Stiff competition? Build strength and speed with automotive flexibility

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Stiff competition?
Build strength and speed with automotive flexibility
The more flexible a business is, the more resilient and resistant to market threats – and responsive to opportunities – it becomes. IBM analysis and interviews with top automotive executives shed light on how a more flexible business infrastructure can help automotive companies cut costs, reduce time to market, increase profits – and, perhaps most importantly, prepare for unpredicted challenges in a rapidly changing industry.

Destination: Business flexibility
Any star athlete will tell you that flexibility leads to greater strength and agility. And any industry executive will tell you that this idea holds true in business as well. In the automotive industry, overcapacity, vehicle complexity, rising warranty and service costs, and increasing regulatory requirements make for a tight market – companies have to work harder than ever to turn a profit. More and more, rapid change will preclude automotive companies’ planning and preparing for market opportunities and threats – there simply won’t be time. As customers increasingly demand more for less, and long-range forecasts become a thing of the past, how can automotive companies stay nimble?

Research from the IBM Institute for Business Value suggests that increasing business flexibility across the automotive enterprise can help companies keep pace with a challenging market. Industry analysis, along with interviews with top automotive executives, identified the inherent obstacles to automotive flexibility that exist in current business processes, and the key characteristics and actions necessary for automotive companies to maneuver through industry and corporate roadblocks. Although enhanced marketing and cutting-edge technologies can help automotive companies temporarily pull ahead of the pack, long-term strides to enhance productivity, cut costs and increase profits require building flexibility into the entire business infrastructure.

Complexity and change in a tough industry
Industry challenges have led automotive companies to change over time. Today, market forces require ever increasing levels of flexibility. However, industry analysis and interviews with top automotive executives uncovered significant challenges and roadblocks to achieving greater flexibility across the design, build, and sell and service phases.
Design distress

In the design phase, the pressure for speed remains, despite lackluster economic conditions and increased vehicle complexity. Time-to-market for new vehicles can average 32 months, with costs ranging from US$200,000 to US$1 million per day.\(^1\)\(^2\) As suppliers take on a broader role and contend with increasing vehicle complexity, OEMs continue to mandate price reductions. Software is predicted to become 90% of innovation.\(^3\) Build-to-order is up to 60% in Europe and gaining traction in the US.\(^4\)

In their struggle to contend with an increasingly challenging environment, design executives see significant roadblocks to improving collaboration and design cycle management (see Figure 1). The size and complexity of vehicle programs create difficulty in managing weight, cost and timing targets. Problematic issues are not visible until late in the process, and can’t be solved in time to avoid costly delays.

Many automotive companies lack commonality in their product architecture – it is often easier to design a new part than to integrate an existing one into a new design. Engineering objectives sometimes conflict with those of procurement. And companies have difficulty managing and distributing design, manufacturing, warranty, service and market learnings across platform teams or to other organizations and suppliers upstream. Last but not least, disparate processes and systems across divisions and platforms mean that technology integration and reporting systems can’t keep up.

Figure 1. Executives speak out about design challenges.

“Collaborative management of engineering challenges is still a void.”

“Mostly we need to organize vehicle complexity.”

“We’re pushing our people to the wall – we need technology to pick up the slack.”

Roadblocks in build

In the build phase, estimated losses from producing vehicles to meet demand that never materializes, and associated discounts to sell excessive stock, can cost automotive companies up to US$80 billion a year.\(^5\) On average, vehicles take 2 days to produce, but 45 days to deliver.\(^6\) Fixed costs are high: the average factory breakeven point is at 80% of capacity utilization.\(^7\) Increasing globalization by top industry competitors also threatens OEMs and suppliers’ ability to sustain profits.
Build executives see increased business flexibility as necessary to dramatically improve quality and speed—but acknowledge significant roadblocks to flexibility in current business processes (see Figure 2). To achieve flexibility in assembly, companies need flexible process design, execution and staffing. But the current lack of standardized processes and process discipline across multiple plant and distribution locations makes a quick response to errors and problems difficult for OEMs and suppliers.

Industry executives cite poor communication between internal and external organizations—such as the loose communication with suppliers around parts—as a formidable obstacle to increasing build speed. Another troubling factor is the state of current legacy technology applications across the industry. Many require standardization, or even replacement. Finally, most automotive businesses have still to find a working balance between process simplicity and vehicle complexity, while at the same time meeting increasing customer demands.

**Figure 2. Executives speak out about build challenges.**

"Organization collaboration is much simpler than integrating our systems."

"Can’t catch errors the moment they occur and fix them on the spot."

"Tracking and reporting the increasing number of serialized parts per vehicle is labor intensive due to disparate information and systems."

**Sell and service setbacks**

In the sell and service phase, high inventory, warranty costs, long vehicle lead times and incentives continue to reduce automotive profitability. Carrying costs of inventory can average 74 days at a cost of US$755 million. In the US, incentive pricing is over 18 percent of the average vehicle price, while warranty costs eat away 30 percent of vehicle profit.

Keeping customers over a lifetime of vehicle transactions can mean as much as 12 times the revenue of a single transaction, and service content has been up 8-10 percent of profit per year since 1998. Targeting customer loyalty and increased service content has become increasingly important to profits in the automotive industry. But auto executives in sell and service are often frustrated by the enterprise’s inability to react quickly to increasing customer expectations (see Figure 3).
Fragmented customer data and process linkages across brands – as well as channels, call centers, Web, dealers and marketing – limits the ability of most automotive companies to understand customer needs and respond to potential opportunities. Delivering customers what they want in the expected time frame is hindered by excessive order to delivery time. The current focus on the vehicle transaction, instead of the long-term value of the customer, leads to lost opportunities to interact with the customer and better understand and satisfy their wants and needs. Lastly, feedback mechanisms are limited, which makes providing timely information – like customer insights and preferences or vehicle problems – to design and production difficult.

Business flexibility: Stretch toward opportunity

With some known hurdles and an unpredictable future in front of them, OEMs need a new framework that helps them become "on demand" businesses, with the ability to respond adaptively and quickly to any customer need, market opportunity or threat. As on demand businesses, OEMs would be more:

- **Responsive** – able to sense change and respond dynamically to the internal and external environment
- **Variable** – able to adapt strategic direction, cost structures, and business processes as changes occur
- **Focused** – able to concentrate on core competencies, using integrated partners to manage selected tasks
- **Resilient** – able to react with consistency to changes and threats in the marketplace.

To respond rapidly to the changes they are sensing internally and externally, OEMs must embed business flexibility in all facets of the corporate infrastructure – strategy, operations, organization and technology – and actively monitor agility on an ongoing basis (see Figure 4). We call this a flexibility infrastructure.
This infrastructure would help OEMs:

- Refine strategies as business conditions change
- Modularize operational processes so that they can be revised and restructured quickly – based on strategy shifts
- Assign individual, team and organizational responsibilities and create governance models in a way that reduces conflicting goals, encourages desirable behavior and facilitates measurement of strategic goals
- Establish modular technology that can easily adapt to process, organizational and measurement changes as they occur.

Having a tightly integrated framework for flexibility is crucial, as nimbleness in one area is rarely capable of effecting substantive business change. For example, flexible technology cannot make a measurable impact without working in tandem with process and organizational changes.

Figure 4. The flexibility infrastructure.
**Strategic flexibility**

Strategic flexibility allows the automotive company to change its corporate direction according to environmental conditions. A flexible strategy model helps automotive businesses manage a portfolio of products best suited to the market, the corporate direction and the core capabilities of the business. The strategy is translated into organizational objectives and performance targets and change is communicated in a timely manner to the rest of the corporation and partners. Measurements for the success of the strategy are based on a financial, customer, learning, and business excellence scorecard. As business conditions change, corporate strategy and goals are refined, then driven down and monitored at operational levels (see Figure 5).

**Operational flexibility**

Operational flexibility, or how efficiently and effectively work is done, allows the automotive company to support the execution of strategy changes. To achieve operational flexibility, automotive enterprises must modularize processes into pieces of work that can be executed and reconfigured as required by changes in the market or in customer demand. In an operational flexibility model, work is defined in measurable process segments with clear boundaries, interfaces, inputs and outputs. Roles and responsibilities are clearly defined as well, and success is measured with key performance indicators (KPIs) that tie back directly to the strategic direction and process outputs.
Organizational flexibility

Organizational flexibility allows the automotive company to utilize human capital to its fullest potential while meeting strategic objectives. An organizational flexibility model defines the organizational structure and roles to best execute business processes. Teams are formed and disbanded according to changing process and project needs, utilizing corporate and partner human capital as needed – or ad hoc – and the teams’ success in executing business processes are measured against KPIs. In an automotive company with organizational flexibility, knowledge is maintained for reuse, skills are managed as business needs evolve and change is communicated across the value chain in a timely, effective manner.

Technological flexibility

Technological flexibility facilitates the integration of processes, teams, and associated strategic performance measures. In a technological flexibility model, an open-standard, integrated IT environment serves as a foundation for solution development and operation that adapts as the business infrastructure changes (see Figure 6).

Figure 6. Technology reflects how the enterprise works – from organization to operational processes to measurements – and integrates the pieces into a cohesive whole.

Strategy, process, organization and metric definitions are captured, modularized, formalized and refined as business conditions change. Teams and processes share integrated information, and process knowledge is captured for reuse as work is done. Technology and interfaces are standardized to increase speed, and the use of a common infrastructure improves communication across the value chain – thereby enabling the reallocation of resources and reducing complexity. Technology is monitored constantly to optimize its performance.
Monitoring flexibility

Monitoring flexibility to measure how well the enterprise performs against its strategic objectives is paramount. With success defined by KPIs, flexibility monitoring measures performance and allows the automotive company to sense and respond to changes and react accordingly. As refined business objectives, processes, teams and technologies are deployed and integrated into the production environment, automotive companies need to capture and aggregate data so that the business KPIs can evolve as well. The data is then analyzed to continually manage the business and stay competitive as the environment changes (see Figure 7).

Figure 7. The automotive flexibility lifecycle.

Limber up: Gaining business flexibility

A business flexibility infrastructure can increase revenue, reduce cost and risk and improve quality and speed. A flexible business has the ability to deliver profitable products and services to their customers' satisfaction despite an ever changing market environment. How can automotive companies begin to become more flexible? There are three initial steps companies can take to start improving flexibility:

- Assess the current state of flexibility within the organization as a whole;
- Based on that assessment, identify which flexibility infrastructure areas can be implemented;
- Prioritize the areas based on the goals to be achieved.
With a basic flexibility infrastructure in place, companies can pursue a number of specific actions – across each aspect of the business – to gain additional flexibility. Many of these changes are made possible by “flexible” techniques such as modularized processes and standardized IT applications and will help speed the move toward a more flexible infrastructure.

**Design**

To combat the current distress they are experiencing in the design phase, automotive enterprises should work to adopt the characteristics of a flexible business: speed of innovation, speed of supplier collaboration, and vehicle and program complexity management. They will also need to engineer parts, vehicles, and modules simultaneously. Flexible automotive companies will succeed by providing customers with the up-to-the-minute “style” they want from a new vehicle, while employing common modular design, architecture and standards, and reusing parts across brands to save money and time. The ability to deliver personalized products and manage vehicle design to predefined targets further distinguishes flexibility in design.

IBM industry analysis suggests the following actions for automotive companies seeking greater flexibility in design:

- Integrate closed loop customer and market information into business cases, design flow and production planning
- Adopt common vehicle architectures and standard software architectures
- Streamline project management and decision layers
- Install joint supplier/OEM design and testing
- Deploy library of reusable modules and components
- Establish parts reuse across platforms and brands
- Enforce disciplined processes
- Set, maintain and monitor requirements for collaboration
- Enable short cycle feedback with Build and Sell & Service
- Utilize “one stop” issue resolution and change management.
Design flexibility in action: DaimlerChrysler paints a profitable future

DaimlerChrysler is working to unclog the traditional build bottleneck due to the batching of single colored parts in the paint shop. Both the vehicle and the manufacturing processes are designed with assembly in mind, which helps DaimlerChrysler meet customer demand at the last minute. The colored outer panels of the vehicle are hung on “space frames,” or metal frames, allowing the customer to alter the colors later in the process.

The benefits of design flexibility are:
- Reduced time-to-market
- Fast variable access and deployment of resources
- Fewer test failures and launch problems
- Lower cost from reuse
- Lower capital requirements.

Build

To achieve the flexibility needed to maneuver around existing roadblocks in the build phase, automotive companies will need to manage vehicle complexity, building multiple model assembly lines, production lines efficient enough to adapt to new or modified products, and processes for predictive quality management and verification. Speed through lean manufacturing, realtime tracking and response capabilities, and fast action on issues and errors also characterize build flexibility. Late customization and fast change implementation will separate the truly flexible enterprises from those with less focus.

The following list of examples details necessary actions for automotive companies to achieve increased flexibility in the build phase:
- Integrate closed loop sell and service feedback into build process
- Streamline project management and decision layers
- Establish platform and parts reuse across vehicle lines
- Develop virtual tracking and reporting of serial and software parts
- Create “this minute” error identification and situational quality teams
- Implement virtual, realtime OEM/supplier teams
- Develop late customization techniques
- Integrate supply/demand planning and execution across vehicle brands and services
- Enable flexible manufacturing/produce multiple models on the same assembly line.
Build flexibility in action: Honda harmonizes production

Honda has probably gone furthest down the road to flexible global manufacturing. Not only are all its car factories capable of making several models, they are also now equipped to switch from one model to another very quickly — even in a matter of weeks — simply by changing the software in the robots. To achieve this, it has installed one single global manufacturing system. Honda is also “harmonizing” its production systems (the positioning of welding points in body shops, for instance) in order to make vehicle changeover even faster.

The benefits of increased build flexibility are:

- Reduced time-to-market
- Fast, variable access and deployment of resources
- Reduced faults per vehicle, lower warranty costs
- Lower cost due to reuse
- Lower capital requirements
- Lower operating costs
- Faster supplier coordination
- Increased revenue (through reduced time to market)
- Higher customer satisfaction.

Sell and service

In the sell and service phase, flexibility is characterized by a deeper understanding of customer needs and increased speed of response across all channels. Sell and service flexibility requires automotive companies to adapt rapidly to demand through late customization and supply chain optimization. Leveraging cooperative sensing with dealers and quick, customized bundled or soft offers will help automotive extend their brand value with customers to end of life. Sharing service information and reacting quickly to customer feedback will help win more profits from customer loyalty.
Most automotive companies have a long road to travel to achieve true flexibility in sell and service. To strike the precarious balance between the human (customer wants, needs and insights) and technological (interactive applications, universal standardized platforms and proactive data analysis tools) aspects of sell and service flexibility, automotive companies should consider the following actions:

- Utilize lifetime customer satisfaction metrics
- Integrate customer data from all touchpoints, and make it available virtually to sales, customer care and dealers
- Implement common OEM and Dealer processes, collaboration, IT and data sharing
- Develop realtime after sales services
- Install cross-brand/division/dealer processes providing vehicle and or services bundles, i.e., “fast reaction” offers to customer requests
- Develop and track measurements of customer value (lifestyle needs)
- Develop virtual tracking and reporting of serial and software parts
- Create “this minute” error identification and situational quality teams
- Train dealers and OEM team on experience and services
- Develop Web-based customer connections and customer care
- Implement opportunity analysis tools
- Adopt 360 degree customer management and performance metrics.

Sell and service flexibility in action

Recently, Ford Motor Company built a “global warranty measurement system” that incorporates a data warehouse with 24 months of warranty information and business-intelligence software, to help 10,000 of its dealers improve their service operations.

Ford uses the system to find out how many repairs individual dealers are performing, and at what cost. The system then compares the results with other dealers, making it possible to spot instances in which dealers may be performing unnecessary repairs or are spending too much to service vehicles. Ford then works with the dealer to correct the problems, and savings are passed on to the customer.

While the program helps Ford lower its warranty expenses, the real goal is to help dealers improve service provided to customers. Toward that end, the company has begun providing dealers with the ability to drill down into the report’s underlying statistics over the Internet. Ford is also leveraging the data warehouse for tasks such as forecasting future warranty costs and identifying gaps in dealer technician training.
The benefits of improved flexibility in sell and service include:

- Higher customer satisfaction and loyalty
- Adaptability to demand
- Reduced sales and marketing cost per sale
- Increased services revenue (aftersales, telematics, parts and service) beyond warranty
- Reduced order to delivery time
- Increased quality perception and personalized customer experience
- Improved dealer relations and services growth
- The ability to interact with customers through their preferred channel.

**Flex your muscles**

How flexible are you? The following questions are designed to help automotive companies measure their current strategic, operational, organizational, and technological flexibility, and begin to plan their course toward a more flexible business infrastructure.

- How well is your corporate strategy defined, communicated and executed? How flexible is your strategy?
- What metrics are in place to measure the success of your business strategy?
- How often is your strategy revised to keep pace with market and industry changes?
- How modular are your business processes? Are they standardized, or used commonly, across the enterprise?
- How personalized are customer interactions across channels?
- How tightly are KPIs for teams, tasks and goals tied to your corporate strategy?
- How quickly can cross-enterprise teams be configured, and reconfigured to address issues and opportunities?
- How well do business units, managers and teams collaborate across corporate boundaries?
- How much do you know about your customers? What is the shelf life of the information – from customers, production, marketing, and sales – your company currently uses to make decisions?
- How well does your current technology solution capture and support changes in business process, strategy, and performance monitoring models?
- How adept is your company at using captured data to improve quality, speed production and delivery, reduce vehicle flaws or cut costs?
**Conclusion**

In the automotive industry, the days of the ten-year forecast are over. As the future becomes increasingly difficult to discern, planning any more than three years into the future can seem futile—and even that can be a gamble.

Sustaining profitability in any industry is more a marathon than a sprint. Boosting the bottom line will take more than marketing incentives or slick technologies alone, but a focused, enterprisewide effort toward increased flexibility.

Business flexibility can begin with streamlined strategy, refining operational and organizational processes, or a new technology solution. But to enable long-term profitability, automotive companies will have to push all facets of the business toward a more flexible future—primed to grab opportunity and outrun market threats. A truly flexible business infrastructure will enable automotive companies to move toward an on-demand operating model that will leverage their strengths, bolster their weaknesses, better serve their customers, and prepare them for the unknown in a quickly changing industry.

In a tight industry, becoming a more flexible business can seem like a long haul. It takes perseverance, ingenuity and planning to run ahead of the pack. Many automotive companies will no doubt weather many more market challenges before they cross the finish line—it’s best to start training for a win today. To explore the ways in which we might assist you in building a more flexible business infrastructure, please e-mail us at ibv@us.ibm.com. To browse other resources for business executives, we invite you to visit:

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