

Cases in Strategic-Systems Auditing

RIETER

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Introduction

Rieter Automotive North America, Inc. (Rieter), a subsidiary of Rieter Holding Ltd (a publicly traded company), is a specialized acoustics integrator, designing and supplying acoustic, thermal, and trim systems to manage, control, and prevent unwanted noise and heat in automobiles.

Rieter Holding Ltd., a Swiss company, operates on a global scale in the textile, automotive, and plastics industries. It is organized into two divisions—Rieter Textile Systems and Rieter Automotive Systems. Rieter Automotive Systems develops and manufactures separate and integrated components for noise control, thermal insulation, and interior trim for the automotive industry. Rieter operates within the automotive division of Rieter Holding Ltd. and the parent company charges a fee to Rieter for some administrative functions it performs.

Rieter was acquired in May 1995 to increase Rieter Holding Ltd.'s presence in the North American market. Formerly known as Globe Industries, Inc., and privately owned, Rieter has a long history as a leading supplier of acoustical components to major North American automakers. Acquisition of Globe Industries, Inc. provided a way for the Swiss company to enter the largest and most important car market in the world.

For a short time after the acquisition, Rieter Holding Ltd. retained the Globe management team. By 1997, however, the Rieter management team primarily consisted of executives from other automotive parts suppliers.

Goals and Strategies

Rieter's stated strategic objectives are to:

- Bring value to its customers, shareholder(s), and employees in order to attract and retain customers.
- Increase profitability and market share.

In its strategic plan, the following description is provided for how Rieter intends to accomplish the above objectives:

Rieter's Strategy to Accomplish Objectives
<ul style="list-style-type: none">■ Capitalize on Rieter's global presence and worldwide resources.■ Reduce customer costs (by improving installation and overall quality).■ Form strategic alliances.■ Enter the vehicle development process in the earliest phase, focusing on systems and not specific components.■ Expand recognition as a full-service supplier of carpet floor-systems having integrated acoustics and heat management.

Tight financial control is maintained by the parent company with heavy emphasis on meeting profit targets and keeping costs within budget. The parent company produces and distributes an annual financial handbook to its subsidiaries. This handbook contains all financial expectations and principles, including equity and capital borrowing guidelines, allocation of capital funds, monthly reporting requirements, and investment policies.

Products

Rieter develops, designs, and manufactures acoustical and thermal components and interior systems for automobile manufacturers in North America. Rieter was awarded the 2000 Automotive News Pace Award for breakthroughs in engineering insight and innovation for its “Ultra Light vehicle noise–management system.” Rieter approaches the problem of vehicle noise using principles of absorption rather than insulation. Rieter’s two-layer noise reduction material absorbs sound efficiently and reduces the weight of acoustical treatments in vehicles. Working with customers, Rieter develops and manufactures components that produce optimal sound solutions in terms of noise, vibration, and harshness (NVH). Rieter’s acoustic engineers (NVH specialists) employ their knowledge and experience to identify and analyze the sources and locations of vehicle noise and create assembly ready panels in key sound-absorption areas.

Plastics and fibers are produced from raw materials and then made into parts for new automobiles. Examples of the types of components that are made include liners for engine compartments that shield heat and noise, floor material and interior trim for the cabin compartment to absorb sound and provide insulation from outside air and noise, and other sound damping components that are placed in the trunk.

Figure 1 shows the specific components Rieter sells as part of its acoustic systems product line.

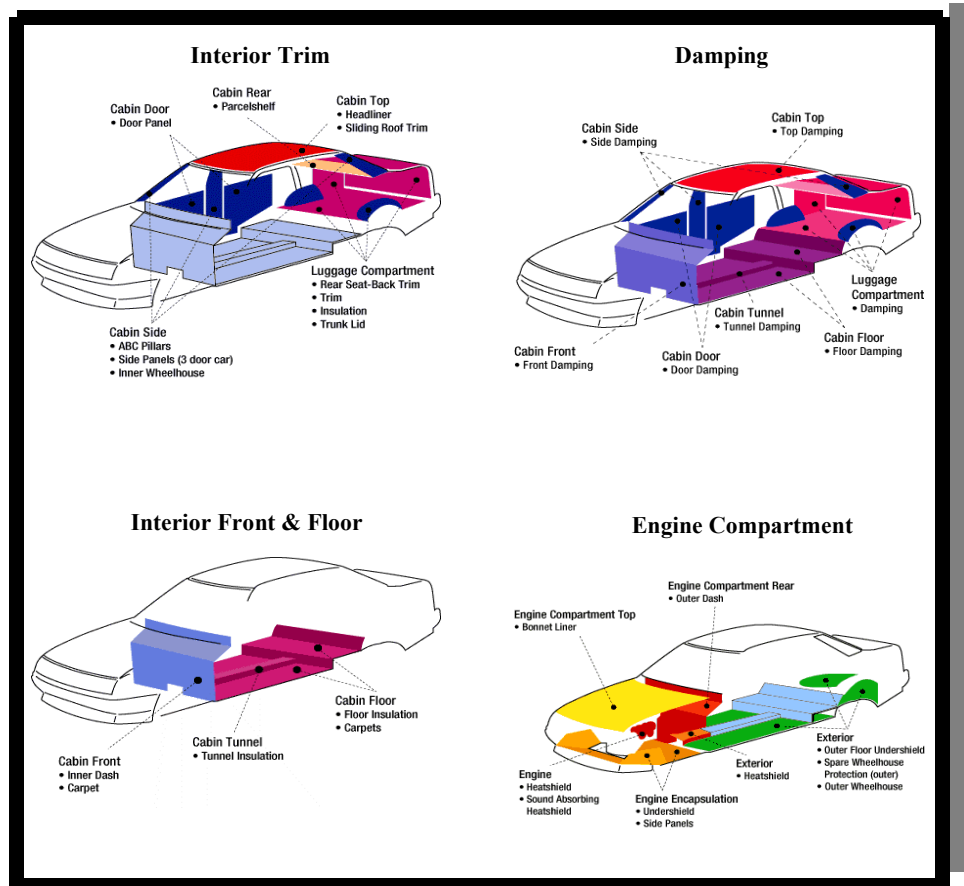


Figure 1

Source: www.rieter.com/auto/product

The majority of Rieter’s sales are made to automobile original equipment manufacturers (OEMs) with operations in North America. OEMs are the U.S.-based companies Ford, General Motors (GM), Japanese transplants (e.g., Honda production facilities located in the United States), DaimlerChrysler, and European transplants. Some of Rieter’s products also are sold for use in household appliances as insulation and sound damping components, but this is a small portion of Rieter’s business. To diversify its product line, Rieter recently has begun to develop acoustical components for heavy trucks by capitalizing on Rieter Holding Ltd.’s competencies in the European heavy truck market.

Organization Structure and Facilities

Rieter’s corporate headquarters are located in Farmington Hills, Michigan. A new headquarters building was opened in 1996 along with a state-of-the-art technical facility used for acoustical testing (NVH testing) and product design. Approximately 120 employees work in the Farmington Hills location.

Moving from the former Globe facilities in Chicago to this Detroit suburb was strategic because it allowed more interaction with major North American automotive manufacturers and suppliers.

Rieter is a *matrix* organization¹ that is divided into sales and marketing units — known as Customer Business Units (CBUs) —to enhance the relationship between the company and each of its customers. (See Figure 2.)

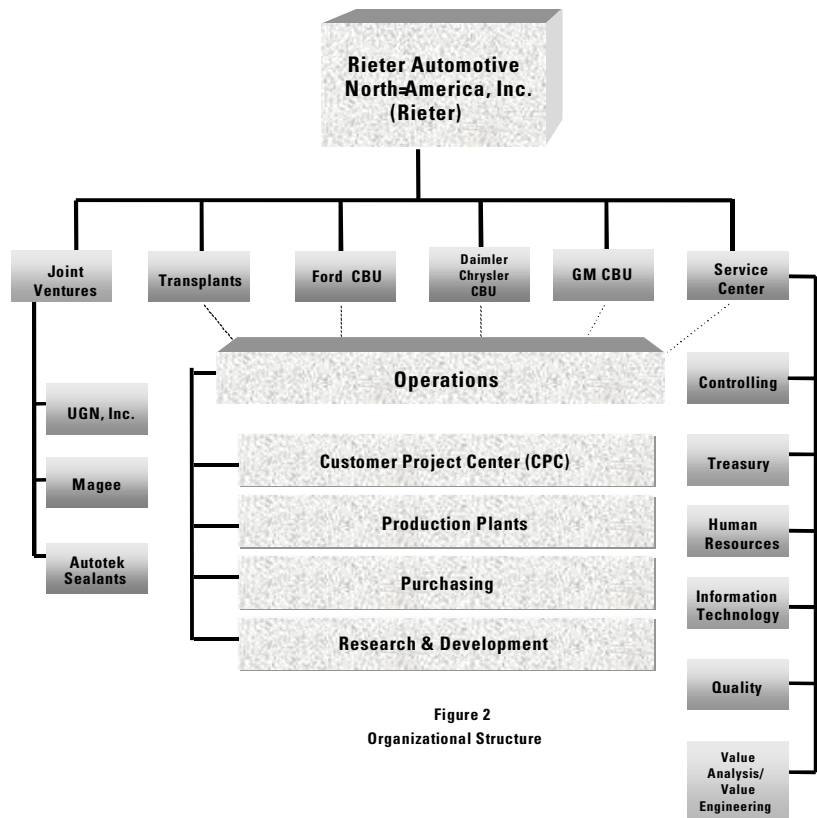


Figure 2
 Organizational Structure

There are separate business units for General Motors, Ford, DaimlerChrysler, and transplant manufacturers. Within each of these CBUs, sales personnel work exclusively with their specific OEM to promote and provide Rieter solutions.

Rieter’s Operations function includes the following four units: the Customer Project Center (CPC), Production Plants, Purchasing, and Research & Development. Unit heads report to the Chief Operations Officer (COO).

¹ Technical terms that may be new to readers appear in *italics* and are defined in the Glossary.

Rieter also has support functions that serve all Operations units. These support functions are as follows:

- Controlling
- Treasury
- Human Resources (HR)
- Information Technology (IT)
- Quality
- Value Analysis/*Value Engineering* (VA/VE).

The following table (Table 1) provides an explanation of the activities performed by each of the operating and support functions.

Table 1: Explanation of Activities

Functional Areas	Description of Activities
Customer Business Unit (CBU)	<ul style="list-style-type: none"> • Specify contacts for product development, marketing, and production.
Service Center	<ul style="list-style-type: none"> • Coordinate service from support functions. • Perform costing and quoting.
Support Functions	
Controlling	<ul style="list-style-type: none"> • Perform controllership activities.
Treasury	<ul style="list-style-type: none"> • Perform treasury activities.
Human Resources (HR)	<ul style="list-style-type: none"> • Perform corporate HR activities.
Information Technology (IT)	<ul style="list-style-type: none"> • Manage IT applications.
Quality	<ul style="list-style-type: none"> • Measure and evaluate design and production quality.
Value Analysis/Value Engineering (VA/VE)	<ul style="list-style-type: none"> • Identify cost reduction opportunities. • Work with CBU heads on price concessions and other cost savings ideas on an annual basis.
Operating Departments	
Customer Project Center (CPC)	<ul style="list-style-type: none"> • Develop concepts. • Report to Chief Operations Officer (COO).
Production Plants	<ul style="list-style-type: none"> • Manufacture acoustical and thermal components. • Report to COO (plant managers).
Purchasing	<ul style="list-style-type: none"> • Develop supplier relationships. • Negotiate annual blanket purchase orders for plant operations. • Report to COO.
Research & Development (R&D)	<ul style="list-style-type: none"> • Develop applications for basic research conducted by Rieter Holding Ltd. • Develop new materials for products. • Report to COO.

Sales activity is coordinated by each CBU with support from the other units. CBU Managers:

- Coordinate bidding on new products.
- Develop prototypes.
- Deliver final products to OEMs.

(The life cycle of a typical Rieter product is described in greater detail later in the case.)

Rieter operates production plants in five locations in the United States and Canada. Each plant is run by a manager who reports to the COO. Short-term production and shipment is coordinated through daily and weekly OEM “customer release schedules” sent via an *electronic data interchange* (EDI) system. These schedules are updated quite frequently. Although contract terms specify a product’s anticipated annual shipment quantity, the customer release schedule identifies each OEM’s specific production schedule for planning finished product shipments. Rieter is expected to meet these customer release schedule demands with no delays. The development of *lean manufacturing* operations by OEMs has dramatically escalated the expectations for suppliers to meet time commitments. Long-term production forecasts by product line also are developed in conjunction with OEM forecasts, allowing Rieter to anticipate capital commitments and revenue/cash inflows for periods extending as long as 12 quarters.

In addition to *distributing* finished products to OEMs, Rieter is concerned with activities pertaining to purchasing and *sourcing* of raw materials. Purchasing activity is coordinated by headquarters purchasing personnel using blanket purchase orders negotiated annually with suppliers.

Rieter’s organizational structure is intended to address its key business activities and objectives. Developing and marketing new products successfully is the primary determinant of future business and profitability. Products selected for inclusion in new platforms by OEMs must be placed into full-scale production. Rieter’s sourcing, production, and distribution must be managed carefully so that quality, timeliness, and profitability goals can be met.

Industry Analysis

Customers

Rieter's matrix structure allows each CBU to focus its marketing effort exclusively on providing superior products and services to their respective OEMs. Today, "superior" implies more than just competitive pricing and on-time delivery. Companies such as Rieter have to be in a continuous innovation mode and be ready to re-engineer entire acoustical systems and develop new products that further reduce or eliminate noise from a car's interior. Only a decade ago, automakers were responsible for new product design and development. Now that responsibility has been handed-off to preferred suppliers. Although automakers continue to award many contracts to suppliers on the basis of cost, design quality (such as reducing the weight of acoustical components) has become a criterion as well. (See Exhibits 1 and 2 for synopses of articles that describe these recent changes). With supply contracts spanning most automobile platforms' entire three-to-five year life, it is vital that suppliers like Rieter be successful in winning new bids.

Competitors

Lear Corporation and Collins & Aikman are Rieter's major competitors for auto interior supply contracts with automakers. In the past few years, companies in this sector have significantly expanded their operations by acquiring smaller suppliers and, in effect, consolidating the industry.

Consolidation has changed the nature of competition in three ways: (See Exhibit 3.)

- Creation of a "two-tier" supply system

First, it has created a "two-tier" supply system in which a select group of companies (Tier 1 suppliers) sells directly to the automakers, and other, smaller companies (Tier 2 suppliers) sell to the Tier 1 suppliers. Currently, Rieter sells to automakers and other Tier 1 suppliers, such as Johnson Controls and Magna International, who supply complete vehicle interiors to automakers.

- Economies of scale

Second, consolidation has led to a dramatic increase in the size of auto-supply companies. In 1992, only six auto suppliers generated \$2 billion or more in sales. Five years later, 17 companies were generating this level of sales. In comparison, global sales of Rieter Holding Ltd.'s Automotive Systems division for the year ended December 31, 1997 amounted to approximately \$1 billion. Consequently, most of Rieter's competitors now are significantly larger with greater access to financial resources and technology than ever before.

- Change in nature of products

Third, the nature of products being supplied has changed. The growth that accompanied industry consolidation has enabled Tier 1 suppliers to satisfy automakers' preferences for complete interior systems rather than individual modules or components. For example, in the last few years, Lear Corporation has transformed itself from a seat supplier to a systems integrator of complete vehicle interiors, now supplying seats as well as door panels, interior trim, headliners, flooring, acoustic systems, and instrument panels.

Joint Ventures and Alliance Partners

Rather than embarking on a spree of acquisitions, Rieter has responded to industry consolidation through joint ventures and strategic alliances with companies involved in acoustic product development and manufacturing. These ventures have expanded Rieter's product lines significantly to include interior trim, damping, front and floor components, and engine compartments. Rieter's choice of alliance partners is based on the potential for expanding its product lines. It also chooses partners to enhance customer relationships so that sales of current products will increase.

Rieter has three joint venture arrangements to help meet its production requirements. Autotek Sealants produces extrudable sealants and sound dampening butyl patches that seal automobile body seams and openings and fill hollow cavities to inhibit body-panel corrosion. UGN, Inc., a joint venture that Rieter formed more than a decade ago, produces acoustic components to supply Japanese transplant automakers. Further, Rieter has established a joint venture with Magee Industrial Enterprises (Magee-Rieter), a leading carpet supplier to General Motors. Magee consistently has won GM supplier quality awards. The joint venture has been beneficial to both Magee and Rieter. Magee has the opportunity to expand its business with other OEMs through Rieter's customer base and Rieter uses this new affiliation to expand its existing product line and enhance its own relationship with GM.

Suppliers

The most significant raw material inputs used in Rieter's product include resins, asphalt, clay, and shredded fiber. These raw materials are produced as commodities by a number of suppliers for a wide range of application. Because most suppliers (e.g., Dow Chemical) are certified by the *International Organization for Standardization* (ISO-certified) and little investment is made in establishing information networks, Rieter easily can substitute one supplier for another. Furthermore, most supply contracts are negotiated globally by Rieter Holding Ltd. This substitutability encourages commodity suppliers to establish and maintain competitive prices, and allows Rieter an opportunity to solicit quotes from several suppliers before establishing high-volume contracts.

Product Life Cycle

Rieter spends a great deal of time, energy, and money long before it sells and delivers products to a customer. This section describes the sequence of activities involved in this process. (See Figure 3.)

Request for Proposal

As stated earlier, since the mid-1990s, OEMs have pushed the responsibility for new product development onto their suppliers. This responsibility has been quickly assumed by some of the larger preferred suppliers because it provides yet another dimension on which to gain a competitive advantage. The process begins about three years before an automotive OEM plans to launch a new model, when it sends a *request for a proposal* (RFP) for a particular product or system to suppliers.

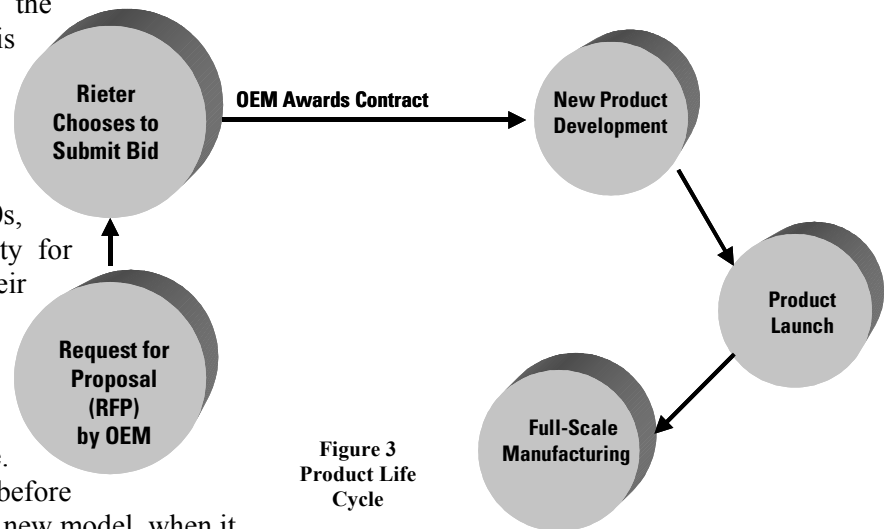


Figure 3
Product Life
Cycle

The RFP identifies the product concept and specific requirements for the product such as quality, launch date, features (e.g., size, weight), and performance (e.g., sound reduction). The RFP is intended to be specific enough to allow suppliers to understand the constraints under which they must design and produce the product. For example, for an interior front and floor system (see Figure 1), the OEM might specify precise dimensions (for proper fit with other components), a maximum weight for the entire system, and minimum sound-reduction performance (NVH measures). Suppliers then design a system satisfying these constraints using the best materials and technology available for such products.

When Rieter decides to pursue a RFP, it assembles a cross-functional team to develop a product design that complies with the concept and specified requirements. For a large project or new platform, the bid team includes five or six employees from engineering, NVH specialists, *computer aided design/computer aided manufacturing* (CAD/CAM), quoting, manufacturing, and purchasing who apply their knowledge of innovations in raw materials and other recent product development projects. Smaller projects will have fewer team members. Suppliers generally are given a lead-time of about three months to submit proposal bids.

Actual costs of a specific product on a given platform are likely to be incurred relatively evenly throughout the product's life cycle. Some initial investment in equipment and tooling occurs prior to full-scale production, but material and labor costs are incurred fairly consistently throughout production (with some efficiency gains realized each year). Rieter will have committed itself to almost all of the eventual costs of production for that product by the time the product is fully developed and ready for manufacture. Prior to bid submission, Rieter must accurately estimate all future costs. Rieter locks itself into a commitment to supply a given product at a given price to an OEM at the time the bid is submitted for consideration (nearly two years prior to generating cash inflows). Bid preparation activities, therefore, are extremely important to ensuring a profitable contract. If the bid were to underestimate the eventual costs,

Rieter would suffer the consequences during the duration of the product's life (which may extend beyond three years).

Selecting a RFP on which to bid is a very difficult decision due to conflicting forces. Rieter must bid on RFPs as often as possible to (a) maintain a presence on OEM platforms as OEMs tend to favor working with previous suppliers, (b) maintain production volume, and (c) provide new work that will keep its engineers on the leading edge of innovation in the industry. However, Rieter must be ensured that its bids will generate the desired profit over the product's life cycle. The importance of selecting RFPs is highlighted by the fact that awarded contracts are not revised unless the OEM initiates an *engineering change order* (ECO) for modifications to the product's specifications. When an ECO is issued, the OEM reimburses Rieter for the additional costs incurred.

Rieter has developed a formal process for developing and approving bids to ensure that a bid proposal is "right." A price that is too high will not be competitive and is likely to be rejected. A low bid could win the contract; however, a low bid also increases Rieter's risk of not realizing a satisfactory profit over the product's life cycle. The CBU managers are responsible for ensuring appropriate bids. After a team has assembled its proposed bid, the Quoting Department analyzes it to ensure that the quote fits the parameters of the RFP, the calculations are correct, and the price is competitive as well as profitable. The Quoting Department reports to the Chief Financial Officer. Winning bids are determined by such factors as price, product quality (e.g., sound reduction capability), and weight of components.

Costs included in bids are raw materials, direct labor, engineering, tooling and overhead, adjusted for anticipated inflation. Contracts are written such that the price that the OEM pays decreases at the end of the first year and each year thereafter of the model's life. The decrease in the price each year varies per the terms of the contract. This pricing structure requires that Rieter generate annual productivity gains if a product is to be profitable over its life cycle.

New Product Development

After a contract with an OEM has been won, product development, manufacturing, and marketing responsibilities are assigned to the CBU that deals with that OEM. Generally, it takes about two years to develop a new product. Increasingly, success in new product development requires the appropriate mix of employees (e.g., various types of engineers, NVH specialists, purchasing, and manufacturing) and technology (e.g., CAD/CAM). Success also requires that new products incorporate the latest materials because they usually are lighter and/or offer more sound reduction. The materials used by Rieter for noise reduction must not only absorb sound efficiently but must also reduce the overall weight of acoustic treatments in vehicles.

Value engineering is crucial during the development stage because Rieter must provide the technical capabilities of each product demanded by OEMs, but the costs to provide the product also must be minimized. *Concurrent engineering* also is used to assure that design, raw material, and manufacturing issues are considered for product decisions.

The push by OEMs to have suppliers assume more of the product development responsibility has changed the demand on Rieter's engineering capabilities. Before the recent industry changes, Rieter's engineering focus was on the design of the manufacturing process. Improvements in the production process allowed Rieter to produce at lower costs and/or with higher quality. With increased demands from OEMs to design products, Rieter now faces the additional challenge of

engineering the product development process. Rieter has had to develop capabilities for design engineering and at the same time integrate it with manufacturing. Increasing capabilities to assure concurrent engineering efforts are successful continues to be a priority for Rieter management.

A typical Rieter product development project starts with planning. During this phase, characteristics of the product are specified such as functionality, price, performance, and expected release time. Many of the activities in this phase take place during the bid preparation and submission process because most of these product characteristics are needed for the bid. In the second phase—concept design—additional details are developed in terms of the technological specifications of the product and the development project parameters (e.g., target costs, technological performance, interfaces with other automotive platform components, and production release dates). During the third phase—product design—intensive development takes place with significant effort to coordinate product cost and performance trade-offs. Concurrent engineering determines the production process while making development decisions because manufacturing will dictate many of the product's features. The last two product development phases, production launch and full-scale manufacturing are described in the following paragraphs.

Rieter works closely with its parent company in an attempt to stay on the leading edge of product development. The company has established contacts with academics and other research centers and set up Centers of Excellence to focus on *basic research* and *applied development* projects. An informal employee exchange arrangement exists between engineers and designers from Farmington Hills who frequently travel to Europe to learn about the latest developments in basic research and the European staff who travel to the United States to observe the challenges in applying the results of basic research.

Product Launch

An important part of launching new products is ramping-up production, which is designing and developing the required equipment and tooling to make the product. Designing and manufacturing tools and equipment is a specialized activity because quality and performance demands are extreme. Almost any tolerance problem in tools and equipment could result in a faulty product that must be rebuilt. Rieter outsources this function and just as OEMs expect Rieter to have design and technology expertise, Rieter expects its suppliers to provide leading-edge tooling and equipment design. Rieter relies on a limited number of these suppliers and works with them in developing new product and material applications. This type of tooling is becoming increasingly expensive and, because it is developed for specific auto platforms, it is not easily converted for other platforms.

After the required tooling and equipment is installed, pilot production begins. This period of experimental production tests how well the tooling interfaces with the materials and how well various parts fit together. When problems are identified, one or more products (Rieter's or the OEM's) must be redesigned or tooling or equipment must be modified. If the problem stems from Rieter's failure to comply with contracted design specifications, Rieter must bear any additional costs to make the product conform to specifications. Alternatively, a problem could be the result of an OEM's need to revise product specifications or its failure to anticipate interface problems with other suppliers' products. For this type of problem, the OEM issues ECOs to make the products fit together within specified tolerances and reimburses Rieter for

additional costs. Rieter's cost accounting system collects and reports costs of launching a new product. Variances from planned launch costs are investigated.

Full-Scale Manufacturing

Manufacturing a new product begins about six to eighteen months before the OEM plans to start selling a new model. Rieter uses *just-in-time/total quality management* (JIT/TQM) to organize and control its manufacturing processes. Because many of its suppliers are not located near its manufacturing plants, Rieter orders and maintains sufficient raw materials to supply about 10 to 15 days of production. Raw materials periodically arrive in large batches. There is no incoming inspection of these commodity-like materials because Rieter's suppliers thoroughly inspect them before shipment.

The majority of Rieter's facilities use *repetitive manufacturing*. In one of the facilities, production flow is paced by a *Kanban system* in which work-in-process inventory is "pulled" through its production process from workstation to workstation.

For a typical product, the manufacturing cycle time is about three hours. A *manufacturing resource planning* (MRP) system also is used to a limited extent to control production and compile production statistics. Rieter's cost system gathers and reports information about full manufacturing cost per unit of product, production cost variances, and gross margin per product line.

OEMs have very specific schedules as to when particular quantities of each product are to be delivered to each factory. Rieter obtains current information about these delivery schedules from an EDI system. This delivery information is input to its *business planning information and control system* (BPCS) to coordinate purchasing and manufacturing activities. Contracts with OEMs impose financial penalties for poor quality and failure to meet delivery times, but Rieter continuously manages its processes to exceed those constraint levels. Given the competitive nature of the automotive supply industry, Rieter recognizes the importance of maintaining positive long-term relationships with OEMs, and satisfying quality and timeliness demands is paramount to maintaining and strengthening those relationships.

Reporting Financial Performance

As in all enterprises, the content of the external financial statements is a function of the activities of the business. The relationships between Rieter's key business processes and significant components of the financial statements are explained below. For most manufacturing concerns, significant components of the balance sheet and income statement are accounts receivable, inventory (and related accounts payable), tooling, property, plant, and equipment (PP&E), sales, cost of goods sold (COGS), and selling, general and administrative expenses (SG&A). Other important but less obvious financial statement components include disclosures pertaining to financial viability, risks and uncertainties, and related-party transactions. The following discussion tracks the economic effects of a typical Rieter product on the external financial statements.

Request for Proposal

In January Year (X), Rieter received 12 RFPs from OEMs that invited bids to supply acoustic systems that would be installed in passenger vehicles slated for full-scale assembly beginning in July Year (X+2). Rieter chose to submit bids on nine projects of varying sizes. It assembled one team for each bid and most teams consisted of managers from each functional area. Because these managers had been merely reassigned from day-to-day management activities to another administrative function (i.e., proposal development work), their related payroll costs continued to be reported in SG&A accounts.

New Product Development

In March Year (X), Rieter learned that it was successful on four of its proposals. Each proposal led to a three-year contract with the possibility of renewal beyond that date, depending on the OEM's satisfaction and on the success of the vehicle lines into which Rieter's systems would be assembled. Rieter's successful bids were attributable not only to competitive pricing but also to innovative features that undercut competitors' expected product weights. By winning these contracts, Rieter could expect to produce and deliver products to OEMs in Year (X+3), Year (X+4), and Year (X+5). Although the product concept and design was reasonably well-established at the time the bids were submitted, a fair amount of work still was needed to develop materials that would be used in the production of prototypes for the systems. Although no precise forecasts could be made, Rieter's staff estimated that significant development costs would be incurred in Year (X) and Year (X+1). As required by SFAS No. 2, *Accounting for Research and Development Costs*, these costs are treated as period expenses.

Product Launch

In late Year (X+1), Rieter developed the materials and production process that would be used to manufacture and assemble the product systems for the four contracts. Through its alliance with Magee, Rieter was able to identify and secure a reliable supplier of tooling and equipment. Tooling required for the bids is expensive and is expected to be used for the entire period of production but will not likely be used in any subsequent vehicle lines. In Winter Year (X+1) through Spring Year (X+2), Rieter worked closely with OEMs in pilot production. Additional design work was required to rectify several problems. Although the redesign work and related scrap costs were significant, Rieter had been issued ECOs ensuring full cost recovery from the OEMs. Consequently, Rieter recorded these launch costs in accounts receivable. Other launch costs that are not directly recoverable (e.g., anticipated scrap) are deferred and allocated to inventory when full-scale manufacturing commences.

Full-Scale Manufacturing

Rieter began purchasing sufficient quantities of raw materials during May Year (X+2) to support full-scale manufacturing in June Year (X+2). At the same time, standard costs were developed and are being assigned to inventory as production proceeds. These costs are transferred from inventory to COGS at the time of product delivery. Variances between actual and standard costs are determined each month by product line and are allocated between inventory and COGS.

Concluding Comments

Rieter has carved a niche by developing expertise in providing specialized acoustics integration for automobiles. Rieter has outpaced major competitors through continuous innovation and strategic partnering, thereby, meeting the auto industry's challenge of providing an ever-increasing quality product at the right price and time. Not surprisingly, Rieter's future will depend on its ability to continue to outpace competitors in meeting the needs of automobile OEMs who also operate in an increasingly competitive industry.

Glossary

Applied development—The knowledge gained from basic research that is used in product design and production.

Basic research—Research that primarily is concerned with inventing new technologies and products that someday may benefit production. Examples range from creating new polymers to developing new noise reduction concepts (e.g., reengineered energy flows).

Business planning information and control system (BPCS)—BPCS is an information system used to manage manufacturing processes. It preceded the current forms of enterprise resource planning systems.

Computer aided design/computer aided manufacturing (CAD/CAM)—CAD/CAM is a set of information technologies that are used to design and draft products and to design the operating instructions governing the manufacture of products.

Concurrent engineering—The simultaneous design of a product and the process used to make the product. The approach is in contrast to sequential design by which the product is designed by product engineers and then manufacturing engineers design the process for production. Concurrent engineering generally results in a lower product life-cycle cost because coordinating product design and manufacturing streamlines production and post-sale service costs are lower.

Distribution— Outputs (finished goods) are sent to OEMs.

Engineering change order (ECO)—ECO is an instruction from engineering that details changes that should be made to the materials and/or the process used to make a product.

Electronic data interchange (EDI)—EDI is the direct computer-to-computer exchange between companies of standard business documents such as invoices, bills of lading, and purchase orders.

ISO—The International Standards Organization developed a set of five quality standards, which collectively are known as ISO. Obtaining ISO certification demonstrates that a company has a quality control system that is fully operational and is backed by detailed documentation of quality control procedures, and the intended level of quality is being achieved on a sustained and consistent basis.

Just-in-time (JIT)—JIT management is a strategy that has as its goal the completion of a value-adding activity in the minimum possible cycle time and immediately before the product/service is needed by the next activity or the customer.

Kanban system—This is an information system that signals when the next activity needs inputs or a customer needs a product. Kanban is a Japanese word that means "card" and is used in Japanese factories to signal visually that a workstation needed input from the preceding workstation.

Lean manufacturing—This is a term used to describe a manufacturing process that employs teams of multi-skilled workers at all levels of the organization and uses highly flexible, increasingly automated machines to produce volumes of products in enormous variety.

Matrix organization—When an organization's structure emphasizes responsibility by function **and** by, in Rieter's case, customer, it is considered to use a matrix design. For example, a Rieter engineer working on Ford products would report to someone in the Ford CBU **and** to someone with overall responsibility for Rieter engineering functions.

Glossary (continued)

Manufacturing resource planning (MRP)—MRP is a computer-based planning and scheduling system designed to improve management's control of manufacturing and its support activities. It translates a firm's business, sales, and production plans into specific day-to-day activities through several subsystems dealing with master scheduling, materials planning, capacity planning, shop-floor control, and vendor scheduling.

Repetitive manufacturing— Repetitive manufacturing is a form of manufacturing in which various parts/components with similar routings are made using the same processes during production. Products may be made in separate batches or continuously. Repetitive production is not a function of speed or volume.

Request for proposal (RFP)—An RFP is a formal set of product information and specifications provided to potential suppliers of a product or service. The request typically details precise requirements for product characteristics as well as the procedures to follow to submit a bid for the product.

Sourcing—Inputs are physically moved from suppliers to a company.

Total quality management (TQM)—TQM is a set of activities whose purpose is continuous improvement of processes and whose objective is total customer satisfaction.

Value engineering—This is a process that includes examination of each component of a product to determine whether it is possible to reduce costs while maintaining functionality and performance.

Exhibit 1 Excerpts from article

“A New Paradigm for Interior Sound” excerpts — *Automotive & Transportation Interiors*, May 1998. Reprinted with permission.

While the subject of air quality is a hot topic, acoustics and sound insulation are no less important. Manufacturers now have entire multi-million dollar research facilities and hundreds of engineers dedicated to the task of reducing, if not actually eliminating, sound from a car’s interior.

Jeff Van Buskirk, director of NVH development, Rieter Automotive North America Inc., a major acoustical system vendor in Farmington Hills, Mich., says he’s seeing the same kind of trend in acoustical engineering as in other areas of automotive engineering. “Previously, the underlying belief was that the only way you make a car quieter was to simply add more insulation and acoustical material to more and more areas of the car. But since this adds weight and cost, we are being asked to produce the same level of sound reduction, and luxurious cabin environment, but with either less, lighter or more strategically placed acoustical material.” Challenging this belief, and forcing suppliers like Rieter and others to go “outside the box,” has led to dramatic changes in the old paradigm, he adds.

“As a result, we’re coming up with entirely new approaches to solving the problem,” he says. “Instead of trying to create a more or less sound-proof box, we’ve moved to what we call an Ultralight concept, which involves analyzing and managing the energy flow inside the cabin. What that has led to is the development of an acoustical system freed from simply looking at adding mass or reducing physical weight to manage sound. We now see that we can indeed absorb sound with lighter materials, but we’re also relying on parameters other than weight.”

Van Buskirk notes that in the past six months alone, using this new technique, company engineers had completed acoustical systems for two high-volume sedans and one high-volume pickup in which they were able to take out 50 percent of the weight of the components now being used in the current models. According to Van Buskirk, that amounts to a weight reduction of between 20 to 30 pounds, depending on the vehicle.

Exhibit 2 Excerpts from article

“Market Trends” excerpts —*Automotive & Transportation Interiors*, November 1998. Reprinted with permission.

Cost has always been a driver in auto interior design and materials selection. In the current environment of over-capacity, shrinking margins and ever narrower market niches, it has assumed particular importance. Today’s approaches to cost savings more likely involve technological innovation, supply chain shifts and new manufacturing approaches than traditional OEM pressures on suppliers.

The auto interior supplier industry is well into a period of consolidation, globalization and shift of design, technical development and manufacturing responsibility toward a smaller number of global suppliers, vying for a chunk of the \$50 billion global interior market. Competing on this battleground are not only 20 different plastics and textile families but also important new fabrication technology companies.

The combination of increased cost emphasis, radical industry structure change and supply chain globalization have created a period of technical discontinuity in which –

- geographic boundaries become irrelevant to the transport of new technology;
- development cost risks can be amortized over a large number of vehicles;
- incentives for materials and process technology innovation are enhanced.

Exhibit 3 Excerpts from article

“It’s a Deal” excerpts—*Automotive & Transportation Interiors*, September 1998. Reprinted with permission.

With high-profile, big-money, talk-of-the-town type deals (Daimler-Benz’s acquisition of Chrysler, Johnson Controls’ acquisition of the Becker Group, etc.) dominating much of the industry’s attention, it’s easy to overlook the many smaller transactions. But these deals, despite their lower price tags, still play important roles in making the automotive industry one of the most robust economic sectors in the country.

PricewaterhouseCoopers LLP has recently published its 1997 global deal survey for the automotive sector, an annual publication that tabulates merger and acquisition deals closed in 1997. The survey shows a total of 161 transactions among component manufacturers, of which almost half were between interiors suppliers. Of the 161 transactions, 66 disclosed the value of the deals, which totaled \$9.7 billion. Of this amount, roughly \$3.4 billion came from deals that involved interiors suppliers. The survey does not include deals announced in 1997 but closed in 1998, such as Johnson Controls’ acquisition of Becker.

The survey reports that the primary trend “continues to be toward leveraging core design, engineering, manufacturing, and distribution competencies.” It adds that in 1997, acquisitions were ‘often structured to enhance the ability of suppliers to sell systems or modules to OEMs,’ and that non-core businesses that are deemed strategically unimportant were sold.

One of the authors of the survey, William Doepke, a Chicago-based managing director with PricewaterhouseCoopers’ global automotive team, says most of the deals came as no surprise to him. “They’re all logical,” he says. “They represent suppliers’ expansion of their core businesses and fulfilling their modular competencies. For some, it means supplying a module and not only a part; for others, it means supplying a system and not only a module.”