

## FINDING A PLACE IN THE AUTOMOTIVE SUPPLIER HIERARCHY IN THE YEAR 2000 AND BEYOND

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### Abstract

The global automotive supplier industry is undergoing a major restructuring and consolidation. The defining characteristics of the industry in the year 2000 and beyond will be fewer suppliers at all levels of the supply chain, but especially among the ranks of direct suppliers to the motor vehicle manufacturers. Direct suppliers will consist primarily of systems integrators that are capable of designing, manufacturing and delivering complete modules to motor vehicle assembly plants. Many of the systems integrators will have global reach. Since there will be relatively few systems integrators, suppliers that do not become an integral part of a systems integrator must either carve out a position as an indirect supplier in the supplier hierarchy that evolves or leave the business. In order to remain part of the automotive supplier base in the long term all suppliers must decide where they will best fit in the supplier hierarchy and determine what they must do to survive the transition and position themselves to thrive after the restructuring and consolidation of the supply base is complete. In this paper the options available to Canadian suppliers and the strategies that some of them are following to position themselves in the year 2000 and beyond are explored. The objective of the research is to identify some of the elements of successful strategies for suppliers at various levels in the supplier hierarchy.

### INTRODUCTION

As the restructuring of the automotive supplier industry that began in the mid-1980's proceeds, the defining characteristics of the industry in the year 2000 and beyond are becoming increasingly clear. There will be fewer suppliers at all levels of the supply chain, but especially among the ranks of direct suppliers to the motor vehicle manufacturers.<sup>1</sup> Direct suppliers will consist primarily of systems integrators that are capable of designing, manufacturing and delivering complete modules to motor vehicle assembly plants. Many of the systems integrators will have global reach.

Of the suppliers that are positioning themselves to be full-service systems integrators, all but a handful of the largest, most-capable suppliers in the world are building up their existing capabilities and adding new ones through mergers, acquisitions, and other forms of alliances. Since there will be relatively few systems integrators, suppliers that do not become an integral part of a systems integrator must either carve out a position as an indirect supplier in the supplier hierarchy that evolves or leave the business.

In the supplier industry that is emerging the traditional definitions of the levels in the supplier hierarchy — Tier 1, Tier 2, and Tier 3 — are becoming less meaningful. While the customers that a supplier serves remains a distinguishing feature, the primary determinant of a supplier's position in the new hierarchy is its capabilities. For the purpose of the discussion that follows, reference will be made to the supplier hierarchy described by the Automotive Consulting Group. There are four levels in the hierarchy<sup>2</sup>:

**Component Manufacturer** - a "process" specialist, such as a metal stamper, die caster, injection molder, or forging shop that builds parts to print. In almost all cases a component

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<sup>1</sup> For example, The International Business Development Corporation estimates that the number of Tier 1 suppliers around the globe will shrink from 1,500 in 1996 to about 375 by the end of the century. Of the remainder: 450 will go out of business, 375 will be acquired, and 300 will leave the automotive business. (*Automotive News*, July 6, 1996, page 3.)

<sup>2</sup> The Automotive Consulting Group, Inc., *Supplier-Supplier Partnering, Opportunities and Trends*, 1995.

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manufacturer is an indirect supplier to the motor vehicle manufacturers whose customers are suppliers that are higher in the hierarchy.

Subassembly Manufacturer - a process specialist with additional capabilities such as machining and assembly. A subassembly manufacturer has responsibility for design and testing of the component(s) it manufactures, but not the design of the entire sub-assembly or the other components ("gray box" supplier). A subassembly manufacturer is an indirect supplier in most cases, with fewer and fewer opportunities to supply motor vehicle manufacturers directly.

Systems Manufacturer - suppliers that are capable of design, development, and manufacturing of complex systems ("black box" supplier). Systems manufacturers may supply motor vehicle manufacturers directly or indirectly through Systems Integrators.

Systems Integrators - suppliers that are capable of integrating components, subassemblies, and systems into modules that are shipped to motor vehicle manufacturers' assembly plants.

In order to remain part of the automotive supplier base in the long term all suppliers must decide where they will best fit in the supplier hierarchy and determine what they must do to survive the transition and position themselves to thrive after the restructuring of the supply base is complete; probably within a few years of the beginning of the next millennium. The consolidation and restructuring will have profound effects on the global and national automotive supplier industries. In the remainder of this paper the options available to suppliers and the strategies that some of them are following to position themselves in the year 2000 and beyond are explored. The objective of the research is to identify some of the elements of a successful strategies for suppliers at various levels in the supplier hierarchy.

Given this objective, when selecting companies for inclusion in the field research there was a bias towards those that were expected to remain in the business after the re-structuring of the supplier base is complete. In-depth personal interviews were held with 14 senior executives of Canadian-based suppliers. Nine were either the chief executive officer of their company or the head of a largely autonomous division of a multi-division company. The other five were senior corporate and operating executives of multi-division companies.

The discussions with each of the senior executives were between two and three hours in length. The topics covered included:

- how the decision on the product mix and level in the hierarchy was/is being made,
- identifying and acquiring the additional capabilities that were/will be required to become or remain in the selected product areas and level in the hierarchy,
- determining the level of sales required to support the up-front and ongoing costs of acquiring and maintaining the additional capabilities, and strategies to obtain the target sales volume,
- the impact of globalization on the above, and

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- funding the up-front investment to acquire the necessary capabilities and increases in output.

The bulk of the remainder of this paper consists of observations and preliminary findings on how some Canadian suppliers are dealing with the question of where they plan to be in five to 10 years and the strategies that they are following (or planning to follow) to get there. In order to place that discussion in context, it is preceded by a description of the forces that are driving the restructuring and consolidation of the automotive supplier industry and the implications for suppliers.

### BACKGROUND

For at least the last two decades the most pervasive influence on the automotive supplier industry has been the relentless drive to reduce costs. Cost reduction has not only defined the relationship between motor vehicle manufacturers and their suppliers, but also the structure of the supplier industry. Low costs and the ability to continuously reduce costs, while meeting their customers' quality, service and other requirements, are the primary determinants of supplier success.

By the mid-1990's affordability of new cars and light trucks had become a critical issue. The average selling price of cars and light trucks has been increasing at a faster rate than household incomes since the early 1970's.<sup>3</sup> Based on annual median family earnings and average expenditures for new cars in the United States, the number of weeks of earnings to buy a new car increased from a historical low of 17.5 weeks in 1973 to a peak of 25.4 weeks in 1994 before starting to fall in 1995 and 1996.<sup>4</sup>

Car and light truck price increases have been driven by the costs of meeting safety and environmental regulations and, more recently, the addition of comfort and convenience features that consumers are demanding, but increasingly unable to afford. The costs of meeting safety and environmental requirements will continue to grow, but vehicle content of comfort and convenience items is decreasing in an attempt to make new vehicles affordable to a larger segment of the market.

Whereas the focus of suppliers' engineering efforts during the 1980's was to develop new technology, their focus in the 1990's is to reduce costs while meeting the requirements for form, fit, functionality and quality. The challenge facing motor vehicle manufacturers and their suppliers was succinctly stated by Rick Wagoner, the president of General Motors' North American Operations:

“ I believe the real heroes in our business over the next decade will be the engineers and inventors who will come up with major cost breakthroughs to help us solve the critical affordability issue that is threatening the future growth of our industry.”<sup>5</sup>

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<sup>3</sup> For example, from 1975 to 1994 average family income in Canada increased by 329% (Statistics Canada Cat. 13-208, *Family Incomes*) and the average transaction price of a new car increased by 373% (Statistics Canada Cat. 63-007, *New Motor Vehicle Sales*).

<sup>4</sup> American Automobile Manufacturers' Association, calculated from: Department of Commerce, Bureau of Economic Analysis (“Average Transaction Price Per New Car”) and Bureau of Labor Statistics (“Median Family Earnings”).

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With almost 90 percent of the factory cost of producing light duty vehicles accounted for by the cost of parts, the motor vehicle manufacturers increasingly are turning to their suppliers in order to reduce costs and obtain the best technology. The best technology has become largely synonymous with the product and process technologies that offer the lowest-cost solution to meet the motor vehicle manufacturers' specifications.

All of the motor vehicle manufacturers have established programs to reduce parts costs. Ford's target of a 20 percent reduction over four years, starting in 1995, is among the most aggressive of those that have been made public. However, the 20 percent reduction applies to the entire value chain, suppliers are not expected to reduce their cost by the entire amount, but are expected to work with Ford to achieve the reductions. In at least one case, almost one half of the savings have come out of Ford's cost.<sup>6</sup>

Starting in about the mid-1980's the North American motor vehicle manufacturers initiated three changes that are redefining the relationship with their suppliers and the structure of the supplier industry:

1. Motor vehicle manufacturers started to shift more of the responsibility for product design and program management to their suppliers. This allowed the motor vehicle manufacturers to focus their resources on developing and maintaining their core capabilities, which primarily are: overall design and systems integration, drivetrains, assembly and marketing of complete vehicles. It was also a recognition that even the largest companies did not have the resources to be cost and technology leaders in all automotive components and systems.
2. The size and complexity of the "chunks" of vehicles that are sourced from suppliers has been growing from individual parts and components to entire systems (e.g., anti-lock brake systems, seating systems) and, more recently, complete modules (e.g., complete body in white, complete interior). By outsourcing more of their requirements to lower-cost suppliers, motor vehicle manufacturers are able to reduce their costs for parts and components. Sourcing of complete systems and modules offers further cost savings through reductions in the size of the plant and workforce needed to assemble vehicles.
3. As the two trends described above proceed the motor vehicle manufacturers are able to reduce the number of their direct suppliers and offer them long term contracts. This reduces the overhead costs of managing their supply base. An added benefit of fewer suppliers is that vehicles assembled at plants with fewer suppliers tend to experience fewer supplier-related quality problems.<sup>7</sup>

The net impact of these changes is a consolidation and restructuring of the supplier industry. The Automotive Consulting Group estimates that there were between 2,000 and 3,000 suppliers in each of the three tiers of the traditional supply structure.<sup>8</sup> In the new

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<sup>5</sup> Excerpts from an address to the SAE International Congress and Exposition, February 29, 1996, *Automotive News*, March 11, 1996, page 14.

<sup>6</sup> Versical, David, "Ford's warning to suppliers: Slash costs, improve quality", *Automotive News*, April 29, 1996, page 4.

<sup>7</sup> Pil, Frits K. and John Paul MacDuffie, *Quality Trends at Automotive Assembly Plants: Updated Analyses from the International Assembly Plant Study*, IMVP Annual Sponsors Meeting, São Paulo, Brazil, June 10, 1996.

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structure that is emerging, the Automotive Consulting Group estimates that the North American supply base will consist of 30 to 50 systems integrators, 150 to 250 system suppliers, 2,000 to 3,000 subassembly suppliers, and 2,000 to 3,000 component suppliers.

In another recent study, EDS Management Consulting Services Inc. and the University of Michigan's Office for the Study of Automotive Transportation, reached a similar conclusion on the consolidation of the supply base. One of EDS and OSAT's findings was that some 2,500 direct suppliers worldwide will consolidate into 150 systems integrators by 2005.<sup>9</sup>

Recent events in the braking system supply base provide an excellent illustration of the forces that are driving the re-structuring of the supplier industry and their impact. In March, 1996 AlliedSignal Inc. sold its anti-lock brake system (ABS) business to Robert Bosch for US\$1.5 billion.<sup>10</sup> The portion of AlliedSignal's Bendix division to be purchased by Bosch is also a major producer of conventional brakes. The operations to be sold generated US\$2.1 billion in sales in 1995. AlliedSignal concluded that it could not compete with the dominant players in the North American ABS market. Over the past five years Allied Signal's ABS business lost US\$180 million dollars. Its market share was seven percent in 1995 compared to 29 percent for ITT, 27 percent for General Motors' Delphi Chassis Systems, 23 percent for Kelsey Hayes, and 10 percent for Bosch.<sup>11</sup> The sale will free up cash that AlliedSignal can use to expand its more profitable automotive businesses.

With the acquisition, Bosch will have the capability to supply complete brake systems. Bosch is a dominant supplier of ABS electronics, but prior to the acquisition, its product lines did not include other brake components, such as master cylinders, vacuum pumps, rotors and hubs.

With AlliedSignal leaving the ABS business, four dominant players will remain in North America and Europe. Most of Delphi's sales are to other North American divisions of its parent, General Motors. Kelsey Hayes's strength is in low-cost, two-wheel ABS systems that are used mostly on light trucks. Bosch and ITT are among the largest ABS suppliers in both the United States and Europe. All four companies are spending heavily on research and development to maintain their technological and cost edge.

In an unrelated development General Motors took a 17 day strike in March, 1996 at two Delphi brake plants in Dayton, Ohio over its right to outsource some of its requirements for ABS systems. The strike involved only 3,000 workers, but it cut off the supply of critical parts to General Motors' assembly plants. By the time that the strike was over, 26 of 29 of General Motors' assembly plants were closed and 178,125 General Motors hourly workers

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<sup>8</sup> The Automotive Consulting Group, Inc., *Supplier-Supplier Partnering, Opportunities and Trends*, 1995, page iii.

<sup>9</sup> Chappell, Lindsay, "Supplier mergers are only halfway there", *Automotive News*, April 15, 1996, page 1.

<sup>10</sup> Sedgwick, David, "Bosch wins round in ABS battle", *Automotive News*, March 4, 1996, page 1.

<sup>11</sup> *Ibid.*, industry estimates.

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were idled in the United States, Canada and Mexico.<sup>12</sup> Tens of thousand of additional workers were idled at General Motors' suppliers' plants.

The event that precipitated the strike was General Motors' decision to source the ABS systems for its 1998-model Camaro and Firebird from Bosch. The reasons for selecting Bosch as the supplier was technology and cost. For more sophisticated ABS systems Delphi's technology is a generation behind Bosch.<sup>13</sup> The hourly labor cost (wage plus benefits) at the Bosch plant in Charleston, South Carolina which will supply the 1998 Camaro/Firebird is US\$16.83 compared to US\$43.58 earned by General Motors' UAW workers. Labor generally accounts for a relatively small portion of factory costs (typically 5 to 12 percent), but is one of the few costs that varies significantly between the motor vehicle manufacturers' in-house parts operations and outside suppliers.

In the past General Motors moved quickly to settle disputes with the United Auto Workers over outsourcing in order to avoid disruptions such as those caused by the strike at its Delphi Chassis Systems' brake plants. As a result of the strike, General Motors' first quarter after-tax earnings were reduced by US\$900 million.<sup>14</sup> General Motors' resolve to assert its right to source parts from outside suppliers reflects the intense pressure on the company to reduce costs in order to remain competitive. Of the "Big Three", General Motors faces the toughest challenge in reducing its costs due to its size and structure. General Motors obtains about 35 percent of its parts from outside suppliers, compared to about 50 percent for Ford and 70 percent for Chrysler. Chrysler is the lowest-cost producer, followed by Ford and General Motors.

The recent events in the brake system supply base illustrate the intensity of the motor vehicle manufacturers' drive to reduce prices and the re-structuring and consolidation of the supply base that is occurring as a result. All segments of the supply base are facing the same market dynamics as brake system suppliers. Over the next few years virtually all suppliers, large and small, will have to restructure their businesses in order to remain competitive into the next century. They will have to narrow their product lines and/or manufacturing processes to those for which they can become significant players in global markets. The nature of the products and services that they have the capabilities to supply largely will determine their positions in the supplier hierarchy.

### OBSERVATIONS AND PRELIMINARY FINDINGS

Despite the challenges that suppliers worldwide face, the outlook is far from bleak for Canadian suppliers. The best of them are meeting their customers' cost reduction targets; in fact they are exceeding the targets and keeping a few percentage points of the cost reductions for themselves. They are spending up to 10 percent of sales on forward activities, mainly on product and process R & D, applications engineering, and program management, for programs that have not yet reached production and, therefore, are not generating any cash flow. And, their net profits are seven percent or more of sales. This performance was achieved over the last two to three years, which was a period of relative

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<sup>12</sup> Blumenstein, Rebecca and Nichole E. Christian, "Parts Dispute to Remain Despite GM-UAW Accord", *Wall Street Journal*, March 25, 1996, page A3.

<sup>13</sup> Sedgwick, David, "GM to UAW: Not this time, Competitive brake market at Strike's root", *Automotive News*, March 18, 1996, page 1.

<sup>14</sup> Henry, Jim, "Strike drags down GM earnings in quarter", *Automotive News*, April 29, 1996, page 6.

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stability in motor vehicle production volumes. Few, if any, suppliers can sustain these levels during the periodic downturns in motor vehicle production volumes.

Some segments of the industry are inherently more profitable than others, especially when earnings are measured as a percentage of sales rather than as return on assets. Therefore, some suppliers may never earn more than a few percent of sales even if they become among the best suppliers in their segment. However, the benchmarks for the best suppliers, described in the previous paragraph, may be useful as targets for suppliers that are restructuring their operations to become among the best in the business. By definition not all will succeed, but those that strive for anything less than to become among the best at what they do are less likely to be suppliers to the automotive industry after 2000.

### **Finding a Place in the New Supplier Hierarchy**

In general, the lower a supplier finds itself in the new hierarchy, the less opportunity it will have to capture value-added in the supply chain, and, as a result: the fewer the opportunities for growth and the lower the profit margins. Only a very small number (perhaps two or three) of the current Canadian-based Tier 1 suppliers are likely to emerge as full service systems integrators. Some suppliers will be absorbed by systems integrators. The goal of most of the remainder will be to position themselves as high as possible on the hierarchy.

The suppliers that remain at the bottom of the hierarchy will be producers of low-value-added commodity items. Even the lowest-cost producers in this category can expect thin margins and short-term contracts. In many cases they will be swing producers for higher-level suppliers. During peaks in the motor vehicle production cycle some production will be sub-contracted to them. During downturns higher-level suppliers with excess capacity may pull the work in-house since the marginal costs of making the components in-house during periods of excess capacity often is less than the costs of buying them from lower-cost producers.

The options available to a supplier will be largely determined by its current capabilities and position in the industry, the resources available to it, and the owner's growth, profitability and other goals. While the research to date includes a relatively small number of suppliers, they cover the spectrum in terms of their current circumstances and the options available to them in deciding where they want to be in the supplier hierarchy in five to 10 years. The options are:

- Sell some or all the business - This option is available to suppliers at all levels, but likely will be attractive to relatively few.
- Move up the hierarchy - Two moves are most likely to be feasible: component manufacturer to subassembly manufacturer and systems manufacturer to systems integrator.
- Consolidate position at current level - This option is likely to be attractive to subassembly and systems manufacturers that have the capabilities and resources to entrench themselves as low-cost suppliers of products that incorporate the best technology.

Each of the options are discussed below.

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### **Sell The Business**

Selling the business will be a very attractive option for some suppliers and may be the only option for others. As suppliers, especially the larger ones, position themselves to be global, full-service systems integrators they are adding capabilities by acquiring other, usually smaller, suppliers. Subassembly and systems manufacturers that supply critical components and technology are especially in demand. Those that have well-established relationships with motor vehicle manufacturers, are well-managed, and are financially sound are commanding premium prices from strategic investors, such as budding systems integrators.

A key consideration for the acquiring supplier is the extent to which the ultimate customers, the motor vehicle manufacturers, wish to continue to do business with the supplier that is to be acquired, although not as a direct supplier. In the initial stage of the relationship between a systems integrator and the motor vehicle manufacturers, the latter usually specifies the indirect suppliers of key subassemblies and systems. As the relationship matures, they jointly select the indirect suppliers. In a mature relationship, the systems integrator has the sole responsibility for selecting indirect suppliers and for managing the entire supply chain.<sup>15</sup> Since establishing itself as a credible systems integrator with one or more motor vehicle manufacturers is obviously the first critical step in the process, acquiring suppliers that are well-regarded by the motor vehicle manufacturers offers significant advantages beyond short term financial returns.

Suppliers that are currently successful Tier 1 subassembly or systems manufacturers may find it very attractive to sell if the following conditions are present:

- The supplier has determined that it must form a partnership with a systems integrator in order to continue to be successful over the next five to 10 years.
- The supplier has determined that it would be a junior partner in the relationship by virtue of the lead supplier's size and/or capabilities, and that it would be uncomfortable in that position.
- The supplier does not have access to the resources necessary to become a systems integrator. In many cases the only feasible route to becoming a systems integrator is to acquire larger suppliers.
- The supplier has determined that it probably has access to the resources, but finds the prospect of attempting to transform itself into a systems integrator unattractive. This would require raising funds through the debt and equity markets. For private companies it would likely be necessary to take the company public, which may not be an attractive option to the owners. Attempting to make the transformation from a successful, but relatively small subassembly or systems manufacturer to a much-larger systems integrator is extremely risky; it is tantamount to "betting the company", with somewhat less than even chances of succeeding.

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<sup>15</sup> Volkswagen is reportedly planning to take the process one step further by having its Tier 1 suppliers directly responsible for final assembly at a new plant in Brazil. (Posthuma, Anne and Glauco Arbix, "Lopez hits 'plateau' at plant in Brazil", *Automotive News*, February 26, 1996, page 1.



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The majority of Canadian suppliers are privately owned and relatively small. Some will find themselves in substantially the circumstances described above, and decide to sell their companies over the next two to three years. The acquiring companies most likely will be multinational companies that are establishing themselves as global systems integrators.

At the other end of the spectrum are suppliers who may have few options other than to sell their companies. After years of cost pressures and thin profit margins, some suppliers have not been able to make the investments in engineering, facilities, training, and other areas that are necessary to stay abreast of their competitors. The future prospects for these suppliers was expressed succinctly by some of the supplier executives who were interviewed: "Any suppliers that aren't currently generating sufficient cash flow to re-invest in their businesses have little chance of doing so in five to 10 years", or words to the same effect.

Low profitability and under-investment have weakened the financial position of some suppliers to the point that they require a major infusion of cash in order to stay in business. Such companies generally are not very attractive to lenders or equity investors, but may be attractive as strategic acquisitions by suppliers that need additional capacity, see value in the existing and potential future supply contracts that would come with the acquisition, and have the resources to turn around the faltering operations of suppliers that they acquire.

Regardless of a supplier's current position and reasons for deciding to sell the business, there probably will not be a better time to sell than now. There is currently a very high level of merger and acquisition activity in the global supplier industry as it restructures and consolidates. Industry production levels and profits are near the peak of the current cycle. The timing and depth of the next downturn are debatable, but its inevitability is not. When it occurs, the value of suppliers will fall, there will be fewer suppliers interested in adding capacity, and the pace of merger and acquisitions will slacken.

### **Move up the Hierarchy**

Until two to three years ago the primary success factors for most Canadian suppliers were: long-standing relationships with their customers, manufacturing capabilities, and the ability to react quickly to meet customers' needs. Since then the list of success factors has grown rapidly to include various product design and development and program management capabilities. Whereas, in the past, a supplier could succeed by doing a few things well and reacting to it's customers needs, in the future successful suppliers, especially those that are planning to move up the supplier hierarchy, will have to do many things well and become more proactive in their relationships with their customers. In short, they will have to make fundamental changes to the way they do business.

Adding capabilities entails significant costs and risks to suppliers. The risk is due largely to the uncertainty that either margins or sales volumes will grow enough to recover the up-front costs of developing the capabilities. With the motor vehicle manufacturers demanding price cuts from their suppliers, higher margins to offset the costs of developing and maintaining additional capabilities can only be obtained through reducing costs in existing operations. With an expected annual compound growth rate of the North American automotive industry of less than one percent, the only suppliers that are going to achieve significant growth are those that are either capable of winning business away from other suppliers or expanding into new markets. Therefore, any investments in new capabilities must be very tightly focussed on reducing costs overall and increasing sales volume.

### Component to Subassembly Manufacturer

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Enhancing their engineering capabilities is the costliest item on the "to do" list of suppliers that are moving up the supplier hierarchy. For component manufacturers that aspire to become subassembly manufacturers, the first step is to acquire the engineering talent and facilities to design, test and validate, and prototype the products that they previously built to blueprints and other specifications supplied by their customers. Component manufacturers typically spend little or nothing on product engineering and only a little more on manufacturing process development. The best subassembly manufacturers consistently spend about three percent of sales on engineering, most of it for product development.

For a component manufacturer, going from zero to three percent of sales for engineering costs is a huge leap. For many, three percent of sales exceeds their average annual net profit over a boom-bust cycle. For the two to three years or more that it may take for a supplier to begin production of components that it has designed, there will not be any additional revenues to offset the costs of first building and then maintaining an engineering capability. The costs are an investment that must be funded out of the resources of the company. For companies with a strong balance sheet, it may be possible to fund the engineering costs internally, but at a substantial cost to shareholders' equity. For companies with weak balance sheets, the only options are to inject new equity into the company or take on new debt.

In addition to acquiring an engineering capability, suppliers moving from being component manufacturers to subassembly manufacturers will have to assume responsibilities for additional manufacturing operations (*e.g.*, machining, painting, assembly) and program management functions such as managing a supply chain and providing a higher level of customer service. Receiving compensation for the additional costs of providing these services is less of a challenge than funding up-front engineering costs since most of the costs will not be incurred until production begins. However, the supplier must become good enough at these new functions to be able to provide them cost-effectively; *i.e.*, at less total cost to the motor vehicle manufacturers.

It is only after a subassembly manufacturer has acquired the necessary engineering, program management and other capabilities, as outlined above, that it can realistically expect to increase its sales volume. Displacing existing suppliers for models that are in production is extremely difficult, and in cases where it is possible, rarely financially rewarding. The best opportunities for new business are to win supply contracts for new models. However, only the best-qualified subassembly manufacturers will be invited to participate in new model programs by the motor vehicle manufacturers and, increasingly, systems integrators.

A component manufacturer's success in making the transition to a subassembly supplier will be measured by the extent to which it emerges as a supplier of lower-cost, higher-technology sub-assemblies than its competitors. Existing Tier 1 suppliers that succeed on these criteria and, in the process, strengthen the relationships with their customers can expect to remain in the automotive supply chain, but, in the longer term, not as direct suppliers to the motor vehicle manufacturers.

As the consolidation of the industry progresses, there will be fewer opportunities for component and subassembly manufacturers to be direct suppliers. In the initial stages of the transition, the remaining direct suppliers will be asked by the motor vehicle manufacturers to buy components and subassemblies from their preferred suppliers, many of which have long-standing relationships with the motor vehicle manufacturers. This will ensure that subassembly manufacturers will not be squeezed out by systems integrators, at

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least not immediately. The subassembly manufacturers will, however, have to establish and nurture relationships with new customers.

### Systems Manufacturer to Systems Integrator

In theory, any supplier with the necessary resources, desire and vision can become a systems integrator. But the ones that are most likely to complete the journey, in the short time that is available, are the ones that have the least distance to travel. The systems integrators that are most likely to prosper will be among the top three or four in their segment, in terms of size and capabilities, in at least two of three of the world's developed automotive industries (North America, Europe, and Japan). As their customers, or perhaps more accurately, partners, the motor vehicle manufacturers expand in developing markets (Eastern Europe, Latin America, Southeast Asia, India, China, etc.) the systems integrators must be prepared to supply assembly plants in those markets.

The suppliers that are most likely to be invited to join the rather exclusive club of systems integrators are existing systems manufacturers. (In cases where the systems integration capability is currently resident with a motor vehicle manufacturer an "invitation" is an essential first step since the motor vehicle manufacturers must agree to transfer the systems integration capability to the supplier. Clearly only the best suppliers are going to receive invitations.) Some possibilities are: seats to complete interior modules, brake to axle/suspension/brake/wheel modules, and bumpers to complete front end modules. The systems manufacturers that are best positioned to become systems integrators already are supplying the core products and technologies for the modules. To become full service systems integrators they will have to strengthen their (or add) systems engineering and integrated supply base management capabilities. They may also have to acquire key technologies and/or manufacturing capabilities through either acquisitions or partnerships with other suppliers.

Suppliers that are making the transition to full service systems integrators for models that are scheduled to go into production between 1997 and 2000 are investing the equivalent of 10 and 12 percent of current sales in the forward programs, most of it for engineering. The majority of the engineering costs, typically 60 to 80 percent are for applications engineering. Virtually all applications engineering is carried out at engineering centers that systems integrators have established in close proximity to Detroit and other locations where motor vehicle manufacturers' new model development teams are located.

The remaining 20 to 40 percent of systems integrators' engineering costs is devoted to new product and new technology development. The newer the product/technology being developed, the higher the portion of engineering costs that will be devoted to it. While the engineering resources allocated to it generally are less, success at new product/technology development probably is more important to the future of a systems integrator than applications engineering. Having leading-edge products "on the shelf" is the key to retaining existing customers and attracting new ones. Without proprietary products/technologies that are in demand applications engineering becomes, at best, something that a supplier does for others on a fee-for-service basis.

The challenges facing suppliers that are making the transition to systems integrators fall into two distinct categories: financial and organizational. The financial challenge is relatively straightforward. From three to five years will elapse between the time that a systems integrator starts working on a program to the time that delivery of complete modules to assembly plants and cash flow begins. With engineering and other program costs running at 10 to 12 percent of sales, the investment can exceed one-half year's sales before there is any return on the investment.

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The intent of the agreement between motor vehicle manufacturers and systems integrators, at the outset, is that, once the program is in production, the volumes and margins generated by the new business will be high enough to adequately compensate systems integrators for their risk in making the up-front investment. In the meantime, very few suppliers can fund the up-front investment from the cash flow from existing business. For suppliers making the transition to systems integrators, the existing business was closed on the basis of lower costs and margins. This leaves three options for funding the up-front costs: debt, new equity, and cash flow from the suppliers' other businesses.

If there was the certainty of future cash flows, lenders would be more inclined to provide funds to cover some of the up-front costs. A number of things introduce considerable uncertainty and risk, including: the new model program may be delayed or even canceled on short notice, sales volumes may be below expectations, especially if a model comes to market during a recession, and the systems integrator may not meet the target costs. Needless to say these are not the type of prospects that bankers and other lenders find attractive.

In most cases, investors would find buying equity that is to be used to pay for a systems integrators' up-front costs unattractive for the same reasons that making loans for the purpose is unattractive to bankers. The exception may be systems integrators that are working on revolutionary new technology that has the potential for large returns. For example, Ballard Technologies of Vancouver, British Columbia has been able to fund most of the development costs for its fuel cells through equity. While Ballard's fuel cell technology shows great promise, commercialization of the technology is still several years away. This leaves the existing shareholders of emerging systems integrators as the most likely source of new equity, assuming of course, that they have access to sufficient funds.

Multi-business suppliers that are generating strong cash flows and earnings from the majority of their businesses are in the best position to turn one or more of their businesses into full-service systems integrators. They can use the cash generated by their "cash cows" to invest in the "stars" that are most likely to become successful systems integrators. Inherent in such a strategy is that, with proper nurturing, the systems integrators will become large enough and profitable enough to become self-sustaining.

Perhaps more difficult than mustering the financial resources needed to become a full-service systems integrator is making the organizational changes that are required. The greatest strength of the most successful Canadian-based suppliers is their entrepreneurial drive. Owners of suppliers with relatively few plants tend to be hands-on managers whose business lives or dies on the improvements that they make at the plant level. The largest suppliers tend to be collections of largely autonomous businesses that are run by highly-motivated managers whose compensation is tied to the performance of the business. Entrepreneurial management works well for relatively small businesses that are providing a limited range of goods and services. It will work less well for systems integrators.

Highly-motivated managers of manufacturing operations will continue to be critical to the success of suppliers at all levels of the hierarchy, including systems integrators, since most of the manufacturing cost reductions will continue to be made at the plant level. However, successful systems integrators will have to do many things well in addition to manufacturing. Advances in product technology and further cost reductions are more likely to be realized if there is effective collaboration between product engineering and manufacturing groups. Managing a systems integration program will require marshaling both the internal and external resources of a large number of groups in order to deliver the lowest-cost and best-technology products and services. In short, creation of a certain

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amount of bureaucracy and integration of diverse operations is not only inevitable in becoming a successful systems integrator, but also necessary. The challenge is to make the organizational changes without compromising the existing strengths of the organization.

### **Consolidate Position at Current Level**

In contrast to the substantial changes that the other options entail, the best strategy for some current Tier 1 suppliers is to "stick to the knitting"; *i.e.*, to stick with what they do best. This strategy does not imply stasis. Suppliers will have to continue to hone their core capabilities and, in almost all cases, will have to shift their customer focus from motor vehicle manufacturers to systems integrators. The suppliers that are most likely to succeed at this strategy are those that are already good at their "knitting". They are currently meeting the motor vehicle manufacturers' targets for cost reduction, quality, and service. Most of the Tier 1 suppliers that meet these criteria and are otherwise well-regarded by their customers will remain in the supply chain, but not necessarily as direct suppliers.

Suppliers in this category will divide into two distinct groups: product specialists and process specialists. Suppliers of components that are no longer designed by the motor vehicle manufacturers will focus primarily on products. They will be responsible for all aspects of product design, testing, manufacturing and delivery. In short, they will take on all the responsibilities of a systems manufacturer, but will have a limited product range. Depending of their size and resources, suppliers in this group may design and manufacturer only a handful of relatively simple products, but they will be among the best suppliers of those products and will produce them in very high volumes. They will constantly be evaluating new materials and new designs for their products, and must be prepared to abandon existing manufacturing processes if they are no longer compatible with state-of-the-art materials and designs. For example, new plastics compounds and non-ferrous alloys may make some steel components obsolete. Suppliers of the steel components have the choice of re-tooling their plants to handle the new the materials or face loss of business to competitors.

Process specialists can continue to grow and thrive, at least in the short to medium term, as long as they are producing components for systems that remain "core" to the motor vehicle manufacturers, *e.g.*, bodies, engines and transmissions. Much of this business will remain build-to-print for some time. While these businesses are very large<sup>16</sup>, they are not growing. Growth for suppliers will come from increased market share. The successful process specialists will be the lowest cost suppliers that consistently meet quality, delivery, and service requirements.

In the longer term, suppliers will assume more of the responsibilities for the design of the motor vehicle manufacturers' core systems. For example, most of the body styling likely will be kept in-house by the motor vehicle manufacturers, but responsibility for structural design may be transferred to a supplier of essentially all of the body panels. Suppliers of engine valves may be asked to design and supply the entire valve train. In planning for the longer term, process specialists in these areas must position themselves to take on the additional responsibilities. They will do this by acquiring additional design and program management capabilities along the way and growing so that they have the size and financial resources to take on the additional responsibilities when the time comes.

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<sup>16</sup> For example, approximately 75 percent of the factory cost of engines is made up of purchased materials and components. Source: Whitney, Daniel and Guillermo Peschard, *IMVP Engine Plant Study*, IMVP Annual Sponsors Meeting, São Paulo, Brazil, June 10, 1996.

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As noted above, in the initial stage of the relationship between a systems integrator and the motor vehicle manufacturers, the latter usually specifies the indirect suppliers of key subassemblies and systems. Therefore, as the motor vehicle manufacturers purchase more components, subassemblies, and systems through systems integrators, the suppliers that previously supplied these items directly will have some protection against being squeezed out by systems integrators. Their biggest challenge will be to establish long-term relationships with a new customer base, consisting mainly of systems integrators.

The systems integrators may be less bureaucratic and, in some respects, less demanding of the indirect suppliers that they take on at the motor vehicle manufacturers' behest, but the indirect suppliers will, in virtually all cases, be the junior partners in the relationship. As the systems integrators' relationships with their customers mature it will become even more critical for indirect suppliers to establish positions of price and technology leadership in their areas of expertise in order to avoid becoming marginalized or squeezed out of the supply chain by the systems integrators.

Some suppliers, especially those in low-margin, low value-added businesses, such as commodity plastics processors, that choose to remain in the same product and process businesses may have few options other than to move their operations or switch large portions of their business to lower-cost regions. Suppliers in this group may be doing everything right with the limited resources available to them, but have little scope for gaining further cost or technology advantages because of the nature of the products and the manufacturing process, factor costs where they are currently located and/or other constraints.

### **CONCLUSION**

Given the relatively small sample of senior supplier executives that were interviewed during the field research, the findings presented above must be considered preliminary. However, the sample was large enough for distinct patterns to emerge, and these patterns are consistent with the findings of other studies of the supplier industry.

As the re-structuring of the global supplier industry continues there will be room for suppliers at all levels of the hierarchy, but there will be fewer of them, especially at the top of the hierarchy. After the turn of the century the number of suppliers in Canada will almost certainly be fewer than the approximately 550 currently. Industry output and employment will not necessarily be affected, however, as the industry will become concentrated in fewer, larger, more capable suppliers. Fewer suppliers will remain in private hands, but those that do will have evolved well beyond their "mom and pop" origins. The Canadian suppliers that remain will be among the best in North America and, arguably, the best in the world.