

An Empirical Study of Continuous Improvement Practices Using BE/TQM Frameworks – Case Studies from Indian Industry

Rajagopalan Jayaraman

S P Jain Institute of Management and Research, Mumbai, Maharashtra, India

Abstract

TQM came into India in the early 1980's, followed by business excellence (BE) through the adoption of the Malcolm Baldrige Model (MBM) and the EFQM Model. Since then, many Indian corporates have embraced TQM/BE to continually improving their performance. The paper, using a qualitative research methodology, highlights the key practices adopted and the frameworks used to introduce and administer TQM/BE. Achievements and learnings in two Indian companies have been examined in detail. The cases are illustrative of the time taken to initiate BE/TQM, the many actions needed for successful implementation and the metrics that are used to measure the "success".

Keywords: BE, MBM, EFQM

JEL Classification: M14

Paper Classification: Research Paper

Introduction

Based on Dr Deming's series of lectures delivered to Japanese companies in 1950, the TQM movement was kicked off as a means to improve the quality of Japanese products (see Artemis et al, 1990 and Blankenship et al, 1999). Toyota took the lead and started its work on TPS, which developed into the now famous 4P lean management. (Liker, 1999; Womack and Jones, (1996). By the early 80's TQM had taken firm roots in Japanese and other industries.

In 1987, the US government introduced the MBM, as a holistic set of guidelines to run companies in an "excellent" way. Although a similar effort was made in Canada in 1984 it was soon overtaken by the MBM in reach, application, importance and impact. Over the years the MBM represented the "Business Excellence" (BE) paradigm which was built on the foundation of TQM, best practices, process-oriented approach and a systematic and holistic framework for organisational growth (Report by the General Accounting Office, USA, 1991; Taylor, 1999; Khoo et al, 1997). Followed by EFQM (European Foundation for Quality Management) in 1989, and many other such "models of BE", introduced by individual countries to promote excellence in the corporate sector (to begin with), (for example, McCarthy et al, 2006;), the BE movement



is currently the biggest and most proliferous SOP (Standard Operating Practice) in modern day business. Since all the BE models are based on practicing PDCA as a part of execution, over time, TQM techniques and thinking got embedded into the BE methodology, and became the foundation on which BE was built. Thus, TQM is a part of BE.

Purpose of this research

While BE/TQM principles have been successfully embedded in the culture of many companies in India over the last 30 years (for example, Tata Steel, Tata Motors, Bharat Heavy Electricals Limited (Haridwar Unit), Tinsplate Company of India Limited, Hewlett Packard India Limited, Infosys, TVS), there are also examples of companies stagnating (divisions of Larsen and Toubro, divisions of Bharat Electricals Limited) or not getting in at all (many large, small and medium scale industries). Moreover, in different companies, different levels of performance have been achieved, the methods used have been quite different, time taken to drill down BE/TQM practices across the organisations have varied. The myriad of approaches deployed by the Indian industry is a strength as well as a weakness, as the quality and quantum of results have varied, leading some to abandon the efforts, while others waste a lot of time and efforts to achieve little. While there are many studies on the practices of BE in Indian companies (references are quoted in the literature review section below), there is no systematic or empirical study to explore why companies adopt different methods to practice BE. This study aims to fill this gap, using an empirical, exploratory methodology, with the purpose of this research defined through the following research questions (RQ):

- RQ1: What are the factors that are addressed by Indian companies to run-in BE/TQM? What actions have been taken by Indian companies?
- RQ2: Why do they lead to different results?
- RQ3: What needs to be done to improve the effectiveness of the approaches to achieve better performance results?

Research Methodology

The research methodology adopted is as follows:

- i. Examine the literature of TQM and BE, with specific reference to practices and happenings in Indian industry, to identify the key themes.
- ii. Analyze the three Research Questions RQ1, RQ2 and RQ3, as mentioned above, using the learnings from the literature survey in an empirical way. The analysis is done using chronological developments in TQM, BE and linking them with the happenings in Indian industry.
- iii. Illustrate the conclusions through two case studies, of two different companies from India, to illustrate the varied results achieved from following different BE/TQM practices for instilling "excellence" in performance.

A literature review of how BE has been practiced in India

When JRD Tata vigorously pursued his call for an open Indian economy, he had already realised that Indian industry had become quite outmoded and non-competitive due to the licence – permit raj. Continuous protection from global economic competition had rendered the Indian economy toothless and vulnerable. He realised that once the government opens the doors (which eventually happened in 1991, see, for example, Srinivasan, 2003) the flood of foreign companies

could overwhelm the stretched Indian value adders. Since then many things have happened in the Indian industry in the areas of productivity upgradation, process improvement, new technologies induction, absorption of new ideas in excellence which collectively have helped the Indian industry survive the entry of foreign companies.

In the 1930's and 1940's, building on Shewhart's work in statistical process control and PDCA, Dr Edwards Deming, Dr Joseph Juran, Philip Crosby, Kaoru Ishikawa, Shigeo Shingo laid the foundations of high quality management using principles based on their experiences and work experiments (Petersen, 1999; Blankenship and Petersen, 1999; Juran et al 2000; Artemis and Garvin, 1990; Kano et al., 2000). Toyota led from the front in embracing Dr Deming's theories of SPC and SQC, and, combining it with its own philosophy of organisational administration, it developed the concept of lean management into a fine art and science over the next 30 years, culminating in the Japanese auto industry cracking the 25 % market share barrier in the USA (Womack et al, 1990).

By the time the Indian government was forced to open up its economy (see, for example, <https://www.quora.com/What-exactly-happened-to-the-Indian-economy-in-1991-in-laymans-terms>), some preparations to face the impending onslaught had been made. The CII, especially, had taken the lead, in making Indian industrialists aware of the developments in global industry, specifically in TQM. In 1989 the CII undertook the first of its many missions to visit Japanese companies in collaboration with the JUSE (see <http://cii-iq.in/index.php/2014-06-02-15-43-16>). During these visits, Indian CEO's were shown the many achievements of Japanese companies using TQM. The first industrial groups to get committed to TQM included TVS, Rane Madras, Tata, BHEL (where the first quality circle was kicked off by Mr Udupa under the Chairmanship of Mr V. Krishnamurthy. See Udupa, 1990). Over the years many tools and techniques have been introduced (Jayaraman 2013a, Jayaraman 2013b, Jayaraman 2014).

The next step was taken in 1993 when the Tata Group Chairman Ratan Tata decided to institute the Tata Business Excellence Model (based on the Malcolm Baldrige Model for Performance Excellence). Soon enough, in 1994, the CII introduced the EFQM model into India. An all India movement under the banner of the "CII EXIM Bank award for business excellence "was instituted and the first winner was HP (Hewlett Packard) India. Joining this movement were scores of large Indian corporates – both PSU's and private corporations – who vied with each other to become excellent. This movement, with its many spin-offs, has sustained till date and needs to be reinvigorated manifold if India is to become a leading economy in the near future. Several authors have chronicled the success of such efforts in India and abroad. (Muthuraman and Jayaraman 2014, Rajpal and Sagar, 2003, Dahlgard et al, 2007, Ionica et al, 2010, Muthuraman, 2003, Goh and K. Ridgway, 1994, Ahire et al, 1996, Ojha, 2000).

As reported by McAdam and Leonard (2005), similar to the practices in Europe, which they studied, many Indian companies also use TQM at the operational level and the BE model as an integrator, especially the implementation of strategy throughout the company. Over the years many different practices for adopting BE/TQM have emerged in the Indian industry. The basic models followed for design and implementation of the BE/TQM journey in two large Indian companies (BHEL and Tata Steel) are shown in Figures 1 & 2 below:

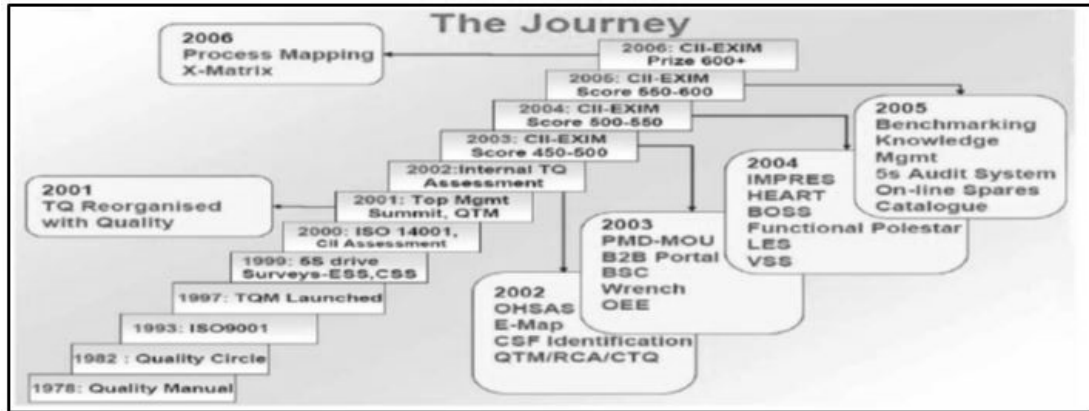


Figure1: A typical “journey” adopted by large corporates in India to design and implement BE/TQM models in their organisations (Source : Pankaj Madan, 2010)

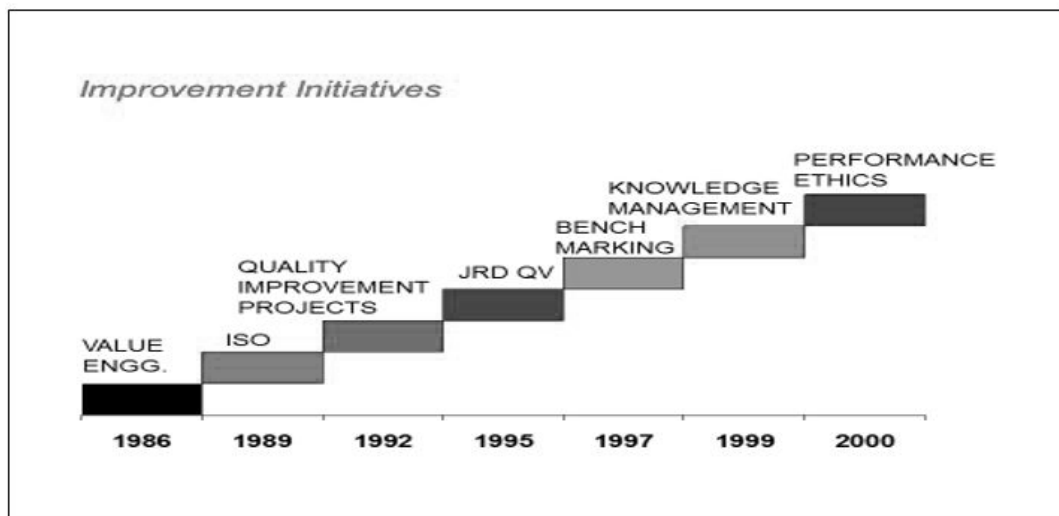


Figure 2: A typical “journey” adopted by a large company (Tata Steel) in the design and implementation of BE/TQM across the organisation (Source : B.Muthuraman and R.Jayaraman, 2014)

The figures show the series of steps (or initiatives or interventions) taken up progressively over time to introduce and deepen practices which are sourced from the BE/TQM models. Various actions are identified based on the “areas to address” which are described in the MBM/EFQM type of models. Both models aim to improve the “levels of excellence” in companies. (For example, see Kim et al, 2010, for a comparative study of EFQM, MBM and ISO 9000. Also see Manu K Vohra, 2013, for an exposition on the importance of business excellence to the sustainability and longevity of companies).

Kanji, 2008, has developed a Kanji Business Excellence Model, a Kanji Business Scorecard and the Global Excellence Measurement System to improve upon the existing BE models like MBM and EFQM. Lu et al, 2011, have proposed a “world class diamond model” for driving business excellence. Antony and Sanghamitra, 2011, have proposed a performance-excellence model for

measuring excellence in SME's. To understand the types of actions which have been undertaken by companies in different parts of the world, a compilation is shown below, Table A1:

Table A1: Compilation of key practices in companies adopting BE models to become "world class"

Company Name and details	Practices / initiatives taken up for implementation to install BE model practices in the organisation					
Bharat Heavy Electricals, Unit: Haridwar, large corporate , EFQM, Won CII EXIM Prize in 2006 (I was the lead assessor) (Reference : Pankaj Madan , 2010)	Declare VMV, Apex committee of top management, role model initiatives, personal involvement of all managers,	Regular ,structured meetings across the organisation, communication – horizontal and vertical , covering all stakeholders, PDCA	Partnership with suppliers, policies and strategy developed, reviewed and improved upon, working with local communities,	Transparency in HR, well developed appraisal system, motivation of employee, customer satisfaction measured and high, employee recognition, safety	System of KRA's, KPI's flowing down from the X Matrix, regular and systematic measurement of performance parameters across the organisation ,	Systems certification – ISO 14000, 9000, OHSAS 18000, total process orientation, end to end process mapping, deployment of TQM across the organisation
Practices in some companies in India, based on a survey conducted by Mann et al, 2011 and reported in the TQM Journal	Improvement teams, performance benchmarking, VMV	Use Balanced score Cards, BPR, CSR, TPM, QFD, PDCA	Design and deploy a quality management system , with an apex council of top management and other councils in the organisation	Conduct surveys of customers satisfaction , employees satisfaction, employees appraisal, employees suggestion schemes	Knowledge management , TQM , performance benchmarking, best practice benchmarking	Systems certification – ISO 9000, 14000, OHSAS 18000, process mapping and process improvements using TQM tools
BE Practices in New Zealand, Malaysia and Singapore , reported by Musli Mohammad et al , 2011	Role model initiatives, MBWA, Strategic Planning , strategic deployment, VMV	CSR, Balanced Score Card, Customer satisfaction measurement, customer segmentation, market research, BPR, PDCA	Leadership development program, OHSAS, quality management system, risk management , knowledge management	HR planning , rewards and recognition systems, improvement teams, quality circles, Supply chain management, lean	Assets management , financial management , LSA's, change management , Six sigma, business continuity	Systems certification – ISO 9000, 14000, OHSAS 18000, process mapping and process improvements using TQM tools
Tata Steel, India, Muthuraman, et al, 2014	VMV, horizontal and vertical communications, leaders personally involved, APEX quality council of top management	Customer satisfaction , strategy planning an deployment using AQUIP (world class best practice), BSC's, BPR, PDCA , corporate strategy map	Leadership development through 360* feedback, regular and systematic appraisals, KPI's, KRA's, knowledge management	Quality circles, Value engineering teams, small group activities, innovations, continuous improvement, stakeholder involvement in improvement projects	Automation, computerised MIS, strategic sourcing, theory of constraints, competency mapping and employee development, internal customer concept	QMS, Quality Systems Standards- ISO 9000, ISO 14000, ISO 18000, TS 19649, SA 8000, CSR, TQM, six sigma, QFD, OR techniques for optimisation

Selected – 22 - US companies, reported in the US GAO report, 1991	Leaders personally leading PDCA and TQM, leaders involved with customers, quality driven strategic planning and deployment ,	Customer defined quality, focus groups discussions, surveys, linking business processes with customer satisfaction elements	Use Kano model for marketing , Online customer feedback, customer complaints handled by call centres using 1-800 numbers	Partnerships with suppliers, internal customer concept, integrating quality processes into all business activities with leadership provided by senior leaders	Employees satisfaction, engagement, fact based decision making, town halls, innovations , systematic well planned training and employee development	Accessibility of senior leaders, employees suggestion schemes, rewards and recognition, employee empowerment, flexible and responsive corporate culture
---	--	---	--	---	---	---

There is ample evidence that BE models have added considerable value to companies in the long run. What has been summarised in the GAO study released in 1991 is still valid. The main points of benefit to corporates as given in the GAO study are summarised below, Table.A2

Table A2: List of actions from the GAO report, 1991, along with the results connect

GAO summarised actions	Connect with results
Corporate attention focused on meeting customer requirements	Improved customer satisfaction , loyalty, repeat purchase, some leverage in pricing
Senior management led the way in building quality values in company operations	Strong impetus for alignment by the rest of the organisation, clear signal for quality related work
All employees were suitably trained, empowered and involved in efforts to continuously improve quality and reduce costs . All employees were held accountable, for which they were given specialised training as required	Empowered employees are motivated, are able to use their intelligence better, improve team work and contribute a lot in improvements. Employees get involved and engaged in their work and stop negative, destructive tendencies
Systematic processes were integrated throughout the organisation to foster continuous improvement	Efficiency, effectiveness, quality, timeliness are improved. Delivery compliance is better and manufacturing lead times reduce
Practices are useful to small , medium and large companies, as well as manufacturers	All types of companies can use BE/TQM, however actions and methods could differ
Companies improved their performance after 2 ½ years, management allowed enough time for results to be achieved rather than emphasising short term gains	The BE/TQM is a long term initiative, with sustainability, continuous improvement, excellence as the main objectives. Results are not so important in the short term.
Companies have adopted many methods to obtain continuous improvement. Measuring a whole host of parameters is a key feature. A number of statistical methods have been used to support decision making.	Diverse methods used, but many based on statistical techniques, such as, control charts, sampling, six sigma, correlations etc. These techniques offer deep insights into the root causes
The increased interest in Japanese management methods was also accompanied by research in the United States that documented that firms can reduce their costs by improving quality. Quality management practitioners began citing the large, hidden costs that companies were incurring due to producing substandard products and services. These costs, known as the “cost of nonconformance,” included appraisal, inspection, rework, and warranty fees as well as the cost of replacing customers driven away by poor quality. Some experts estimated that manufacturing costs could be reduced by over 30 percent simply by eliminating scrap and rework that occurs from correcting defects in the manufacturing process. Total quality is the “strategy of choice” for assuring the economic position of U.S. firms in the global marketplace.	Cost reduction is an important aspect of BE/TQM efforts, such reductions are obtained through continuous quality improvement – product quality, process quality etc.

<p>TQM, by improving the quality of products and services, reduces the direct costs associated with poor quality: inspection, rework, warranties, etc. Improvements in quality tend to lead to increases in productivity. The combination of improved quality and increased productivity leads to increases in market share.</p>	
--	--

Approaches to deploy BE/TQM in organisations in India

BE/TQM introduction is an exercise in organisational transformation. A good description of the methods adopted to introduce BE/TQM in Indian companies is given in Surinder Kapoor, 2010, RK Gupta, 2016, Mahindra and Mahindra, 2007, Jayaraman et al, 2003, Muthuraman, 2003, Irani, 2003, Cristabelle Noronha, 2008, Blythe et al (1997), Charu Gupta and Belokar (2014), Jagadeesh, 1999, Mostafa Moballegghi, 2007, Sandeep Kudtarkar, 2016, Aboubakeur & Abdelouahab, 2014 and other works. All these studies describe the steps taken to establish a BE/TQM culture, actions taken by top management, training and empowerment of employees, results orientation, performance achievements and the roadblocks to implement BE/TQM. Using these studies, we will try and answer the RQ1 and RQ2. We will, then, describe two case studies from Indian industry to show how different performance results can be achieved by using different approaches to BE/TQM. Finally, we will try and answer the RQ3.

RQ1: What are the factors that are addressed by Indian companies to run-in BE/TQM? What actions have been taken by Indian companies?

The framework for undertaking the BE/TQM journey has been adopted by Indian industry managers and CEO's through knowledge gained from books, visits to companies in Japan, USA, Europe and other parts of the world, engaging with consultants and, finally, learning by doing in their own companies. The framework is largely adopted from the MBM and EFQM business models. However, the understanding and implementation of the frameworks are quite different in different companies. For example, the TVS group, with a number of Deming winners in its portfolio, does not use ISO 9000 whereas the Rane Madras group uses all the certifications – ISO 9000, 14000, 18000, QS 9000. While the TVS group uses the QCC's (Quality Control Circles), Automotive Axles Limited, a Kalyani Group company, has not seen the need to run QCC's.

The framework for the BE/TQM journey is a combination of core values; an enabler-results construct, which provides the details for deploying the core values; a holistic approach to performance management across the entire organisation, recognising that the elements of the construct are correlated with each other; and, a PDCA based continuous improvement program. Since this chain of value driving/ value enhancing activities consists of four distinct elements it becomes clear why the differences in approaches come about. For example, take the value chain diagram of a manufacturing company shown in Figure 3 (Jayaraman, 2013).

Figure 3: Operations Value Chain Diagram in a manufacturing company (typical)

Materials procurement	Inward materials receipt	Production Planning and Control	Systems certification	Distribution	HR for Operations
Vendors and suppliers management	Inward inspection	Inspection, Quality Control	TQM and Business Excellence, continuous improvement	Customer returns	Administration for Operations
Inward logistics	Unloading and storage	Process Control	Maintenance	Customer Complaints Handling	Operations strategy group
Inventory control	Store keeping	Technology scanning , selection, planning	Manufacturing	Project Management	COO's Office
Strategic sourcing	Issue to manufacturing	Engineering and Development	Research and Development	Packaging and FG stores	

Each of the value adding centres has to be included in the BE/TQM transformation and hence appropriate actions have to be decided upon. For example, in R & D, QCC's may not work; in the maintenance function, TPM could be appropriate; in marketing, QFD could be useful, as also in product management; and so on. This connect with the value chain is the cause of the differences that one comes across when examining the actions taken up for deployment. However, integrating the elements of the value chain into a holistic, aggregate entity to yield superior performance at the organisational level through PDCA makes the BE/TQM coupling work well. We can, therefore, in principle, separate "value chain" actions and "organisational" actions. Both are complementary to each other and must lead to harmony and resonance. If we were to depict the "holistic framework" from which the Indian industry picks and chooses the pieces for driving BE/TQM, it will look like what is shown in Figure 4.

Figure 4: A model for understanding the multiple connectivity and requirements of a BE/TQM introduction in a manufacturing company



The actions needed to introduce BE/TQM will include those shown in Figure 5.

Figure 5: Important actions to be taken in the various blocks of the organisation (as shown in figure 4) to deploy BE/TQM across the company



(source : author's research)

The list of actions in Figure 5 have been culled out of the various studies listed in the previous paragraphs. The list is illustrative and not exhaustive. Typically, the actions listed in the “top management” box in Figure 5 are “organisational” in nature, while all others are functional/ value-adding-block oriented.

Case studies in BE/TQM implementation in Indian industry

Case study 1: Tata Steel

Tata Steel was one of the first companies to adopt the BE/TQM transformation model to become the world's best steel company, with the lowest cost of hot rolled products. The movement which began in 1986 (see figure 2), with the adoption of value engineering as a means to start the PDCA campaign, took many steps to drive the transformation to its logical conclusion, when, in

2000, it won the JRD QV award of the Tata Business Excellence model (this model is the same as the MBM, and the company used Baldrige assessors from the USA for all its assessments. It also used Baldrige consultants from the USA to seek guidance and help in designing and deploying various initiatives). This was merely another milestone in the company’s relentless journey towards excellence. For example, it continued to pursue excellence and went on to score 700+ in the JRD QV awards system, the highest ever by any company, in 2003. It then went on to win the Deming prize in 2008. It is currently re-engaged in the JRD QV awards system. The reason why the company did so well, and became a world class benchmark for excellence, was the comprehensiveness of the actions taken, the depth to which each and every initiative was driven, the quest for “local maxima” in every sphere while ensuring that the “global maxima” was assured through the balanced score cards (BSC) system, the quality management system (QMS) and the annual quality improvement plans (AQUIP) methodology. Details of the actions and results can be found in Muthuraman et al, 2014. Some of the main actions taken by the company are listed below:

Action area as per the MBM	Actions taken between 1994 and 2003	Results obtained
Leadership	<ul style="list-style-type: none"> • Quality flag adopted • Quality pledge taken • QMS established • Apex quality/BE council established • Consultants appointed to draw up VMV periodically • AQUIP formalized and rolled out throughout the company • Quality coordinators appointed covering all departments (voluntary positions) • Rewards and recognition • Corporate Ethics Counsellor appointed • Corporate Citizenship Scorecard adopted • Top, middle and junior management dialogues • MD Online • BSC’s across the company 	<ul style="list-style-type: none"> • Goalposts established • Visible and impactful top management involvement • Employee morale and empowerment built up • Performance management system aligned with the QMS • Continuous, systematic, regular reviews drove superior performance in every area of the company • Score cards system established a transparent, well-coordinated, continuous upward movement, slippages of any of the departments surfaced immediately and CAPA done • Cross functional co-ordination • Visible and impactful top management involvement • Employee morale and empowerment built up • Performance management system aligned with the QMS • Continuous, systematic, regular reviews drove superior performance in every area of the company • Score cards system established a transparent, well-coordinated, continuous upward movement, slippages of any of the departments surfaced immediately and CAPA done • Cross functional co-ordination
Strategy	<ul style="list-style-type: none"> • Strategy planning process established • Strategy described in words and score cards • Strategy maps used to communicate strategy across the organization • AQUIP used to deploy and monitor strategy implementation • Strategy closely linked to the VMV • Best practices adopted through global benchmarking 	<ul style="list-style-type: none"> • Aligned and integrated strategy flowing out of the VMV • Strategic goals clear to all across the organization • The QMS and the cascading of the BSC using the AQUIP was a world class process to communicate, deploy and monitor strategy continually

<p>Customer focus</p>	<ul style="list-style-type: none"> • Customer satisfaction surveys • Kano Model • QFD • Customer Value Measurement • Customer intimacy • Mystery shopping • Customer segmentation • Customer complaints resolution • Customer partnerships & loyalty programs • Repeat purchases • Brand building • New products introduction • New markets • Convert potential customers to current customers • Premium priced products • Market growth • Product mix enrichment • Product portfolio matrix 	<ul style="list-style-type: none"> • High customer satisfaction and delight scores in surveys • Well designed and readily accepted products • A stream of new products to continuously win new customers and retain current customers • Build loyal base of customers • Promote premium brands to build profitability • Deliver on time, every time • Minimize customer complaints • Prompt resolution of customer complaints
<p>Knowledge and information management</p>	<ul style="list-style-type: none"> • Information systems planning • Continuous upgradation of MIS • Automation • Develop knowledge management system • Involve employees in knowledge management • IPR • Innovations 	<ul style="list-style-type: none"> • Enable speedy and accurate communications/ MIS • Copyrights • Value addition through automation, MIS, information systems planning • KM for developing IPR's, innovations, copyrights • Linkage to business results • Use MIS for performance reviews
<p>Human Resources</p>	<ul style="list-style-type: none"> • Employees satisfaction measurement • Empowerment • Training & development • Administration • Manpower planning • Competency development • Performance appraisal • Compensation policies • Increments and promotions • Employees welfare • Provident fund • Skill development • Multi skilling • Union relationships • Harmony and peace at work • Superior performance 	<ul style="list-style-type: none"> • Involved and engaged employees • Measuring training effectiveness • High morale • Co-operative unions • High productivity, efficiency • Suggestions • Involvement in small group activities, QCC's, kaizens • Promote products with customers • Increase customer satisfaction and delight
<p>Processes</p>	<ul style="list-style-type: none"> • Processes mapping and documentation • Systems certifications – ISO 9000, 14000, 18000 etc. • Computer systems security • Disaster recovery • Process efficiency • Process reporting, continuous improvement • 5S, Why six sigma • Balanced process metrics – leading and lagging, run the business and change the business • QTEC metrics • Continuous improvement • PDCA • Vendors and supplier's management • Value chain management • Vendor and supplier's partnerships and score cards 	<ul style="list-style-type: none"> • Efficiency • TPM, CBM, LCM • Effectiveness • Delivery compliance • First time right, every time • Zero defects • Six Sigma quality • CAPA • Measurability, repeatability and predictability • High production and productivity • Low maintenance downtimes

Based on the actions listed above, there was a considerable improvement in all areas of performance. Below is a chronological summary of the improvements achieved in the company, Table A3.

Table A3: Effect of PDCA actions on the leadership processes in Tata Steel (Source : authors research)

Year	Leadership Process: Imp. Actions	Results	Further Actions Required
1995 'Business Excellence'	Adopt the JRD QV Total Quality Award system for continuous improvement	Approaches identified, deployment put into place	Re-engineering of processes needed
1996 'Business process re-engineering'	Identify and adopt eight Key Business Processes and start re-engineering	OG & F and market development processes re-engineered	Other processes to be improved
1997 'Reengineer project management' 'World class' syndrome	Restructure supply chain and create new organisation for planning and implementing Customer Relationship Management (CRM)	Supply Chain restructured; CRM planned and implementation commenced using world class PM methodology	Improve strategy processes
1998 - 2004 'Strategic re-orientation'	Total revamp of several processes through TBEM feedback; Vision-2007; BSC cascading; QMS; AQUIP; TOP, CIP's - strengthened; PEP implemented; CCI introduced; Leadership system; Leadership effectiveness survey; ASPIRE; Lakshya 2007	Industry leader - JRD QV Award in 2002 ; CII EXIM award.; Declared one of the Best Steel Company in the world by WSD; Won PM's Trophy for the best integrated steel plant for three consecutive years; Strategic orientation at grass root level.	To map Tata Steel Enterprise Process model ; To consolidate on Visual Quality; To reduce process variability; To consolidate TPM & Six Sigma.; Consolidate leadership effectiveness system.

. Note: TBEM – Tata Business Excellence Model, AQUIP – Annual Quality Improvement Plan, TOP – Total Operations Planning, PEP – Performance Ethic Program., CCI – Corporate Citizenship Index, WSD – World Steel Dynamics, TPM – Total Productive Maintenance, OG & F : Order Generation and Fulfilment, CIP – Continuous Improvement Project, ASPIRE & Lakshya 2007 : New Management Development Programs, BSC: Balanced Score Cards, PM's Trophy : Prime Minister's Trophy

Some of the other key results achieved in the period 2000 to 2005 are illustrated in Figures 9 to 13, which clearly show that the company put up an all-round show. Tata Steel can be considered as a world class example of using the BE/TQM transformation engine to make comprehensive, sustainable improvements, which has perhaps helped the company to absorb the shocks after the Corus acquisition.

Figure 6: Overall customer satisfaction index over the years, survey conducted by the steel ministry

YEAR	02	01	00	99	98
TATA STEEL	1	1	1	1	1
BOKARO	2	5	5	3	4
BHILAI	3	3	5	2	4
ESSAR	4	5	2	2	na
VSP	5	2	3	2	3
ROURKELA	6	4	6	5	5
DURGAPUR	7	2	5	4	2

SOURCE : IMRB & ORG – MARG

Figure 7: Overall complaints (in PPM) of Cold Rolled/ Hot rolled coils sales

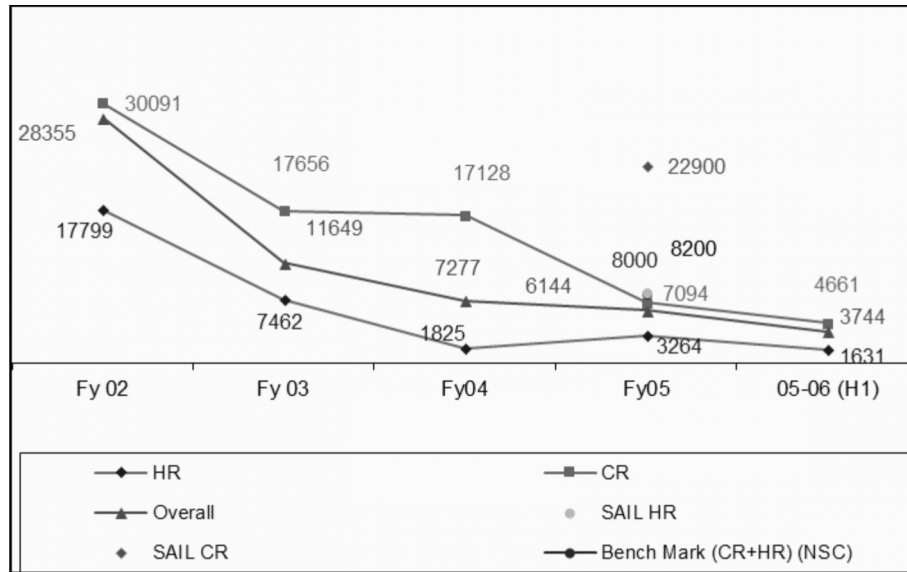


Figure 8: The EVA growth, Tata Steel is the only steel company in the world to have had a positive EVA consistently over 5 years

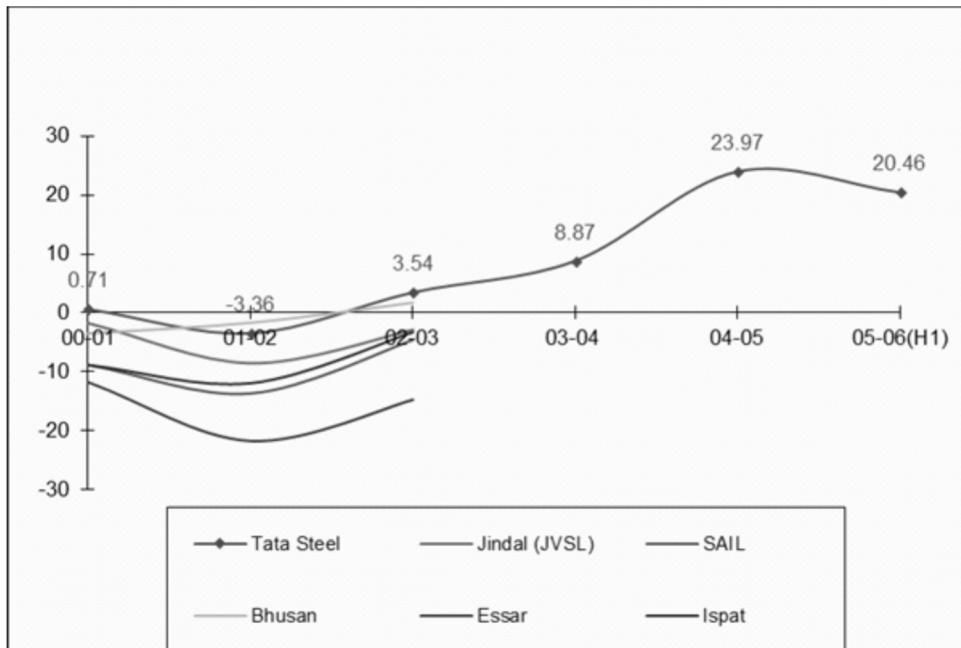


Figure 9: New products introduced by Tata Steel , growth by over 6 times between 2000 and 2005

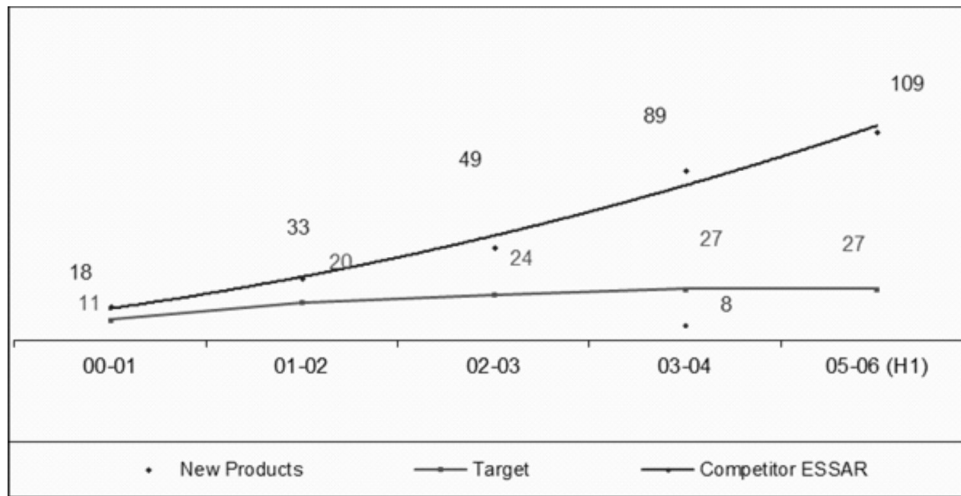
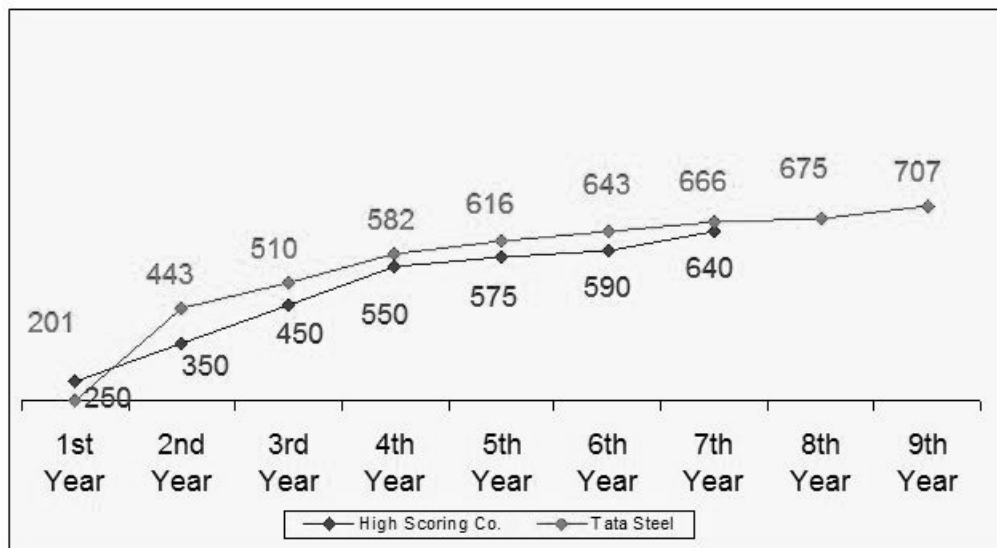


Figure 10 : JRD QV awards scores – showing the overall level of excellence in the company, and comparison with a high scoring Baldrige Applicant

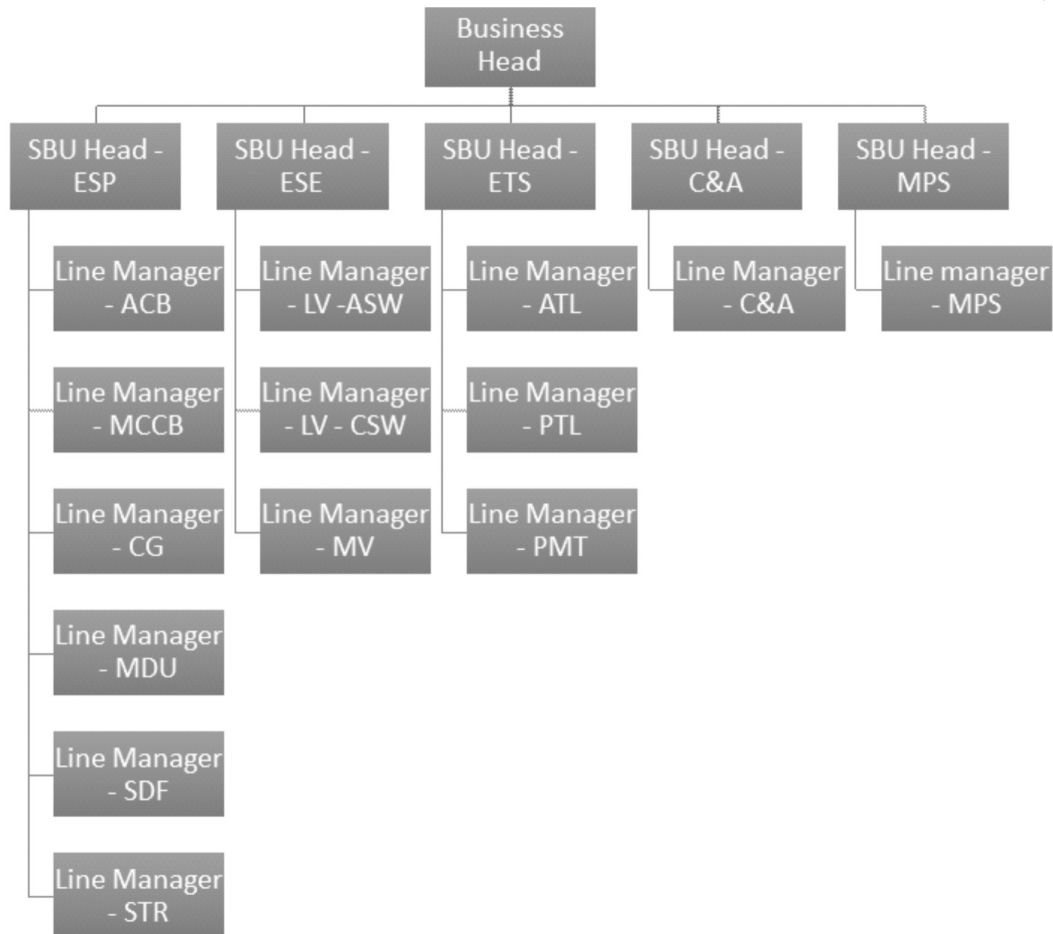


Case study 2: A Group company of Larsen and Toubro

A group company of Larsen and Toubro, an engineering and EPC MNC, headquartered in India, has taken a structured approach towards quality improvement, lead time reduction, waste reduction and value increase; most of these activities are directed towards operational excellence. Some of the key initiatives being implemented are Six Sigma, Poka-Yoke, Failure Mode Effect Analysis, 5S, Lean, Total Productive Maintenance, Quality Function Deployment, and Quality Circles as a part of its efforts to install BE/TQM in the company. (see, for example, L&T - Electrical & Automation, L&T Annual Report, 2012, and L&T Sustainability Report 2013)

The structured approach towards TQM was started in 2006 with the formation of a steering committee. The committee (or the Quality Management Structure – QMS) was headed by the Business Head, and the respective line managers who report to the business head. (Figure 11)

Figure 11: The QMS structure (Steering Committee) to drive BE/TQM in the company



Every product line had one coordinator for each of the initiatives – Six Sigma and Poka-Yoke, Lean, TPM, 5S and Value Engineering. The initiatives were centrally administered by the Corporate Initiatives Team, led by the GM Corporate Initiatives; this team had a Centre of Excellence (COE) for each of the initiatives, the COEs have the responsibility to facilitate implementation of these initiatives through awareness generation, training, idea generation, handholding, project review and audit.

The decision to go for overall improvement was taken by the steering committee. In the beginning of every financial year, the steering committee decided on the key pain areas for each of the product groups at every manufacturing location. As per the inputs from the top management, the corporate initiatives team and the line managers jointly decide on the importance of the initiatives and they take targets in terms of number of projects, savings to be achieved, 5S level to be attained in-house and at vendors, sigma level to be attained, resource utilization etc. These targets were time bound, and the performance of each of the SBUs (Strategic Business Units) was evaluated every month on a pro-rata basis.

The key areas were identified by the top management, as per business needs, in terms of product quality, costs, lead time, transportation costs, inventory, vendor performance, efficiency etc.

Line managers and coordinators decided the annual targets according to need of the business and availability of trained resources, further, as per required improvements; employees were trained to have adequate numbers of Six Sigma Green Belts, Black Belts and Master Black Belts, Associate Value Specialists. internal and external trainings were also conducted for 5S, Lean, PFMEA/DFMEA, Poka-Yoke and TPM. Workers were given Six Sigma yellow belt training and TPM training. To create awareness among the employees, new entrants were educated in the basics of improvement initiatives by internal trainers.

These trained resources that range from workers to managers, identified projects in their areas of operation. These projects were registered with the corporate initiatives team and the team provided all the support regarding expertise of various tools and techniques for the completion of the projects. The team also conducted statistical analysis, idea generation sessions, value chain mapping to identify areas where projects can be taken up. These projects were then audited by the authorities in related areas for validating the benefits claimed.

Each of the SBUs were evaluated and assigned a score, as per their performance, every month. Steering committee meetings were held every month to report the performance to the top management and identify further areas of improvement. Employee achievements were promoted by publishing best of the projects, in each category, in the monthly magazines. The project leaders also got a chance to present these projects to the top management in the steering committee meetings. Every year, there was a country wide competition held for selection of the best project in each of the improvement initiatives wherein the entire project team, including workers, got awarded by the business head. These are summarised in Figure 12.

Figure12: Methodology adopted to run-in BE/TQM in the company



Some of the key benefits achieved through implementation of these projects were: reduced incoming rejection, reduced in-process rework/ rejection, reduced customer complaints, reduced costs, reduced inventory, reduced variation, reduced material wastage, better utilisation of resources, reduced costs, improved efficiency, higher equipment effectiveness, reduced cost of poor quality, improved value for the internal and external customer, reduction of non-value adding activities, reduced lead time, better responsiveness and improved employee motivation and win-win situation with the suppliers. These are shown in Figures 13 to 17.

Figure13: Number of six sigma projects done

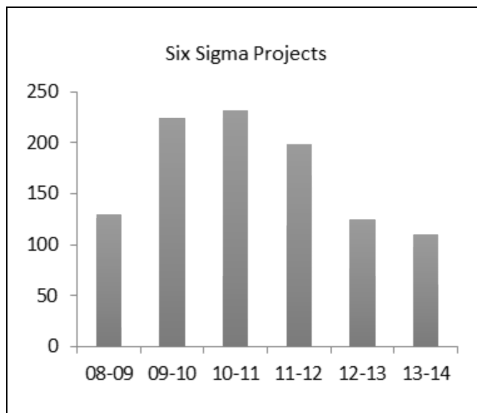


Figure 14: Number of Poke Yoke projects completed

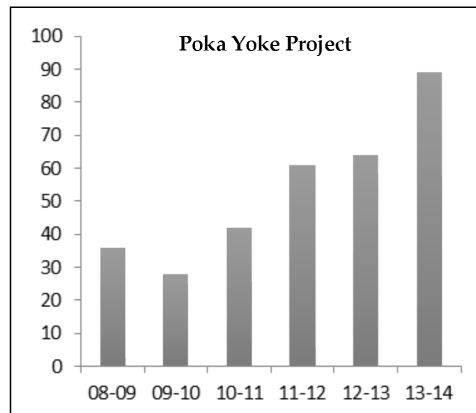


Figure15: Savings due to value engineering (indexed)

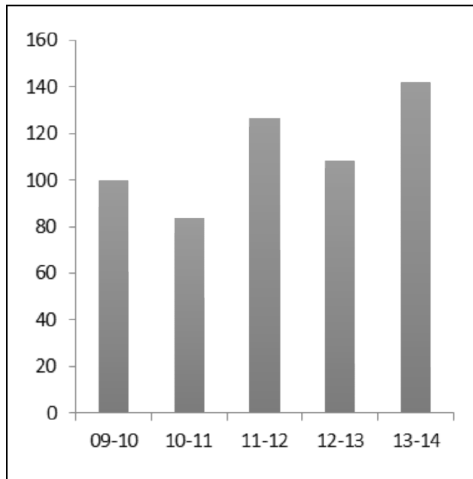


Figure 16: Number of lean projects

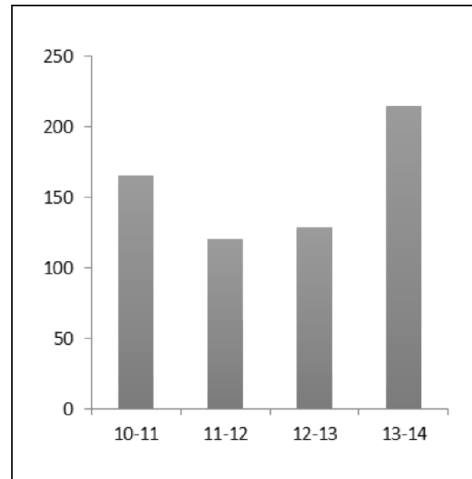
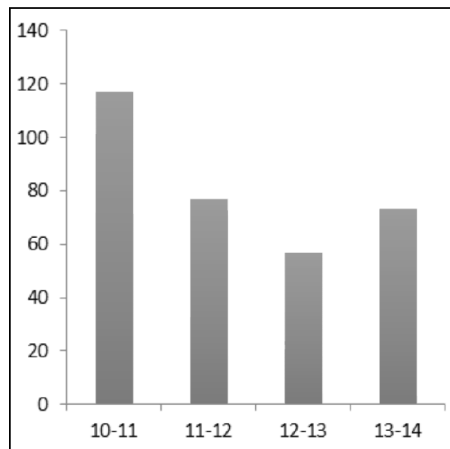


Figure17: Number of Value stream projects completed



Based on the above descriptions of the actions taken in the case of the two companies, and also other similar studies, we can now proceed to answer the RQ2 and RQ3, which are :

RQ2: Why do they lead to different results?

RQ3: What needs to be done to improve the effectiveness of the approaches to achieve better performance results?

The results in the two cases are different due to the factors summarised below, Table A4:

Table A4: The effect of various BE/TQM factors on the parameters of excellence. (Note: The numbers indicate the “level” of the practice, with 5 being highest and 1 being lowest)

Factors of BE/TQM	BE/TQM at Tata Steel	BE/TQM at L & T division
Strategic Alignment	5	3
Leadership and Team structure	5	4
Process Structure	5	3
Employee Empowerment and Training	5	4
Rewards and Recognition	5	4
Continuous Improvement	5	3
Innovation	4	4
Sustainability	4	3
Supplier Focus	4	4
Customer focus	4	3
Quality	4	3
Cost	5	5
Delivery	5	3
Value	5	4
Efficiency	5	3

The main differences in the factors are : the initiatives have been driven at Tata Steel for longer time, the comprehensive leadership team structure at Tata Steel, rigorous follow-up, review and CAPA, higher effectiveness of training of resources, deployment of AQUIP which is a world class tool for deploying and communicating strategy. Not that the L & T results are any lower, but, in comparison, they appear to provide scope for further improvement.

In order to improve further companies like L & T and Tata Steel could look at the following interventions,

Using the “Three Box Solution” for discovering new ways to drive the business strategy (Vijay Govindarajan, 2016)

Introducing “measures to change the company” and “measures to run the company” in the balanced score cards. Such a bifurcation of metrics will enable a company to create two organisations within one – one, which runs the current business using the BE/TQM methodologies, and, two, another organisation which looks at new metrics to create new businesses.

Integrating CSR activities, EMS (Environmental Management Systems) activities and business activities through the strategic planning and AQUIP systems to bring about sustainable

growth. Using the “Corporate Citizenship Index” to measure CSR activities to enable appropriate allocation of corporate funds with accountability (The BSC for Corporate Citizenship, introduced by Tata Steel, is a best practice) . Reinvigorating methods like customer value management, Kano model and quality function deployment (QFD) in unison to create and sustain customer delight. Encourage KM (Knowledge Management) and tie it in with innovations in the company. Create a continuous product pipeline, to refresh the product portfolio, using lean principles like rooting out muda, by doing “group working” (see Jacobs and Herbig, 1998), in preference to sequential design. Drive continuous improvement projects by strengthening team work, by offering different methodologies – for example, six sigma, FMEA, VE, lean, QFD, etc. – the idea being that each team picks up the appropriate method for the project at hand. This view is also supported by Kosaku Yoshida, a key aide of Dr Edwards Deming (Yoshida, 2001).

Conclusions

BE/TQM has become the SOP for modern companies. Indian industry has embraced this movement and took an early start in the 1980’s. Since then many companies, including the Tata Group, Aditya Birla Group, Mahindra and Mahindra, BHEL, BEL, NTPC, TVS Group, Rane Group, many MNC’s with operations in India have made great strides in using this framework. Different companies use different actions to run-in BE/TQM under the overall umbrella of the Kotter 8 point agenda for organisational transformation. However results achieved have varied. Both, the actions taken, and the results obtained have been examined at length in the body of this paper using sources from literature, the author’s personal experience in driving such movements as a hands on manager as well as a consultant/ assessor, and two case studies. Finally some further actions have been mentioned which can and must be taken up for implementation so that the Indian industry stays current and at the cutting edge of excellence.

Further work

This paper has been possible mainly because of the personal knowledge of the author, his association with the BE/TQM movement in India since inception and a wide data collection effort over the last 25 years. What is needed for further work is to conduct a survey of the current status of the BE/TQM movement in Indian industry, perhaps, one for the manufacturing and another for the services, so that the gaps in design and implementation can be identified. Moreover, there have been further developments in TPS, lean manufacturing, Theory of Constraints (TOC) which have led to higher levels of maturity in these areas. Concepts like agile manufacturing, mass customisation, digitalisation and digital technologies, big data, industry 4.0, SMAC, and similar such new methodologies are also available for use. All these have impacted the concept of “excellence” and need to be integrated. Based on the survey, a national level movement has to be taken up once again, so that the growth rates mentioned in figure 2 and the new initiatives like “Make in India”, “Skill India” etc can be successfully rolled out.

References

- Aboubakeur, B., & Abdelouahab, B. (2014). The relationship between business excellence and employees’ empowerment—case study on Algerian sonatrach Oil Company. *Revue Européenne du Droit Social*, (24), 205-218.
- Ahire, S.L., Golhar, D.Y., & Waller, M.A., (1996). Development and Validation of TQM Implementation Constructs. *Decision Sciences*, 27(1), 23-56. doi:10.1111/j.1540-5915.1996.tb00842.x

- Antony, J.P., & Bhattacharyya, S. (2010). Measuring organizational performance and organizational excellence of SMEs – Part 1: a conceptual framework. *Measuring Business Excellence*, 14(2), 3-11. <https://doi.org/10.1108/13683041011047812>
- Blankenship, B., & Petersen, P.B. (1999). W. Edwards Deming's mentor and others who made a significant impact on his views during the 1920s and 1930s. *Journal of Management History*, 5(8), 454-467. <https://doi.org/10.1108/13552529910290511>
- Blythe, R.M., Rao, H., & Shahani, N. (1997). TQM in Glaxo India: A step by step implementation process. *The TQM Magazine*, 9(2), 98 - 105. <https://doi.org/10.1108/09544789710165536>
- Goh, P.L., & Ridgway K. (1994). The Implementation of Total Quality Management in Small and Medium sized Manufacturing Companies. *The TQM Magazine*, 6(2), 54-60. <https://doi.org/10.1108/09544789410054064>
- Govindarajan, V. (2016, April 26). The Three-Box Solution: A Strategy for Leading Innovation. Boston, MA: Harvard Business Review Press (Harvard Business School Publishing). Product #:15029-HBK-ENG
- Gupta, C., & Belokar, R.M. (2014, May 15). Applications of Total Quality Management in Indian Airline Industry. *International Journal of Science and Research (IJSR)*, 3(5), 1077-1081.
- Gupta, R.K. (2016, February). Implementation of Total Quality Management (TQM) in Indian Industry. *Special Issue on International Journal of Recent Advances in Engineering & Technology (IJRAET) V-4 I-2 For National Conference on Recent Innovations in Science, Technology & Management (NCRISTM)*, Gurgaon Institute of Technology and Management, Gurgaon 26th to 27th February, 2016, 33-36.
- Ionică, A., Băleanu, V., Edelhauser, E., & Irimie, S. (2010). TQM and business excellence. *Annals of the University of Petroșani, Economics*, 10(4), 125-134.
- Irani, J.J. (2003). Business excellence for corporate sustainability. Tata Search, 1-6.
- Jacobs, L., & Herbig, P. (1998). Japanese product development strategies. *Journal of Business & Industrial Marketing*, 13(2), 132-154. <https://doi.org/10.1108/08858629810213351>
- Jagadeesh, R. (1999). Total quality management in India – perspective and analysis. *The TQM Magazine*, 11(5), 321-327. <https://doi.org/10.1108/09544789910282381>
- Jayaraman, R. (2013a, July). Impact of TQM on operational excellence. *ZENITH International Journal of Business Economics & Management Research*, 3(7), 61-70.
- Jayaraman, R. (2013b). Succeeding Through People: An Overview of How Business Excellence Practices Have Changed the HR Landscape. *Prabandhan – Indian Journal of Management*, 6(1), 5-12. doi:10.17010/pijom/2013/v6i1/59944
- Jayaraman, R. (2014). Impact of Business Excellence practices on Technology Management in India – perspectives and a case study. *MERC Global's International Journal of Management*, 2(1), 1-19.
- Jayaraman, R., Agarwal, R., & Chatterjee, A. (2003). The Transformation of Tata Steel. Tata Search.
- Juran J.M. (1999). Section 40: Quality in United States, 40.1-40.14. In Juran, J.M., & Godfrey, A.B. (Ed.). *Juran's Quality Handbook* (5th ed.). New York, NY: McGraw Hill. Retrieved July 22, 2017, from: <http://www.pqm-online.com/assets/files/lib/books/juran.pdf>.
- Juran, J.M., & Godfrey, B.A. (Co-Ed.) (1999). *Juran's Quality Handbook* (5th ed.). New York, NY: McGraw Hill.
- Kanji, G.K. (2008, April). Architecture of business excellence in the public and service sectors. *Total Quality Management & Business Excellence*, 19(4), 399-415. <http://dx.doi.org/10.1080/14783360801987779>
- Kapur, S. (2010, October 04). India's quality revolution. Retrieved July 22, 2017, from: http://www.business-standard.com/article/management/india-s-quality-revolution-110100400070_1.html

- Khoo, Hsien H and Tan, Kay.C. (1997). Managing for quality in USA and Japan: differences between MBNQA, DP and JQA. *The TQM Magazine*, 15(1). 15-24.
- Kim, D.Y., Kumar, V., & Murphy, S.A. (2010). European Foundation for Quality Management Business Excellence Model: An integrative review and research agenda. *International Journal of Quality & Reliability Management*, 27(6), 684-701. <https://doi.org/10.1108/02656711011054551>
- Kudtarkar, S.G. (2016, January). Deming Award, A Journey Towards Business Excellence. *IOSR Journal of Business and Management*. Retrieved from www.iosrjournals.org/iosr-jbm/papers/ies-mcrc-ibrc/volume-2/RC-14.pdf
- L&T Annual Report(2012-13). Retrieved from http://www.larsentoubro.com/Intcorporate/Uploads/L&T_Annual_Report_2012-13.pdf
- L&T Sustainability Report (2013). Retrieved from <https://www.globalreporting.org/Pages/FR-Larsen-Toubro-2014.aspx>
- Larsen & Toubro (2017). L&T - Electrical & Automation. Retrieved July 22, 2017, from: <http://www.larsentoubro.com/>
- Lua, D., Betts, A., & Croom, S. (2011, December). Re-investigating business excellence: Values, measures and a framework. *Total Quality Management & Business Excellence*, 22(12), 1263-1276. <http://dx.doi.org/10.1080/14783363.2011.631336>
- Madan, P. (2010, December). An award journey for business excellence: the case study of a public sector unit. *Total Quality Management & Business Excellence*, 21(12), 1343-1364. <http://dx.doi.org/10.1080/14783363.2010.530774>
- Mann, R., Adebajo, D., Laosirihongthong, T., & Punnakitikashem, P. (2011, November). Awareness and impact of business excellence in Asia. *Total Quality Management & Business Excellence*, 22(11), 1237-1258. <http://dx.doi.org/10.1080/14783363.2011.624772>
- March, A., & Garvin, D. A. (1990). *A Note on Quality: The Views of Deming, Juran, and Crosby*. HBS, Boston, MA: Harvard Business School. No. 9-687-01.
- McAdam, R., & Leonard, D. (2005, August). A TQM dynamics perspective on baldrige and business excellence model comparisons. *Total Quality Management & Business Excellence*, 16(6), 771-791. <http://dx.doi.org/10.1080/14783360500077757>
- McCarthy, Grace and Greatbanks, Richard. (2006). Impact of EFQM Excellence Model on leadership in German and UK organisations. *International Journal of Quality & Reliability Management*, 23(9), 1068 - 1091
- Moballegghi, M. (2007). Total quality management (TQM) implementation in automotive industry: a case study of selected firms in India (Doctoral dissertation, University of Mysore, India). Retrieved from http://shodhganga.inflibnet.ac.in/bitstream/10603/15886/1/01_title.pdf
- Mohammad, M., Mann, R., Grigg, N., & Wagner, J.P. (2011, November). Business Excellence Model: An overarching framework for managing and aligning multiple organisational improvement initiatives. *Total Quality Management & Business Excellence*, 22(11), 1213-1236. <http://dx.doi.org/10.1080/14783363.2011.624774>
- Muthuraman, B. (2003). The quest for excellence: Tata Steel in the new millennium, *Tata Search*, 7-16.
- Muthuraman, B., & Jayaraman, R. (2014). Driving Business Strategy through BSC in Large Organizations. *Vikalpa*, 39(1), 1-20.
- Noronha, C. (2008). Business of Excellence: The Tata Journey. Tata Review. India: Tata Sons.
- Ojha, A.K. (2000, April-June). Total Quality Management: How can We Make the Implementation Effective?. *Vikalpa*, 25(2), 19-29.

- Park, S.M.D., & Dahlgard, J.J. (2007). Excellence – 25 years evolution. *Journal of Management History*, 13(4), 371-393. <https://doi.org/10.1108/17511340710819606>
- Petersen, P.B. (1999). Total quality management and the Deming approach to quality management. *Journal of Management History*, 5(8), 468-488. <https://doi.org/10.1108/13552529910290520>
- Phutane, L. (2007, July 5). Mahindra and Mahindra. Retrieved on July, 22, 2017, from: <http://www.managementparadise.com/forums/miscellaneous-projects/16093-mahindra-mahindra.html#post62630>
- Rajpal, S., & Sagar, RR. (2003, October-December). Business Excellence in the Indian Scenario. *Vikalpa*, 28(4), 77-81. Retrieved from http://www.vikalpa.com/pdf/articles/2003/2003_oct_dec_77_81.pdf.
- Srinivasan T.N.(2003) Indian Economic Reforms: A Stocktaking. Retrieved on July 22, 2017, from: <http://www.econ.yale.edu/~srinivas/Indian%20Economic%20Reforms%20A%20Stocktaking.pdf>
- Taylor, Chris. (1999). Baldrige winners learn that quality really does pay. *Managing Service Quality – An International Journal*, 7(2), 65-68.
- Vora, M.K. (2013). Business excellence through sustainable change management. *The TQM Journal*, 25(6), 625-640. <https://doi.org/10.1108/TQM-07-2013-0080>
- Womack, J.P., & Jones, D.T. (1996,). *Lean Thinking: Banish Waste and Create Wealth in Your Corporation*. New York: Simon & Schuster.
- Yoshi, K., & Noriaki K. (1999). *Quality in Japan*. In Juran, J.M., & Godfrey, A.B. (Ed.). *Juran's Quality Handbook* (5th ed.) (pp 41-33). New York, NY: McGraw Hill. Retrieved July 22, 2017, from: <http://www.pqm-online.com/assets/files/lib/books/juran.pdf>.

Appendix

Acronyms used in the paper

TQM – Total Quality Management

EFQM – European Foundation for Quality Management

BE – Business Excellence

TPS – Toyota Production System

PDCA – Plan, Do, Check, Act

QC – Quality circles (also known as Quality Control Circles)

QFD – Quality Function Deployment

QMS – Quality Management Structure

FMEA – Failure Mode Effect Analysis

SOP – Standard Operating Practice

MBM – Malcolm Baldrige Model (for Performance Excellence)

MBNQA – Malcolm Baldrige National Quality Awards

Author's Profile

R Jayaraman has had an illustrious career spanning over 35 years. He was educated at IIT Bombay in Metallurgical Engineering , IIM Ahmedabad and University of British Columbia where he graduated with Distinction in Metallurgical Engineering (MS), as also a Diploma in Production Management from the SIES Institute of Management, Starting with Mukand Iron and Steel Limited where he worked in production, design and R & D of a steel plant, he went on to successfully install and commission the non-ferrous bi-metal sintering line for the manufacture of automotive bearings in Gabriel India Limited. He played a key role in the acquisition and merger of Special Steels and Ahmedabad Advance Mills with Tata Steel. He worked in the highest offices in Tata Steel – EA to the VC, Executive Officer to the MD Dr JJ Irani, head of Selection of a Coastal site for a 10 mtpa steel plant of Tata Steel, Chief of Project Planning, Monitoring and Cost Control of the world class 1.2 million tpa Cold Rolling mill project of Tata Steel which set several world records in project management and cost Rs 2,000 crores. He has also served as the Chief of Business Excellence of Tata Steel and Tata Communications Limited, both global giants in their respective areas of operations. He also worked as Senior VP of Technology and Chief Safety Officer of Tata Teleservices where he introduced industry standard practices in telecom tower management. He has co-authored, with the past Vice Chairman of Tata Steel, a well acclaimed book on project management. He has also authored more than 60 technical and management papers in various national and international journals some of which have won awards. He was selected by the “Best Citizens of India forum “and the India International Friendship Society “ for the “ Best Citizen of India” and “Bharat Jyoti” awards for his services to academia and industry in 2013 . He was also nominated by Tata Communications Limited for the “Best Changemaker “in the telecom industry in India in 2008. His current research interests are in Inventory Management, Supply Chain, Operations Planning, Lean Management and Operations Strategy.
