PSM Insight
CONSULTING SERVICES

Contents:

PSM delivering bottom-line improvements
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An Industry under siege

Its products, 60 million per year, are accountable for almost half the world's consumption of oil and almost 50% of the global rubber production. In addition, the products use 25% of the world's glass and 15% of its steel. The sector accounts for 10% of GDP in the richer countries with a further 4-5% from associated automotive services. Our future, and that of the automotive industry are inextricably linked. The industry is facing some of the most extreme challenges in its 100+ year history. We explore the key ones here:

Appeal - fewer wrongs don't make a right!

With the top 10 automotive groups fighting over 75% of the global market it is no surprise that the challenge is to understand the customers buying criteria. In the late 70s and early 80s Japan's car manufacturers demonstrated that a reliable car could win market-share. This focussed the Original Equipment Manufacturers (OEMs) on minimising the number of defects per car . Today a zero-defect vehicle is taken for granted and is no longer a part of the buying criteria, which are more subjective. Consumers increasingly want cars to be fun, ergonomically designed, stylish and with the latest in-car infotainment system (navigation, music, video etc). A car that starts using voice commands is cool...until you lose your voice after a heavy cold.

Technology - changing the way we drive

In 2002 the British Government estimated the benefits from preventing road traffic accidents in the UK to be about £20 billion. In addition motor vehicles contribute about one third of the greenhouse gas emissions. The industry is under continuing pressure to clean up its act and make driving safer. Technology will make a major contribution in both these areas:

- **Emissions:** Electronics will play an ever-increasing role in making engines more efficient by closer combustion control and the management of hybrid systems and hydrogen fuel cells.
- **Safety:** Position sensors that feed the driver information (e.g. parking sensors) are now commonplace. "Car to car" communication is under development and will be able, for example, to detect if someone brakes heavily several cars ahead. The challenge is to make this technology effective in the early days when few cars are equipped.

Market - variety, and fragmentation

In the 1970s it was possible to achieve 30% of the European mid sized market with one model - the Ford Taunus/Cortina. Today it requires five or six derivatives of the same model including a 5-door, estate car, an MPV and an SUV. The model lifecycle was seven years with a mid-term facelift, whereas today models are updated every year. The explosion in variety and market fragmentation demands cycle-time reductions in both design and supply chain processes. Compressing the design time requires 'continuous' working, which demands either a shift system for designers or spreading the work around the globe to take advantage of global time zones. These changes put huge demands on creating, sharing and managing the design, test and manufacturing data. The challenge is to standardise the design processes and deliver the right information to the right person at the right time.

Capacity - too many factories in the wrong place

Western vehicle manufacturers have the majority of their capacity in the most mature markets (US and Europe) and continuous efficiency improvements create 3% capacity per year. This, coupled with a gain in market share by Japanese and Korean competitors, means that there is significant excess capacity in the US and to a lesser extent in Europe. GM and Ford are biting the bullet and moving capacity from the West to China, but they have been slow to address this problem, always believing that they have the 'killer model' in the pipeline. In addition, they have been slow to source components from lower-cost parts of the world for new vehicle build. Closing factories is also adding to the pension problem facing GM and Ford who now have more pensioners than employees!

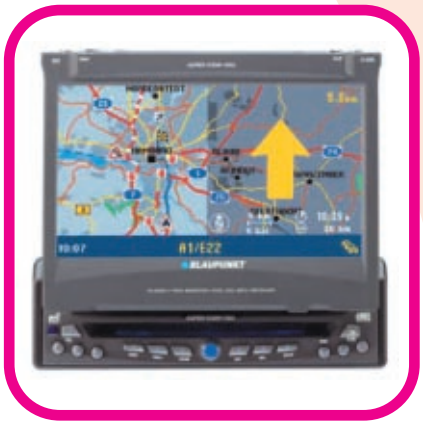
The supply chain - the paradox

First and second tier suppliers operate 'just in time' production systems which result in components for each car arriving at the right place on the assembly line several times per day. When the car is finished it sits around in distribution centres and forecourts for 1-2 months - a huge pile of inventory eating into profits. The 3-day car has been discussed widely in the industry, where the car is assembled to customers' orders. Customers will specify and pay for their car online, and it will be built locally and delivered directly within 1-2 weeks. This prevents a problem of smoothing production at the factory. Imagine an assembly factory, not owned or managed by the OEM, manufacturing a range of vehicle brands for the local/national market. Phasing the model year changes would result in smoother production. Local production would result in a massive reduction in delivery time, and shorter assembly times reduces the issue of direct labour cost. Is this the future for automobile assembly?

It is easy to see why the automotive industry feels that it is under siege on all fronts. From our perspective the automotive industry is not unique and over many years history has shown that they have to take the lead in addressing fundamental business issues, that are subsequently faced by other sectors. PSM specialise in helping clients to apply solutions developed in other industries to their business. We spotlight some examples of our work on the next pages...

Zero Defects in the

In heavy urban traffic you will apply your brakes on average 10 times per kilometre. After 100,000 kilometres you will have applied the brakes one million times. With a one ppm (part per million) failure rate, it means that you could expect your brakes to fail once in 100,000 kilometres. Would you buy a car that carries this level of risk?



As we discussed on page 1, electronics play an increasingly critical role in the control of all systems in new motor vehicles and the microchip is often at the heart of this control. Zero defects for these system-critical components is no longer an important concept, it is becoming an absolute necessity.

Early in 2005 the Semiconductor Division of a major global electronics business launched a top-level internal program focused on achieving zero defects for its microchips used in the automotive industry. PSM were selected to provide experienced support to help make the program successful.

Achieving zero defects requires the absolute dedication of all employees throughout each step of the business chain and this was well recognised by our client. The scope of the program therefore covered the full business chain (technology development, through product development and design-in, testing, manufacturing, assembly operations and customer service and support). Just one weak link in the chain meant that the zero defect objective could not be met. The program therefore was complex, consisting of multiple projects integrated into one overall program. This demanded careful and professional program management and thus the client's request for PSM's recognised expertise and support. PSM focussed on three aspects of the program.

Establishing the Program Governance and the Program Office - An early step was to put in place clear governance for the program. This involved establishing program sponsors, a program office with program manager and formalising a steering committee with representation from the main stakeholders. PSM played a key role in this early phase in coaching the program management members in their new roles and in particular in preparation for the initial progress review meetings. This set the standards by which future progress reviews were run. The result was a robust progress review process, in terms of content, timing and commitment to resolve issues raised by the program office.

The deliverables from this early step were:

- A clear charter for the Steering Committee and the Program Manager, setting out their roles and responsibilities.
- A time plan and an agenda for the progress reviews based on the priorities of the individual projects
- A simple/transparent reporting structure to drive proactive management of risks within the projects, and to make progress visible.
- Clear prioritisation of the projects to focus the resources on what was needed to achieve the optimum results within the planned timescales
- A simple model to assess program resource requirements that indicated overlaps/conflicts across the projects. This helped in the alignment of resource to the overall priorities.

Project team management and reporting - In parallel to establishing the program governance, a system was implemented for capturing and reporting project status information to the program office/steering committee.

This was based on the PSM project workbook, which uses simple predefined templates to enable the project leaders to report progress efficiently. The frequency of reporting was agreed and aligned to steering committee reviews. This provided a simple progress reporting framework

Automotive Sector

comprising:

- Clear definitions of the project milestones and risks, using traffic lights to highlight status against the milestone
- Transparent and practical Key Performance Indicator (KPI) tracking (showing the relationship to the overall program KPIs)
- Effective use of an electronic project team room for the storage and sharing of project documentation.

Coaching project leaders - In addition to establishing the program governance and progress reporting, PSM provided specific coaching to project leaders to help them better engage their team members and manage the work streams. This support helped to:

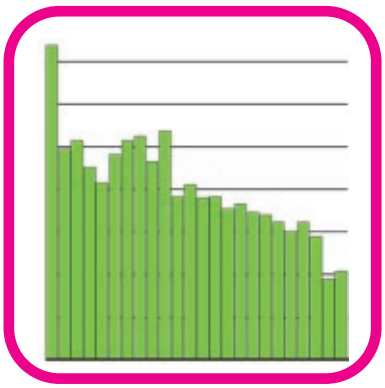
- Embed the tools/techniques for reporting into the projects
- Sharpen the deliverables and timing from each project.
- Speed up the delivery of benefits where possible
- Install improved risk management practices, thus avoiding untimely and unwanted delay
- Provide focussed input to the progress review meetings to enable fast decision making from the Steering Group.

Business Benefit

The business benefits from the program are becoming visible with a number of changes now delivering results. For example, there has been an improvement of 50% in the defect detection and prevention rate in some factories helped by the introduction and improvement of two key activities:

- Screening: Improved methods for screening silicon wafers have been introduced. These methods more accurately detect when products are outside specification limits. This condition triggers quarantine action to prevent the product being shipped.
- Maverick Lots: There are conditions where the product meets specification, however the performance characteristics may give reason for suspicion. An improved statistical method of analysis has been introduced which is able to detect these "maverick" batches and isolate them for further investigation.

Another area showing early improvement is the management of customer complaints. New ways of working that provide greater visibility of individual complaints now allows management to resolve them more quickly and effectively. This has resulted in the reduction of the customer complaint backlog in one particular Business Line by over 50% in 5 months.



Conclusions

Achieving Zero Defects is an attitude of mind and therefore the improvement initiatives that started as a discrete program with this client are creating changes in ways of working that are becoming locked into the processes and procedures of the organisation. The goal of zero defects is a continuous pursuit and elimination of the causes of defect throughout the total business chain. And the goal is not just product related: an error on an invoice must also be seen by the organisation as a failure to provide the perfect service to its customers.

However, a word of caution, any process that is to be designed to meet the goal of zero defects must be based on a clear definition of its customer expectations and needs. The ideal is to aim for a process and finished article that conforms exactly to customer requirements. It should not fall short of or 'significantly' exceed these requirements.

Remember the next time you put your foot on the brake - this is where the goal of zero defects becomes reality!

Enabling a hybrid organisation to deliver as an integrated automotive business

Increasingly, making significant quality improvements is no longer a matter of localised changes, but instead it requires a focused mindset across the entire organisation and all business processes and their linkages. This poses a particular challenge for companies where the fulfilment of the automotive business uses the same assets, processes and organisations as their non-automotive business, as a result there is no vertically integrated 'automotive' organisation.

PSM has recently enabled a client to define and put in place a virtual organisation that allows the company to operate as if it were an integrated automotive business, irrespective of the actual organisation and process structure. We used a proven framework that bundles five key themes:

- **Performance Indicators**

  The ultimate customer-related performance is measured in terms of parts per million that fail (ppm) and number of incidents. However, in order to ensure that quality performance was not just measured, but also effectively managed, we helped complement these lagging indicators with appropriate, properly deployed leading indicators which recognise not only the 'local' quality, but also how local performance affects quality across the entire process (design-launch-manufacture-shipment-after sales).

- **Procedures and standards**

  Consistency is an important contributor to excellent quality, and hence unfailing adherence to appropriate quality procedures and internal or indeed external standards is crucial. We worked with several client teams to ascertain that the required quality procedures are adequately adapted to the circumstances and are used and maintained intelligently, rather than applied in a prescriptive manner.

- **Organisation structure and business processes**

  Establishing a virtual organisation on top of an existing organisation presents its own specific challenges: the objectives and imperatives of the former can be at odds with those of the latter. We identified areas of potential conflict, and developed pragmatic approaches to make sure that structural conditions (such as business objectives, business process models or cross-organisational administration) did not thwart the effective implementation of the virtual organisation.

- **Communication and knowledge**

  This is the 'secret weapon' of the virtual organisation. A great many instances of process inefficiency and quality erosion can directly be traced to insufficient knowledge of what happens in a distant part of the organisation, or a lack in appreciation of the significance of one's actions and decisions. We helped our client pinpoint the key areas where a smooth information flow (including to and from the customer) would have a major impact on performance, and established low-effort mechanisms to maintain this flow.

- **Ways of working and mindset**

  The effect of the above elements is harnessed through a proactive quality mindset in all members of the virtual organisation. We created a progressive framework, based around simple but effective interventions such as short, themed quality workshops, to help instil an attitude that encouraged people proactively to seek out quality problems to resolve, both by focusing on their immediate work environment, and by thinking and working outside conventional organisation (or process) silos, considering themselves being part of a network.

Koen Smetts

Andrew Mansell

...and when not at work

Andrew's enthusiasm for motor sport can be traced back to the days when he could be found riding a motorbike around the fields at the age of 12 - no longer acceptable today! Andrew's interests are now focused on two cars; one for the road and one for the racetrack.

• **"One for the Road"** A 1959 Austin Healey 3000 Mk1. It was built in December 1959 in Abingdon, Oxford in the same factory that now makes the BMW Mini. It was shipped directly to Los Angeles where it had several 'careful' owners in California and Arizona. t was re-imported to the UK in 1994 where Andrew found it in 2004, in a shed looking a bit shabby. With some care and attention in Andrew's garage the car has regained its former good looks. Today, Andrew and his wife, Jette, use the car to take part in rallies in Europe. Only once has it needed to be rescued after a gearbox failure in the Ardennes!

• **"One for the Track"** A 1969 Merlyn Mk 11a Formula Ford. Designed initially for racing driver training in the 1960s, these cars combined a Formula 3 chassis with a Ford 1600cc engine to produce a fast, lightweight (420kg) circuit racer. They were so successful that "Formula Ford" was created and the first race was at Brands Hatch, Kent in July 1967. The Formula proved very popular and during the seventies and eighties it is estimated that over 150 firms between them built more than 8,000 cars and over 30,000 people competed in championships. Formula Ford became a vital step on the way to Formula 1, with drivers such as Schumacher, Senna, Mansell *(Nigel, not Andrew...Ed)* and Hakkinen honing their skills in this Formula. For those like Andrew, with affection for historic cars, there is now a championship in Europe for early cars manufactured before 1972. Andrew prepares and races the car himself and competes in 10-12 races each year at some of the great European tracks such as Spa Francorchamps, Silverstone, and Brands Hatch.

Everyone at PSM breathes a sigh of relief when Andrew returns safely from an event, then listens patiently to the stories and pictures he shares with us...!

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