresponding counter measures.

Given their market power and financial strength, this seems to be far easier for OEMs compared to the suppliers.

During the last couple of years, this clearly has been the case. EBITDA margins of OEMs have been above supplier's margins providing them with additional financial leeway. However, before 2019 suppliers usually achieved higher margins than their OEM customers. While OEMs that leverage supply shortages to increase price levels will be impacted by price increases with a time lag, suppliers felt the impact much faster. However, what will prevail are new competitors without legacy structures and a trend toward shrinking potential for differentiation. Therefore, I believe that the profitability ratio OEM vs. suppliers will flip again.

Do you think that suppliers will manage to increase their profitability in the future? How does this fit the often-mentioned view that the current economic environment might lead to an increasing number of insolvencies in the supplier landscape? The situation is critical, but there is a significant difference between the various market segments of the automotive supplier industry. Powertrain, the largest segment, is highly dependent on ICE, and suppliers in this segment are particularly affected. Global production volumes will decline significantly, leading to further erosion of fixed cost coverage. However, consolidated sub-segments in ICE powertrain like injections systems or turbochargers will be able to operate an attractive business model if they consequently focus on cash. Many other segments e.g., suppliers in interior or exterior will benefit from the market recovery and increasing content per vehicle.

> While OEMs have had greater financial leeway in recent years, I believe the profitability ratio between OEMs and suppliers will reverse again.

In this aspect some market players follow the so called "last man standing" strategy. Is this an approach you would recommend to our clients?

I only recommend this approach if the company already has a significant market share and ranks among the Top 2-3 players in the global markets or core regions. These players are "natural last men standing". Their cash cows regularly have good margins and require limited investments. Becoming a "last man standing" is different. In most cases I have seen it does not pay off due to required investments to gain share in shrinking markets, typically through acquisitions.



Suppliers whose product portfolio is especially focused on ICE related products are faced with the need to adapt their strategy. What else can they do besides downsizing their businesses?

There is no one size-fits-all solution across the industry. Strategies strongly depend on the specific situation of the supplier. If a supplier, specialized in powertrain, was not able to establish a sustainable business model suitable for EV till now, only a few alternatives remain.

Either the supplier can expand its competencies in different segments (e.g., interior, chassis) within the automotive industry or is able to offer its core competencies in completely different industries. Both ways require a substantial financial investment to be successful. As a rule of thumb, I recommend exiting from every unsustainable business, defined as not being able to deliver relevant/ similar profit pool within the next 5 years.

Besides suppliers being in a distressed situation, what other challenges are companies currently facing?

The transformation to EVs has accelerated in recent years. Most OEMs have aggressive roadmaps to invest only in CO2-free platforms and to stop selling ICE models in core markets. The era of ICE engines will largely end by 2035 / 2040. Efficiency factors of alternatives like e-fuels or H2 injection will prevent meaningful shares for these technologies. Suppliers with a sustainable business model addressing the needs of EVs must meet the challenge of becoming profitable despite the following key issues:

- 1. Managing a significant number of parallel ramp-ups/ SOP in time, quality, and costs,
- 2. Acquiring attractively priced revenues to achieve critical production volume, allowing sufficient fixed cost coverage
- 3. Tight management of cost base as underlying macroeconomic challenges (inflation, shrinking demand, difficult supply chains etc.) affect the supplier landscape needs to be addressed

Cost management is a topic that should always be on the agenda of the automotive suppliers' management teams.

Of course, classic cost reduction (e.g., in purchasing, manufacturing, and supply chain) is key and requires continuous focus. But the current "perfect storm" additionally calls for structural measures. I see the current situation as a "perfect opportunity" for successful companies to reconsider:

- Cash Management: until recently, cash was not in focus for many suppliers. That changed with lower volumes, insecure supply chains, increasing raw materials prices, and increased interest rates. Lenders are careful. Strict cash management is a key requirement now and in the future,
- Pricing: the likeliest scenario for 2023 is that OEM sales will further shrink due to the overall economic situation. Therefore, it will be much harder for suppliers to renegotiate prices successfully. Pricing (incl. change and claims management) is critical and needs to be based on a clear understanding of product profitability by customer and platform, as well as the cost impact of rising material prices, energy costs, and labor rates.

ABOUT GÖTZ KLINK

Götz Klink is a Managing Director with Alvarez & Marsal Corporate Transformation Services in Munich and co-leads the firm's Industrial Practice.

He specializes in large-scale transformations, design and implementation of new business and target operating models. His primary areas of concentration are improving operational and financial performance.

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Cash and Pricing are definitely key. But can you share further structural measures?

You are right. Let me come to even more challenging levers.

- Portfolio management: specifically, suppliers with multiple divisions / business units have a combination of traditional and future business and should ask themselves:
 - What is required to generate adequate profit pools with future businesses?
 - Is my traditional business able to finance future businesses?
 - Am I the right owner for my businesses?

I expect many portfolio adjustments via carve-outs and M&A

 Rightsizing: before Corona, suppliers enjoyed a long growth period with EBIT margins of 6-8% in average. Vast majority of segment leaders earned higher margins. In consequence, structures (plant networks, R&D centers, overhead functions) grew and were hardly challenged. Now, a zero-based approach is beneficial, where required capacity and an affordable cost base are derived from expected realistic market volumes and cash and profit targets. *Leadership*: it seems obvious, but leadership is hardly in focus unless something goes wrong. In transformation projects I supported, top and middle management made the difference with regards to success, speed, and impact. This is even more true in situations that require ambidexterity, e.g., managing established products and driving innovation that define the future.

And good for us, as all these activities usually require external support?

Yes, but. Yes, the classic reasons why consultants are hired are to analyze the situation, define measures, and draft a roadmap. The external perspective and the rigid fact base consultants can provide (e.g., benchmarks, best practices) is of course very valuable.

And the but?

In many cases, companies know their issues already and even have plans in their drawers. What companies are struggling with are: taking clear decisions and driving relentless implementation to ensure the desired outcome.

My lessons learned: focus more on the financial value consultants can deliver in supporting implementation than on gaining insights.

Or as we call it at A&M: Leadership. Action. Results.

Transaction activity

In recent transaction news, activity remains focused on re-positioning for an EV-focused future for the automotive industry. Major players continue to purchase capabilities in the face of an evolving regulatory environment: Volvo will be investing in autonomous trucking company Waabi for an undisclosed amount and Shell will acquire Volta for its charging station distribution. Furthermore, Nissan/Renault restructure their long-troubled relationship with a prospective restructuring agreement altering the balance of power between the two. Ford Motor Company is re-entering Formula 1 through a partnership with Red Bull Powertrains.



- Volvo is investing an undisclosed amount in autonomous trucking technology company Waabi Innovation. The investment represents Volvo's view that commercialization of autonomous technology will come in freight before passenger vehicles. Volvo said its investment did not represent a material financial event.
- Shell will acquire EV charging firm Volta for \$169 million in an all-cash deal. Volta, which went public in 2021, installs chargers at grocery stores, office buildings and elsewhere. Volta issued a going-concern warning in May of 2022, citing dwindling cash reserves and workforce cuts.
- Renault and Nissan have agreed to restructure their partnership. The proposed new agreement includes Renault reducing its stake in Nissan from c. 43% to 15%, transferring the 28% into a French trust, and Nissan acquiring up to 15% of Renault's EV business Ampere. A finalized agreement is expected by the end of the first quarter and is scheduled to close in the fourth quarter.
- Ford is partnering with Red Bull Powertrains to reenter Formula 1 in 2026, when new regulations will take over for engine manufacturers. The partnership will supply power units for Oracle Red Bull Racing and Scuderia AlphaTauri from 2026 to at least 2030. Ford's last venture in Formula 1 was through its Jaguar branded team that was sold to Red Bull in 2004.

Regulatory landscape

Diesel Ban in major cities: While the EU recently agreed on only allowing new car registrations for zeroemission vehicles from 2035 onwards, an increasing number of cities are moving forward to ban ICE driven vehicles, especially those with diesel engines from their centers. Munich just announced that from October 2023 onwards EU5 vehicles must not enter the city and Hamburg will transform its entire taxi fleet to EV until 2025. In London, it is discussed to move away from a £12.50 daily-charge for diesel and petrol cars to a complete ban.

Car Recalls: In 2022, the car makers initiated in the EU 209 recalls with Mercedes leading the ranking with 39 recalls. However, there is a positive trend visible as the number of recalls are declining compared to 2020 and 2021. Most recently, the National Highway Traffic Safety Administration initiated a recall of 350,000 Tesla due to issues with self-driving assistance. Tesla plans to fix the problem via a software update.



After slow deal activity in 2020 and 2021, the European M&A activity in the Automotive sector picked up in 2022 and remained on a high level in Q4-22 with a below average deal size.

A considerable number of these transactions relate to acquisitions of companies active in the field of electrification and autonomous driving technologies.

Since mid 2022, insolvency statistics for Europe and Germany show an increase in filings indicating a reversal of the trend of fall in in filings since the corona pandemic in 2020.

The number of filings might experience a further acceleration due to the imminent recession as well as increasing interests rates especially for companies with considerable debt on their balance sheets.





Based on the latest insolvency statistics for Germany, published by the German Federal Statistics office, insolvency figures for FY2022 started to increase and will be slightly above the FY2021 filings.

Despite the ongoing economic and geopolitical challenges in Europe and the global recession risk, which affect all industries, the number of insolvency filings in Germany in HY2 2022 remains on a low level (-25% compared to 2018) and only increases moderately.

- This industry snapshot of financial KPIs compares the quarterly published results of 20 OEM and 70 automotive suppliers since 2017.
- While the OEMs managed to operate at an EBITDA margin above the Suppliers' EBITDA margin almost continuously • since mid 2018, in Q2 2022 the average OEM's margins continued to decline and was at the same level as suppliers.
- Equity ratios for OEMs and Suppliers continue to increase. While the OEMs show a higher average equity ratio than they had before the corona pandemic, the Suppliers have still not recovered from the hit they had to take in 2020.









Equity ratio (%) – Supplier vs. OEM



2019

2020

2021 2022





Source: Company Information, A&M analysis



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ABOUT ALVAREZ & MARSAL

Companies, investors and government entities around the world turn to Alvarez & Marsal (A&M) for leadership, action and results. Privately held since its founding in 1983, A&M is a leading global professional services firm that provides advisory, business performance improvement and turnaround management services. When conventional approaches are not enough to create transformation and drive change, clients seek our deep expertise and ability to deliver practical solutions to their unique problems.

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