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STRATEGIC FRAMEWORK FOR MANAGING FORCES OF CONTINUITY AND CHANGE IN INWARD SUPPLY CHAIN IN INDIAN AUTOMOTIVE INDUSTRY

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ABSTRACT

During the last few years, the production and management systems have been revolutionized in the automobile industry. One of the major changes in the industry has been the opening up and growth of several emerging markets, with critical mass in Europe, Japan and the US. Globally, there has been a wave of consolidation with stronger players acquiring whole or part of smaller companies. There is not enough room for everyone. It is not a cushy, profitable business anymore. Costs have long been a focus of the auto business. Globally, the auto business has been a cradle of innovation in the areas of manufacturing practices and supply chain management.

Continuity and change are hallmarks of strategic thinking all through. Previously, when the environment was stable, the strategies were largely evolved around the issue of 'continuity'. Some important strategies in this respect are that of 'continuity' and 'logic incrementalism'. The organizations used to form strategies so as to survive and grow by maintaining continuity in their business domain. The strategy of 'incrementalism' also focuses on continuity with an incremental change to dynamically evolve. Stability used to be considered a key success factor. In the last two decades, the globalization process made the business environment highly turbulent and the concern of 'change' has received immense interest both by strategic thinkers and practitioners. But even in a highly turbulent and chaotic business environment, a discontinuous change may not always be desirable, as it may add to more turbulence and chaos. Though it may appear to be paradoxical, the movement has taken place to carry both the continuity and change, and stability and dynamism simultaneously. Crafting strategy involves stitching together a proactive/intended strategy (covering new initiatives plus ongoing strategy) and a reactive/adaptive strategy to accommodate changing circumstances. The evidence of a confluence of continuity and change is brought out in many spheres, such as corporate governance, role of first line manager, organizational identity, active waiting, country models such as German model and management of an academic journal. Not only the paradox of continuity and change, many other tensions and dilemmas have created a new strategy revolution the organization or push it for moving to new frontiers respectively. In view of the SAP (Situation-Actor-Process) framework, the continuity forces are generally linked with the `actors' and `processes', whereas the change forces largely emnate from the chanage `situation'.

Increased outsourcing and larger involvement of vendors is one of the strongest trends to emerge in the industry. Auto business is an input-heavy business, i.e., the supply chain is more complex on the inbound side. A typical automobile has over 2500 components. This means that the manufacturers would be dealing with a large number of vendors – often more than 1000. Managing such a huge number of components and vendors is not easy. Ensuring quality and timeliness of shipments is that much more difficult. The trend, therefore, has been to reduce the number of components and vendors.

Outsourcing of components is a means of lowering costs and reducing risks. In the past, there was no long-term contracts or relationship with suppliers. Now, competitive environment requires suppliers to meet stringent quality standards, regularly improve technology and be cost competitive. In fact by integrating the supplier value chain with their own value chain, companies can gain sustainable competitive advantage. By giving the suppliers insight into the supply needs and materials schedules for the coming months, they can anticipate much better the future requirements, which will lead to a higher level of service and lower logistics costs for both parties. Early mutual agreement on quality requirements enables zero defects deliveries, which in turn result in a reduction of quality costs for the contractor. By introducing product and process engineering knowledge and experience of the supplier early into the development process, the time-to-market and start-up costs may be reduced The Maruti experience offers insights on how the supply chain be important for success of an automobile company.

Introduction

Continuity and change are the hallmarks of any strategy paradigm, and are traditionally treated

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in an 'either–or' manner. Conventionally, a lot of work has been done on managing continuity and moving ahead with incrementalism. In the recent years, a lot of change is witnessed in the business environment globally as well as locally. This has led to a plethora of literature on strategic change and transformation. However, dealing with continuity and change simultaneously is a subject matter of growing in est, as a large number of leading organizations with strong legacy are faced with tremendous turbulence.

During the last few years, the production and management systems have been revolutionized in the automobile industry. One of the major changes in the industry has been the opening up and growth of several emerging markets, with critical mass in Europe, Japan and the US. Globally, there has been a wave of consolidation with stronger players acquiring whole or part of smaller companies. There is not enough room for everyone. It is not a cushy, profitable business anymore. Costs have long been a focus of the auto business. Globally, the auto business has been a cradle of innovation in the areas of manufacturing practices and supply chain management.

The competition is becoming increasingly intense. The companies need to lower costs and improve quality. As materials are a significant part of cost of production, hence efficient supply chain management can lead to lowering costs as well as reducing risks. New competitive environment requires suppliers to meet stringent quality standards, regularly improve technology and be cost competitive. The Maruti experience offers insights on how this can be done. When Maruti started operation in India, technology, quality and manufacturing standards of vendors were not of international standards. Maruti brought the concept of supply chain in India. It emphasized on the vendor development program. Since 74% of vehicle cost was outsourced, Maruti's competitiveness depended on quality and cost levels of suppliers. It was in Maruti's interest to improve vendor efficiency and performance. For this, it developed long-term relationships and instilled confidence in vendors. It devoted resources to upgrade vendors in terms of technology and quality. It introduced vendor-rating system. All the above things are done to achieve the objective The Next Leap That is achieving 50% consolidated growth rate within 3 years. Suppliers are the integral part en route to achieving this objective. The suppliers are helping Maruti to increase productivity by 30%, and decrease cost by 30% every year.

To avoid complacency amongst existing suppliers, Maruti should adopt the competitive bidding procedure when the product is of leverage type. While selecting a particular vendor, the main emphasis should be given on the management philosophy followed by the company; because the business objectives of both the companies should be aligned. Maruti has to introduce the product and process engineering knowledge and experience early into the development process to reduce time- to- market and start- up costs.

Indian industry today needs to recognize the importance of outsourcing and upgrading vendors. Since not many buyer companies have resources comparable to Maruti, it is important to build institutional arrangements to provide marketing and affordable consultancy services for small industry.

Objectives

Primary Objective

To study the conceptual framework for inbound logistics at Maruti Udyog Limited in view of managing forces of change and continuity

Secondary Objective

To study the present procurement practices at Maruti Udyog Ltd

To study the role of vendors in success of Maruti Udyog Ltd.

Literature Review

The value chain disaggregates a firm into its strategically relevant activities in order to understand the behavior of costs and potential sources of differentiation. A firm's value chain and the way it performs individual activities are a reflection of its history, its strategy, its approach to implementing its strategy, and the underlying economies of the activities themselves. Differences among competitor value chains are a key source of competitive advantage.

In competitive terms, value is the amount buyers are willing to pay for what a firm provides them. Value is measured by total revenue, a reflection of the price a firm's product commands and the units it can sell. The value chain displays total value, and consists of value activities and margin. Value activities are the physically and technologically distinct activities a firm performs. Margin is the difference between total value and the collective cost of performing the value activities.

Value activities can be divided into two broad types, primary activities and support activities. Primary activities are the activities involved in the physical creation of the product and its sale and transfer to the buyer as well as after sale assistance. Support activities support the primary activities and each other by providing purchased inputs, technology, human resources, and various firm wide functions. Value activities are therefore the discrete building blocks of competitive advantage. How each activity is performed combined with its economies will determine whether a firm is high or low cost relative to competitors. How each value activity is performed will also determine its contribution to buyer needs and hence differentiation.

Primary Activities

There are five generic categories of primary activities involved in competing in any industry, as shown in the figure. Each category is divisible into a number of distinct activities that depend on the particular industry and firm strategy:

- Inbound Logistics
- Operations
- Outbound Logistics
- Marketing and Sales
- Service

Each of the categories may be vital to competitive advantage depending on the industry. In any firm, however, all the categories of primary activities will be present to some degree and play some role in competitive advantage.

Support Activities

Each category of support activities is divisible into a number of distinct value activities that are specific to a given industry.

- Procurement
- Technology Development
- Human Resource Management:
- Firm Infrastructure

Activity Types

Within each category of primary and support activities, there are three activity types that play a different role in competitive advantage:

- Direct: Activities directly involved in creating value for the buyer, such as assembly, parts machining, sales force operation, advertising, product design, recruiting, etc.
- Indirect: Activities that make it possible to perform direct activities on a continuing basis, such as maintenance, scheduling, operation of facilities, sales force administration, research administration, vendor record keeping, etc.

Quality Assurance: Activities that ensure the quality of other activities, such as monitoring, inspecting, testing, reviewing, checking, adjusting, and reworking.

Linkages within the Value Chain

Although value activities are the building blocks of competitive advantage, the value chain is not a collection of independent activities but a system of interdependent activities. Value activities are related by linkages within the value chain. Linkages are relationships between the way one value activity is performed and the cost of performance of another. Linkages can lead to competitive advantage in two ways: optimization and coordination. Linkages often reflect tradeoffs among activities to achieve the same overall result. A firm must optimize linkages reflecting its strategy in order to achieve competitive advantage. Linkages may also reflect the need to coordinate activities. The ability to coordinate linkages often reduces cost or enhances differentiation.

Competitive Scope and the Value Chain

Competitive scope can have a powerful effect on competitive advantage, because it shapes the configuration and economies of the value chain. There are four dimensions of scope that affect the value chain:

- Segment Scope: The product varieties produced and buyers served.
- Vertical Scope: The extent to which activities are performed in-house instead of by independent firms.
- Geographic Scope: The range of regions, countries, or groups of countries in which a firm competes with a coordinated strategy.
- Industry Scope: The range of related industries in which the firm competes with a coordinated strategy.

The Internet and the Value Chain

The power of the Internet in the value chain, however, must be kept in perspective. While Internet applications have an important influence on the cost and quality of activities, they are neither the only nor the dominant influence. Conventional factors such as scale, the skills of personnel, product and process technology, and investments in physical assets also play prominent roles. The Internet is transformational in some respects, but many traditional sources of competitive advantage remain intact.

Beech (1998) argues for an integration of the supply and demand chains:

The challenge can only be met by developing a holistic strategic framework that leverages the generation and understanding of demand effectiveness with supply efficiency. First, organizations must bring a multi-enterprise view to their supply chains. They need to be capable of working cooperatively with other organizations in the chain rather than seeking to outdo them. Secondly they must recognize the distinct supply and demand processes that must be

integrated in order to gain the greatest value.

He suggests three key elements:

- The core processes of the supply and demand chains, viewed from a broad cross-enterprise vantage point rather as discrete functions;
- The integrating processes that create the links between the supply and demand chains;
- The supporting infrastructure that makes such integration possible

Bornheim et al (2001), in considering the impact of information communication technology on the development of value chains, discuss the decline of traditional hierarchies and the growth of digital value chains.

One of the largest developments has been in the automotive industry where both General Motors and Ford moved quickly to create Internet based exchanges to manage their procurement activities. Tait (2000) reported the GM and Ford developments, identifying the anticipated benefits: "Beyond crude dollar savings there would be a better information flow and more low-level supplier involvement in product development…. Other car makers would be persuaded to join the exchanges…." Tait also identified potential problems. Large suppliers have either established their own networks (or are considering doing so). But there are general concerns regarding price concessions that may be expected, the fact that the trade exchanges plan to take a 'percentage' of all deals transacted through their systems, the problem that being involved with TradeXchange may preclude them from any business with AutoXchange.

The two exchanges have different approaches. Ford stresses that AutoXchange will be an open architecture network in which ideas and product design can take place. It will also offer suppliers private portals so that they can retain some sense of their own procurement networks. AutoXchange may become an independent e-commerce business within an independent board and management within a year of it being established. TradeXchange will require all suppliers to join. Its primary goal is to lower the costs of all participants. Tait reports the comments of an Oracle executive who suggests that if too many exchanges are established efficiencies will be reduced.

Burt et al (2000) report on the expansion of the trade exchange e-commerce activities of both North American and European motor vehicle manufacturers. They also report on 'expert views' concerning distribution developments. Sales have shown rapid growth, such that both Ford and GM have established their online retail outlets'…which could eventually bypass traditional dealers, regulatory reform permitting'. They suggest that procurement consolidation through exchanges and product consolidation through mergers and acquisitions are not unrelated. They see them as strategies that are ultimately defensive. 'Most are girding themselves for an eventual market contraction, hoping that Internet schemes and product innovation will offset falling sales. Cash-rich companies are also contemplating deals that will fill gaps in their product and geographic portfolio'. These companies from Burt et al suggest the reasons why the value chain is different from the supply chain. It is a strategic concept in that it can identify trends and opportunities as well as identifying and suggesting virtual solutions. The supply chain, by contrast, typically works within a shorter time pace. Given the 'M and A' activities in the automobile manufacturing industry there is an obvious requirement for flexibility; the trade exchange approach offers this. The fact too that surplus capacity exists on a global basis makes the Ford CEO's statement that the company could ultimately outsource manufacturing more than a possibility. Given a value chain approach Ford would still own the brand and be seen by customers as the brand; this is the point made by Sutton (op cit). Both vehicle design and parts services are clearly seen as outsourcing possibilities in the value chain approach. Burt et al report on a Ford

initiative to create a London-based 'design centre' for product design.

Burt et al report on developments in relationship management and technology management in component supplies. Supplier parks are the logistics solution to filling the gap between final assembly and component manufacturing. These satellite operations have resulted in suppliers taking more responsibility for more of the component assembly, delivering entire systems at the time required by manufacturers. They suggest that 'just-in-time' has now become 'just-in-sequence'. In the drive to reduce inventory levels (and therefore costs), parts and assemblies are delivered to the 'line' just at the point in time they need to be installed. There are both advantages and disadvantages.

Some suppliers (such as Valeo, the French components manufacturer) are critical of supplier parks. They argue that they work well in predictable and stable manufacturing situations. They also argue that 'commonality' of components and systems means they manufacture for several different customers, hence they prefer to supply from a central or large existing plant where they have economies of scale. Burt et al cite Garel Rhys (a motor industry specialist) who suggests the trend towards supplier parks offers manufacturers the benefits of outsourcing, but control is retained, as is a physical link, with suppliers. Suppliers may well be concerned and are clearly faced with a dilemma as the large manufacturers rationalize supplier bases and move into partnerships through mergers and acquisitions.

The value objectives expressed by a wide range of brands and product applications are being addressed by strategic alliances. Often these extend to geographical coverage. One such example is the objectives announced by VW and Daimler/Chrysler in which both companies took 34 % of their target companies. The VW/Scania alliance offers VW a larger presence in commercial vehicle markets by expanding its product range. Mitsubishi gives Daimler/Chrysler key access to small car platforms and engine technology and, importantly, access to Asian sales potential where Daimler/Chrysler has a target of increasing sales from 4 % to 25 % of total revenues. Another important point made by Burt is the growing attraction of alliances in preference to acquisition. This offers considerable benefits for a relatively small equity stake.

The value proposition offered by the industry is strongly influenced by the extent to which individual companies have the capability to meet customer expectations. For example, Audi have introduced a customer specification facility. A number of dealer outlets, plus five airports, are being equipped with kiosks that enable customers to 'build' a vehicle to their own specifications. Fiat redesigned the Punto using a web based interaction exercise and Japanese motor manufacturers are planning to offer purchasers the facility to make changes to vehicle specification during production. Key attributes are customized products, short lead times, and customer managed choice together with the 'qualifying' attributes of quality, choice, and reliability and after sales support.

Supplier and dealer networks continue to be important in the automotive industry but changes are occurring in both networks. The value chain visionary or initiator continues to be the manufacturer and responsibility for partner value objectives remains with manufacturers. Clearly their concern is for supplier and distributor profitability, productivity and liquidity, but increasingly developing supplier and customer loyalty becomes a network objective. Another, covert objective is the development of customer data; knowledge created from information on customer decision making and purchasing processes is likely to prove to be critical in developing IT networks which access customers rather than being simply databases accessible by customers.

Knowledge management and technology management are driving value positioning and competitive advantage strategy, both in turn are being driven by information science. Knowledge

management demonstrates three primary components: customer decision and purchasing; technological developments; and network management systems that provide an opportunity to create cost-effective and cost-efficient systems for external and internal relationship management.

It is technology management that many changes are occurring. Computer aided design shortens development time and sophisticates linkages among designers, suppliers and users. Modular manufacturing, modularity, has resulted in redefining the cells in the production processes: 'Under intense pressure to reduce costs, accelerate the pace of innovation, and improve quality, automotive designers… are now looking for ways to parcel out the design of their complex electromechanical system'. The result has been to redesign the cells in the production processes. Rather than attempt to control a network of hundreds of suppliers, maintaining intricate schedules and large levels of inventory as an insurance against unexpected developments, manufacturers 'delegate' the production to suppliers of modules comprising complete units such as the driver's compartment. Baldwin and Clark report that VW has taken this approach even further. The company provides the factory where all modules are built and the trucks are assembled, but the independent suppliers obtain their own materials and hire their own workforces to build the separate modules. There are implications here for relationship management.

Relationship management is a critical component of the value positioning and strategy decision. The expansion of outsourcing and the integration currently being undertaken in the value chain increases the importance of relationship management. Greater levels of cooperation and collaboration are necessary if the virtual organization structures in modular manufacturing are to succeed. Other issues are of concern. The extension of IT systems into supplier/ manufacturer/distributor/customer communications, negotiations and transactions suggest that cooperation may become conflict. Online sales applications and more recently buying exchanges are expanding for both new and used vehicles. GM have been reported as considering a Net based sales facility that would include other manufacturers' products, and as networks are established by manufacturers, distributors and the dot.com media, relationships begin to come under pressure. For example, the existing dealership structure considers itself under threat as the prospect of direct sales by manufacturers comes closer to reality; commercial market research suggests there to be considerable success for Internet services as search tools. Ford announced its intention to integrate downstream by purchasing equity holding in a large, strategically located, dealerships in order to exercise greater control of marketing and to obtain a share of the expanding services markets such as in tyres, exhausts, batteries, and so on. Upstream activities by Ford include brokering mergers among its suppliers (Sutton: 1998).

Value production and coordination are strongly influenced by stakeholder management concern. Returning to the opening paragraphs of this section, it can be argued that stakeholder management is likely to be more demanding as integration, globalization and concentration intensify. The expansion of operations throughout the world brings with it responsibilities for not just foreign labour forces but possibly for major impact on fragile economies. The Korean motor industry has been the subject of a number of acquisition possibilities by the large European and North American manufacturers and the recent (November 2000) problems of Daewoo suggest the scenario that they may become an offshore contract manufacturing unit for these large manufacturers. Already Ford has hinted at the possibility of extending its outsourcing activities to include manufacturing. There is a logic to this. Technology management is able to ensure that quality standards in manufacturing are uniform; consequently the large manufacturers may consider there to be very little competitive advantage to be gained from bending metal and focus their capital and management expertise on design, development and brand management. This approach makes downstream markets more attractive as sources of revenue and profit.

Operations management is becoming reliant upon information technology. The recent moves by the major manufacturers to collaborate in the development of web-based buying exchanges is an indication of these trends. Industry sources point to the potential for very large savings in terms of cost and time throughout the procurement process. This move has been accompanied by divestment of ownership interests in component subsidiaries. The application of IT to design has been discussed. Other production applications are of interest. Sequenced production techniques permit customer ordering for specific motorcars. In principle, the system has operated for some time but has had initial problems. The revised system, a combination of lean production, sequenced production and AutoView customization, becomes a reality. AutoView has quality checks built in, plus easy-to-change features enabling a manufacturer to individualize production based upon customer requirements. A link is planned with Java, which will facilitate Internet working for JIT with suppliers.

Many of the logistics applications are integrated with production systems. Mercedes, together with IBM, has created an enterprise wide IT system to support its business processes. The direction of most logistics applications is towards the reduction of lead times and of inventory levels throughout the value chain, but availability remains a primary goal.

Service is also becoming web based. After-sales service has intranet applications. Saab has installed IRIS (internet retail information system) and aims to increase after-sales support to both distributors and customers. IRIS offers a data management system detailing vehicle servicing records as well as vehicle sales and parts availability. Saab plans to expand IRIS to include links to financial institutions, carriers, used car information, calendars for online scheduling of service appointments, and online vehicle purchasing.

Value drivers are the link with the customer value model. Operational effectiveness is clearly important and is demonstrated by the response to competitive issues such as product development time, quality and cost management, all of which have an impact on customer product choice through the medium of relative competitiveness. Service offer characteristics to distributors and to customers are clearly important across a number of factors from customization processes for customers via distributor considerations of inventory and service management and market information. Risk management for customers and distributors considers product performance and reliability and cost efficient but high levels of performance from service and support systems.

Role of Procurement in the Value Chain

All activities in the value chain need to be performed in such a way that the total value generated by the company is more than the sum of its costs. In Porter's terms, the total value of the company is determined by the whole of its sales value. The margin reflects the reward for the risks run by the company. Porter regards procurement as a support activity. Lets see what different functions the procurement activity performs in the value chain.

- Primary activities: The procurement function should be able to meet the material requirements related to inbound and outbound logistics, and, often more importantly, related to operations. Operations may have a different structure among manufacturing companies. Different manufacturing situations explain why procurement activities may be radically different between companies and industries.
    - Support activities: Procurement activities may be also related to supplying products and services for the other support functions.

  The following table summarizes the most important differences between buying for primary

and for support activities.

Optimizing the supplier relationship and value chain mapping

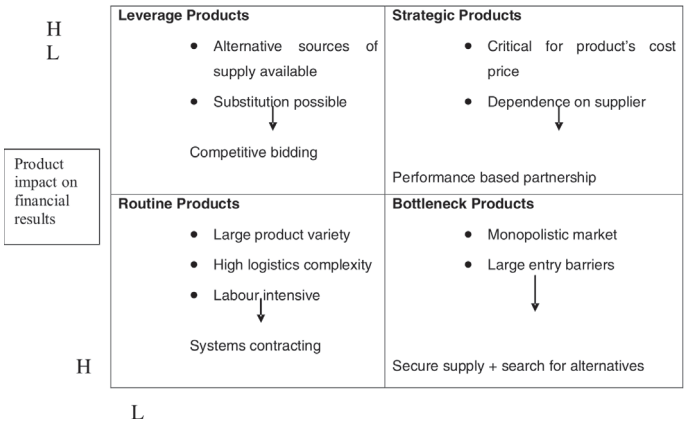


Figure 1: Purchasing Product Portfolio

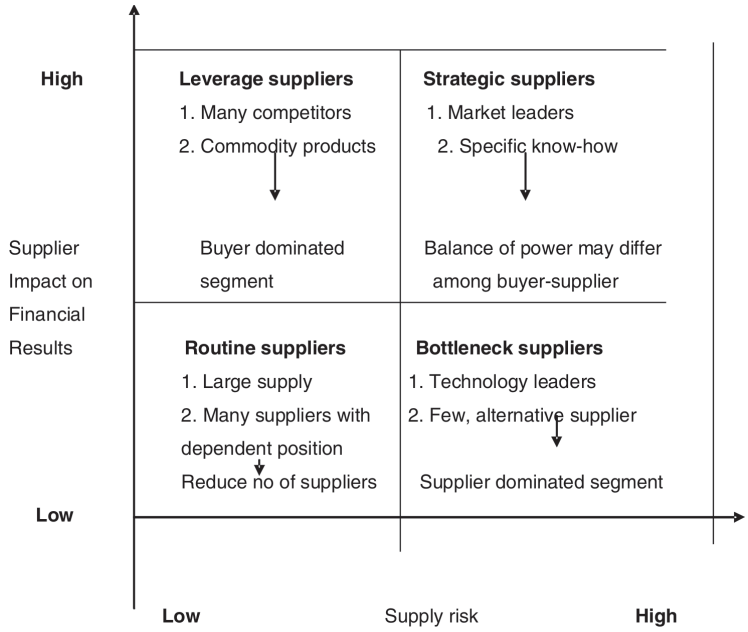


Figure 2: Purchasing Supplier Portfolio

An analysis of any company's purchasing spend per category and its supplier base in general will show that the 20-80 rule applies: 20% of the products and suppliers will represent about 80% of purchasing turnover. This analysis is a first step in identifying the company's strategic commodities and suppliers. The purchasing turnover and the supplier base are analysed based on two variables:

- Purchasing's impact on the bottom line to the company
- The supply risk

Combination of these variables yields a two-dimensional matrix, which is shown above. These present the product groups or suppliers, each offering different interests to the company.

For every segment of the portfolio a different strategy is possible. The strategies are:

- Partnership: Strategic products together with the leverage products make up 80% of total turnover. Minor changes in price levels will have an immediate impact on the end product's costs so that the price and cost changes, as well as the developments in the supplier market, must be monitored closely. These arguments justify a central or coordinated purchasing approach. Depending on the relative power position of the different parties involved, the purchasing policy for strategic products will be aimed at partnership or collaboration. The goal is to create mutual participation based on planned co-operation. An essential aspect of this partnership strategy is the thorough selection of the supplier. Early in the development, the market is scanned for the 'best-in-class' suppliers. These suppliers are screened on their references, financial stability, the present research and development potential, production capacities, the quality of their logistics and their quality systems, and of course their research and development and engineering capabilities.
- Competitive bidding: For leverage products a purchasing policy based on the principle of competitive bidding or tendering will be pursued. Since the suppliers and products are basically interchangeable, there will be, as a rule, no long-term supply contract. This justifies an active market scanning through continuous market and supply research. Buying of leverage products justifies a corporate or coordinated approach where corporate agreements with so-called preferred suppliers are negotiated which can be used by decentral units.
- Securing continuity of supply: The purchasing policy concerning bottleneck products has focused on securing continuity of supply, if necessary at additional cost. At the same time activities are conducted aimed at reducing the dependence on these suppliers. This is done by developing alternative products and suppliers.
- Systems contracting: Routine products require purchasing strategy which is aimed at reducing administrative and logistics complexity. Buyers will have to work out simple but efficient ordering and administrative routines with the suppliers in the form of systems contracts or kitting contracts.

All the previous discussions focus light on the aspect that now the concentration is on continuous improvement within the supplier relationship. The premise here is that in the balance of power there is a relationship, or that the balance of power is at the advantage of the contractor. At this stage concrete objectives and targets on price and cost reduction, quality improvement, lead-time reduction and improvement of customer service are settled. These objectives and targets are often prepared by Supplier Improvement Teams or Supplier Alignment Teams, consisting of specialists from several disciplines from both parties. A major objective is to exchange ideas for improvement activities on both sides. Both parties exchange sensitive technical information and cost information. Often, contractors find out that the greater part of the homework has to be done on their side. Working this way leads to a situation where the supplier becomes gradually integrated in the customer's business processes. This is the reason why Chrysler uses the term 'Extended Enterprise Programme'. They see their suppliers as an extension of their own company, which needs to be equally, or even better, managed than their internal operations. This approach can result in the early involvement of suppliers in the development of new products. During that period of time, specialists of the supplier are actually working within the organization of the supplier when the first trial production runs take place, supporting them in solving start-up problems. At this stage, some advanced contractors will analyse the entire supply chain with help from their suppliers. The instrument used is Value Chain Mapping: per

component, the source of origin of every part is determined. Then, per subcomponent the purchasing contracts are analysed and possible simplifications for purchasing or logistics are identified. In many cases, this results in the contractor helping the supplier with improving his contracts with the next tier of suppliers. This approach is used at Japanese and some American manufacturers. In Europe this approach is still in infancy. Characteristics for this stage is that the improvement activities are initiated and managed by the contractor and followed through progress meetings. Detailed vendor rating schedules showing the achievements of suppliers are discussed in these meetings.

In the final and most advanced phase, purchasing has assumed a strategic orientation with reporting directly to executive management and a strong external, rather than simply internal, customer focus. Non-value-added activities such as purchase order follow-up and expediting have been automated, allowing purchasers to focus their attention on strategic objectives and activities. Organizations demand a higher performance standard from suppliers. Executives take aggressive actions that will directly improve supplier capability and accelerate supplier performance contributions. Examples of aggressive actions include developing global supplier capabilities, developing full- service suppliers, and adopting a "systems thinking" perspective that encompasses the entire supply chain. In such a mode, "insourcing" core activities that add the greatest value, while outsourcing components of their value chain to upstream or downstream parties that are more capable, often occurs. Such a system can directly affect the ability of the supply base to meet world-class expectations, and often involves direct intervention into the supplier's operating systems and processes.

Change and Continuity Forces in Supply Chain

Continuity forces

A set of forces keep pulling it to be clinged to the current business and also the manner in which it is carried out. These are the forces of inertia caused by the organizations themselves. The larger and better performing the organization is, the larger would be this flywheel of inertia. In the current business domain, this momentum helps the organization to steer through the obstacles and grow over time. For leaders in their own area, it is extremely difficult to drastically change the course of this continuity flywheel. It requires tremendous amount of organizational energy and efforts to change its course of action. It is a paradox that the forces that contribute to better performance in the current situation become counter productive to lead change. Some of the important continuity forces are: large customer base, huge infrastructure, investment in technology, well established culture, core competence, supply chain and distribution network and higher level of business performance

Customer Base

One of the important objectives of any organization would be to increase its market share in its business domain. The larger the market share it captures, the larger would be the current customer base it has to serve. Growth is always one of the major corporate objectives of any business entity. But higher the organization climbs the growth curve, higher is the inertia for it to cling with the current products and services and its delivery mechanisms. The increasing size of customer base flywheel creates higher inertia to maintain continuity. Apparently, there may hardly be a valid reason for any organization to move away from such a money spinner

Infrastructure

Infrastructure is a major physical flywheel of any business enterprise. A sound infrastructure of manufacturing and after sales service would facilitate an organization for higher business success

in terms of profitability and growth. But larger the manufacturing and service infrastructure an organization creates, it demands larger continuity of operation for higher capacity utilization and amortization of fixed costs by achieving economies of scale. On the one hand, sound infrastructure aids in business performance and makes it a desirable investment, whereas on the other hand, it acts as a major inertial force for organization to move to another growth curve even if it may appear to be more lucrative.

Technology

Technology is a major strategic driver for leveraging the success of any enterprise. It requires technological excellence to achieve the performance objectives of cost, quality and choice. The technological capabilities can be either developed in-house, by creating a big R&D base, or can be outsourced by acquiring well tested technology from other organizations. In either case, it is a big investment and is associated with a major risk. The manpower capabilities to handle particular type of technologies and associated technical capabilities provide an organization cutting edge and competitive advantage

Core Competencies

One of the widely proclaimed strategic concepts is that of core competence. Though the concept, as proposed by Hamel and Prahlad (1994), is in the context of competing for the future, it may also act as a big continuity flywheel. The leading organizations concentrate their efforts to create a bundle of skills and technologies that are competitively unique and provide a distinct value to the customer. But, in reality, the weight of such unique competencies may be so heavy and the efforts are so concentrated to develop and defend them, that they might come in the way of any radical change aspired by the organizations. It is extremely difficult for any organization to go for a major strategic unlearning to turn the tide of the core competencies and thus these core competencies, at times, may also act as a major continuity force for the leading organizations

Supply Chain Network

In order to add value on the entire value chain and pass it on to the customer, a huge supply chain and distribution network is usually created for the existing products. For the inbound logistics, a military of first tier, second tier and third tier suppliers is raised and for the outbound logistics a huge network of distributors, wholesalers and retailers is established by leading organizations. just-in-time deliveries and so on in the current framework. The contractual arrangements across the network would bind it to perform the current services excellently and hold from any major departure or experimentation. Huge investment in information technology across the whole network though makes it function smoothly, it becomes a major stabilizing force as well. In consumer durables industry, such a network is very vast and is a major fixed cost to be amortized by economies of scale and scope. Thus, it can be seen that global organizations in consumer durables industries, such as Toyota, Honda, GM, Ford have been operating with a lot of continuity in their offerings.

Culture

Culture of any organization is a major unifying force to maintain continuity. Quite a few radical change initiatives could not succeed as the culture of the organization did not match with the radically changed processes/systems. Cultural change in any organization is a cumbersome and slow process. Good work culture is always considered to be a major contributor to organizational performance, but it also acts as a stabilizing force inhibiting major change efforts and usually creates a resistance to change. It is advocated that it is not wise to focus directly

on culture for a cultural change, rather it would be effective to focus on the components shaping it, such as changing people, incentives, controls and organizational structure. The cultural force of continuity is, at times, so high that even in cases of major change efforts by way of mergers and acquisitions (M&A), it tries to convert the culture of the acquired company to match with the parent company. This becomes a major issue of concern in managing post M&A integration.

Performance

Every organization aims to enhance its business performance in terms of profitability, growth, customer satisfaction and other business objectives. Higher performance in current business is always welcome and appreciated. But, at the same time, higher business performance may be sticky and may force the organization to adhere to the current high performing framework

Change Forces

Though The 'actors' and 'processes' linked with the enterprise create forces to maintain continuity, the continuously changing business situation, in particular due to globalization, generates forces that direct the organizations to strive for change. The situational change forces could be both external and internal. The external change forces may emanate from changes on political, economic, social and/or technological fronts, whereas the internal change forces may be because of poor performance (low profitability, loss of market share), change in top management, and so on. The forces of change might result into either a gradual or continuous change, like Total Quality Management (Juran, 1995), or a radical change like Business Process Reengineering (Hammer and Champy 1993, Crego Jr. and Schiffrin 1995) or strategic or organizational transformation (Peters 1994, Edosomwan 1996) Globalization In the last two decades, the process of globalization has pervaded almost all the spheres and not remained isolated in case of few corporations only. Despite cultural, legal and commercial factors that support localization, the The process of globalization creates global competition and pushes domestic companies to move out of the shell. Almost the similar situation is created for Indian organizations that are now facing global competition after intense liberalization in 1991. Thus, even though the organizations, might be leading in the domestic market, such as 'Maruti' and 'Tata Motors' in automobile industry, the globalization forces are demanding a major strategic and organizational change from such well established organizations. As a consequence, organizations in recent past, moved from domestic strategy to multi-domestic strategy, global strategy or transnational strategy. The presence of world-class global or transnational corporations, such as GE, GM, Ford, Electrolux, Toyota, Honda and Maruti, its witnessed in almost all major industries. Thus, globalization can be seen as a major change driver that is influencing all other change forces, either directly or indirectly.

New Opportunities

New opportunities are emerging on the scene and are getting multiplied due to globalization and liberalization of business. The liberalization of tariff and non-tariff barriers and multilateral treaties are throwing a range of opportunities for the business enterprises. However, it requires to make major changes in the strategies, structure and systems to encash these opportunities. The organizations subject to low continuity forces may quickly jump and strategically transform to align with the new ways of doing business. However, the organizations being pulled by their massive continuity forces need to develop more innovative strategies to take immediate benefit of these new opportunities.

Competition

The changing face of competition may also drive the organizations to change. In the wake of globalization, the competition to domestic companies suddenly starts coming. The competition is not only coming from global competitors, but also from the unknown quarters in the transformed industrial landscape. This may be due top substitute products/services, or vertical integration by existing players. In addition to the new competitors, the basis of competition is also shifting in various industries. Rather than only cost, other performance areas, such as quality, choice and speed are also emerging important competitive advantages. This would require the organizations to completely transform their competitive strategies.

Customer Needs

Another major change force constitutes of customers themselves. The customers are becoming more aware, quality conscious and demanding. In a competitive environment, 'customer orientation' is becoming the *mantra* of success. The needs and tastes of customers are changing which are fuelled by the range of competitive choices available in the market place. These are also governed by new product features and options available with technological innovation in the industry. In the Indian automobile market, the customer needs have moved from economy to comfort and style. This has prompted to an economy car manufacture like 'Maruti' to go for brand extension so as to include 'style' by launching its new model 'SWIFT'. Today, customers want more value for money and are not merely looking the price tog. They are expecting total customized solutions to their requirements rather than a merely a product, and are also willing to pay for it.

New Technology

Not only the market-pull is a change force, technology-push is another greater force in the era of globalization. The globalization brings out new technology in the market place which forces existing organizations to upgrade their technology portfolio. With the change in competitors' technology, the organizations are driven to enhance their technology acquisition and developmental efforts.

e-Business

Developments on the front of information technology (IT) have led to the emergence a new business paradigm, that is, e-business. The e-business model has shown tremendous advantages in terms of speed, accuracy, lower transaction cost, larger customer reach, any time-any where business, and so on

Mergers and Acquisitions

As the markets are maturing, the industries are getting consolidated and mergers and acquisitions (M&A) are becoming a major drive. M&As are taking place due to a variety of reasons, such as efficiency, diversification market power, control and others. Some of the global majors, such as Daimler Chrysler and Asea Brown Boveri are a result of large M&A activity. The M&A activity, on the one hand, changes the nature of competition in the market and creates cross-cultural integration pressures within the organizations, on the other.

Government Policies

Government policies and legislation act as macro change drivers. Government fiscal policies, by way to setting levers of taxes and duties, promote or restrict certain products and sectors, encourage foreign trade, facilitate technology flow, and so on. The working of industry is greatly influenced by change in governmental policies which may be either favourable or adverse to it in the current business framework and thus force the organizations to change their strategies.

Industry Profile

One of the major changes in the Automotive industry has been the opening up and growth of several emerging markets, with critical mass in Europe, Japan and the US. Globally, there has been a wave of consolidation with stronger players acquiring whole or part of smaller companies. There is not enough room for everyone. It is not a cushy, profitable business anymore. Costs have long been a focus of the auto business. Globally, the auto business has been a cradle of innovation in the areas of manufacturing practices and supply chain management.

Most innovations in supply chain can be attributed to auto companies. Many of these concepts are derived from the much-acclaimed Toyota Production System. Once the Japanese companies starting conquering the US market in the late 70s with their cheaper but high quality vehicles, the auto industry worldwide sat up to take note of their strategies. Several supply chain advances have taken place since then. Trying to implement lean production and JIT concept have meant several changes in company practices.

India is one of the most important emerging Auto economies in the world. In 1991, the Government of India embarked on an ambitious structural adjustment programme aimed at economic liberalization, based on the pillars of Delicensing, Decontrol, Deregulation, and Devaluation. Post-liberalization, the Government of India's new automobile policy announced in June 1993 contained measures, such as delicensing, automatic approval for foreign holding of 51% in Indian companies, abolition of phased manufacturing programme, reduction of excise duty to 40% and import duties of CKD to 50% and of CBU to 110%, and commitment to indigenization schedules.

The Government of India's new automobile policy attracted a large number of automobile companies to India. These include General \Motors and Ford, and two Japanese, seven European and two Korean companies. In addition, there are three existing Indian companies, Hindustan Motors, and Telco, and one Indo-Japanese venture, Maruti already in the passenger car market. Some Indian companies are already working on introducing small car models. The number of new entrants and the level of investment within a very narrow time window of two to three years is unprecedented and seems unique to India. Some of the entry barriers faced by automobile companies in India are relatively high levels of import duties, a nascent ancillary industry, and product modifications required for relatively poor road conditions and high levels of heat and dust. On the other hand, a rapidly growing middle class, rising per capita income, and high levels of latent unsatisfied demand with customers starved of world class options promise enormous opportunities.

Strategic Sourcing

Increased outsourcing and larger involvement of vendors is one of the strongest trends to emerge in the industry. Auto business is an input-heavy business, i.e., the supply chain is more complex on the inbound side. A typical automobile has over 2500 components. This means that the manufacturers would be dealing with a large number of vendors – often more than 1000. Managing such a huge number of components and vendors is not easy. Ensuring quality and timeliness of shipments is that much more difficult. The trend, therefore, has been to reduce the number of components and vendors. In Toyota Motor Corp., US version of the 1998 Corolla compact, the L8 – litre dual overhead cam engine had nearly 25 per cent fewer parts than the previous year's model. So companies are increasingly looking at buying aggregates from suppliers rather than separate components and putting them together. This reduces the number of suppliers.

Manufacturing practices will have to change considerably to come closer to lean production.

There are about 6350 small and large component manufacturers in India, out of which about 350 are in the organized sector and are registered with the Automotive Components Manufacturers Association. There is a sizeable replacement market for parts and components, but this market is heavily dominated by manufacturers who sell unbranded products at very low prices. The component manufacturers therefore have to rely on assemblers in the domestic market. Industry sales have been growing at nearly 35% since 1992-93. Tooling costs for suppliers remain the same for 10000 units or for 100000 units. Till assemblers achieve volumes, it is not profitable for suppliers to accept orders. Assemblers are thus forced to import components. This pushes up costs and currently prices as well, which in turn affects sales and growth. Maruti developed a quality vendor base over a period of 10 years. However, new entrants can expect to develop a supplier base faster. The Indian auto component industry has had some success in developing parts and components including steering columns, brake linings, power steering, catalytic converters and central locking systems. Current technology upgradation is in plastics, trims, electronics, anti locking braking systems, and environment and safety related items and materials. International supplier firms are looking for Indian partners in variety of areas.

Although India was an early entrant in the automotive market, component makers faced a drastic change only from 1984 when the entry of Maruti Suzuki brought about newer models. With it, came new technology and bigger volumes. Yet, for about 15 – 16 years thereafter, there was not much headway as Maruti was only concentrating on the 800cc vehicle. Barring small volume production of Zen and the Esteem, there was not much dynamism in the automotive scenario that could egg on suppliers. Then, came the multinationals like GM, Ford, Fiat, Daewoo and others; some have had their vendors like Delphi and Visteon following them. As the industry evolves, it is likely that the tier 1 suppliers will be the Delphis and the Visteons who have worked with their own manufacturers in other countries as well. So, Indian auto component makers may eventually become Tier II and Tier III suppliers. Companies like Hyundai and Ford, which have localized procurement of parts to a large extent, have helped Indian auto industry to upgrade technology either internally or tie-up with their suppliers overseas. This ensures the supplier quality they want. The only area of concern is the MNC auto companies commitment to localization.

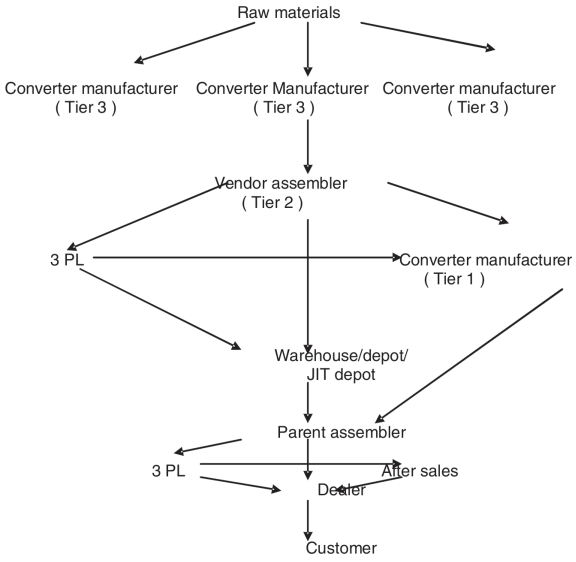


Figure 3: Automobile Manufacturing Flowchart

The Indian industry has been asked to swim against the tide in a very short of span. Unlike China or Korea or Malaysia; there are around nine to ten car manufacturers, which don't give any volumes to their component suppliers. Here, the auto-policy changes from time to time. On the other hand, the ability to innovate will take a long time and this is why many Indian part makers will not make it to Tier 1 supplier position. In terms of cost, the vehicle manufacturers world over expect component manufacturers to drop prices every year by two to three per cent.

One of the key trends observed in the global auto industry is the significant increase in outsourcing of car parts. In India, the development of the auto ancillary has also brought about in this phenomenon. However, the large number of companies for supplying each part implies that in the coming years, supplier power will diminish to a large extent except for suppliers who have almost monopolistic powers like Mico-Bosch. Also, there is an increasing shift towards reduction in vendor base for a car company, which means that the chosen suppliers also have to make substantial financial investments to enhance the quality of their products. Moreover, the lowering of tariffs will expose the Indian automobile ancillary industry to fierce competition from better- quality imports. All these factors will lead to a situation where the automobile manufacturer will have substantial bargaining power with the suppliers in terms of quality and pricing of the product.

Only 7 companies have formal procurement policy. The major focus of the policy being quality and economics. Environment has no role to play. Very few companies have worked towards the greening of supply chain. Only two companies have developed programs for getting their dedicated suppliers ISO 14001 certified. Supply chain structured in tier fashion. The top tier is occupied by major parts/components manufacturers and dedicated vendors. Companies have direct relations with this tier only. Overall, about 85% of the supply chain falls in small and medium scale.

Research Design

Research Methodology

Exploratory Research

- Based on Internal and External Secondary Data
- Based on Depth Interview (Sample Size-15)

Scope of the Study

Area- Delhi and National Capital Region

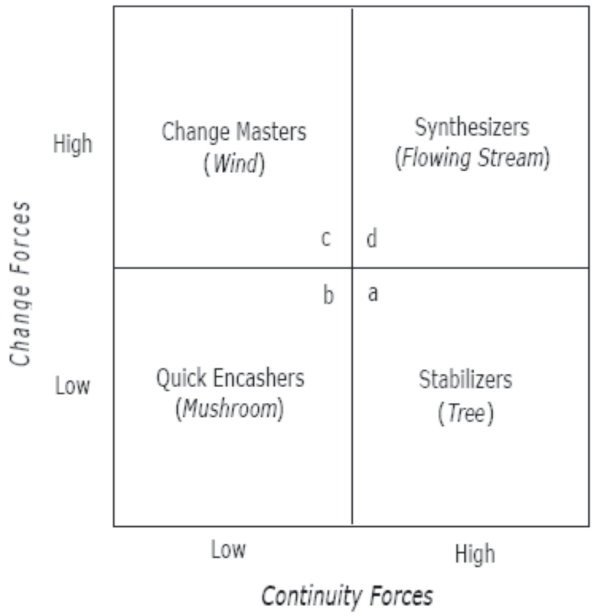
Method of Data Collection

- From Published Secondary Data and Internet Databases
- Direct, personal interview

Analysis and Findings

We have carried out a survey based on questionnaire which basically focused on continuity and change factors and their effect on supply chain. The survey has been carried out by means of in depth structured interviews. The analysis is done qualitatively and the results, penned down here is a compact form. The entire finding is categorized into main heading; Supply Chain Management practices, in which different sub headings follows the effect of continuity and change factors. Strategies for confluence of continuity and change could be generated by understanding the balance of continuity and change forces. In order to map the position of an industry or enterprise with respect to these forces a Continuity-Change (C-C)

matrix is developed, This matrix has continuity forces (due to 'actors' and 'processes') on the x-axis and change forces (caused by the 'situation') on the y-axis. The level of either of these forces could be 'Low' or 'High'. These forces could be assessed independently for each category, such as customer base, infrastructure, technology and so on and agregated as 'continuity forces'. Similarly, the 'change forces' can be assessed for globalization, new opportunities, change in customer needs and so on, as given in the previous section, and an aggregate score can be obtained. As per the proposed C-C matrix, there can be four possible combinations of the continuity and change forces, which are metaphonically named according to the characteristics of that category.

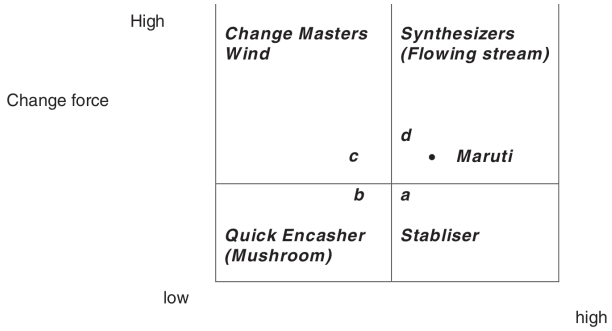


Based upon our study the cumulative score for a particular organization is being found out and thus on the basis of average score of all the participants - MUL vendors has been plotted on the change and continuity matrix.

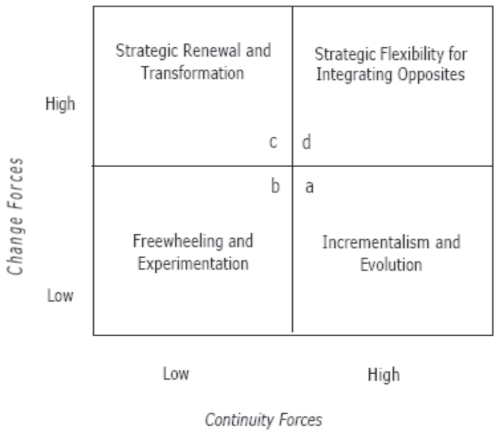
Since the Continuity score has been measured on 29 parameter for 7 continuity forces, hence average score is 2.87

The change forces has been measured on 21 parameter for 7 change forces, hence the average score is 3.1

The average score for the change factors for vendors surveyed for Maruti Udyog Limited is 3.1 while the continuity factors score for MUL was 2.87..On the change and continuity matrix where change factors are at the Y axis and the continuity factors are at the X axisandthe scale is from 1-5. According to the cumulative average scores the Maruti Udyog Limited comes at the fourth quadrant i.e strategic flexibility in integrating opposites.



Mapping of Maruti's Inward Supply Chain on Continuity –change Matrix



Strategy for Maruti Udyog Limited for Inward Supply Chain

The fourth category of organizations that are under high continuity forces as well as high change forces are 'Synthesizers' and are supposed to exhibit strategic flexibility to integrate the opposing forces acting simultaneously.

These are the leading organizations that usually have big customer base, huge infrastructure, a lot of investment in technology, unique core competencies, complex supply chain and distribution network, well established culture and leader in performance. The leaders in their own area are also subject to high change forces owing to globalization, stiff competition, changing customer requirements, advances in technology and so on. The strategy proposed for this category is most challenging and comprise of 'Strategic Flexibility for Integrating Opposites' and can be metaphorically started as '*Flowing Stream Strategy'*. A flowing stream is continuously changing its course, and at times radically, while maintaining its continuity at the same time. This strategy frontier needs to be explored further for a right balance and synthesis of opposing forces acting on well established organizations, so as to divert their inertia on new frontiers without losing the benefits of continuity. This would require to explore a range of strategy options in view of the various types of continuity and change forces. For example, to take advantage of existing huge customer base for change the strategic option could be of 'cannibalization'. The inertia of vast infrastructure can be dealt with by way of 'outsourcing'. The widening of scope to 'offer solutions' in place of individual product and services can aid in tapping new opportunities and change in customer requirements by utilizing the strengths of existing products and services.

The force of new opportunities can also be beneficially channelized by 'extending the application of core competence'.

Continuous Factors

Customer Base

The customer base of Maruti is largest in India and its increasing continuously. Maruti is market leader in and its leading technology and innovations it has been continuously gaining share in terms of number and volume both. Hence Maruti doesn't need to do anything extra ordinary or use resources for it

Infrastructure

Maruti has been the largest producer of private vehicles and it has been able to roll out cars much higher to meet the requirement of its customers. It has got a big infrastructure to support it and it has been continuously increasing it over the period of time. The maruti Udyog has been a state of art infrastructure with all the latest technology and supplements to sue the work efficiently and effectively. Maruti has been providing services to its vendors also to build infrastructure and has been partner to many of its vendors. It has helped these organizations to bring machinery and provided them with latest technology so that it should not be at any point of time be fallback due to its poor vendor infrastructure.

Technology

Technology has been a major factor for success ofany organization and maruti has been at its best in terms of technology. The new swift has been the cornerstone in maruti story which has been launched globally. The new and innovated minds has been working continuously over a period of time to get best technology. But the competition has been increasing and with the entry barriers opening up global players has been coming up with new products. The war has not been fought on price but at technology. Hence maruti has to work over its technology continuously to come out with best technology so that it can satisfy its customers and compete with global players too

Supply Chain and distribution

These days the competition is not among the organizations but among the supply chains of the organizations. Maruti has around 220 vendors all around the Delhi or Gurgoan. It has the best supply chain with major vendors being partners of Maruti itself. To work efficiently and provide satisfaction to its vendors maruti has least credit period and it makes payment within 7days. The effectiveness of a maruti lies in the lean supply chain and cooperation of its vendors. But there has been vendors whose selection has been on the basis on the management pragmatic decision while they have been quite capable enough to do more. Hence Maruti has to be flexible in choosing its vendors and provide them ample amount of opportunities to come out with their own decisions. Maruti offers its vendors to manufacture parts with only their specifications. So there hasn't been any room for opportunities for its vendors base so Maruti has to make its vendors partner in its R&D so that it can get more innovative ideas and compete with competitors.

Performance

The winning organizations are those where the its best resource i.e human resource has been performing at its best . Maruti understands the needs of its employees and has been among the best employers. It has been continuously rewarding its people for their contribution for the growth. Not only its employees but it has also been awarding its vendors for their continuous

support and cooperation for the success story of maruti. Maruti has been continuolsy grading its vendors according to its performance and been awarding them time to time. Hence it has to always been upfront to recognize its employees and vendors efforts. It has to be keep working in development of its employees and vendors so that they keep performing in the same way.

Suggestions and Recommendations

- Maruti has long left the process of competitive bidding amongst current and new suppliers. The main emphasis in Maruti is to look into the existing supplier base if any requirement is there. It is very helpful in building long-term relationship. But it may create complacency. The objective here should be to get a competitive bid from a large number of new suppliers. The important element is that the number of possible suppliers should not be limited to well-known companies. What Maruti has to understand is that the objective is to identify the 'best-in-class-supplier' for the required product, on a performance-based contract. For this Maruti may have to go through a modified rebuy experience, but given the amplitude of the project involved it surely will worth the effort.
- When new supplier is selected, he is mainly checked for the financial and technological capabilities. There is no doubt that these things are important, but the most important thing, which Maruti misses out, is the management philosophy of the selected company. The selected supplier should incorporate the management philosophy of Maruti, which is based on respect for the individual and the full utilization of the creativity of employees, so as to deliver the required output. Hence Maruti has to take into account whether the selected company has the capability to incorporate the Maruti culture or not. If that is accomplished, then both Maruti and the selected supplier are working with common views and barriers between the supplier and the company automatically fades away. For example, Honda of America works with their "Best Practice Programme", which stands for 'Best Practice', 'Best Price', and 'Best Process'. The purpose of this programme is to show suppliers how to eliminate the seven wastes in their production organization: standstill of machinery, moving materials, defects and failures, production disturbance, over-production, lead time and stocks.
- By introducing product and process engineering knowledge and experience of the supplier early into the development process, the time-to-market and start-up costs may bee reduced. But, Maruti doesn't seem to incorporate this idea as followed by different responses. They provide all the designs and specifications to the suppliers and the role of the suppliers is reduced to manufacturing only.
- A very basic criterion for selecting a particular vendor is the proximity of the vendor's plant to the Maruti plant. If the plant of the vendor is far away from Maruti's plant, then Maruti asks the vendor to shift the plant near its own plant. Many a time it's not feasible for the vendor to do the same and the vendor is rejected due to this. This problem may be sort out by using a very efficient transport system. If the vendor is capable to cater to all the needs of Maruti then the proximity problem should not create any barrier to selecting an able vendor.

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Summary of the Questionnaires

S.No	Vendor	Continuity score(score)	Continuity Score(total)	Continuity Score	Change Score(score)	Change Score(total)	Change Score
1	A	114.00	145	**3.93**	66.00	105	3.14
2	B	79.00	145	2.72	57.00	105	2.71
3	C	93.00	145	3.21	68.00	105	3.24
4	D	87.00	145	3.00	49.00	105	2.33
5	E	71.00	145	2.45	56.00	105	2.67
6	F	73.00	145	2.52	61.00	105	2.90
7	G	82.00	145	2.83	62.00	105	2.95
8	H	79.00	145	2.72	61.00	105	2.90
9	I	89.00	145	3.07	65.00	105	3.10
10	J	87.00	145	3.00	58.00	105	2.76
11	K	84.00	145	2.90	62.00	105	2.95
12	L	81.00	145	2.79	67.00	105	3.19
13	M	86.00	145	2.97	57.00	105	2.71
14	N	91.00	145	3.14	68.00	105	3.24
15	O	78.00	145	2.69	76.00	105	**3.62**
16	P	76.00	145	2.62	71.00	105	3.38
17	Q	93.00	145	3.21	68.00	105	3.24
18	R	83.00	145	2.86	74.00	105	3.52
19	S	85.00	145	2.93	78.00	105	3.71
20	U	88.00	145	3.03	69.00	105	3.29
21	V	79.00	145	2.72	72.00	105	3.43
22	W	76.00	145	2.62	68.00	105	3.24
23	X	74.00	145	2.55	73.00	105	3.48
24	Y	87.00	145	3.00	61.00	105	2.90
25	Z	89.00	145	3.07	71.00	105	3.38
26	AA	69.00	145	2.38	68.00	105	3.24
27	AB	78.00	145	2.69	62.00	105	2.95
28	AC	81.00	145	2.79	61.00	105	2.90
29	AD	80.00	145	2.76	61.00	105	2.90
30	AE	85.00	145	2.93	63.00	105	3.00
Total		2497.00	4350		1953.00	3150	
Overall Average Score				**2.87**			**3.10**

Due to confidentiality, the names of the individaul vendors who took part in the survey are not disclosed.