Impact of TQM and Business Excellence on Organisational Excellence

–R. Jayaraman[1]

Abstract

This paper describes the many important events in the quality revolution that has taken place in Japan, the USA and the effect that they have had on the Indian industry with specific reference to the Tata Group. VSNL, a Tata group company started on the road to BE in February 2003, and has done some early work. (VSNL was renamed as Tata Communications). Similarly Tata Steel started its movement of TQM in 1988 and Business Excellence in 1992/93. The author has had the privilege of participating and providing leadership to the processes in both these companies, in addition to other companies in the Tata group and outside. This paper is a result of study, practice, consulting experience, involvement and deep engagement in the movement in over two decades. Beginning with a brief description of the evolution of the TQM movement in Japan in 1950, the paper goes on to present a summarized account of the happenings in the Business Excellence movement which was kicked off in the USA in 1987. The paper then summarizes the key features of the Malcolm Baldrige Model for Business Excellence, and follows it up with an account of how the movement was started in the Tata Group. The purpose of the paper is to emphasize that present practices in high performing companies in India and elsewhere is significantly connected to the developments in the fields of TQM and BE. Indian companies may like to follow the example of their colleagues as well as their foreign counterparts in aligning their operations along TQM / BE lines.

JAPANESE QUALITY REVOLUTION

The visit of Dr. Edwards W. Deming to Japan in 1950 was an epoch making event in the modern movement for continuous improvement. In

[1] Professor, Operations Management, SP Jain Institute of Management and Research, Mumbai, India. Email: rjay_jsr@yahoo.com

the 1940's Dr. Deming was active in the American industry facilitating the use of SPC methods to improve efficiency and quality of products. When the Japanese invited him to introduce the same processes in their industry he was more than keen to help them out. He visited many Japanese companies under the aegis of JUSE and lectured to them on the uses of SPC techniques. Based on the inputs given during this visit Japanese companies began their journey in quality which continues to this day. This movement was started primarily on the shop floors of Japanese companies, to improve product quality, to begin with. Quality Circles and 5 S Circles were started to take forward the concepts of involvement of shop floor personnel in making quality happen, formation of improvement groups to tackle problems, use of simple statistical tools (the Seven QC tools) to be applied to production machinery and practice kaizens for continuous improvement. (Artemis, 1990 and David Garvin, 1987) The Japanese believed in incremental improvements as against quantum improvements, which was practiced more in America.

Following the visit of Dr. Deming, Dr. Juran visited Japan in 1953, to build on the work done by Dr. Deming. Subsequently many Japanese workers in this area contributed to building a body of knowledge and practice which have been chronicled in the literature (Imai, 1990, Logothetis, 2000 and Mohanty and Lakhe, 2002). These efforts which came to be known as TQM included the following:

1. QC's (Quality Circles) (see, for example, R Jayaraman et al, 2003)
2. 5S Circles
3. Policy Deployment (the X matrix or Hoshin Kanri)
4. Strategy Planning
5. Strategy and Policy deployment
6. QFD (Quality Function Deployment) (see, for example, Sharma, J, 2009)
7. TPM (Total Productive Maintenance)
8. 7 QC Tools
9. 7 New QC Tools (see, for example, Kunme, Hitoshi, 2006 and Hosotani, Katsuya, 2005)
10. Visual Quality (see, for example, Michel Greif, 1995)
11. TPS (Toyota Production System) (see, for example, Liker, 2004)
12. Kanban (JIT) (Just in Time)
13. Poke Yoke
14. Waste Elimination

The above is only a partial listing and the reader can get a fuller description in any of the works in literature, particularly the Handbook of Quality published by Dr. Juran (Juran and Godfrey, 2000). These and other techniques enabled the Japanese industries to introduce new products in large volumes at competitive costs. (see, for example, Womack and Jones). One may appreciate that the Japanese suffered from several natural handicaps which made such quality techniques almost compulsory:

1. Japan is a small country of four main islands, far away from both Europe and America, the primary markets which could support the kind of volumes required to mass produce items to achieve the benefits of economies of scale. This led to a steep increase in transportation costs which their competitors located in the continents would not have to bear, being near to their markets.
2. Naturally occurring raw materials- for example, iron ore, alumina or bauxite, coal, manganese ore - were not available in Japan- hence had to be imported, leading to further increase in transportation costs. As these materials had to be imported from far off lands- for example, iron ore from Australia and Brazil, the long sea voyages led to higher yield losses. Fluctuations in the input costs due to currency fluctuations added another dimension, being dictated by factors well beyond the control of the Japanese
3. High packaging costs due to transportation of goods in ships over deep and long oceans and seas. The transportation had to be done over the sea, which called for special packaging (resulting in additional costs) in view of the corrosive nature of the salty winds and climatic surroundings.
4. Language barriers in the consuming markets and supplying countries.
5. In order to neutralize these factors the Japanese were left with no alternative but to go in for the Deming and Juran methods of quality control and improvement. Their competitive edge had to come from higher product quality, lower costs through higher productivity, supply stability and a large portfolio of products to cater to different segments of markets. The large risks attendant in servicing markets in far-off lands made the Japanese opt for kaizens rather than quantum jumps in technologies.
6. In the author's experience of working and studying companies, he has tried to understand the methods by which industrial organizations evolve over time. All organizations start at the beginning of the value

chain - manufacturing (this was the methodology of all manufacturing organizations in the early stages of industrial development, from about 1900 to 1980, after which service organizations became more impactful) and then go on to grow in steps over time. This process of evolution of manufacturing companies can be characterized as below:

7. The First Generation Company: Setting right the methods of production, to ensure that a high quality product(s) can be produced at competitive costs in large volumes, to serve large demand markets at far-off places principally in America and Europe.
8. The Second Generation Company: After setting right the production processes the company concentrates on marketing processes, gaining new customers, building a large customer base and putting into the market a bouquet of products to cater to a variety of customers, to broad base the product portfolio as a means of reducing risks in foreign markets.
9. The Third Generation Company: which, after the production and markets are in place, starts concentrating on the growth phase where finance and working capital management hold the key. In this generation company, typified by multi-locational, multi-products business, finance and working capital management assume importance as the company strives to build depth and breadth in markets and products, uses its R&D to drive new technologies and products and marketing techniques to woo new customers and hold on to existing customers
10. The Fourth Generation Company: Which is managed by systems. In such companies, typically multi-national in character (and implicitly multi lingual), with expansion and new investments in place, the thrust is on managing the business and retaining market shares and improving profit margins through improvements in efficiency.
11. In the 1950's the Japanese economy was in its early stages of evolution and was not well known for the quality of its products. In fact the impression was the opposite. The evolution of industry based on quality began in 1950, supported by the JUSE (Union of Japanese Scientists and Engineers) and companies like Toyota- as the country's industrial leaders began to invest and produce products to a world market they made use of TQM techniques, based on the learnings from Dr. Deming, Dr. Juran, complemented by Dr. Kaoru Ishikawa, Dr. Noriaki Kano, Dr. Shingo and others. (see, for example, Kondo and Kano, 2000). Over the next 30 years they went

about their tasks of rebuilding the World War II shattered industry into a world beater. By 1980 there were a large number of Japanese conglomerates, such as, Toyota, Nippon Steel, Mitsubishi, Mitsui, Marubeni, Ishikawajima Harima Industries, Nippon Telephone and Telegraph, spanning all the way from manufacturing to finance to shipping to electronics. This was the power of quality at work. In spite of the several handicaps that the Japanese faced, they were able to drive away the competition through high quality, competitively priced products and services to all kinds of customers. Large American companies felt the pressure of Japanese competition increasingly in the early 1980's when the Japanese captured almost 25% of the American automobile industry market in the US, which till then was considered unthinkable (for a full description of the impact of Japanese car companies on American and World markets, see Womack, Jones and Roos, "The Machine that Changed the World ", 2003, especially Figures 2.2, 2.3 and 3.1). Many American companies were acquired by Japanese investors, in many the Japanese acquired strategic equity interest thus minimizing risks and ensuring steady and continuous supply of key raw materials like iron ore, coal, oil and minerals. Thus, by the middle of 1980's Japanese companies became a force to reckon with, in a matter of 35 odd years. For example, "during the 1960's there were over 30 American-owned companies making colour television sets. By the early 1990's there was only one" (Juran 2000). This achievement was significantly led by the TQM movement triggered off by the visit of Dr Deming in 1950. (see, for example, Kondo and Kano 2000).

THE AMERICAN RESPONSE

The threat perception by American companies reached its peak when a film was screened in 1980, titled "If Japan can, why can't we? " The essence of the film was that if American companies did not respond to the TQM advancement in Japanese companies which had led to the demise of several leading American companies, then the leadership of American companies could be adversely affected. While American companies pioneered introduction of SPC techniques, in introducing many new inventions which later became best-selling products, increasingly they were beaten in the marketplace in the US by Japanese companies who

used TQM. The following factors were amongst the many that led to this state of affairs:

1. Complacency developed due to the thinking that the quality of Japanese products was far inferior. This thinking may have been correct in the 1950's but then the quality revolution through TQM in Japan was underrated by the Americans. To the extent that even after the Japanese were capturing market after market form American and European domination, Americans refused to change their attitude of " Not Invented Here ". (see, for example, Powell, 1995). This led to loss in product quality and cost competitiveness. The seriousness of the threat may be gauged from this : Japanese imported iron ore, coal and all other raw materials from Latin America and Europe in ships over long distances to produce their steel products, use them in automobiles produced by Toyota (which had, to begin with, borrow from American practices), and then ship them out all the way back to the American backyard in Detroit and other places in America and Europe - all at a cost and quality far superior to the American products at that time. (see for example,..)
2. The dependence of American companies on quantum jumps rather than continuous, incremental improvement, thereby leading to inefficiencies in the short term and long term loss of competitiveness.
3. The typically adversarial relationships between workmen and management in many American companies, as opposed to the co-operative approaches in Japanese industry through the practice of kaizens, QC's and 5S circles.
4. High attrition rates in American companies – compared with Japanese companies where life time employment was the norm - leading to flight of intellectual capacity, the replenishment of which took time and created short term setbacks.

These and other factors led to the state of affairs in the early 80's which made Americans realize that they needed to get their act together and put up a stout defence against the Japanese attack on their markets. This resulted in the development of the Malcolm Baldrige Model for Business Excellence (MBMBE) in 1987. Put together by a group from the NIST (National Institute for Standards and Testing), a US government body, the criteria for Business Excellence (BE) were devised as a defence mechanism to regain competitiveness by American companies and beat

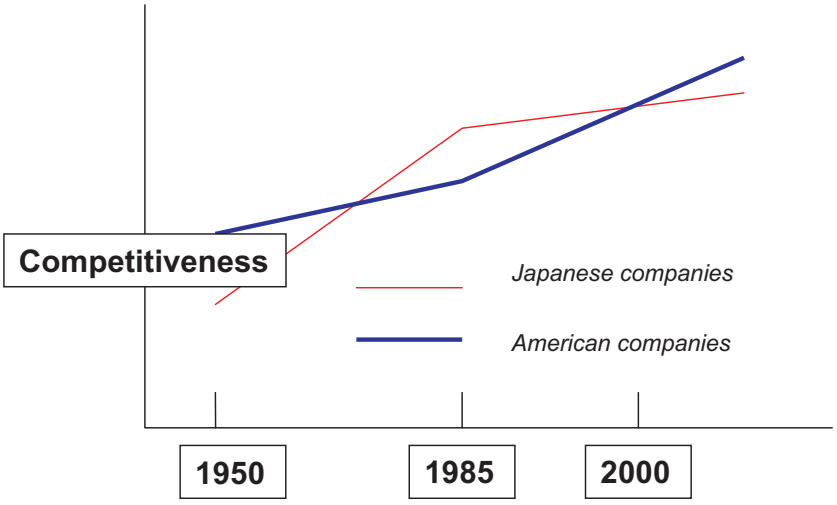
back the Japanese. Introduced as the Malcolm Baldrige National Quality Award (MBNQA) this model was a framework for carrying out BE in all American companies. The idea was to introduce key concepts like continuous improvement, people involvement in quality activities, co-operative relationships between management and workmen, developing a highly motivated workforce through deployment of Statistical Process Control (SPC) and other techniques in all areas of management (not only the shop floor) to improve productivity and profitability of enterprises and using tools like six sigma, ISO and TQM to improve competitiveness through overall quality improvement. The MBMBE, which was run throughout America through the MBNQA, was a resounding success, in that it rejuvenated the American Industry to previous heights, before the Japanese Juggernaut rolled over. (see, for example, Noriaki Kano, 1993)

To such an extent that the Japanese themselves acknowledged that the Americans regained their competitiveness in key markets form the year 2000 onwards. So much so, that MBMBE became a part of the TQM menu and Japanese companies started the practice of the framework described in the MBMBE. For example, many Japanese companies have now adopted some of the HR practices, IT methodologies, performance review mechanisms, leadership system design and strategy deployment, Corporate Social Responsibility and Ethical Corporate Governance in greater depth. While these practices may not be said to be entirely new to Japanese industry there are some special features, like the adoption of the ISO systems, process mapping and alignment of the company's efforts around the company strategy which have lent additional thrust to the continuous improvement efforts in Japan. It is still early days and it is not clear how and what areas will be deeply affected by the Japanese companies practicing the MBMBE guidelines, and how these will be used by them in putting further pressure to become competitive once again, just like in the past. However, for the time being, the Americans are the dominant force which they once were and are likely to continue for some more time to be so. When the author visited Japan on a conducted tour of Industrial Companies by the JUSE in 2000, he saw and discussed with Japanese company officials regarding the effect of MBNQA of Japan. All the companies said that they are in the process or already begun MBNQA assessments in their companies, started the process of training Baldrige assessors and are looking out for consultants who can teach them about the use of MBMBE.

Based on the above experiences in TQM and MBNQA as well the author's personal experiences in many companies over two decades, he

has developed the below concept diagram to illustrate the effect of TQM and MBNQA on the competitiveness of Japanese and American companies in the period 1950 to 2000 (see figure 1 below)

Figure 1: Summarizing the Competitiveness Situation



Source: Author's Research and Estimates

EFFECT ON INDIAN INDUSTRY

It was a prescient move on the part of Dr V Krishnamurthy, then Chairman of BHEL, to have led a delegation of Indian CEO's to Japan, to JUSE specifically, to see the TQM practices in that country in 1980. On his return he started the QCC movement in the Bhopal plant of BHEL (Udupa, 1990). This was the first known, recorded effort on the part of the Indian corporate sector to adopt TQM in industry. While the initial start did not last for very long it set in motion the continuous engagement of Indian entrepreneurs with the TQM methods, the Deming prize, TPM, QFD, SPC, Juran Quality Control methods, use of the cause and effect diagram (or the Ishikawa fish bone diagram) and many other techniques and tools (including the seven QC tools) to improve operations. Industrial groups like the TVS companies, Mahindra and Mahindra, AV Birla, RPG, Bharat Forge, L & T, BHEL, Public Sector banks, HDFC and many others joined the movement to improve quality using TQM. Many of these companies sent a number of their personnel to see for themselves Japanese practices, in which they were facilitated by the JUSE, which organized these visits

systematically every year. They invited Japanese experts like Dr. Kano, Dr. Tsuji Shoba, Dr. Watanabe, several experts from the Japan Institute of Productivity Management (JIPM) and others to teach them how to move up on the quality spiral. QC's, 5 S, SPC's, TPM were practiced soon on all these companies to a lesser or greater extent. A body of knowledge on these experiences was created so that others could also learn, and these were shared through many institutions like the CII which created a dedicated Quality Division, currently headquartered in Bangalore, in the Institute of Quality.

Initial skepticism gave way to conviction that Indian companies could, if they so desired, do the same things that Japanese and American companies could do, and, in some instances, even better than them. For example, the fact that TVS auto component companies were rated highly by General Motors and were selected and honored continuously as preferred suppliers was proof enough that Indian companies could hold their own against international competition. The reasons or the factors that played a key role in the initiation of the TQM methodology Indian industry could be summarized as follows:

1. The impending liberalization, which was seen to be inevitable, in spite of the strong forces of license- permit raj. Some visionary Indian industrialists saw through the smoke screen that had been erected by the high tariff barriers created by the governments to keep out imports into the country to be a temporary phenomenon, and would soon be blown away by the globalization of industry.
2. The Narasimha Rao government made liberalization a reality by the measures of low tariffs, fewer restrictions on FDI and imports
3. The need - and the opportunity - that many Indian companies saw for themselves in international markets, which would become possible only if Indian goods and services could be made cost and quality competitive
4. The sheer outdated technologies and work methods which were being adopted by Indian companies were making them obsolete and uncompetitive even in domestic markets
5. The almost complete lack of systematic approach to modern production and marketing methods, to take advantage of economies of scale, to introduce modern marketing and sales practices more befitting competitive markets shorn of the protection given earlier were realized by Indian companies. For example, licensing norms made introduction of world scale plants difficult if not impossible,

through import of plant and machinery, leading to small size plants with high cost and low quality outputs.

6. The lack of knowledge about TQM practices which were essential to run a modern, competitive enterprise on a sustainable basis, without which, Indian companies realized, no company could make an impression in the highly competitive international markets, where technologies were no more the only differentiators.

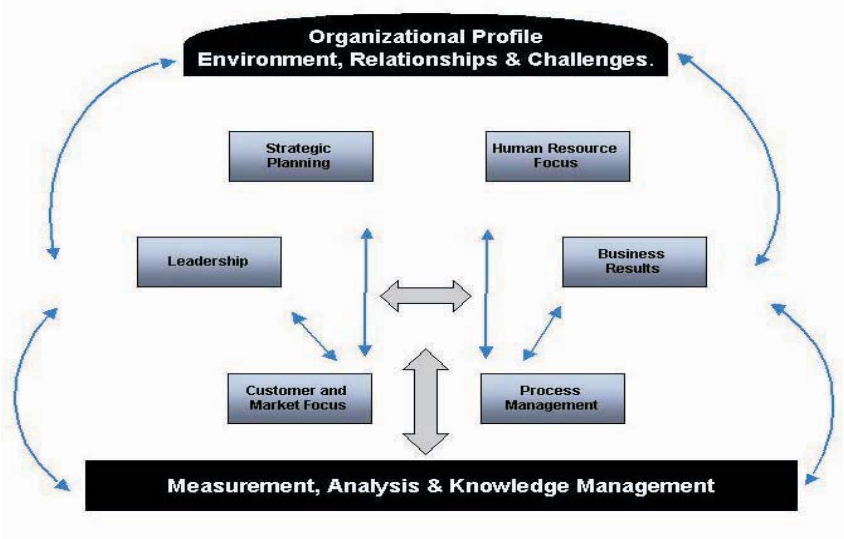
THE ROLE OF THE TATA GROUP IN BUSINESS EXCELLENCE

These factors made the Indian industry leaders to hunt for the best that the world had to offer. The efforts were led by the TVS group, the Tata group and many others. Industry associations played a key role in this push towards quality improvement. Soon Japanese experts started including India as a destination in their travels and were keen to help Indian industry to introduce tools and techniques. While this scenario dominated the 1980's and the early part of 1990's, it was soon to be augmented by another wave of quality improvement. This was the MBMBE. The first industrial group in the country to actively seek out the methodology and put them in practice on an industrial scale was the Tata Group (R Jayaraman, 2003). It was Mr. Ratan Tata, who gave a call to the Tata group companies to become competitive by adopting the MBMBE, to suit the group purpose, in 1993. Prior to this historic event, Dr. Jamshed J. Irani, then Joint Managing Director of the Tata Iron and Steel Company Limited (TISCO), led a group of CEO's to JUSE in 1988, and, on his return, he set up a small group in TISCO, under his direct guidance, to start the TQM movement (R Jayaraman et al, 2003) in that company.

TBEM is a tool for change management and plays three important roles in strengthening the competitiveness of Tata Group companies: (see also figure 2 below):

1. To help improve organizational performance & business excellence practices, capabilities, and results.
2. To facilitate communication and sharing of best practices information among Tata organizations.
3. To serve as a working tool for understanding and managing performance, and for providing guidance for planning and identification of opportunities for learning and improvement.

Figure 2: Framework of TBEM (Source: www.nist.gov / Baldrige)



framework of TBEM (Source : www.nist.gov / Baldrige)

Responding to the call given by Mr. Ratan Tata, many Tata Group companies started their engagement with the MBMBE, which later came to be known as TBEM. During the last eleven years that the movement has been run in a most organized way it has resulted in much advancement in the group, which includes:

1. Creation of "world class" companies as per the MBMBE standards, including TISCO and TCS, which are in the forefront of industrial practices in India.
2. Adoption of world class practices by many companies in the Tata Group leading to higher performance. In fact the year 2003/04 was the best year for the year since its inception. The group was able to achieve its key goals of being amongst the top 3 in its lines of businesses, doubling sales and profits in four and three years respectively, apart from bringing focus to its varied lines of business through concentration on seven key areas of operations.
3. The group now has the largest pool of quality conscious personnel, who are either well versed or knowledgeable in TQM, MBMBE and other tools and techniques of quality improvement.
4. The group has the largest number of companies who are on the journey of BE and have reached fairly high standards as defined by the MBMBE.

5. Most companies in the group now have a position of the Corporate Quality Head reporting to the MD / CEO directly who are entrusted with the responsibility of facilitating practice of TBEM, with a small group of talented officers.
6. The group was the first to create a dedicated group to drive TBEM across all group companies with a small group of individuals who were trained in all aspects in MBMBE, and with a clear-cut mandate to make TBEM happen effectively.

The Tata group has taken many steps to introduce systematic practices of TBEM to infuse a spirit of competitiveness and innovation in all its group companies. Over the last eleven years much progress has been made. An account of the TBEM journey in the Tata Group in available in an internal publication (Cristabelle Noronha, Editor, 2008)

The BE Journey in VSNL (renamed subsequently as Tata Communications Limited-TCL)

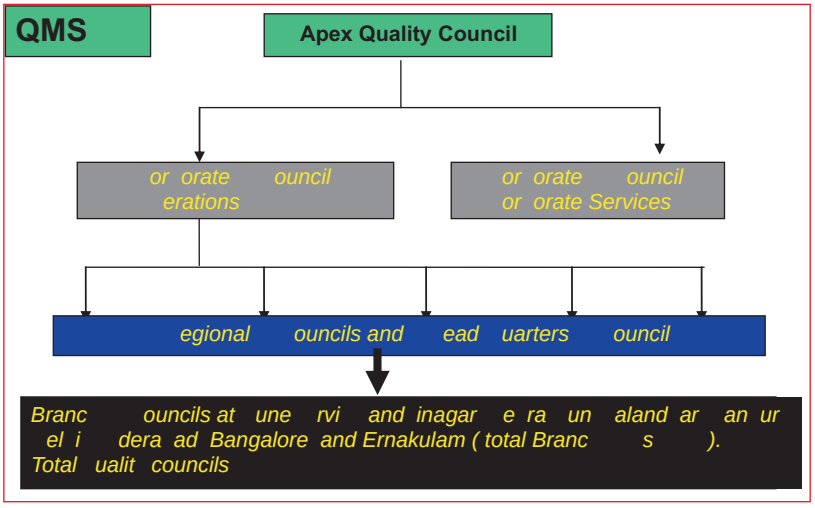
TCL is India's leading provider of International Telecommunications and Internet Services. Besides International Long Distance services, it also offers a host of other valued added services like Internet and Data services, and specialized services that include Video Conferencing, Television / Video uplinking, Program transmission services, Frame Relay Services and Inmarsat services. Tata Communications is listed across all the major stock exchanges in India and also has its ADRs listed on the New York Stock Exchange. VSNL was incorporated on April 1, 1986 under the Indian Companies Act, 1956 to take over the activities of the erstwhile Overseas Communication Services (OCS) and the first MOU signed with the government was in Nov 1991 and then from 1991 to 2002 "Navaratna PSU " rated "excellent" for seven consecutive years – 1994 to 2001. It was acquired by the Tata Group in 2002 and renamed subsequently as Tata Communications Limited.

Using the TBEM framework, many actions have been taken in TCL to practice systems and processes, to make BE happen. These actions include the following:

1. Set up a QMS to guide, monitor and take corrective and preventive actions to continuously improve quality across the organization (see figure 3 below).

2. Introduce the system of BSC's propounded by Kaplan and Norton (Kaplan and Norton, Introduce the system of continuous improvement through kaizens and six sigma projects
3. Introduce the strategy formulation process through the declaration of the vision, Mission, Values, Strategy Architecture, Strategy Map, leading to the preparation of the BSC's and the annual Operating Plan
4. Introduce the TL 9000 system in the whole company to systematize the processes. TCL was the FIRST telecom provider company in the world to obtain this certification, which demonstrates the seriousness with which the company approaches the TBEM movement.
5. Preparation of a Telecom Value Chain diagram to provide a framework for defining the processes in the company (see Figure 4 below)

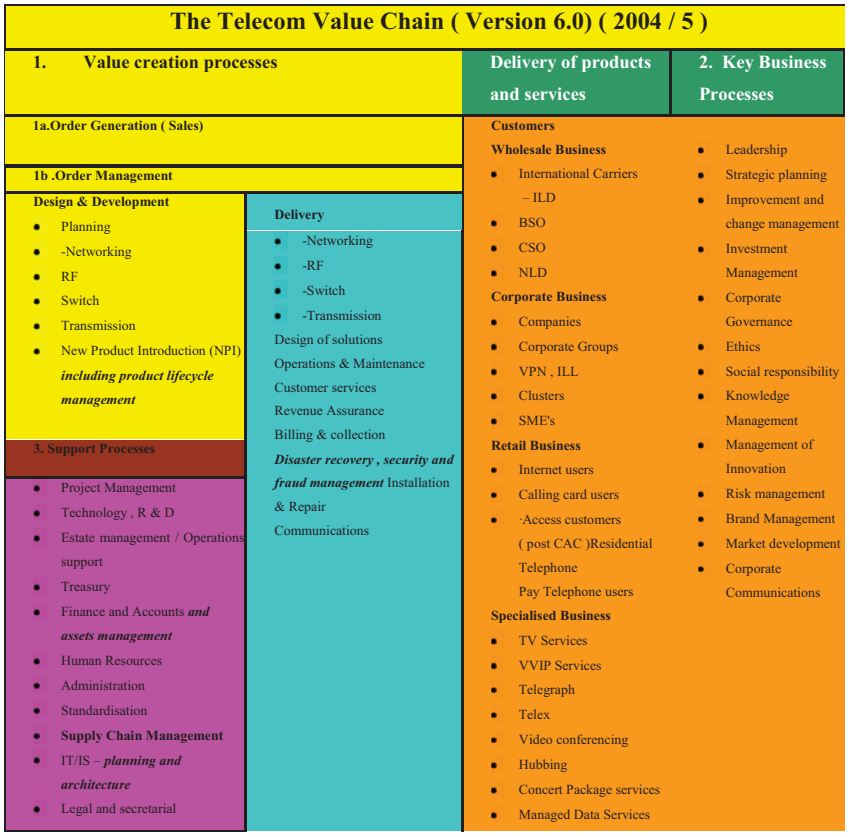
Figure 3: Quality Management Structure (QMS) for performance review inTCL – year 2004/5



(Source: Author's Research and work done in Tata Steel and other companies)

The first application for the assessment of a group of internal and external TBEM assessors was prepared and submitted on December 11, 2003. Subsequently the BE Plan for the year 2004/05 was prepared on the basis of feedback received from this group of assessors. Subsequently several applications have been submitted to the internal Tata Group authority and have been evaluated. The company is fully committed to TBEM.

Figure 4: The Telecom Value Chain in TCL (Source: Author's Research)



IMPACT OF TQM AND BE ON TATA STEEL:

Tata Steel was one of the earliest entrant into the BE movement in the Tata Group. Beginning 1993 the company went on to win the JRD Quality Value Award, the First Winner in the Tata Group, which is the equivalent of the MBNQA award within the Group. The company also won the CII EXIM Bank award in 2001. Some of the main features which led to the award were:

- Tata Steel became the world's lowest cost steel producer
- Tata Steel reduced substantially specific petro fuel consumption, energy consumption, achieved the highest employees satisfaction values in the steel industry, tripled labour productivity between 1995 and 2001, reduced procurement cost by over 40 % in the same period, etc.

Figure 5: Increasing Trend in Sales Revenue, Accelerated between 89 and 2000

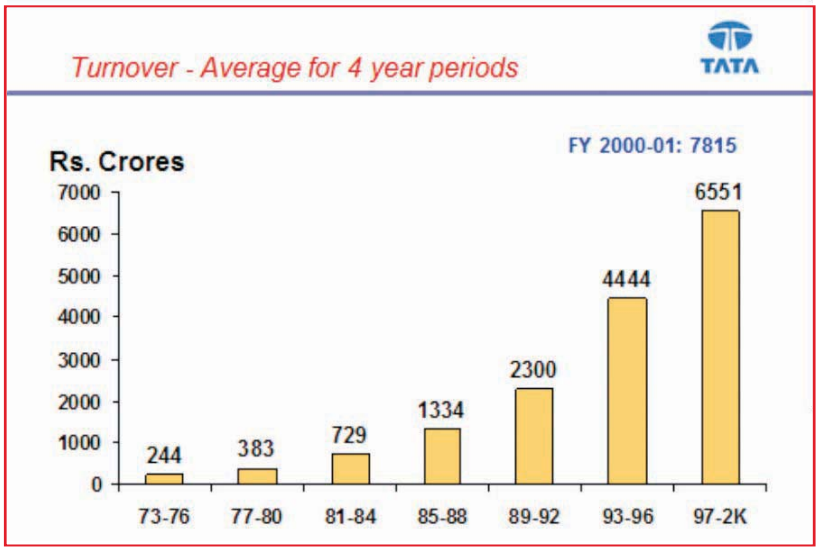


Figure 6: PAT Shows an Increasing Trend

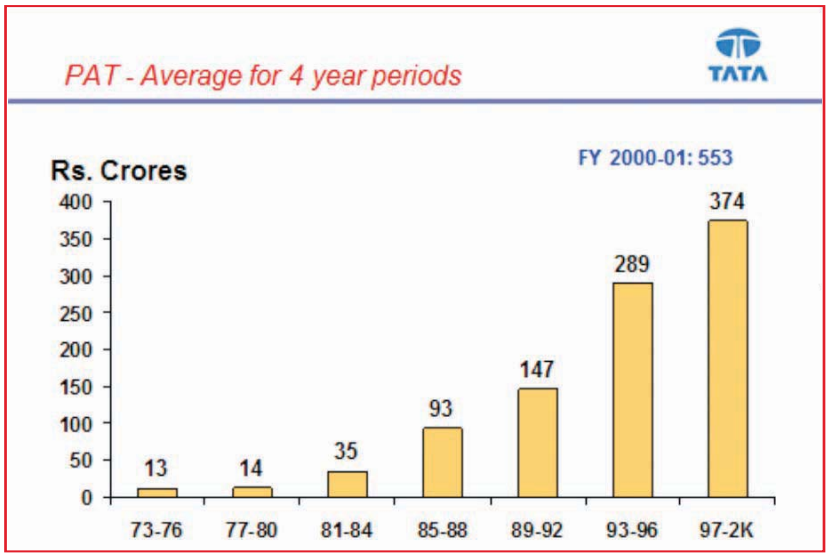


Figure 7: Manpower Reduction - Without Loss of Even a Single Day of Work

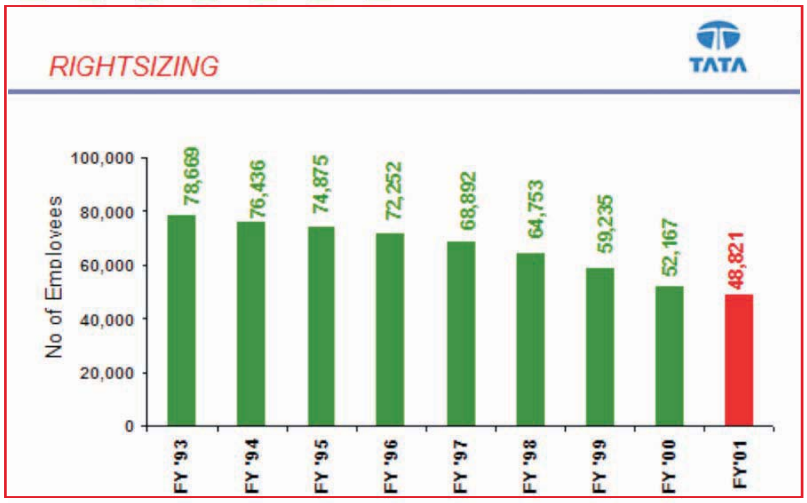


Figure 8: Enablers at the Ground Level- Continuous Improvement Groups across the Organization

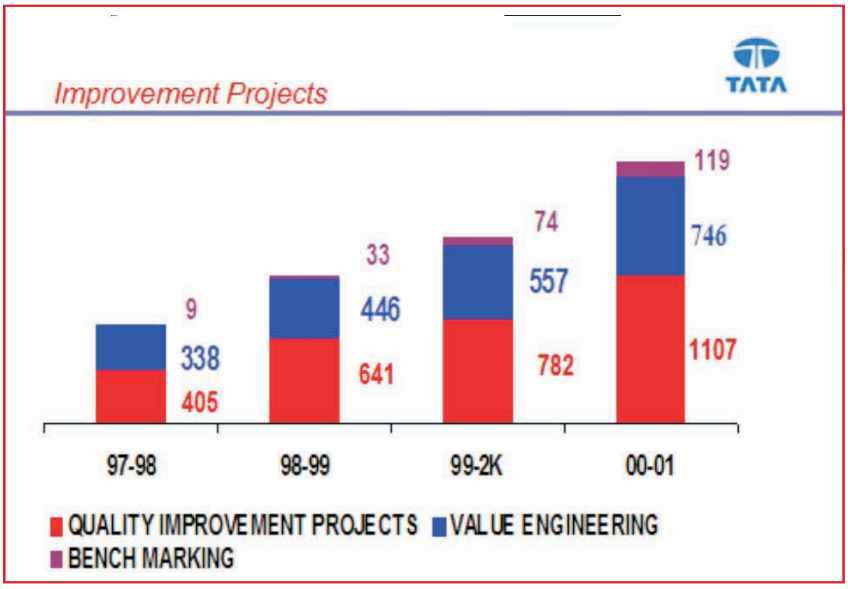


Figure 9: Continuously Improving Labour Productivity

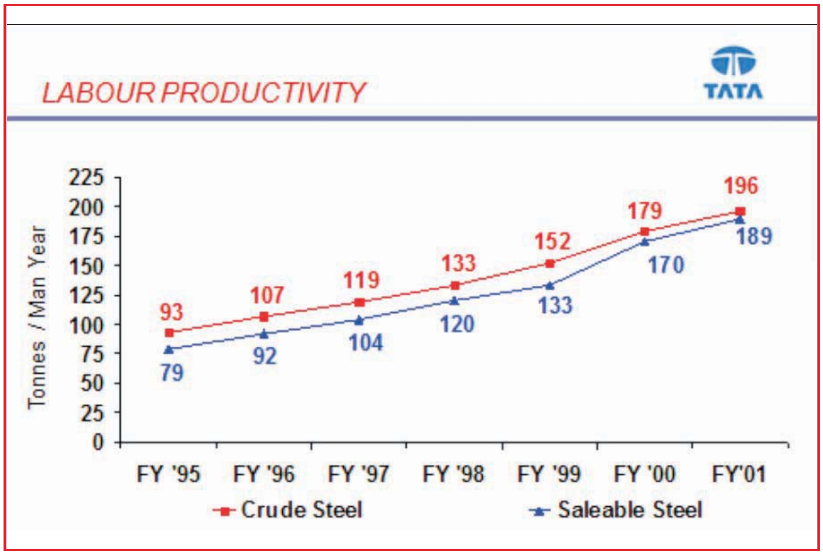
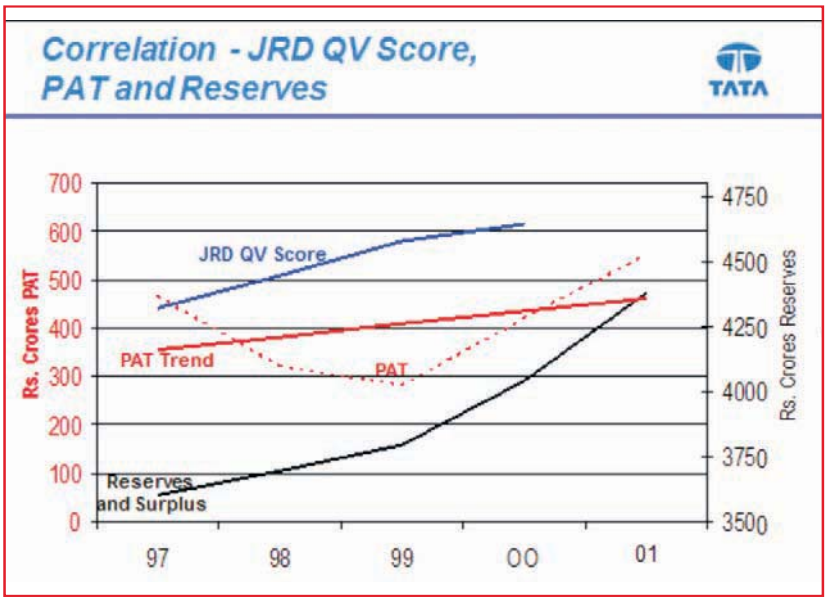


Figure 10: Relationship between TQM/BE and Overall Organizational Performance



(The source for all the above figures is the presentations that Dr. Jamshed J. Irani made to the CII at various forums in India in the years 2001 / 2002)

CONCLUSION

TQM changed the way Japanese approached business. It was the principal pillar on which new standards of enterprise performance were defined and practiced. These practices made the Japanese companies a world beating force by 1985, beginning 1950. Then began the era of the American response, from 1987, with the introduction of the MBMBE. This led the Americans right back where they belonged- at the top of the competitive heap in the world. This has once again stirred the Japanese to rethink their strategies and this is now evolving. We are in for some exciting times in the next ten years when new paradigms will be defined. The Indian industry started its flirtation with TQM in 1980. Since then many companies have embraced the TQM and BE way of running organizations. Industry bodies like the CII have also played role, like that of the JUSE and NIST, to facilitate development of excellence practices. The Tata Group, amongst others, has taken advantage of this new era and made considerable progress in improving the way their companies are run, in a systems driven mode. This has contributed to a large extent to the rejuvenation of Indian companies becoming competitive.

LIMITATIONS AND FURTHER WORK

This work is primarily based on the study and experience - as a participant, as a leader, as a designer of initiatives, as a witness, as a student of TQM/BE - of the author in the field of TQM and BE over the last two decades. Studies have been conducted on the impact of TQM and BE on industrial performance, however most of them are based on correlating perception measures with quality TQM/BE practices in organizations. There are not many definitive studies on how TQM/BE have affected performance as well as the perception of the performance. There is still a debate on how to isolate the effect of TQM/BE from other efforts taken up to improve performance. This debate is not likely to die down soon as the isolation of factors in a company is not that easy. In fact the TQM/BE movement is integrative in approach, establishing linkages between cause and results in a seamless manner. Many causes together and individually lead to results. One must note that an organization is a network of interactions between people, processes and hence not amenable to dissection like in a biology lab. More literature than what is cited in this paper is already available on work done to study the effects of BE and TQM on organizational

performance and more are on to try and establish cause-and-effect relationships between TQM/BE and performance of companies. This is one area. Another area is the study of how the Japanese companies will react to the BE challenge.

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