A firm’s external environment involves both geographic factors and cultural elements. Location and resources are crucial geographic factors influencing both national and corporate success, with population characteristics and institutional arrangements making up the most meaningful components of the cultural elements affecting both the success of firms and of nations.

Resources, population and institutional factors are dynamic, manifesting a number of feedback loops. For example, institutional incentives stimulate technological discoveries, which, in turn, enable firms to pursue resource-substitution policies, thereby modifying production possibilities.

During the period after the second world war, at least through the 1980s, Japan and Japanese firms seemed to have successfully adapted themselves to the competitive forces of emerging global markets. In spite of a poor natural resource base, a dramatically altered set of institutional arrangements (a combination of democratic government, free-markets and the rule of law) created a propitious atmosphere for innovative behaviour.

Nowhere were adaptations to this altered environment more apparent than in the Japanese automobile and semiconductor industries and no firm was more successful, admired and emulated than Toyota Motor Corporation.

Indicative of these changes is a Fortune magazine article, published several years ago, which provided a popular assessment of the successes of Toyota. It reported that Toyota was named the most admired motor vehicle manufacturer in the world in 1997, 1998 and 1999 as well as being ranked 11th among the world’s most admired companies in 1998 alongside firms that have been recognised for setting world-class standards of performance in a wide variety of industrial groups (General Electric, Coca-Cola, Microsoft, Disney and so on). More recently, Fortune ranked Toyota as top automobile manufacturer in the world. A total of 14 international automobile manufacturing firms were included in Fortune’s evaluation of the global motor vehicle industry, including Ford Motor Company and General Motors.

The primary focus of this article is Toyota’s record of successes in the global marketplace. A number of factors help to illuminate and explain the company’s long-term success. First, it

For a firm to experience long-term sustained competitive advantage it must invest in human resources and deploy its scarce assets in the core areas that can most effectively provide the underpinning of a sustained competitive advantage. Gary R Fane, M Reza Vaghefi, Cheryl Van Deusen and Louis A Woods say that Japanese car maker Toyota is a supreme example of a company that has done just that.
examines the geographic and cultural environments of Japan, which provide an essential background for evaluating the decisions made by Toyota. Second, the nature of productivity utilisation is evaluated, with a particular emphasis on labour productivity as an offshoot of corporate selection and implementation of an appropriate production function. Third, the article analyses corporate asset use and Toyota's internal production relationships. Fourth, the role of the company's innovative management culture is examined.

Finally, all of the elements are brought together to provide an integrated explanation for Toyota’s enduring success, in spite of the foundering of the Japanese economy over the past decade. Comparisons are made with Toyota’s US counterparts GM and Ford.

Japanese and European automakers were able to penetrate the US market with their smaller, energy-efficient vehicles

Japan, automobiles and Toyota

In the initial stages of the development of the automobile industry firms were assemblers of components produced by a variety of supplier industries, including iron/steel fabricators, non-ferrous metal works, machine tool makers, safety glass producers and so on. The industry was characterised by out-sourcing most inputs.

Subsequently, however, there was a tendency in the US for auto firms to incorporate many of these activities within the corporate structure in the quest for lower costs and higher profits. Ford and GM, for example, were early innovative firms in this fragmented, largely handicraft industry. These companies sought to reduce production costs via scale economies and to expand the size of their market by creating a highly standardised product, easily mass-produced and mass-marketeted.

The result was a severe reduction in the number of competing firms in the industry as the major players pursued a policy of vertical integration, including in-house production of components and parts. In the US this corporate structure – guided by a hierarchical management system and

animated by Frederick Taylor’s principles of “scientific management” – continued basically unchanged till the end of the 20th century. By the 1970s, however, it was becoming increasingly clear that this US system of manufacturing was under stress. The energy crises of the 1970s, accompanied by “stagflation” and an incipient concern for the environment, led consumers to shift their tastes away from large, energy-consuming automobiles as government policies embraced clean air and water legislation. Both Japanese and European automakers were able to penetrate the US market with their smaller, energy-efficient vehicles and benefit from these trends.

Limited resources versus unlimited ambitions

Fully appreciating the pioneering successes attained by Toyota in the post-second world war period and the rise of “corporate Japan” requires an awareness of a number of critical geographical and historical realities that have provided the foundation of the socio-economic environment of Japan.

Japan is composed of four large and numerous smaller islands with a land area smaller than California (146,000 square miles compared to 158,700 square miles). Japan’s islands are mountainous, with narrow coastal plains and numerous river valleys and it is here that the majority of the country’s population resides. Yet Japan has a population nearly four times as large as that of California and nearly half that of the whole US (127.5 million compared to 281.4 million). It has a population density of over 832 people/square mile, with densities highest on the three southern main islands (Honshu, Kyushu and Shikoku) and lightest on the northern most island of Hokkaido. This compares with a much lower average population density in California – 217.2 people/square mile and an average density of 79.6 persons/square mile in the US.

Small nations are typically less well endowed with rich and diverse mineral resources than are larger nations. Japan possesses a meagre mineral resource base, with some coal, zinc, lead and tungsten. This scarcity has necessitated prodigious imports of raw materials, creating substantial import costs. Resources thought to be necessary for industrialisation are largely lacking in Japan. Iron ore and quality coking coal, necessary for metallurgy, for example, are available only in small quantities and at high costs. Consequently, they must be imported. The same is true of other critical resources, including petroleum, most ferrous-alloys and copper.
It was in this environment that Kiichiro Toyoda established Toyota in 1937, in the militaristic society that characterised Japan between the wars. Japan’s lack of resources and the militaristic environment are often cited as factors that led to expansionary policies and, ultimately, to Japan’s involvement in the second world war. During the war, Toyota shifted its efforts into manufacturing military vehicles. After the war there was a return to manufacturing passenger vehicles. At the time, the firm faced three major problems: lack of a sophisticated technical capability; inadequate financial resources; and a labour force hostile to the market economy. These three elements, in addition to Japan’s resource shortages, appeared to present insurmountable obstacles for the company. In fact, the preponderance of labour problems finally forced the company’s founder to resign, leaving the future of the company in the hands of Eiji Toyoda, his nephew, and Taiichi Ohno, the company engineer. While all three contributed to the creation and implementation of the so-called Toyota Production System (TPS) and lean management, the instrumental architect was Ohno. Toyoda and Ohno were faced with limited resources but were endowed with unlimited ambition.

In 1950, Toyoda paid a visit to Ford’s River Rouge plant in Michigan, which was typical of the US manufacturing model, at the time – perfect vertical integration and a hierarchical organisational structure, using the prevailing Tayloristic management philosophy. During his visit, Toyoda was especially impressed by two factors representative of the prevailing US manufacturing system: the abundance of waste at the River Rouge plant and the absence of flexible, multi-purpose equipment.

His River Rouge experience and his awareness of the seductiveness of communism to the Japanese stimulated Toyoda and Ohno to implement a major decision, unique at the time: to provide Toyota’s workers with life-time employment in return for their total commitment and loyalty to the firm. Toyoda and Ohno diligently sought to establish a work environment in which management and labour could work together in a co-operative, creative manner (typical of the Japanese social psyche) and to design a system that would minimise waste. They called this arrangement *muda*. This decision provided a strong foundation for eventually establishing TPS.

**Intellectual capital and TPS**

One of the most significant factors governing economic relationships in the final decades of the 20th century was the recognition of the paramount role intellectual capital plays in creating and maintaining the competitive edge so necessary for corporate success. T A Stewart, in his book *Intellectual Capital: The New Wealth of Organizations*, has defined it as “the sum of everything everybody knows”. He also enunciates its pre-eminence in forging corporate competitive advantages in the so-called new or information-age economy, observing that: “It's hard to identify and harder still to deploy effectively. But once you find it and exploit it, you win. You win because today’s economy is fundamentally different from yesterday’s. We grew up in the Industrial Age. It is gone, supplanted by the Information Age”.

Stewart has observed that intellectual capital is one of the dominant characteristics of information-age firms and that one of its key attributes is that it is intangible, comprised of intellectual property (patents, copyrights, trademarks and trade secrets), concepts, proprietary information and knowledge. Intellectual capital resides in the innovativeness of a firm’s human capital and not in the productivity of its tangible assets – its plant and equipment.

One of the lessons of this paper is that Toyota was one of the early adopters of new organisational structures, such as TPS and team production, with appropriate incentives for institutionalising the acquisition and deployment of intellectual capital. As such, Toyota and its production system proved to be an exemplar of precisely how the quest to consolidate competitive advantages in the global marketplace could be effectively accomplished.

Crucial to any evaluation of Toyota’s success is a comprehensive understanding of the relation between the much vaunted and emulated TPS and its process of continuous improvement (*kaizen*) and their mutually profound influence on labour productivity. The system represents an early attempt to objectify the creative processes so necessary for the acquisition and deployment of intellectual capital to productive efforts.

Toyoata’s success with this organisational system and its related elements help explain numerous –
and often not completely successful attempts – by other firms, both in the motor vehicle and other industry sectors, to implement similar organisational structures. The emergence, development and implementation of TPS marks a turning point in industrial organisation that is as profound and far-reaching as the creation of the mass-production model in the US based on interchangeable parts and the moving assembly line.

In the early stages of the automobile industry, GM under Alfred Sloan sought to capitalise on its size through exploiting both economies of scale and scope by the internal fabrication of components and parts (a “make” decision as opposed to a “buy” decision) through the pursuit of vertical integration. This was rational, since GM was producing in and for a continental market separated by great distances with significant transport costs on both material inputs and final product.

In contrast, Toyota began to emerge in the mature phase of the global automobile industry in a small insular economy where level industrial land is at a premium. Under these circumstances, Toyota implemented an out-sourcing, or “buy”, strategy governed by a “just-in-time” manufacturing system that reduced the opportunity costs of holding inventory while economising on scarce and expensive warehousing space.

Stewart observes that industrial age and information age firms have starkly different financial structures. One is a collection of physical assets while the other is a collection of intangible assets and it’s not clear who owns them or is responsible for caring for them. For Stewart this means that knowledge-based firms “strip their balance sheets of fixed assets” as “vertical integration cedes to the virtual organization”.

Integral to TPS has been its human dimension – including its organisation, structure and corporate culture – which has been the bedrock of the Toyota’s continuing success. Workers, with lifetime employment opportunities, were considered to be corporate assets. Therefore, constant on-the-job training, job rotation, skills- and-techniques programmes for line workers and operational training for middle management were implemented to enhance the value of employees to the company by improving their labour productivity.

**Productivity: intellectual capital and other factors**

Productivity, as an abstract concept, represents the outcome of any production relationship to some production factor or set of factors per unit of time. Since time is fixed in these relationships, the set of factors must be technology, human and physical capital assets. Over longer periods, these factors change, resulting in changes in factor productivity or output to the relevant factor. This is so, when expansion takes place, since the firm’s production functions are shifted outward. In this context, A P Carnavale has described increases in productivity as the ability to obtain more with the same, or even fewer, resources.

Labour productivity reflects a level of output derived from the use of some specified resource combination, given fixed amounts of land, labour, capital and entrepreneurial ability, which presuppose the use of some technology. It is static, a measure taken at the moment. From the time of Henry Ford, automakers in the US have pursued profits by expanding labour productivity through increasingly specialised capital equipment, incremental increases in the degree of specialisation of task (decomposing tasks into smaller and smaller increments) and by the separation of planning and management functions (the mental activities) from the actual production efforts (the physical activities).

This rigid hierarchic corporate organisation structure of mass-production firms was based on the principles of scientific management formulated by Taylor. This mode of corporate organisation resulted in the creation of an adversarial relationship between workers and management in the US. Competition with Japanese producers that use team production and TPS has forced US producers to seek alternative organisational structures to their traditional mass-production/vertical integration models.

By way of contrast with the vertical integration model, Toyota and other Japanese firms sought alternative paths to profit maximisation through labour productivity improvements such as team production, which is a natural outgrowth of Japanese culture with its emphasis on consensus and co-operation. In addition, Toyota’s management sought to avoid waste by adopting a
flexible production strategy using multi-purpose capital equipment staffed by cross-trained workers charged with responsibility for managing their own immediate work environment. This makes clear the primary role that a well-educated and well-trained workforce plays in TPS; it also clarifies the liberation and empowerment of that workforce, instilling pride in workmanship not seen since mass production displaced handicraft production.

The most impressive aspect of this empowerment philosophy is the way TPS exercises the managerial and team workers’ responsibilities. The workload is divided into what we call: operational (technical-functional), administrative and strategic-entrepreneurial actions as illustrated in Table I.

This managerial philosophy, where empowerment begins at the shop floor, is in contrast to the one we have been used to – top-down management systems.

Over the last two decades, Michael Porter has pioneered the notion that competitive strategies could be based either on cost strategies or product differentiation – imperfect or monopolistic competition.

In addition to his regard for cost and product-differentiation strategies promoting competitive advantages, Porter has also emphasised productivity as a major determinant of corporate, as well as national, prosperity: “A rising national share of world exports is tied to living standards when rising exports from industries achieving high levels of productivity contribute to the growth of national productivity”.

How a firm or a nation’s economy achieves a high level of productivity in order to sustain its competitive advantages is to “upgrade and move to more sophisticated types” of productive assets. These ideas closely resemble the approach championed by Joseph Schumpeter in his model of growth derived from that “perennial gale of creative destruction” that is implicit in innovative and technological change.

This is precisely the path that Toyota and other Japanese car manufacturers have pursued. In a previous research paper, the authors uncovered some powerful relationship between additional assets and sales. We studied the effect of lagged changes in assets and changes in sales. Examining six major car companies, we found that there was no significant relationship in this regard for any

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**Table 1  Leadership levels in lean-system oriented organisations**

<table>
<thead>
<tr>
<th>Organisational levels</th>
<th>Skills needed</th>
<th>1 Technical-Functional (Engineering, Accounting, Marketing, etc)</th>
<th>2 Administrative-Operational Planning (Human Relations, Goal Setting, Decision Making, Problem Solving, etc.)</th>
<th>3 Strategic-Conceptual Entrepreneurial (Strategic Thinking, Scenarios, Issue Planning, Strategic Response, etc.)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>● Directors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Vice Presidents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Executive VPs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Chief Op. Officers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Chief Ex. Officers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Dept. Heads</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Functional Managers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Product Managers</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Project Managers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Team Leaders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First-line supervision</td>
<td></td>
<td></td>
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</tbody>
</table>
of the US-based firms. However, a one per cent increase in assets for Honda and Nissan was associated with 0.3396 and 0.4032, respectively, per cent changes in sales in the year immediately following the increased investment. Toyota realised the highest second-year impact of increased assets on sales. A one per cent increase in year one assets for Toyota was associated with a 0.5131 per cent change in year two sales. The bottom line is that compared with systems of rival firms TPS allows for the relatively easy conversion of assets into sales both in the year the assets are brought on line and in the subsequent year.

The supply chain in the competitive model

Over the years evidence has accumulated that the most effective way to expand a firm’s “productivity frontier” is through systematic investment in human capital, as well as in those tangible fixed assets that directly foster productivity improvements.

Indicative of the effectiveness of TPS in these processes has been a recent announcement made by Toyota that it now can fill a buyer’s new car order in just five days. The significance of this is that it mirrors the flexibility and productivity-enhancing potential of TPS since most of Toyota’s rivals require at least 30 days to assemble vehicles.

Table 2  The jewels in the Toyota supplier network

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Business</th>
<th>Toyota’s stake (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toyota Central R&amp;D Labs</td>
<td>Conducts basic research for the Toyota group</td>
<td>54.00</td>
</tr>
<tr>
<td>Kanto Auto Works</td>
<td>Auto bodies/parts, housing construction equip.</td>
<td>48.95</td>
</tr>
<tr>
<td>Toyota Auto Body</td>
<td>Auto- and special-vehicle bodies and parts</td>
<td>47.07</td>
</tr>
<tr>
<td>Toyoda Gosel</td>
<td>Synthetic resin and rubber products</td>
<td>42.47</td>
</tr>
<tr>
<td>Toyoda Machine Works</td>
<td>Machine tools and auto parts</td>
<td>24.76</td>
</tr>
<tr>
<td>Toyoda Automatic Loom Works</td>
<td>Textile machines, industrial vehicles, autos</td>
<td>24.76</td>
</tr>
<tr>
<td>Denso</td>
<td>Auto elect. components, household appliances</td>
<td>24.58</td>
</tr>
<tr>
<td>Aishin Seiki</td>
<td>Auto and die-cast parts, household appliances</td>
<td>24.47</td>
</tr>
<tr>
<td>Aichi Steel Works</td>
<td>Specialty steel and forged-steel products</td>
<td>24.21</td>
</tr>
<tr>
<td>Toyoda Boshoku</td>
<td>Cotton thread, auto parts, household appliances</td>
<td>11.86</td>
</tr>
</tbody>
</table>


Toyota’s 360 first-tier supplier network, coupled with precise scheduling and precision co-ordination, has made it feasible for the firm to respond promptly to short-notice orders. The supplier network, which at the core of TPS, is the key to this success and this is precisely why Toyota will do everything to enhance and protect this corporate “jewel” from encroachment by rival foreign firms. An overview of Toyota’s supplier network/strategic alliance partners is provided in table 2.

Clearly, these close linkages between Toyota and its suppliers, through equity ownership and technical exchange, facilitate product development, production planning and the co-ordination of component supply with component demand.

A close review of the extensive literature devoted to the superior performance of Japanese firms, especially Toyota and others in the automobile industry, and of its economy in competing in the global marketplace, consistently attributes their successes to their subcontracting or out-sourcing systems. These systems, involving “make-or-buy” decisions, represent a marked departure from those that characterised firms in the transformative stages of the automobile industry in North America.

The guiding principle of Japanese auto firms, like most Silicon Valley firms, is to concentrate their expertise and resources co-ordinating the
design and assembly of the final system and to advance critical technologies with respect to the firm’s core competencies. The firm spreads the cost of production and the risk of new designs through a system of strategic alliances with suppliers.

These close symbiotic relationship and ownership linkages of Toyota and its first-tier suppliers, including both long-term reciprocal interactions and information sharing, are clearly apparent in Table 2. This form of production (kanban) and supply chain management has enabled Japanese automakers to establish a high level of component out-sourcing. The economies resulting from such co-ordinated and collaborative efforts have been difficult to achieve for US firms, which have been both reluctant to share governance with workers and unwilling to share trade secrets with external suppliers with whom they have had adversarial relationships.

Asset utilisation: productivity from another angle

Any discussion of labour productivity in the abstract is misleading, since it is influenced primarily by four factors: changes in physical capital; changes in human capital; changes in technology; and the firm’s intangible intellectual capital (patents, copyrights, trademarks and trade secrets).

In the case of Toyota, its harnessing of each of these elements has been significant in contributing to the company’s sustained competitive advantage. By far the most important, however, has been its emphasis on enhancing its human capital (which includes the firm’s intellectual capital) by both broadening and deepening its proficiencies through superior horizontal organisational structures. These include: team production (flexible work teams, quality circles, and job rotation); cross training labour or multi-task performance, empowering workers to actively participate in continuous process improvement and to control their local work environment (shutting down the assembly process to assure quality); the creation and development of its supply linkages; and co-ordination among related units.

The first three elements are known as Kaizen, the fourth is referred to as keiretsu, and the last has been designated as kanban. Toyota is employing all three factors efficiently and the outcome is productivity of its human resources as reflected in Table 3.

Physical capital or assets (plant and equipment) of a firm are expanded by its rate of saving and patterns of investment. Investment in new and improved plant and equipment serves to increase the efficiency and effectiveness of labour, increasing its marginal product – the output per worker per unit of time – thereby improving the firm’s productivity. Capital-induced improvements in productivity provide benefits that are shared by the firm and its shareholders (increased profits), by labour (increased wages and other benefits) and by consumers (lower prices and improved product quality). The outcome of capitalisation is reflected in Table 4. There is a direct and positive relationship between improvements in technology and increases in productivity – each unit of labour is capable of a larger output per unit of time since labour’s marginal product has been increased. Changes in technology, as used here, are the products of both invention and innovation. Just as the case of capital-induced productivity improvements, technology-induced increases in productivity will be shared by the same constituents for the same reasons. Increasingly, the competitive advantages of firms are derived from their exploitation of their intellectual capital.

Stewart has pointed out that in 1996 Microsoft’s total capitalisation was more than 20 per cent greater than that of IBM’s, while IBM’s physical capital was more than 16 times larger that that of Microsoft. This reflects the shift from tangible assets characteristic of an industrial age firm, to the intangible assets of information age firms.

Corporate innovation: Toyota’s key to success

Schumpeter first addressed the social and economic significance of innovation in detail. He employed innovation to explain Kondratiev’s “long waves” in business cycle theory, those of 54 to 60 years’ duration, and the nature of the economic growth processes. The Kondratiev/Schumpeterian view gained increased popularity at the end of the 20th century. Innovation, for Schumpeter, was not the same thing as invention – innovations may be copied and may not be protected by “intellectual property rights”, or IPRs, (with the exception, perhaps, of trade secrets) while inventions are protected for a specified period of time by IPRs such as patents and copyrights.

Innovations for Schumpeter reflect: the introduction of “new methods of production” or a change in current production functions; the creation of “new forms of organisation”; the discovery of “new sources of supply”; or the opening of “new trade routes and markets”. Further, he identified the source of innovation as the consequences of the actions within a capitalist system of the entrepreneur seeking competitive advantage in the quest for profit.

TPS is representative of this Schumpeterian definition of innovation. It is the result of “new
Table 3  Sales per employee

Table 4  Assets per employee

Table 5  Net income per employee

Source: Data were derived from Fortune Global 500, company websites and other sources.
methods of production” as well as the adoption of “new forms of organisation”. Toyota’s substitution of lean production – based on a flexible batch process using multipurpose equipment, manned by a multi-skilled (cross-trained) workforce, supplied by a just-in-time inventory system – for the mass-production model based on highly integrated firms was revolutionary.

Critical elements of lean production systems, as practised by Toyota, may be summarised as minimally involving all of the following elements: flexible batch production using cross-trained workers using multipurpose equipment, and a just-in-time inventory system; with goals to eliminate waste (muda), minimise costs of capital equipment, increase productivity using flexible batch production and pursue continuous product and process improvement (Kaizen); and use of just-in-time inventory systems, empowerment of line workers to identify and correct assembly line problems to promote product quality, organise suppliers into tiers and co-ordinate supply-chain performance, and decentralise design and decision making.

The analysis of Toyota, the TPS and its organisational structures are significant for understanding the firm’s contributions to contemporary business management practices. But, perhaps, even more significant is the realisation that North American and European manufacturers have not easily emulated the Toyota model. This inability to copy the Japanese approach to corporate organisation reflects different historic development patterns, as well as different physical endowments and cultural heritages.

Perhaps the most significant barriers to non-Japanese firms for totally adopting the Toyota model have been an unwillingness of corporate managers to acknowledge the need to accept a new way of thinking about corporate organisation, incentives and control systems and the recognition that the system necessitates acceptance of greater responsibility by both workers and management, reflecting an enlarged commitment to the firm, its products and customer satisfaction.

The Toyota system has its foundation in a horizontal organisational structure, in contrast to the vertical or pyramidal configuration with its command and control functions that had evolved in the US and Europe.

Resistance to change, or organisational inertia, characterises any well-entrenched bureaucratic organisation, both in the private and the public sectors. This frictional element of inertia impedes any broad, sweeping change, if not making such change impossible. There are a number of factors that are likely to contribute to this resistance to change: basic human fear of the unknown and untried (inherent conservatism); vested interests concerned with the loss of privilege, stature or potential rewards (base self-interest); and the comfort of routine (corporate lethargy). Such barriers to change encourage partial solutions and half-hearted fragmentary implementation of alien systems.

The position taken in this study is that the major reason for Toyota’s success in setting world standards in efficiency, productivity and quality is due primarily to: a network of suppliers in Japan, and, more recently in the US; a state of the art assembly system; a system of just-in-time inventory that reduces waste (muda); and a unique combination and deployment of effective and efficient human and capital assets resources, management practices, programmes and processes. The cumulative outcome of such combination is evident in Table 5

Toyota, knowing its limitations from the outset, positioned itself, in Porter’s terminology, to benefit from economies of scale and dedicated lifetime employable workers. The firm had to pursue its goal of car making fully realising the fact that it had been told by the Japanese government that it should not produce cars because such a product would require two major ingredients that the Japanese economy possessed in short supply, namely petroleum and ore. Therefore, creating a network of suppliers and a continuous investment in assembly lines minimising waste became the main ingredients of a positioning strategy that has established Toyota at the forefront of the global automotive system.

The result of this deliberate strategy has been a steady increase in sales of Toyota products and with it other components of the revenue stream. But the continual increase in sales may not be the most important indicator of the firm’s success in the long run. What is even more significant is the productivity of the human resources and the capital employed by the firm. In businessmen’s terms, productivity is the dollar value of all

North American and European manufacturers have not easily emulated the Toyota model

Competitive advantage the Toyota way
While TPS conceptually is not especially complicated, its implementation and co-ordination can be exceptionally demanding.

The accounting data drawn from *Fortune* magazine’s Global 500, company websites and annual reports covering 19 years, indicate that among the top eight car producers (GM, Ford, Chrysler, Toyota, Nissan, Honda, Volkswagen and Renault), Toyota stands out as the most productive among the eight firms. Toyota’s productivity is unrivalled by its competitors. Almost all car producers have poured in capital assets but Toyota has pursued capitalisation more consistently and on a regular annual basis. The intermittent capacity increase and decrease exercised by Ford and GM produce uncertainty, destroy morale and other non-quantifiable elements that impact the firm’s performance in the short run as well as long run.

**Conclusion**

Above we have briefly mentioned the role of intellectual capital in forging corporate competitive advantage. Therefore, the question is: how should a firm maintain and enhance its intellectual capital? Porter’s constant reference to innovation and upgrading as effective tools of competitive advantage provide an appropriate platform for this argument. Table 4 is an indication of Toyota’s deliberate policy of maintaining its product development and manufacturing lead in the global automotive industry. With the exception of Ford, other members of the group have not been as rigorous as Toyota in asset augmentation, including the deployment of intellectual capital assets. The outcome has been that employees, or associates as they are called at Toyota, have more advanced tools and equipment to work with, reflecting imbedded intellectual capital. This is also in line with Toyota’s philosophy that safety is number-one priority at Toyota plants. A safety-conscious place of work helps maintain morale of the associates; maintaining morale increases the opportunity to produce quality work. The quality factor helps the productivity factor, which ultimately ends up in lower cost, enhancing corporate competitiveness.

The generally steady increase in Toyota’s net-income (Table 5) contrasts with that of GM and provides further evidence that the concept of continuous improvement, or *Kaizen*, is alive and well and continues to bear fruit. It also demonstrates that it has been difficult if not impossible to implement TPS within the world’s largest automobile producer, GM, and the second largest, Ford.

TPS, as currently implemented in Toyota plants in Japan and Georgetown, Kentucky, is defined by its architects as “...a framework of concepts and methods for enhancing corporate vitality...which enables companies to achieve continual gains in productivity while satisfying customers’ expectation for quality and prompt delivery”.

Implementing TPS requires a different managerial mentality. It takes a tremendous amount of detailed planning, discipline, hard work and careful attention to detail. Although many companies have sought to imitate Toyota’s TPS, none have been able to match Toyota’s results. The inability to successfully adopt TPS by many firms appears to be related to the idiosyncratic nature of the system as it evolved at Toyota. Even though Toyota’s TPS has been studied to death, it is not properly understood.

**Resources**


