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Challenges in Sourcing and Procurement during an Economic Downturn

A Case Study of an Indian Automotive Parts Supplier

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Abstract

Indian automotive parts industry plays an important role in the automotive supply chains of major manufacturers around the world. Nearly all global auto manufacturers including Hyundai, GM, Ford, and Honda have established plants in India. After a decade of strong growth the industry suffered during 2008-2009 as a result of the global crisis. This case study analyzes Rane (Madras) Ltd., a leading parts maker in India, and illustrates the complexity in navigating the challenging current environment of severe price constraints and pressuring suppliers while working with them and supporting them for long-term growth.

JEL classification numbers: L62, M11
Keywords: Supply chain management, Sourcing, Auto industry, Supplier relationships

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1 Introduction

On a scorching hot day in June 2009, key members of the Sourcing and Materials team of Rane (Madras) Limited gathered to discuss the plans for the upcoming year. The past fiscal year had proved to be very challenging, and market conditions continued to be very difficult. The team was involved in providing input for the budget plans for the current year, and was seriously concerned about managing its supplier base not only for the short term but also for the longer term. What should Rane (Madras) Limited do now in supplier management to be in a stronger position when the automotive industry eventually returned to a growth mode, which was bound to happen?

2 Company Information

2.1 Rane Group

Rane Group was one of India's leading auto parts suppliers with a rich history. Founded in 1929 as a distributor of automobiles & parts, it subsequently diversified into manufacturing, and during the seventies began making IC Engine Valves, Friction Material, Manual Steering Gears, and other auto components. In the early nineties it established joint ventures with TRW, JMA and NSK. Rane Group is organized as a holding company with seven manufacturing companies serving various Original Equipment Manufacturer (OEM) segments (Figure 1). The Group had sales of Rs. 13.657 billion ($273 million) in the 2008-09 fiscal year. The company is a key supplier to major OEMs in India and abroad and its products can be found in passenger cars, multi-utility vehicles, light commercial vehicles, medium & heavy commercial vehicles, farm tractors, three-wheelers, two-wheelers and stationary engines. The company had 34 manufacturing plants in India (Figure 2). It partnered with automobile companies to provide end-to-end solutions using the integrated design, manufacturing & testing facilities at each of the group companies. The company exports its products worldwide. The company initiated a serious effort to improve quality significantly and won several awards. Four of the company's seven divisions received the Deming Application Prize between 2005 and 2009. Rane implemented SAP as the core ERP system across all its companies. It also established the Rane Institute for Employee Development (RIED), initiated a Rane Operators Competency Enhancement (ROCE) training program, and founded a Centre of Excellence for Manufacturing Systems at PSG College of Technology, Coimbatore.

2.2 Rane (Madras) Ltd. (RML)

RML was established in 1960 to manufacture steering and suspension systems. It was a supplier to all the major domestic and international OEMs in the industry

and exported to many of the assembly plants of the major automotive system manufacturers worldwide (Figure 3). It had strategic technical partnerships with TRW. RML's sales for FY 2008-09 were Rs. 3.542 billion (approximately US$ 71 million), up from Rs. 3.492 billion in 2007-08. Profit before tax was Rs. 12.012 million (US$ 240 K) in 2008-09 while the firm lost Rs. 23.975 million the prior year. This was quite impressive in light of market conditions; however the economics of the auto component industry was quite challenging. Auto makers like Maruti-Suzuki enjoyed far better returns than component makers like RML (Table 1). Driven by a design philosophy of "getting it right the first time" RML engineers used contemporary computer aided engineering and design applications and performed finite element analysis for all critical parts, and performed vehicle steering system analysis to simulate real life conditions. Each of the company's production plants (Figure 4) addressed a specific industry segment. The Chennai plant served the Light Commercial Vehicle, Heavy Commercial Vehicle and Utility Vehicles segments, the Mysore plant the Tractor and Commercial Vehicle segments, the Puducherry plant the Passenger Car segments, the Varanavasi (Chennai) plant served the Exports market, and the Uttarakhand plant served specifically the customers in Northern India. Independent manufacturing cells produced specialised high-end components for their segments. The company achieved IS0/TS 16949:2002 and IS0 14001 certifications for each of its manufacturing locations and was also certified to OHSAS 18001 standards. RML had made significant investments in its people, and had pursued and won the Deming Application Prize in 2007, the fourth Rane Company to win the coveted award. RML invested 1.02% of sales in R&D in 2008-09, and had 942 employees.

3 The Indian Auto and Auto Parts Industry

The economic reforms of the early nineties led to a boom in Indian automotive sales and exports. The opening up of the financial industry to the private sector led to a number of domestic private sector banks and foreign banks offering auto loans. This drove the sales of the autos even further in the recent decade. In 2008-09, India's automotive industry had sales of US $55bn. Vehicle sales accounted for US $36bn and component, tyre and aftermarket sales accounted for US $19bn[2]. Passenger cars accounted for 45% of industry sales while commercial vehicles accounted for 27% and the remaining sales were composed of two wheelers and three wheelers. During April 2007 – March 2008 year sales of passenger cars grew by 11.79 percent, Utility Vehicles by 10.57 percent and Multi-Purpose Vehicles by 21.39 percent. Medium & Heavy Commercial Vehicles declined by 1.66 percent but Light Commercial Vehicles grew by 12.29 percent. Sales of three-wheelers sales decreased by 9.71 percent. The affordability

[2] Society of Indian Automobile Manufacturers (SIAM)

of passenger cars led to a decline in sales of two-wheelers, with motorcycles and electric two wheelers segments declining by 11.90 percent and 44.93 percent respectively. However, scooters and mopeds segment grew by 11.64 percent and 16.63 percent respectively. Automobile Exports registered a growth of 22.30 percent during the year, led by two wheelers which grew at 32.31 percent. By 2015-16, automotive industry turnover in India is expected to reach US$150-200bn[3].

Despite the growth trends over the past ten years, 2008 shaped up as the worst year for the Indian auto industry as total demand declined for the first time in recent history (Table 2). In November 2008, car sales in the country slid to 83,059 units from 103,031 units in November 2007, the lowest sales figure in eight years. Sales of buses and trucks in the country fell by nearly 50%, worse than a 48.6% decrease in January 1998. Sales of two-wheelers slumped 14.7% to 567,502 units. This year was called "annus horibilis" for the Indian automobile industry by International Business Times. The global economic downturn had serious effects on the Indian export-dependent industries, and this spilled over to the auto sector[4]. Automobile loans became more difficult to obtain and were more expensive.

According to the Automotive Component Manufacturers Association of India (ACMA) the automotive component industry's output was estimated to be US$ 19 billion in 2008-09 with a growth rate of 6.1% against 2007-08. It was expected to touch US$ 40 billion by 2015-16, increasing India's share in the global auto component market from 1 per cent to 3 per cent. However, India's auto components industry, accustomed to compound annual growth rates of 25% to 30% over the past four years, experienced a collapse in orders beginning in October 2008. A combination of the global auto market slowdown and currency volatility affected exports significantly. Domestically, the commercial segment had slowed down significantly and Original Equipment Manufacturers (OEMs) were extracting deep price concessions from component vendors and also extending payment cycles. Component vendors with significant exports were affected to a greater degree by the increasingly tenuous financial condition of major U.S. auto makers, while those with significant after-market sales and support were faring better. Indian auto component makers were also seriously worried about competition from Chinese firms, who were selling components in the Indian market at below-market prices. However the quality of the Chinese components, currently, was far below that of the Indian firms. Of the more than 592 members of ACMA, 564 were certified to ISO 9001/9002, 186 companies were awarded ISO 14001, 397 companies received TS 16949, 60 companies were certified to OHSAS 18001, 11 companies had won the Deming prize. One Indian

[3]http://www.companiesandmarkets.com/Summary-Market-Report/india-automotive-market-review-forecasts-to-2014-264611.asp

[4] Indian Auto Industry Tipped Over due to Downturn - http://www.rncos.com/Blog/2009/02/Indian-Auto-Industry-Tipped-Over-due-to-Downturn.html

company had also won the highly coveted Japan Quality Medal and 15 companies had won the JIPM Excellence award.

The component industry exported around 20% of its output and exports were growing at the rate of 8%. In the year 2008-09, industry exports totaled US$ 3.8 billion versus US$ 3.5 billion in year 2007-08. Principal export items include replacement parts, tractor parts, motorcycle parts, piston rings, gaskets, engine valves, fuel pump nozzles, fuel injection parts, filter & filter elements, radiators, gears, leaf springs, brake assemblies & bearings, clutch facings, head lamps, auto bulbs & halogen bulbs, spark plugs and body parts.

While most global OEMs had a presence in India there was a relatively smaller presence of global suppliers due to low production volumes. Maruti Suzuki, Hyundai and Tata Motors together accounted for 76% of the passenger car market (in terms of volume). Hence, suppliers with strong linkages to South Korean and Japanese OEMs thrived. According to a Research Analyst at RNCOS, "Auto manufacturers have always considered India as a long-term target, expecting strong demand from the Indian market. The cost of manufacturing is also low in India. But presently, the Indian auto industry is experiencing a downturn. However, government's stimulus package has reduced the automobile prices, but as long as higher credit rates and liquidity crunch are prevailing, the industry is unlikely to recover. Also, a lot more efforts should be made by the government to re-boost the sagging demand."

4 Supply Chain in the Indian Automotive Industry

In the past the automotive manufacturers in India had relied on a large number of smaller companies which supplied the many parts and components that went into a vehicle. Over the past fifteen years the automakers had begun to buy entire systems and sub-systems from OEMs, thus reducing the number of suppliers they dealt with and the number of parts they purchased. The OEMs in turn purchased component parts from smaller firms like RML who purchased metals and lower value parts from their suppliers (Figure 5).

Indian Automotive Parts Industry had proven to be vibrant and had risen quickly to meet the technical and quality demands of major automotive manufacturers around the world. Nearly all global auto manufacturers including Hyundai, GM, Ford, and Honda had established plants in India. As they turned to domestic suppliers for parts and systems, both for their Indian and international needs, they insisted on global standards of quality, commitment to delivery and internationally competitive prices. This raised the expectations for Indian automotive parts manufacturers like RML, who subsequently invested in quality improvement and training programs.

According to RML's managers, four factors – quality, cost, delivery, and technology, played a primary role in enabling the parts manufactures like Rane to meet the requirements of the automobile industry.

Quality: A defect rate of ten to twelve percent was acceptable a decade ago. Today OEMs expected defect rates of less than 100 ppm or 0.01%. Quality was of paramount importance. RML management realized that its ability to produce high-quality parts was heavily dependent on sourcing quality products from its suppliers.
Cost: In the past parts manufacturers would fix the price of their products based on estimated costs with some margin for profit. Recently, as evidenced by Tata Nano (which was designed with a target market price of one lakh rupees (approx. $2000), the auto makers established target prices for different sub-systems and expected the OEMs to meet those targets. In turn the OEMs specified the "target prices" for the parts going into the sub-assembly. Therefore parts manufacturers like RML had to work backwards and create profits by operating and sourcing efficiently and strategically.
Delivery: All automobile manufacturers had implemented JIT manufacturing. This tricked down to the parts makers who had to manage inventory of the parts to ensure that they were available when required.
Technology: Advances in technology impacted parts manufacturers in many ways. OEMs were creating assemblies with more functionality than ever before. Many systems were being controlled electronically, so technology was becoming a key aspect of many parts. Further the process and equipment technology on the factory floor was also changing at a rapid pace. Parts makers had to keep implementing new technology in their plants to realize operational efficiencies that were critical to meeting target prices with an acceptable margin. They also had to invest significantly in Information Technology (IT) to collaborate with their global customers and suppliers.

5 Sourcing and Procurement at RML

Though Rane Group had seven manufacturing companies there was no centralized purchasing policy or group. This was partly because there weren't many common components among the seven companies. The heads of Sourcing and Materials of the seven companies met annually and shared information about suppliers, including product range and quality and prices. Purchased materials accounted for 60% of the total cost of the products produced by RML (Figure 6). Small savings in per-unit material prices could reduce costs considerably. Therefore, sourcing was considered a strategic activity at RML.
RML collected information about potential suppliers through catalogues, sourcing databanks, references from existing suppliers or customers. Occasionally customers would insist that RML use a supplier identified by them for a particular material or part. Once the supplier details were obtained, a profile assessment of the supplier was performed by sourcing department based on the number of years of operation and the clients served. Once the profile assessment was complete members of RML's Materials and Sourcing department (M&S) visited the

supplier and reviewed the equipment and technology in the plant. The M&S group also performed a commercial viability analysis to assess the competency of the supplier to produce products at a cost that would be acceptable for RML. Suppliers who passed this review were visited by RML's Supplier Technical Assistance (STA) team which audited the potential suppliers' Quality Processes and Systems. These firms were assessed on seven items using questionnaires. RML required that the cumulative score had to be at least 80% for a firm to become its supplier. Individual categories also had a cut-off percentage but these were relaxed for one or two items if a supplier did well cumulatively. However the suppliers were pushed to take corrective actions in those areas where they lagged, and were audited again once the corrective actions were taken. After the STA team signed off on the audit the company was added to RML's supplier list (Figure 7).

6 Sourcing and Supplier Management

6.1 Sourcing process at RML

RML followed both single (sole) sourcing and multi-sourcing based on the volume of the procured items. If the quantity of an item to be procured was high, RML preferred multi-sourcing, otherwise it selected a single supplier. Not all the suppliers had plant locations near RML plants and in order to maintain Just-in-time (JIT) inventory RML's suppliers formed warehouse hubs near RML's manufacturing plants. RML also involved its suppliers in the design process for certain products. RML negotiated pricing with its suppliers based on historical data as well as current market prices. Pricing contracts were reviewed every year and updated if needed. No product liability clause was signed by Rane with the suppliers. Quality of the products sourced was the suppliers' responsibility. RML's STA team provided process expertise to suppliers and helped them in improving their processes.

6.2 Reverse auctions

RML had tried reverse auctions two years ago with little success. Many suppliers were unwilling to participate. Further the high-value products to be sourced were customized (to some degree) for RML and the latter could not find a lower price through reverse auctions as most of the suppliers did not quote below a certain price.

6.3 Supplier relationship management

RML conducted Supplier Satisfaction Surveys every year. It sent all its suppliers a questionnaire and based on the survey mapped the suppliers into a 3 X 3 matrix

based on two factors: Supplier Dependency on RML (based on the % of the supplier sales that were generated through RML) and RML Dependency (based on the % of the total RML spend given to that supplier). RML determined suitable strategies for the suppliers in various quadrants (Table 3).

6.4 IT in sourcing

RML did not use any particular procurement software for sourcing. While all the group companies shared a common ERP system (SAP) it was not used for sourcing and procurement. There was no Vendor Managed Inventory system as the suppliers did not have that capability currently. Consequently RML did not share real-time inventory with its suppliers.

7 Supplier Relationship during Recession

The last two years had proven to be quite challenging for the parts manufacturers. Prices of metals and other raw materials and labor costs were going up quite dramatically. However, competition was severe among automotive manufacturers, and therefore they did not pass on the full impact of rising costs to consumers. Instead they expected the OEMs to absorb the rising costs, and the OEMs in turn expected their suppliers to do the same. Further the auto makers and the OEMs were extending payment cycles. While RML could follow the same path, it recognized that its suppliers were much smaller and less capable of dealing with both cost reductions and working capital stresses. However RML was compelled to improve its operational efficiencies to grow. It had brought down its operational cost by implementing Quality at Source. But Quality was becoming a requirement and not a differentiator. RML realized that business was cyclical and that the market growth would return. The question was – what actions should it take now so that it would come out of the downturn in a stronger position and with better relationships with its stakeholders, including suppliers.

8 Teaching Note

8.1 Case synopsis

Rane Group was one of India's leading auto parts suppliers with a rich history. Founded in 1929 as a distributor of automobiles & parts, it subsequently diversified into manufacturing, and during the seventies began making IC Engine Valves, Friction Material, Manual Steering Gears, and other auto components. Rane (Madras) Ltd. (RML) was established in 1960 to manufacture steering and suspension systems. It was a supplier to all the major domestic and international OEMs in the industry, both. It had strategic technical partnerships with TRW. The

last two years had proven to be quite challenging for the parts manufacturers. Prices of metals and other raw materials and labor costs were going up quite dramatically. However, competition was severe among automotive manufacturers, and therefore they did not pass on the full impact of rising costs to consumers. Instead they expected the Original Equipment Manufacturers (OEM) or subsystem manufacturers) to absorb the rising costs, and the OEMs in turn expected their suppliers to do the same. Further the auto makers and the OEMs were extending payment cycles to their suppliers, so the latter had to wait for a longer period to collect their payments. While RML could follow the same path, it recognized that its suppliers were much smaller and less capable of dealing with both cost reductions and working capital stresses. However RML was compelled to improve its operational efficiencies to grow. The question facing RML's Supply chain Managers was how to support and develop suppliers so that RML could emerge in a stronger position when the automotive market recovered.

8.2 Case synopsis

This case is intended for courses in Purchasing, Strategic Sourcing, Supply Chain Management, Strategic Management, International Business and related courses at the graduate or undergraduate levels. In an undergraduate course it has been used to educate the students on the complexities of a supply chain in a rapidly developing emerging market and on the problems faced by the various players in a difficult macro-environment. In a graduate course it has been used to illustrate the challenges faced by parts manufacturers in a difficult macro-environment, and in a supply network where the bargaining power resides with a few final car assemblers and their primary suppliers, the subsystems manufacturers or OEMs. Graduate students can also build analytical frameworks for making decisions in these situations.

8.3 Teaching objectives

The teaching objectives of the case are to enable students to

a) Understand the role of suppliers in a company's product development and product support activities over the product lifecycle

b) Develop and analyze in-house versus outsourcing options for parts, services and combinations, considering both short and long term impacts

c) Develop approaches to collaboration with supply chain partners, considering both benefits and costs.

8.4 Teaching plan

The case was written for a class discussion lasting a half hour or more. Students are expected to read the case and explore the websites of relevant companies in the industry prior to discussing the case in class.

This case is introduced by observing the dichotomy of growth in the automobile sector between the developed countries and the emerging markets. Auto sales in India and China and other emerging markets have been growing at more than 20% CAGR for the past five years. The instructor can initiate a discussion on recent trends in outsourcing and their drivers, especially in the automotive and truck industries. Themes like focusing on core competency and faster time to market should come up as part of the discussion. Some students may observe a movement by manufacturers towards buying entire 'sub-systems' and not just 'piece-parts' from suppliers. Another observation is that manufacturers are consolidating their supplier base and are increasing collaboration with a smaller group of suppliers.
Students are then asked to put themselves in the role of leading the Sourcing and Materials Team at RML. The company is under pressure from the customers (automakers and the OEMs) to reduce prices but understands the need to develop long term relationships with its suppliers. It was clear that the industry would come out of the recession and would have great growth prospects ahead. The team had to figure out a strategy to prepare for this future growth, while dealing with the cost pressures of today.

8.5 Teaching notes

1. What do Industry Analysis frameworks like Porter's Five Forces reveal about the auto parts industry in which RML competes?

Key points include the fragmented industry, the significant power of the customers (OEMs and their customers, the automakers) and the power of metal suppliers. While the barriers to entry are lower for the parts manufacturers like RML and its smaller suppliers these companies are trying to raise the barriers by focusing on quality and improving responsiveness to customers.

2. What is the value chain in the automotive industry? Which areas add the most value?

The value chain stretches from the natural resource extractors (metals and petroleum producers) to the small parts suppliers to larger parts manufacturers like RML who provide the key parts for subsystems like transmission or braking. The subsystem manufacturers or OEMs purchase parts from suppliers like RML and integrate them and sell them to the automakers, who either sell directly through their showrooms or through dealerships. While data is not available for all the players in the chain, the case makes it clear that the value is captured primarily by the automakers and then their OEM suppliers.

3. Materials-related costs are becoming a larger component of a firm's costs. What factors are influencing this trend?

Benton (2010) indicates four factors that are influencing this trend, especially in the fabrication- assembly industries- a) materials Shortages, b) use of synthetic materials, c) Inflation, and d) complex, high-value products. Students can also note that the systems manufacturers like the auto-makers are bringing more value-added complex products to market, but are holding prices steady or are

having small price increases due to competitive factors. Consequently, the overall cost structure of the firm (per unit) is steady or decreasing, but the materials costs are not decreasing at the same rate.
Assume Total Sales in time (t+1), TS(t+1) = m * TS(t), where m is the sales multiplier.
Firms want Total Cost in time (t+1), TC(t+1) = r * TC(t), where r < m
Materials Costs MC (t+1) / TC(t+1) > MC(t) / TC(t)

4. The case states that "RML had tried reverse auctions two years ago with little success". Should RML pursue reverse auctions again?

This generates discussion about the benefits of using reverse auctions versus the benefits of developing suppliers for the long-term. A fragmented supplier base with suppliers possessing capabilities for participating in auctions is needed for enabling the use of reverse auctions. In the Indian context getting the suppliers to improve their quality requires collaboration and training by the customers, factors that are difficult to achieve through reverse auctions.

5. Trent (2005) classifies supply chain relationship management on four behavioral dimensions, the four Cs: Counter-Productive, Competitive, Cooperative, and Collaborative. Apply this framework to the relationship between RML and its customers, and between RML and its suppliers.

Counter-Productive	Competitive (Transactional)
Each party is focused exclusively on maximizing its benefit and to such an extent that it puts the other at a disadvantage. This is not recommended. The relationship between RML and its customers reflects some of these aspects.	Power relationship- the more powerful organization tries to capture an advantage for the present, without considering the well-being of the other party (often found with tier-three suppliers). It appears that the relationship between RML and its customers falls into this category.
Cooperative	**Collaborative**
Both parties recognize the need for strong relationships but lack the team effort to optimize benefits for all (tier-two suppliers). It appears that RML wants to work with its suppliers in a cooperative mode. Has RML tried to work with its customers in this mode rather than in a competitive mode or collaborative mode?	Both parties have cooperative teams working together to develop strategies that deliver long-term benefits for both. Often characterized by significant sharing of information and resources. Tier-one/strategic suppliers.

6. RML has won a number of quality awards and certifications. How does this affect its relationships with its customers, and with its suppliers?

Winning the quality awards and certifications enables RML to gather more sales and also to reduce production costs and improve its productivity. However it also raises the expectations of customers, and RML has to raise its own expectations for its suppliers. If the latter do not meet raise their own standards, RML might suffer in the long term by not meeting the high expectations it has set for customers. It can consider pushing its suppliers to pursue the quality awards and certifications like ISO series.

7. According to the case the auto makers are moving to a target cost based approach in designing cars. What are the consequences of this approach on strategic sourcing in the industry?

The target cost based approach works as follows:

Final market price to consumers is targeted to be X.

Let Md be the margin for the dealer and Mm the margin for the automaker. Then

X * (1- Md) * (1- Mm) is available to allocate to various sub-systems and other parts in the vehicle. The allocation sets a ceiling for the price of the particular subsystem for the OEMs, who would then use similar logic to set prices for their suppliers. This approach can be successful only if the customer-supplier relationship falls into the "collaborative" box of Trent's 4Cs framework (2005). So while RML might face significant cost pressures from this approach, it might also induce the OEMs to work closely with RML on product and process design and improvement to meet the targeted costs.

8. If you were heading RML's Supplier Management efforts how would you use the Dependency matrix?

The Dependency matrix can be tied to the 4Cs of Trent (2005). See Figure 7.

In this context the instructor can also introduce the model proposed by Cousins (2001) for managing long-term relationships, shown below.

9. How can RML evolve to Relationship Portfolio Management?

Wagner and Boutellier (2002) discuss Relationship Portfolio Management, using Daimler Chrysler as an example. They mention a number of criteria that, in the context of RML in India, include:

- Number of suppliers to have for each product or material category.
- Procured type mix, i.e. the mix of piece parts, components, subsystems and systems suppliers in the mix.
- Regional distribution of suppliers.
- Supplier risk, i.e. the risk that one or more suppliers may fail to deliver.
- Proportion of quality-certified suppliers (those that have achieved ISO 9000 series or other certifications).

Other criteria could be included in the process. RML could use these criteria to manage the size of the four quadrants of the dependency matrix and determine the appropriate portfolio mix, subject to the resource constraints of RML.

9 Figures and Tables

Table 1: Breakdown of Rane (Madras) Ltd. (RML) and Maruti-Suzuki (M-S)'s Statements of Income (2008-09), as a % of Sales

	RML	M-S
Sales	100	100
Cost of Goods Sold	(64.26)	(77.63)
Employee	(10.70)	(2.34)
Selling, General and Admin.	(19.77)	(11.71)
Interest/Other Financial exp.	(2.33)	(0.27)
Depreciation/Amortization	(2.81)	(3.49)
Other Adjustments	-	3.73
Profit before taxes	0.14	8.30

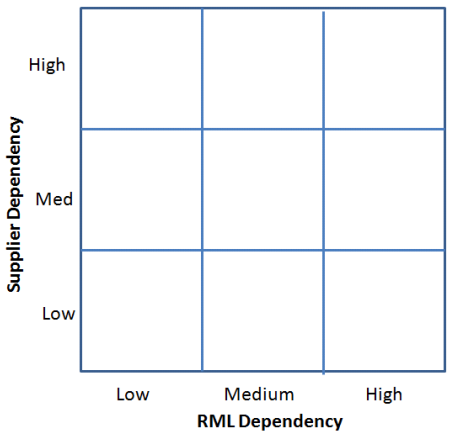
Source: Company Annual Reports

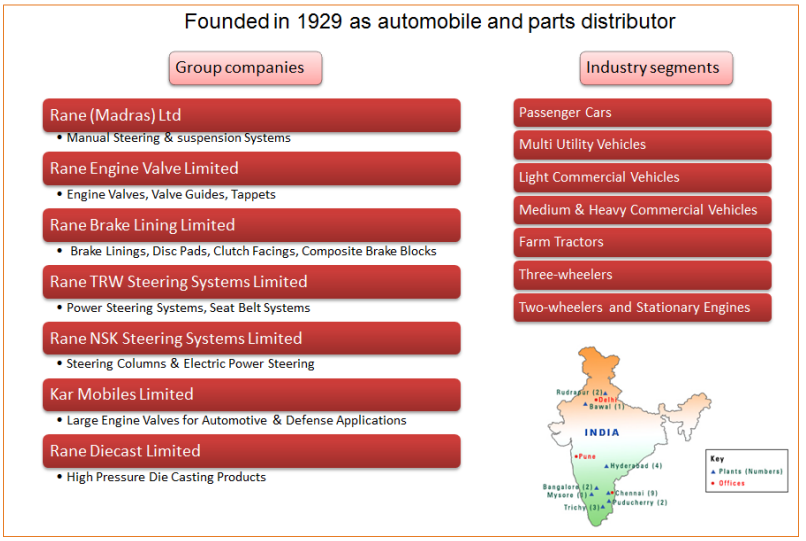
Table 2: Growth rates in the Indian Automotive Industry

	2007 - 08	2008 - 09
Passenger Cars	16%	5%
Utility Vehicles	10%	-11%
Small Commercial Vehicles (< 1 ton)	26%	12%
Light Commercial Vehicles	60%	-24%
Medium and Heavy Commercial Vehicles	0%	-35%
Three Wheelers	-10%	-1%
Two Wheelers	-5%	4%
Farm Tractors	2%	-7%

Source: Society of Indian Automobile Manufacturers

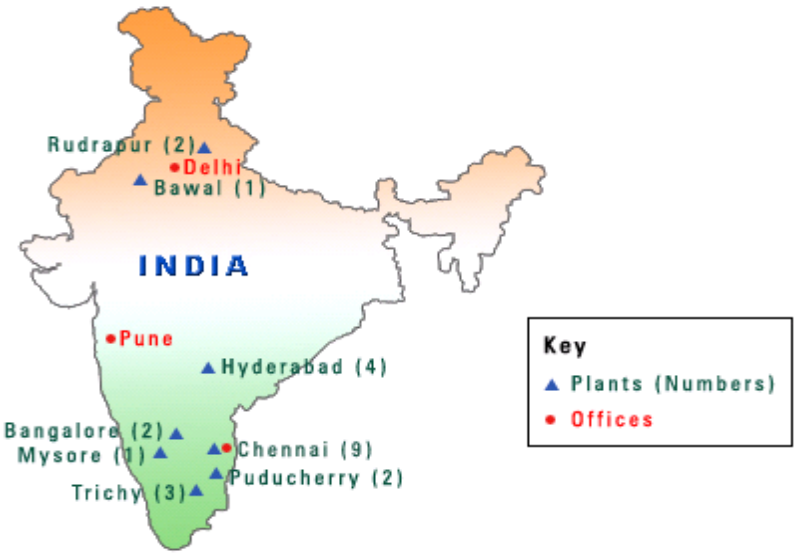
Table 3: Dependency Matrix





http://www.ibef.org/industry/autocomponents.aspx

Figure 1: Rane Group's Manufacturing Companies

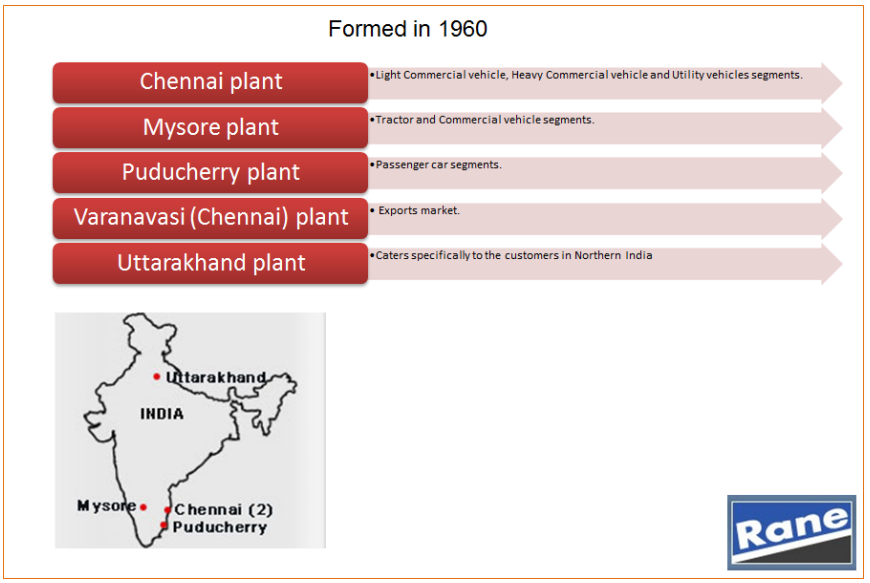


Source: Company's website

Figure 2: Rane Group's Plants

Source: Company's website

Figure 2: Export Destinations of Rane Group Products



Source: Company's website

Figure 3: RML's Manufacturing Locations

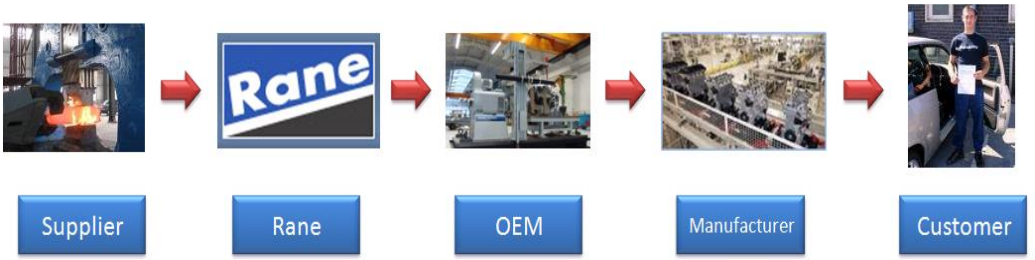


Figure 4: Automotive Industry's Supply Chain

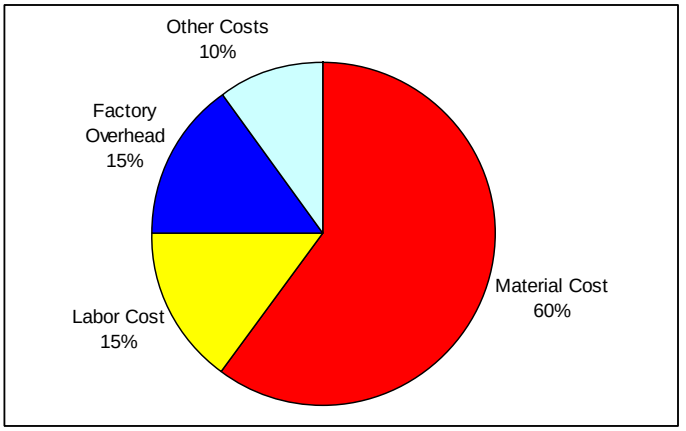


Figure 5: Distribution of Manufacturing Costs

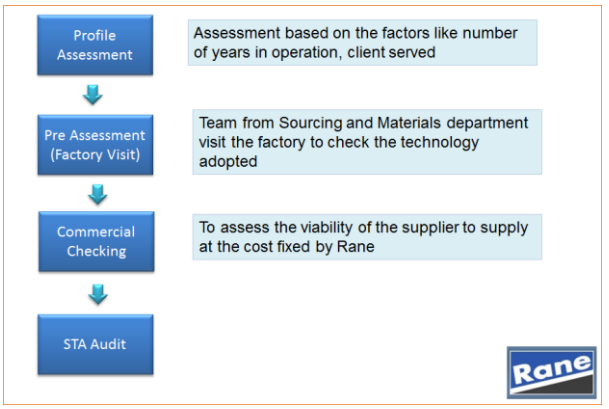


Figure 6: RNL's Supplier Selection

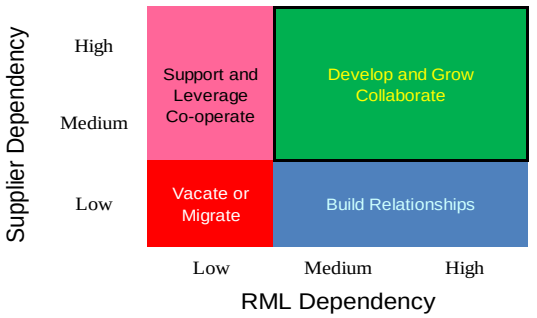


Figure 7: Dependency Matrix

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