Arthur D Little

Automotive Quarterly Newsletter

Spring 2006

What Now for LDV?

2005 will go down as the year Birmingham finally lost its automotive heritage. Rover succumbed to the inevitable as declining market share finally levelled out at near zero and the economics of its under-sized production facilities strangled the cash flow. Then four months later LDV, another automotive "Phoenix" crashed to earth. Throughout both sagas, we heard the comments, from Management and Unions alike: how could these businesses with such great products be allowed to die?

The facts are simple. Virtually anyone in the industry would agree it was a miracle (well with a little Government funding) that these businesses survived the 1990's at all. As Nanjing and SAIC fight over the carcass that was Rover, a more interesting question is what will Sun Capital make of LDV?

This "Phoenix" arose in 1993 as a management buyout from DAF NV's bankrupt van manufacturing division as Leyland DAF Vans Limited. At the time there was serious questioning in the press as to how could the business be sold to a failing management team at what seemed very advantageous terms.

The first few years were stable. They phased out the Sherpa and developed the Convoy and Pilot products during a buoyant market for light commercial vehicles that grew year on year both in the UK, and in Europe. Then as the late 1990's arrived, a tie up with Daewoo, an investment of £40m and talk of 80,000 units a year from Washwood Heath seemed to open the door on a new dawn.

However, the curse of the British motor industry was not far behind. Halfway through the new van development cycle, in 2001, Daewoo went into receivership (to be bought by GM…. another story). LDV managed to buy the tooling and recover the designs but the damage was done. The new van was now well behind schedule, and the current models were rapidly running out of steam, particularly against a whole new range of vans from both the East and Europe, making market conditions very competitive. Market share plummeted; from being 3rd in the UK with just below 10% in 2000 LDV dropped to eighth and less than 4% share by 2004.

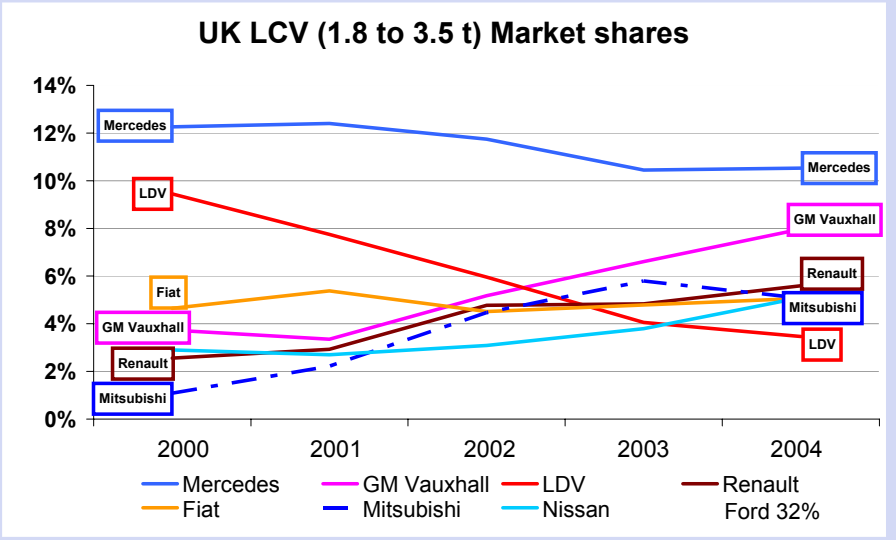
The impact on the business was clear. Volumes began to drop from an already low production volume of 15,000, and losses grew. However, simple business economics were not going to stop LDV. Large government grants and venture capital injections to pay for new production facilities, married to some careful asset sell offs and creditor management, kept the business afloat.

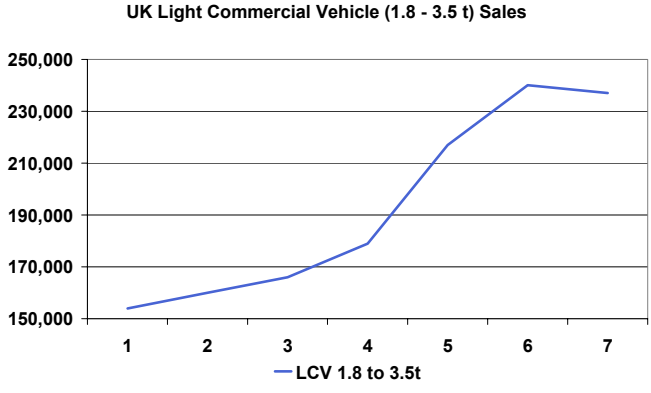
The Changing UK Van Market

Since 2000 the UK Light Commercial Vehicle (LCV) market has seen all the major auto manufacturers launch new van products.

Ford has managed to retain its dominant market share at around 32% while Mercedes has dropped slightly from 12.5 to 10.5%.

However, the real winners from the LDV problems have been GM Vauxhall growing from 3.5% to 8%, Mitsubishi (1% to 5%) and Renault (2.5% to 5.5%).





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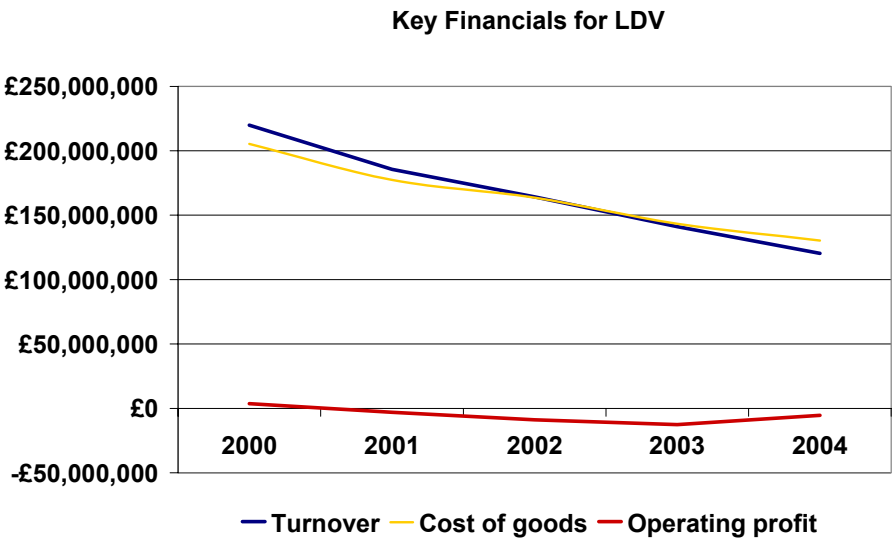
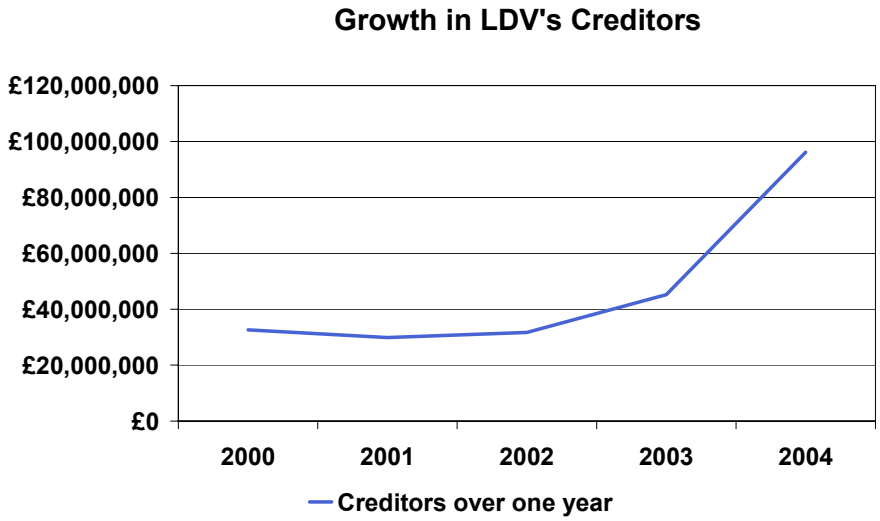
Every year talk of growing volumes kept spirits up. Shangri la was just around the corner, and it was only last May that the Trade and Industry Secretary Patricia Hewitt opened the new Magnus production line with further high hopes of success.

Now we come to the real victims. As 2005 came to a close clearly the Magnus had not achieved the market penetration required; cash and supplier goodwill began to dry up and creditors over one year sky-rocketed (below). By November 2005 suppliers probably called it a day. The factory gates shut, and the employees were retained to build as much as possible from the remaining stock, putting it beyond the hands of creditors.



However, to keep a business, with £100m in outstanding bank debt and only £120m turnover was just simply impossible. Then suddenly, just before Christmas the business was dropped into receivership ostensibly to ring fence the Pension scheme (£30m), but it also enabled future owners to hide from over £150m of creditors. Then in steps Sun Capital and buys the business for its remaining assets. No doubt suppliers were just expected to turn to their insurers to cover their losses. No doubt these are the same insurers who have just had to pay off large amounts to Rover suppliers as well.



So where to now for Sun Capital? Clearly existing suppliers will be very wary of any future credit limit without insurance cover, thus just being able to re-energise the supply chain will be a major achievement. There must have been a number of smaller suppliers who did not have insurance cover and must be feeling particularly bruised from the receivership saga. These are the small businesses who used to be a core customer for LDV's products and who have always suffered from this kind of cynical debt-avoidance. One has to ask how much goodwill they will extend to LDV, knowing that the new owners have fundamentally used the same trick.

However, getting the assembly track rolling again is only the start of Sun Capital's problems. Just what do you do with a small production facility and its inherent poor economies of scale relative to its multi-national competition?

There are not many options. They could opt for today's popular answer to everything automotive and sell the design and local sales rights for the Magnus to a Chinese producer to gain some revenue.

They could change the structure of the production lines to become a specialist builder for an auto-major; while volumes of 50,000+ per annum are well served by the likes of Magna and Pininfarina, short production runs (<10,000) of niche vehicles can give an OEM a real brand boost yet few facilities exist to fulfil this need. LDV's OEM processes and shiny new paint shop could give it a real edge in this sector.

Possibly they could utilise the skill base to build sub assemblies for the majors, although it is hard to see what they would add compared to any other tier 1 supplier.

Maybe they should dive into the specialist vehicle industry which makes everything from fire engines and dustbin trucks to armoured luxury cars. This is a sector which seems fairly diluted in the UK. Can LDV use its assembly capabilities which should be clearly superior to the 'cottage industry' players to carve out a big chunk of this market and shape the restructuring of the sector?

Whatever solution they pick the future for LDV is not clear and unlike the sports car market there is little economic sense continuing in their current form. There will have to be a radical re-think or else we could be seeing another Phoenix fall back into the fire.

Nick Toone, Senior Manager
toone.nick@adlittle.com

“From Cars to Automotive Solutions” – a new Paradigm for Securing Profits

Open the business section of any newspaper and you will find more bad news about the performance of the auto sector. At the time of writing we have just seen Dana filing for Chapter 11, Jaguar abandoning plans for a unified platform, and VW CEO Bernd Pischetsrieder fighting for his job while the unions threaten strike action.

An increasingly complex and competitive market, driven by changes to both the demand and the supply side, continues to stifle profits.

Price transparency and tougher competition have created significant price pressure at the point of sale.

While the group tests conducted by car magazines have always been a major influence on car buying, buyers now have access to far more information than ever before. Not all car magazines are now aimed at enthusiasts – there is more focus on the choice of run-of-the-mill cars. And while the average buyer is still wary of buying online, they will happily trawl the internet for car configuration and pricing information.

Changes to retail formats are also facilitating comparison – clusters of dealerships on out-of-town retail parks, multibrand dealers and car supermarkets all make it easy for a prospective customer to flit between a number of cars in a short timeframe.

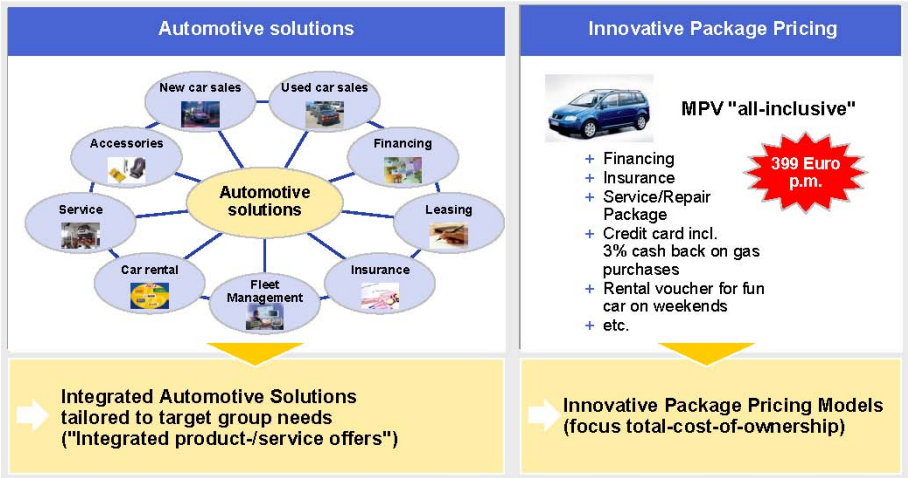
Competition between brands is intensifying: Car demand has been little more than stagnant and products from relatively recent entrants (such as the Korean car makers) are now seen as just as capable as those of the established European and Japanese players.

At the same time, traditional dealers are under more pressure from car supermarkets, grey imports and to a lesser extent online purchases from car brokers or online retailers.

The result is that on all but the most sought-after models, car dealers have been forced into a culture of discounting.

At the same time, the economics of supply are changing.

Dealership costs are mounting as dealers invest in showrooms, technical equipment and personnel, driven by OEM presentation



standards and the ever-increasing technical content of vehicles.

Manufacturing costs are also changing. Although new models are sharing platforms and powertrains, stricter standards for emissions, fuel economy and safety have driven up development costs for these major components. So although the variable cost of the car declines steadily, OEMs are tied into achieving high volumes in order to absorb sunk development, infrastructure and marketing costs.

Faced with these challenges, the task for OEM, National Sales Company (NSC) and dealer is to find innovative ways of securing margin.

One option is the aftermarket. Downstream services currently account for approximately 50 % of the total revenue within the automotive value chain. However, they account for about 90% of the profits!

Servicing revenues have always been a valued revenue source for dealers (and the labour rates a long-standing irritant for the consumer). The end of block exemption seems to have had little impact on these revenues – second hand buyers still value a full set of dealer stamps in the service book.

While the OEMs already have a presence through the sale of spare parts, they have eyed up other parts of the aftermarket sector for a few years and wondered how to extract value from it. One thing seems clear, hard times call for firm actions. Merely bolting on a couple of extra services (such as insurance, free servicing or extended warranties) or worse, buying your way into the aftermarket then failing to integrate (Ford with Kwik-fit for example), won’t make much difference.

The answer for the OEM could be to embrace complexity and to innovate. There is an opportunity for a complete carve-up of the way we own cars - a move from car ownership to buying automotive solutions.

New car buyers have moved from checking only the purchase price of a new car to considering the total cost of ownership during its life cycle. This changing consumer behaviour is marked by a distinct shift to finance or leasing packages. Approximately 70% of all new cars are now financed or leased.

In the UK in particular, taxation policy has a led to a decline in company car use. Presented with a monthly cash alternative to the company car, ex-company car users opt to lease or finance a car rather than buy outright, and the monthly cost (covering finance and depreciation) is the prime means of comparison.

However, this growing population of former company car drivers miss the convenience that they used to enjoy – someone else used to organise servicing, insurance, repairs and car tax.

Does this lead to an unsatisfied market for an all inclusive automotive solution covering all the costs of car ownership, tailored to individual needs and budget?

The closest that any OEM has come to this in the past was Daewoo on its European launch. While this offered generous warranty and service terms (including collection from the owner’s home) it

Own a Ford, borrow an Aston?

Maybe the current fashion among the global OEMs for owning a premium brand or two could be used to enhance the parent brand for once.

When you buy a Ford, Fiat or VW do you really care that Aston Martin, Ferrari and Bugatti are owned by the same OEM?

But if part of your Ford automotive solution included the loan of a prestige car for a weekend treat for example, then you might start thinking of the blue oval in a different way.

Those about to move house might be more persuaded by the use of Transit for a week…

stopped short of a full service offering, and was hampered by a virtually unknown brand and ageing models.

As this trend develops, there are a number of key challenges in effectively exploiting the downstream potential of these all inclusive packages.

Firstly, defining the scope of the package. How much more than the current offering is required? Is it simply a case of bundling current services? Equally important is knowing where to stop. The car companies would like to get a share of fuel costs as well (possibly via a credit card offering), but are they really going to add any value to this?

Pre-configured product and service packages are not the ideal solution for all customers. It will be necessary to identify and define target customer segments with homogeneous interests and tailor solutions according to the needs of these segments.

Secondly, while most automotive manufacturers already cover a good share of the products & services on offer, they are often inefficient. In many cases, OEMs use a variety of separate teams to sell products and services to customers. Multiple sales forces therefore approach both retail and end customers with their individual product and service offerings. This results in poorly coordinated activities and significant inefficiencies. Wide ranging changes to systems and organisation (explored in the box opposite) would be required to make this work.

Finally, support from the dealerships is critical to a successful launch of this new service.

Selling product and service packages is a new challenge for the sales force, requiring comprehensive training across disciplines, and adjustment to incentive and compensation systems.

Yet while there are major opportunities here for OEMs, there may be less benefit for dealerships. If taken to its ultimate conclusion, this trend redefines relationships between OEM and consumers; OEMs may also take the opportunity to reduce the dealerships' share of the value.

The Western automotive industry is facing stronger challenges than ever before. Offering a complete automotive solution has the potential to achieve the kind of downstream integration that the industry has long yearned for, with significant first-mover advantage available to whichever OEM seizes this opportunity.

Nick Toone, Senior Manager
Marc Winterhoff, Associate Director
Alexander Krug, Manager
Christoph Terrahe, Senior Manager

Key Changes

The move to automotive solutions increases complexity and requires fundamental changes:

Sales strategy and objectives

The objectives of all the business units involved (from manufacturer to dealerships) must be aligned to focus on total profit.

Sales systems & processes

All relevant information must be available at the point of sale, customer communication has to be consistent. To achieve this, sales information systems and processes must be aligned across the business units.

Internet capabilities and online car configuration facilities must be redesigned to suit this integrative model. Customers need to be able to view comprehensive and complete information on product and service offerings from the Internet.

Organisation

Success will depend on increased cooperation between the different departments and business units involved. Major organisational change may be the only way to achieve this.

Innovative Hybrid-Electrical Vehicle Concepts Drive Next Generation of Power Electronic Modules

I. Introduction

The emerging trend towards the use of hybrid powertrain concepts is creating an increased demand for power electronics.

The function of power electronics is to control and convert electrical power. As a result it is a cross-sectional technology that can be found in various automotive applications. In modern cars, many electrical loads - from actuators to lighting systems – are now controlled via smart semiconductor modules.

Growing consumer demand for superior performance and enhanced safety features continue to drive the increased application of electro-mechanical modules with high integration potential.

Mechanical actuators and contacting sensors are being replaced by 'smart' components. Environmental pressures are resulting in increasing numbers of hydraulic actuators being replaced by electric actuation, reducing weight and system size and improving fuel efficiency.

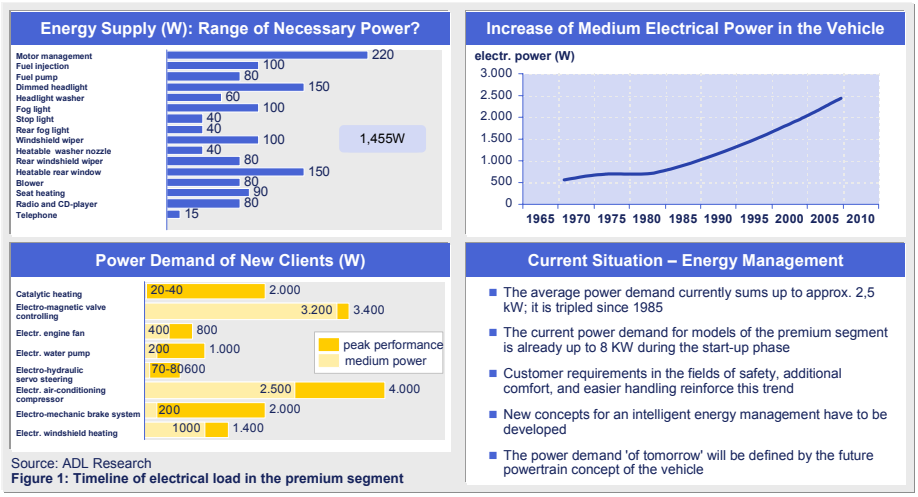
The first components to adopt the new technology were technical products such as pumps, fans and blowers. Over time this has expanded to include engine, transmission and braking systems. But as each new power electronics system needs energy, this has resulted in electrical loads of the order of 2.5 kW for today's premium automobiles.

As a result, the automotive industry is seeking new efficient energy management concepts based on innovative storage technologies beside the conventional battery.

II. New power electronic modules

New automotive developments (e.g. X-By wire, Adaptive Cruise Control, Intelligent Battery Sensors), as well as the electrification of existing functions (e.g. power assisted steering) require the application of power electronics. Cost reduction of power electronics will continue to be a major challenge for the industry.

The following three examples of current production systems illustrate the impact of power electronics.



Source: ADL Research

Figure 1: Timeline of electrical load in the premium segment

Starter-generator system

A starter-generator system consists of a synchronous machine attached to the combustion engine, linked to the battery by an electronic inverter. In simplest form, the starter-generator is attached by belt drive to the engine, minimising mechanical changes. This form of mild hybrid allows engine shut off during low speed deceleration or idle, a degree of regenerative braking and some transient power enhancement, leading to fuel economy benefits of up to 13%.

Electronic clutch system

To reduce driver workload (particularly in city driving) an electric actuator and clutch position sensor replace the conventional mechanical link which opens and closes the vehicle's clutch. An electronic control unit drives the actuator, analysing pedal position, clutch and gear shift position and car conditions to optimise clutch control.

Advanced Xenon lighting systems

Decentralised intelligent electronic components are directly attached to Xenon lighting systems and their ignition unit. The ignition of the Xenon system reaches a peak voltage of about 20 kV, which is smoothly handled by power electronic modules. The innovative manufacturing process of fixing the SMD components on ceramics with heat-sink technology gives high temperature resistance characteristics, a basic requirement for this harsh operational environment.

III. Conclusion

Cost reduction of power electronics is the key challenge to enable broader penetration in the automotive market. As discussed above, the automotive environment has specific key characteristics (high reliability, harsh environments) and higher long-term requirements than other industries. If the electronics industry is able to meet these challenges, the automotive power electronics market will expand more and more rapidly.

Hans-Peter Erl, Senior Manager
Stefan Lippautz, Associate Director
Wolfgang Bernhart, Director

Product Portfolio and Platform Strategies a Case Example of the Roadmap to Excellence

Introduction

Growth through innovation is back on the management agenda. In Arthur D. Little's third Global Innovation Excellence Study published in 2005, enhancing a company's innovation was considered to be the most important lever to increase profitability and growth.

Specifically, one key parameter to success is to implement competitive product portfolio and platform strategies.

Case Example – The Challenge

A global automotive company asked Arthur D. Little for help to improve performance by implementing a "best practice" product portfolio and platform strategy. The company had been struggling with poor financial performance for a number of years. Area managers optimised their business performance, sometimes "bypassing" product planning to trigger product development. This drove reactive rather than proactive R&D behaviour. In addition, there was no clear link between business plans and product plans. This limited the CEO's ability to challenge suggested product investments and their contribution to the overall company performance and priorities.

The project started off by modifying the existing product/market segmentation model. The revised model focussed on aligning the market and application factors with the product dimension. In addition, the new model offered a high level of standardisation in each market segment.

Benefits

- A base for competitive product planning through segmentation
- The right degree of complexity in terms of number of segments in the model (27 in total)

Prioritise to fulfil strategic intent

All segments were thoroughly analysed for market needs to understand the current situation and the business requirements over future years.

Benefits

- Highlighting mismatches between priority and R&D spend – 30% of the R&D budget was currently allocated to a low priority segment

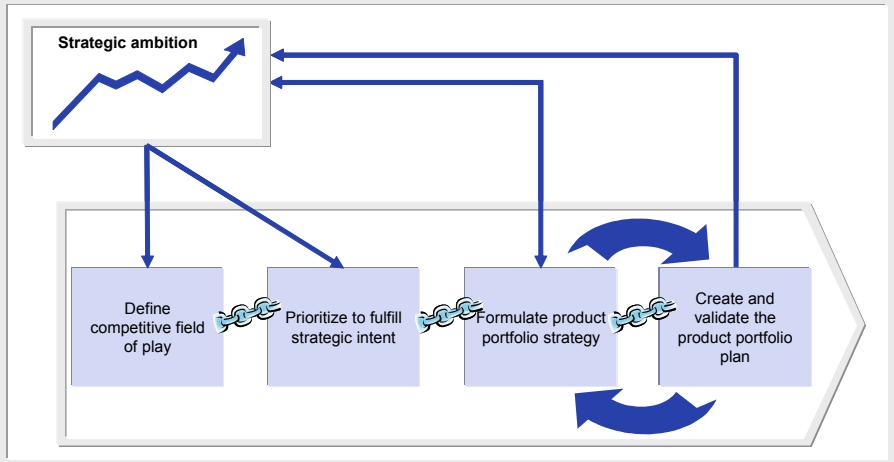


Figure 1: Roadmap to excellence

- A clear definition of "where to compete"

Define product portfolio strategy

The product portfolio strategy reviewed questions like how, when and against whom to compete in each segment. As a result business objectives in the business plans could be challenged and gaps closed.

A new product platform structure with improved modularisation was created. This overcame inefficiencies in the current range.

All in all, this set the prerequisites for a competitive product portfolio, meeting the defined, business ambitions.

Benefits

- An aligned product portfolio and corporate strategy
- A totally new product platform and modularisation concept
- A reduction potential in product complexity of about 40-50%, with a product cost reduction potential of more than 10%

Create the product portfolio plan

After the product portfolio strategy was formulated, the product plan was built up.

A number of scenarios were developed to support management's decision on the way forward, e.g.:

1. An aggressive scenario with a rapid parallel platform introduction pace supporting products in high and medium priority segments
2. A moderate scenario with a medium (serial) platform introduction pace supporting products in high priority segments first and medium priority segments later

Based on management's restrictions, two major blocks built up each scenario:

1. The "Must have" – R&D efforts needed to stay in business in all business areas
2. The "Management options" – R&D resources available for optional actions

The segment prioritisation guided the creation and order of the "Management options".

The two scenarios were tested in a simulation session. Management decided to implement the moderate scenario.

Benefits

- A new way forward for the company described down to the product and platform level
- A fully anchored product plan aligned with business ambitions
- A base to fully align market and supply chain strategies
- Increased CEO confidence in the decision logic from business planning to product planning

Anders Johansson, Manager
Per I Nilsson, Principal
Wolfgang Bernhart, Director

Latest Research in Brief

Mastering Complexity in Global Engineering Development Organisations

Arthur D Little and the University of Berlin have developed a technique to measure how closely a company's development organisation fits with its strategy. Based on interviews with 66 global companies, of which 37 were automotive, the study concluded that most development organizations are suboptimal for delivering the stated strategy and, therefore, there are significant opportunities for improvement.

The study highlighted some major opportunities for automotive companies to further reduce costs and lead time:

Increased central coordination of engineering - 51% of automotive companies opted for engineering organisations reporting to BU heads, rather than to a global head of engineering – however this only fitted with strategy in 10% of these companies. So for the majority of these companies, any brand differentiation benefits were outweighed by lost opportunities for economies of scale and re-using common parts and concepts.

Globally centralised engineering - 60% of automotive companies had some form of matrix structure for engineering; however this was only appropriate for about a quarter of these. A more globally centralised model would lead to potential cost reductions and reduced innovation cycles.

Independent project management was felt to be the best model for project control (used by 33%), yet more companies used the less effective alternatives of a matrix structure (50%) and line reporting with a project coordinator (17%).

Specific, personalised responsibility for lifecycle product/program management, the most effective method, was only present in 30% of companies; in 51% of companies it was carried out by committee and in 19% of cases there was no explicit responsibility.

Integration of engineering, purchasing and manufacturing only occurred in 13% of companies where they all report to one head - In 71% of cases these three critical functions were completely independent.

For further information please contact Paul Eccles, Director

Will development engineering follow the trend in production and move off-shore?

Arthur D Little has recently concluded a study across 55 global companies from the aerospace & defence, automotive, engineering and electronic sectors. Not surprisingly, the study concluded that most respondents anticipated moving significant amounts of their development engineering off-shore over the next five years. However, the reasons for doing this were not primarily cost but closeness to market or access to qualified resources.

This highlights the importance of emerging markets, particularly for automotive suppliers. Interestingly, in aerospace and defence the primary reason for moving activity off-shore is access to qualified resources. Clearly, this says a great deal about the standards and numbers of suitable development engineers graduating from our western education system.

China looks set to be the primary destination for off-shored development activity. Our respondents expect some 27% compound annual growth rate in this activity between now and 2010. In China almost 40% of university students are studying engineering related topics, rather than media studies.

Interestingly, Eastern Europe was rated second by our respondents primarily because of geographic proximity. Here we see no shortage of qualified labour with, for example some 75,000 engineers/IT specialists graduating each year in Russia.

India was placed third, with some 80,000 graduate engineers and IT specialists each year. Costs in India are typically 45-50% below Western Europe. The additional advantage in India is the widespread use of English.

This raises some key questions for policy makers. Is this the start of a wider trend and will research follow development engineering off shore?

If you would like more details please contact Paul Eccles, Director

Our Automotive Background

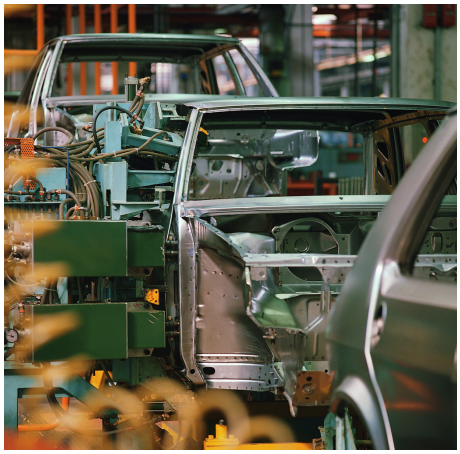
Arthur D. Little's Global Automotive Group helps you to find answers to the key questions facing the automotive industry. We have a track record of automotive work dating back to the creation of the first R&D lab for GM in 1911. Our consultants, many of whom have an automotive industry background, are experienced at working with:

- Passenger car manufacturers
- Truck manufacturers
- Tier 1 and Tier 2 suppliers
- Engineering service providers
- Distributors & Dealers

In recent years Arthur D. Little experts have been involved in highly transforming projects such as strategy (including industrial strategy and off shoring), technology and innovation management, R&D efficiency, performance improvement and distribution streamlining.

We regularly carry out studies on important industry trends and issues related to innovation and effective complexity management.

Collaboration is at the core of our approach, to ensure concepts, analysis and plans are committed to at all levels in the organisation.



Our Core Areas of Expertise

- **Technology management**: Achieving superior returns on technology investment; identifying where to invest in future
- **Product innovation**: Increasing the product value while shortening the development times
- **Differentiation strategies**: Simplifying the product and build, but increasing the differentiation
- **Programme management**: Utilising staff skills and, embedding success
- **Global Sourcing**: Focusing on strengths, knowing what to focus on and what to buy in
- **R&D effectiveness**: Optimising R&D functions, matching to brand strategies
- **Lean operations**: Minimising waste, increasing service
- **Complexity management**: Managing the product range but increasing the sales and profit
- **Sales and Distribution streamlining**: optimising the network while improving the customer experience

We are supported by a global network of experts. We bring to bear a vast shared resource of experience, methodologies, tools, best practices and case examples for the benefit our clients anywhere in the world.

Arthur D Little

Do you have specific questions to this "Automotive Quarterly Newsletter" or questions concerning other topics in the automotive industry? Please contact the Automotive Team of Arthur D. Little:

Dr. Wolfgang Bernhart
Director
Tel. +49-611-7148-202
Fax +49-611-7148-283
bernhart.wolfgang@adlittle.com

Paul Eccles
Director
Tel. +44 (0)870 336 6670
Fax +44 (0)870 336 6601
eccles.paul@adlittle.com

Nick Toone
Senior Manager
Tel. +44 (0)870 336 6677
Fax +44 (0)870 336 6601
toone.nick@adlittle.com