Transferring the Toyota Production System into India
A Case Study

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Abstract

This study argues that the success of international transference of Japanese lean manufacturing practices in general, and the Toyota Production System (TPS) in particular, is in varying degrees contingent upon the socio-cultural, historical, and environmental context of the host nations into which such transfer occurs. It contends that TPS is not simply a set of concepts, techniques, and methods that can be implemented by command and control. The specific cultural and environmental factors within Japan were central to the conceptualization, acceptance, and development of TPS in that country. In the course of transplantation of TPS practices from Japan into overseas affiliates, either an absence of due consideration, or disregard for a host nation's unique socio-cultural and environmental factors (and the compatibility of these factors with the specific needs of TPS) could lead to unproductive organizational outcomes for the parent company. This theme is explored through an analysis of the decade-old association between the automobile industry giant Toyota Motor Corporation (TMC) Japan, and its affiliate in India, Toyota Kirloskar Motors (TKM), at Bidadi near Bangalore, India.

Key words: Lean manufacturing, Toyota Production System (TPS), Transplantation.

Introduction

This paper adopts the following sequence. A brief description of the Japanese headquartered global automobile manufacturing organization Toyota Motor Corporation (TMC) is provided at the outset, after which we elucidate on the salient features of lean manufacturing and its more advanced form TPS, as well as the historical and environmental factors that influenced development of these philosophies in Japan. Following this we explore TMC's attempts to transplant its TPS system into a different socio-cultural context, namely its international affiliate Toyota Kirloskar Motors (TKM) near Bangalore in India. This is achieved by drawing comparisons between the 'ideal' environment conducive to implementation of TPS, and the unique Indian environmental context. Finally, we address aspects covering methodology, findings, and a conclusion.

It is important to note that the considerable literature on the transfer of Japanese management techniques and lean production from Japan to other nations has tended to focus on developed countries such as the USA and Europe (Berggren, 1994; Besser, 1996). The transfer to developing countries has been less extensively analysed (an exception being Becker-Ritterspach, 2009). Given   the importance of rapidly developing economies such as China and India this is a

gap which requires filling. Our study is important in being conducted at this time in order to aid theorists and practitioners to understand the forces inherent within such transplantation situations, leading to smoother introduction of management practices across lean production companies, especially motor vehicle manufacturers in industrialising countries.

TMC and 'One Best Way'

TMC came into existence in Japan prior to World War 2 and has since grown into a multi-national motor vehicle manufacturer with unprecedented success since its formation. In 2009 it overtook General Motors to become the world's largest motor vehicle producer, despite this also being the year when TMC made its first financial loss since 1950. Toyota's success has been intensively researched and painstakingly documented, yet what really happens inside the company for many people largely remains a mystery (Spear and Bowen, 1999). Although recently being displaced as the world's number one automobile producer by Volkswagen (VW) after the latter's takeover of Porsche, it is widely believed to possess larger global production capacities than VW, which it is likely to exploit after recovery from the technical and quality defects-related slowdown it has suffered during 2009-2010.

TMC has 52 overseas manufacturing companies in 26 countries outside Japan. Its production crossed the 8 million vehicles mark in 2006 during which its global workforce accounted for 350,000 people. The company is widely regarded as the originator of the lean production system which is imitated across the globe by all other leading motor vehicle producers. With an unshakeable faith in its customised lean production approach, as encapsulated within The Toyota Way and the Toyota Production System (Jones et al 2010), the company believes that the approach represents a universal one-best-way system for manufacturing environments which can be reliably exported and transplanted into different countries and cultures around the world. Consistent with this belief, TMC has increased its production volume and sales over recent decades by establishing affiliate companies located across the industrialised and industrializing nations. Major affiliates are located in USA, Canada, Europe, Australia, Asia-Pacific, and China. A major new production facility is currently being rolled out in India. These production facilities have largely been responsible for securing Toyota's ranking (until the recent VW takeover of Porsche) as the number one motor vehicle producer, with the expanded Indian facility likely to cement this scenario.

However, very few of these overseas affiliates have been successful in implementing the 'pure' form of TPS despite the best efforts of large numbers of Japanese trainers and executives located within the facilities. Invariably some form of hybrid system has been implemented which amounts to a considerable compromising of the TPS system. Recently, the parent Japanese company has taken steps to reduce the prevalence of these compromised systems within its overseas affiliates and has commenced the process of creating a stronger 'pure' and 'standardised' version of TPS across all its international affiliates. This is planned to be achieved through the implementation of the Floor Management Development System (FMDS). This system is aimed predominantly at group leaders within Toyota to ensure a standardised interpretation of continuous improvement systems through more emphasis on 'visualisation' methodology and implementation as close as possible to the source of the action on the assembly floor.

One particular case in which the TPS approach has experienced a troublesome introduction is within the Indian context. Toyota commenced production in India in 1999 with high aspirations of capturing a major share (10% by 2010) of this important developing market. This however has failed to materialize. Strikes, lock-outs, and industrial unrest have punctuated most of its decade long experience. In 2006 the company reiterated its stated sales projection of 10% market share by 2010 despite the actual figures reflecting a different story. Market share in 2006 was only 2.5% and there seemed to be no signs of targets being met. A statement from the MD at the end of 2006 that the company '*was in the process of studying how to grow in the Indian market*' (Tribune, 2006) seemed to indicate the company's lack of certainty about Indian conditions. In 2008, the most senior Indian executive at TKM abruptly parted ways with the company, followed by the standing down of Japanese MD Toyoshima who was replaced by Hiroshi Nakagawa. In September 2008 Nakagawa announced that the company's target of a 10% market share by 2010 has been put back to 2015, admitting that '*we did not have much experience in the past ten years; now is the time for us to jumpstart*' (Business Line, 2008). Starting from the same month, other TKM executives started to adopt the new slogan of a 'jumpstart decade' for the company (Financial Express, 2008)

In the face of such problems the company was forced to re-think its entire process of doing business in India. Commencing as from 2007-2008, and with its market share still hovering stubbornly around the 2-3% level, the company has undertaken a progressive series of measures that have seriously compromised its pure TPS philosophy. In an attempt to reconcile its approach with those of Indian cultural and societal norms, the system of TPS has now (unofficially) been transformed to TIPS (Toyota Indian Production System). Before analysing the reasons for such a change of direction we first critically discuss some aspects of the system of lean production with particular emphasis on the historical and contextual factors that existed at the time of their conceptualisation and development in Japan.

Lean Production and the Toyota Production System

Lean production centres around the relentless pursuit of the elimination of all non value-adding aspects within an organization. Proponents of this philosophy refer to 'lean' as being synonymous with dramatic improvements in the performance of the system in areas including productivity, quality, and flexibility. It is claimed that lean production uses less of everything in mass production: half the human effort in the factory, half the manufacturing space, half the investment in tools, half the engineering hours, to develop a new product in half the time. Also, it requires keeping far less than half the needed inventory on site, results in many fewer defects, and produces a greater and ever growing variety of products (Womack et al, 1991, in Hummels, H. and Leede J., 2000).

The 'lean' concept lends itself to two interpretations in the literature (i) lean production is an efficient, humanistic machine - a viewpoint popular amongst managerialists, engineers, consultants, and popular writers in an 'apologist' vein (eg, Liker and Hoseus, 2008); and (ii) lean production is a very sophisticated prison - a viewpoint popular among critical theorists (eg, Parker and Slaughter, 1988, 1994). Underpinning both these viewpoints is a common belief supporting the transferability of the lean model as technical objects from one cultural setting to another, for example Japan to the USA (Florida and Kenney, 1991). However, aspects such as

the contextual setting, socio-cultural environment, and historical trajectories are insufficiently addressed.

Some analysts regard the Toyota Production System (TPS) as the secret weapon of Toyota's competitiveness (Spear and Bowen, 1999). TPS was developed by the Vice-President of TMC, Taiichi Ohno, during the 1950s .He founded TPS on concepts designed to maximize flow, eliminate waste of all kinds, and ensure respect for people. The basis of the concept rests on efficient use of resources to produce materials with a repetitive, reliable system. Non value-adding physical activity is eliminated by the system through the use of continuous improvement (kaizen), automation, and a multi-functional labour force. Also central to TPS and its successful implementation is the role of teams, cooperative labour-management relations, careful selection and training of workers, fewer hierarchical levels, and providing workers with authority to ensure safety and quality are not compromised. It was under Ohno's guidance and the effort of many others, particularly the company's founder Eiji Toyoda, that this unique production system has become deeply rooted within TMC during the past half century. The goal of TPS is achieved through the use of a range of scientific tools and techniques. Various versions of the TPS training programme have been developed during different stages but the following have remained as the essential elements of TPS – just-in-time production, jidoka, standardised work, and kaizen (Moden, 1998; Womack and Daniel, 1996; Zaman, 1993; Womack et al, 1990; Shigeo and Dillon, 1989; Graham, 1988; Moden, 1983).

Socio-cultural context of TPS

However, it would be a mistake to regard TPS as simply a set of concepts, techniques, and methods that can be implemented by command and control. It is more than the sum of its production tools. It is a culture of striving for the best in all aspects of company life centred around a fully integrated management and manufacturing philosophy and approach that must be practiced across all hierarchical levels. An important feature of TPS is that it was developed in response to the unique cultural and environmental factors faced by Japan. The most distinctive factor was lack of natural resources. The second distinctive feature is that daily living in the Japanese concept (which significantly differs from the Indian culture) tends to be centred around a cultural pre-occupation with work.

Constrained natural resources and socio-cultural factors have had a significant influence on the values, beliefs, and behaviours of the Japanese workforce. The drive to minimise waste in every form is an important ingredient of lean thinking. As Robbins (1996) points out, national culture continues to be a powerful force explaining a large proportion of organizational behaviour. Spear and Brown (1999) found that TPS and the scientific methods that underpin it were not imposed on the workforce. The system grew naturally out of the workings of the company over five decades, so that the thinking and behaviour of Toyota employees have been moulded continuously by the developing norms of the company (Burnes, 2000). Jones and Liu (2005) argue that culture is central to the efficacious operation of TPS (see also Womack and Jones (1996); Sugimore, Kusunoki, Cho, and Uchikawa 1997). They argue that the needs of TPS are complimented by the existence of a homogeneous culture, single language, and religious background, which facilitates close familiarity between Japanese people.

The interplay between the 'ideal' lean environment and trade unionism is clarified by Jones et al (2009) who claim that unitarist considerations are central to lean systems. Such organizations see themselves as families characterized by high levels of trust, commitment, involvement, and concern for the company's success, as a consequence of pulling together in the same direction. As such, working groups with a differing agenda, including external trade unions, are inconsistent with the environment of a lean system. Trade unionism introduces an unnecessary form of pluralism and antagonism into the system. They are perceived as a problem to be solved – a wasteful, non value-adding activity that should be eliminated using traditional TPS techniques (such as 5-whys analysis). Within a lean system, trade unions invariably take the form of an inside company union (sometimes called sweetheart unions), although isolated exceptions are sometimes observed in Toyota affiliates (most notably in India, Australia, and at the NUMMI joint venture in the USA).

Congruence: Ideal TPS environment versus the Indian environment

In view of the above discussion regarding the ideal nature and environment of TPS we argue that several crucial aspects of Indian social and cultural mores appear to clash dramatically with the requirements for TPS. India is an extremely heterogeneous country. It represents a multi-cultural, multi-ethnic, multi-religious, and multi-linguistic federation of many different States. The extant literature contains several studies relating to the social, cultural, and work practices and values to be found in India (Sinha and Sinha, 1990; Tripathi, 1990; Schwartz, 1999; Chatterjee, 2007; Becker-Ritterspach, 2005) and several articles concerned with Indian human resource management (Gupta, 2008; Jain, 1987; Chatterjee, 2007). Resulting from our analysis of this literature, we have demarcated three major areas of difference between the Japanese and Indian work context: industrial relations; decision making; and work ethics and motivation. For the purposes of brevity only a brief amplification of these is provided below:

Industrial relations: Whilst Japanese companies stress enterprise-level (company) unions that operate in an atmosphere of co-operation with management within a unitarist culture, Indian companies stress external unions, often affiliated to political parties, which operate in an atmosphere of confrontation with management within a pluralist culture. Toyota failed to factor this aspect into its TKM operations by refusing to recognise an external trade union. It under-estimated the power and influence wielded by trade unions in India and failed to understand their structure, constitutional and legal standing, political linkages, and dynamics. After many years of industrial unrest a flashpoint was reached in 2006 involving a strike, violence, and a subsequent lockout initiated by TKM management. These events turned out to be epiphanous within TKM's history, following which the company recognised the trade union and commenced negotiations with it in an attempt to secure industrial harmony.

In addition, TPS is consistent with the concept of demand-driven flexible production and flexible labour organisation enabling workers to be hired and fired to facilitate levelling of production. This flexibility caters to the need to eliminate all forms of waste and explains the large numbers of temporary or contract workers usually employed in lean systems. However, this requirement is inconsistent with the existence of inflexible labour laws that have traditionally dominated the Indian industrial relations scene under which workers are assured of long term, permanent employment. TKM faced several difficulties dealing with unions in this regard.

Decision making: The concepts of education, communication, consultation, participation, involvement, empowerment, facilitation, and support are all evident within the Japanese (Ringi) system of group-oriented, consensus-seeking decision-making, designed to integrate worker and company interests. Group work and cohesion are stressed. Responsibility is delegated to groups to perform and design tasks, identify problems, make improvements, and monitor quality. Exploring and learning together between managers, supervisors, and employees is a critical objective. On the other hand, Indian companies prefer centralised decision making, emphasising bureaucratic and hierarchical relationships between different groups. There tends to be limited delegation and tight controls. Decisions are made by authority figures, often surrounded by strict secrecy (Jain, 1987). The common style of leadership is paternalism, invariably exhibited by superiors who are older, more experienced, and 'wiser', and is concerned with guidance, protection, nurturance, and care towards the subordinate. In return, the subordinate offers deference, loyalty, and respect to the superior.

Work ethics and motivation: The concepts of loyalty and identification with the company are stressed in Japanese systems, accompanied by devotion to one's work. However, in Indian culture, loyalty to one's family is the main priority. Employees are oriented more towards personalised relationships than productivity (Gupta, 2008). Motivational tools in Indian companies are less oriented to increases in productivity, cost reductions, or quality improvements; rather they emphasise social, interpersonal, and even spiritual relationships with one's colleagues. Also, Indians are described as informal, emotional, sensitive, and with a lack of discipline in relation to the necessities of industrial life, in contrast to TPS requirements which emphasise such qualities as being punctual, precise, measured, and systematic. Cultural incompatibility between Indian workers and Japanese trainers and managers caused strained relations between the two during the early operations at TKM. Indian workers refused to clean their work areas or mop the floor (this was regarded as menial work) and the tendency of Japanese trainers to abuse and shout at Indian workers was interpreted as culturally unacceptable. In the early days TKM management was found wanting in its ability to understand and appreciate these differences. Despite producing an excellent product, TKM management displayed poor people skills within the Indian context.

Methodology and Data Collection

A qualitative methodology has been adopted in this study, involving personal interviews, observation, and document analysis. During the course of two field visits to Toyota India during April 2009 and September 2010 interviews were conducted with the Chairman of the joint venture company, three senior Indian managers, the Principal of the training institute, three union shop stewards, two external trade union officials, a former senior company executive, a long-term employee from the shop floor, and five business/industrial journalists from local newspapers (a total of 17 interviews). All interviews were recorded and transcribed. In addition, we visited the company corporate head offices and the marketing / sales division, and tours were arranged for us around the production facilities and the training institute, during which time we made personal observations and wrote these up as field notes immediately afterwards. We have also acquired much information from company documentation, media reports, internet sources, and journal articles.

Findings

Evidence gathered from our primary and secondary sources suggests that the magnitude of TKM's failure to appreciate the subtleties, nuances, and major socio-cultural and environmental factors in India, led to dissonance between Indian workers and TKM management. TKM's attempts to suppress pluralist tendencies organic to Indian workforces, for example, its anti-union stance and attempts to achieve flexible production outcomes in the absence of cooperative labour-management relations, led to a progressive degeneration in the overall industrial climate culminating in the crippling strike and lockout in 2006. As a result, a major change in direction was commenced as from 2006 during which changes were effected to the standard TPS approach. This change in direction has resulted in TPS being transformed into TIPS (Toyota Indian Production System), according to information received from the union shop stewards. A number of significant changes have occurred which for the purpose of brevity are outlined below but not extensively analysed:

Recognition of the trade union: TKM recognised a trade union with external links and agreed to take back workers who had been suspended over the years for agitating for a trade union. These workers were subsequently elected to senior union positions within the plant.

Foregrounding Indian managers and backgrounding Japanese managers at senior levels: A shift in policy was adopted in order to move Indian managers into higher level senior roles previously occupied only by Japanese personnel. Simultaneously, Japanese trainers and managers were moved into the background to occupy only advisory and coordination positions.

Steeper organisational hierarchy: Additional levels were added to the managerial organisational chart to satisfy the Indian managers' desire for enhanced status through job titles in the hierarchy.

Appointment of a new Managing Director: A new Managing Director was appointed who was generally perceived to be more union and worker empathetic (through strong grass roots experience) than his former colleagues at this level who lacked credibility and were linked with mishandling previous events within the company.

Acceptance of a fixed ratio between the takt (production cycle) time and the number of workers on the line and per each individual station: This means that increases in takt time would have a corresponding increase in the number of workers on the line .This is a significant departure from Toyota global practices, signifying acceptance of the Indian social norm that work does not lie at the centre of daily living. Social, relationship, and family needs should be accorded a similar consideration as production-related needs. Elsewhere in Toyota's operations, increased production implies increased takt times with the same number of line workers, resulting in intensification of work and greater worker stress.

Management acceptance of wider worker representation through the union: A policy was instituted of negotiating wages, working conditions, and production issues with the union. Ten permanent and full-time union officials operate in the plant with no duties other than union issues and paid by the company.

Union consultation with external bodies: TKM management has accepted that union officials can consult outside the plant with the Centre of Indian Trade Unions (CITU) during working hours on full pay. However, outside officials are not allowed inside the plant, nor can they take part directly in negotiations with TKM management.

Substantial wage increases: TKM workers have secured substantial increases in their pay, elevating them to the second highest-paying manufacturing organisation in Bangalore. This has been achieved despite a 30% reduction in TKM production during 2009.

Conclusion and Implications

In this paper we have argued that the Toyota Production System was conceptualised, designed, and grew out of Japan's unique cultural, social, historical, and environmental factors. However, when transplanted overseas the efficacy of TPS is contingent upon the unique cultural, social, historical, and environmental factors peculiar to the host country. This is consistent with claims of Jones and Liu (2005) who posit that TPS evolved from its inception to the current state of being deeply entrenched within Japanese industry, mainly on account of the cultural strength of Japan and its need to overcome shortages of natural resources. Attempting to transfer TPS practices to countries outside Japan, where cultural and environmental factors are different, would result in problematic outcomes.

Often TPS has been viewed as a technical object devoid of context and easily amenable to transference anywhere in the world. Such thinking has, however, proved to be wrong in the case of India. Environments with unitarist leanings, characterised by union-free culturally homogeneous settings, are most conducive to successful implementation of TPS. Conversely, countries with strong pluralistic inclinations and with strong traditions of unionism, such as India, are not naturally amenable to TPS (Cooney and Sewell, 2000; Jones and Liu, 2005). In such situations trust and commitment are usually replaced by suspicion and resistance (Jones et al, 2009) unless specific actions are taken by management to alleviate such tendencies.

During our field trips to India most respondents focused on the topic that Toyota had misread the Indian cultural environment, and despite bringing new technology and a superior product into the country had mishandled its people management portfolio. They pointed to the fact that India is a complex heterogeneous country and Toyota's lack of knowledge of the social and cultural aspects of life and work in India acted as the primary factor in the company's less than impressive performance. Any attempt to regard TPS and Japanese manufacturing practices as technical objects that can be divorced from cultural and historical issues and transplanted into other socio-cultural environments should be resisted. This approach caused many years of industrial unrest in India. Eventually TKM was forced to compromise and adapt its TPS system to become more accommodating of the local context.

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