

Total Quality Management Philosophy in Improving Singing Performance: A Case Study



Vinod Kumar Khanna
(qems70@hotmail.com)

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Though TQM philosophy has been beneficial in all types of industries, however, there is hardly any literature indicating that this philosophy can be used in improving an individual's singing performance. The purpose of this paper is to share how TQM philosophy can be used in improving an individual's singing performance through a case study. A questionnaire-based methodology was adopted to analyze the singing performance before and after the implementation of the TQM philosophy. The paper concludes that TQM philosophy does make a difference in improving an individual's singing performance in the shortest possible time. TQM philosophy, thus, has been recommended for all aspiring singers to improve sixteen key quality characteristics of singing and how this journey can be followed step by step. We also discuss some of the difficulties being faced while implementing TQM and propose some solutions to eliminate them.

Keywords: Total Quality Management, Quality Tools, Singing, Case Study, India

1. Introduction

The application of the Total Quality Management (TQM) approach has played an important role in the survival and growth of many industries, such as service industries, warehousing, and film industries (Frazelle, 2002). Khanna and Gupta, (2014) during their study establish the importance of competency-based training for improving TQM in industries.

A study by Kalu *et al.*, (2021) recommends that modern organizations should make the adoption of TQM practices a priority in view of its positive contribution to organizational performance. Terziovski and Samson, (1999) studied the manufacturing sector of Australia, New Zealand, and India and concluded that manufacturing organizations are more likely to achieve better performance in employee relations, customer satisfaction, operational performance, and business performance, with TQM than without TQM. There has been a slow change/movement/ transformation in the construction industry from quality control (QC) to total quality management (TQM) (Harrington *et al.*, 2012). Kristianto *et al.*, (2012) presented a case study of the wheat flour mill company and emphasized that for

achieving customer satisfaction, TQM strategy is a must. TQM can be defined and described in a variety of ways, from a variety of perspectives. It has been defined as follows: TQM means “Total”: every person in the firm is involved; “Quality”: customer requirements are met exactly; “Management”: senior executives are fully committed (Wilkinson and Witcher, 1991).

Gunasekaran, *et al.*, (1999) presented a case study on how to improve the effectiveness of warehousing through TQM concepts. Starting with higher education, this scope was widened to include health care, airlines, hotels, local government, and public services, tourism, banking services, logistics, servitization, IT, innovation, and entrepreneurship, so that today it covers all types of services (Evans and Lindsay, 2004; Editorial, 2018; Deming, 1992). As per Grandinetti *et al.*, (2020) exploratory study findings exhibit that access to customers and data is critical to enable advanced digital services and improve the quality of relationships. Zimbabwe is one of the nations that has not been able to fully explore and benefit from the film industry and thus, the Zimbabwean film industry must establish a quality management team and implement management practices to improve the quality of its production and become sustainable (Pradhan, *et al.*, 2017). TQM is also being implemented in organizations including service organizations like in Banking, Food industries (Talib and Rehman, 2009), Real Estate, Retail Sector (Chiguvu, 2016), Education, and Pharmaceutical Manufacturing (Najmi, *et al.*, 2021), and in Film Industries.

The effective use of quality tools, according to some analysts, is the most striking differentiator between world-class and non-world-class organizations (World Class Manufacturer, 2007). Japan’s automobile industry started out several decades behind the USA’s but during 1980s, it overtook the USA’s and became the biggest automobile industry in the world. This success was based on the adoption of the total quality management (TQM) philosophy (Ulrich *et al.*, 2000). Many industries, such as electronics, cameras, watches, motorcycles, machine tools, automotive products, shipbuilding, and even some aspects of aerospace are either dominated by Japanese firms or highly impacted by them (Khanna, 2009). Oakland and Tanner, (2006) emphasize more on the initiatives on change management for the effective implementation of quality initiatives in the organization. National Quality Award (NQA) models provide a systematic framework for understanding and implementing TQM (Khanna *et al.*, 2008).

Though TQM philosophy has been beneficial in all types of industries, however, there is hardly any literature indicating that this philosophy can be used in improving an individual’s singing performance. Therefore, it was, decided to explore the possibility of using TQM philosophy in improving singing performance through a case study.

The first part of this paper reviews the concept of TQM, including National Quality Award models and five TQM tools as fundamental steps for the implementation of TQM. Subsequently, the paper examines the methodology for the case study and TQM tools implementation for improving singing performance. This paper discusses performance indicators, highlights the achievements made in the singing performance through TQM philosophy, and it also identifies and analyses some of the difficulties faced during implementation, and proposes some solutions to eliminate them.

2. Defining Total Quality Management (TQM)

As per Ishikawa, (1985) companies and individuals may give different interpretations, but broadly speaking, total quality control means management control itself i.e., Total Quality Management (TQM).

TQM is a companywide control. It simply means that everyone in every division in the company must study, practice, and participate in quality control. Merely assigning QC specialists in every division as suggested by Feigenbaum is not enough (Ishikawa, 1985).

As per Kondo, (1999) there are two indispensable conditions for a company to fulfill; it must serve society in some ways, and it must innovate unique methods that cannot be copied easily by others. Every employee has to understand the importance of internal customer and internal supplier relationships for the overall growth of the organization (Charantimath, 2004). Juran, (1986, 1992) developed the idea of the Quality Trilogy to bring continuous improvement in the process as well as in each of them-quality planning, quality improvement, and quality control. Khanna *et al.*, (2008), suggested six phases and 18 major steps for TQM implementation.

TQM models have been based on a premise that quality improvement requires enlightened and influential leadership, which drives quality movement forward and nurtures an innovative and creative workforce capable of meeting customers’ expectations (Ho and Cicmil, 1996). The popular models in Indian organizations are Deming’s approach and Ishikawa model; however, the Deming Prize model, European Quality Award model, Malcolm Baldrige National Quality Award Model (MBNQA), CII-EXIM Award model, and Rajiv Gandhi National Quality Award model are also being used.

2.1 National Quality Award

A generic framework for an NQA model can be divided into two parts: enablers and results. Such an analysis rightly suggests that the existence of “good” enablers underpins better results. A simple, pictorial representation of this quality framework model is shown in Figure 1 (Khanna *et al.*, 2002; Gorantiwar and Shrivastava, 2014).

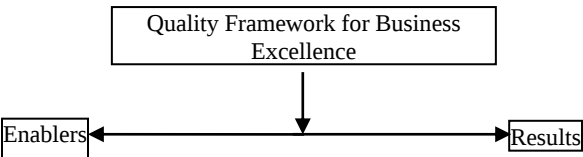


Figure 1 Quality Framework Model

As per Khanna *et al.*, (2002) the focus on seven enablers and five results are turning points for organizations.

The TQM index (TQMI) is the sum of enablers and results of the business processes of the organizations. Strategically, organizations are required to focus on improving the enablers for improving TQMI (Pannirselvam and Ferguson, 2001).

A brief explanation of the full set of variables, which includes seven enablers and five result variables is shown in Tables 1 & 2.

Table 1 Definition of Variables for Enablers

Variables	Remarks
Leadership	Senior managers provide clear vision and values that promote total quality. The most important TQM enabler for driving a TQM culture
Strategic Planning	Business strategies incorporate long-term and short-term goals based on customer and market expectations.
Information Management	Effective information and communication systems for continuous improvement of all work.
Human Resource Focus	Maximize opportunities for all employees to realize their full potential.
Customer and Market Focus	Customer (internal and external customer) relationships must be managed to secure clear understanding of requirements.
Suppliers Focus	Suppliers are treated as partners in the process of improvement.
Process Management	Systems approach to quality in control of all operations including appropriate use of “quality tools”.

Table 2 Definition of Variables for Results

Variables	Remarks
Impact on Society	Societal responsibilities / environmental management.
Human Resource Satisfaction	All employees are motivated and dedicated to continuous improvement - feeling empowered and valued.
Customer satisfaction	Internal and external customers know that their needs are important – and addressed.
Supplier Satisfaction	Suppliers want to do repeat business – as partners.
Company-Specific Business Results	Do the company’s results demonstrate effective performance?

Table 3 Relationship of Score with Organizational Maturity (Caravatta, 1997)

Score Range	Characteristics	Description
1000	World-class quality performance	Excellent approaches, full deployment, and processes continuously improved sustained results
800	Superior quality accomplishment	Good, systematic, and effective approaches have been refined and are deployed throughout most of the company. Results are good to excellent in most key areas. Continuous improvement in place. Positive improvement trends.
400	Quality awareness	The organization is aware and needs to begin to formalize its quality efforts. No systematic approaches, results are weak and poor.
200	Traditional find and fix	The main emphasis is quarterly profit maximization, cost containment and reduction.
0	No quality awareness	—

A literature review revealed that organizations getting around 600 against the MBNQA criteria are considered serious contenders for the award and site visits are undertaken for these organizations only (Brown *et al.*, 1994).

To get a feel of the level of organizational maturity, the TQMI can be compared with the levels shown in Tables 3 & 4 based on the results of Caravetta (Caravatta, 1997) and Siow *et al.*, (2001) Tables respectively.

Table 4 Relationship of Score with Organizational Maturity (Siow *et al.*, 2001)

Evaluation Criteria	Evaluation Definition	Grades
World-class	Comprehensive evidence of a systematic approach to succession plans. Clear evidence that these plans are being regularly reviewed, leading to improved business effectiveness.	1.0
Award winners	Extensive evidence of a systematic approach to succession plans. Clear evidence that these plans are being regularly reviewed and refined.	0.75
Improvers	Evidence of a systematic approach to succession plans. Clear evidence that these plans are being regularly reviewed.	0.50
Drifters	Little evidence of a systematic approach to succession plans. Clear evidence that these plans are being occasionally reviewed.	0.25
Uncommitted	No evidence of a systematic approach to succession plans. Any plans are not reviewed/No plans are reviewed.	0

Research findings of Khanna *et al.*, (2002) on the basis of System Dynamics (SD), are that it takes about ten years to achieve TQM maturity level during a scenario of “external enabler strong” and about 13 years to achieve TQM maturity level during a scenario of “moderate” or “weak” with the highest effectiveness of enablers. They developed a Table that compares TQM maturity levels under three market scenarios. Comparative data is shown in Table 4.

Table 5 Comparison of Performance at Different Market Scenarios (Khanna *et al.*, 2004)

Run no	External enabler	Enablers	Results	TQMI after tenth year	Years to achieve TQM maturity
11	Strong	538	345	883	10
52	Moderate	540	295	836	13
93	Weak	552	276	829	13

As per Khanna *et al.*, (2002) three market scenarios are External enabler strong, which is the most optimistic market scenario, that is, when the competition is negligible and it is very easy to show good performance; External enabler moderate, which means that competition is growing and customers are becoming more demanding; External enabler weak, which means that competition is very stiff and customers demand the highest quality.

When all three market scenarios are compared with Carvatta Table 5, it is evident that such organizations fall between Superior quality accomplishment and World-

class quality performance after 10th year of implementing TQM with the highest effectiveness of enablers. As per Siow *et al.*, (2001) Table 5, it is revealed that such organizations fall between award winners and world-class.

2.2 TQM Tools

The versatile quality tools used by the organizations are mainly: 5 ‘S’, Kaizen, Total Productive Maintenance (TPM), Plan-Do-Check-Action (PDCA) i.e., Deming Circle, Benchmarking, Suggestion scheme, Quality Function Deployment, Design of Experiments, Programme Evaluation and Review Technique (PERT) and Critical Path Method (CPM), Failure Mode and Effect Analysis (FMEA), Business Process Reengineering (BPR), 7 New & Old QC tools (Khanna, 2009).

The most important tools, which have been used for this case study, are: 5 ‘S’, Kaizen, TPM, Problem solving process (PDCA) circle, and Benchmarking, which has been explained in brief.

2.2.1 5 ‘S’

As per Ho, (1999) 5 ‘S’ is the foundation for implementing TQM philosophy and 5 ‘S’ is the primary driver for the success of TQM in any organization. As per Osada (1991), the 5 ‘S’ practice is a technique to establish and maintain a quality environment in the organization. Imai (1997) considers 5 ‘S’ to be an integral part of the house of Gemba management and critical to the kaizen process which enables organizations to be successful in deploying TQM philosophy. Toyota production system is by far the more/most well-known example of how the 5 ‘S’ principles were applied in practice to be effective in the TQM journey (Shingo, 1982). A study by Ho *et al.*, (1995) suggests that many European firms are already practicing principles, which are similar to those of the 5 ‘S’ for implementing TQM philosophy. Also, both manufacturing and service industries consider 5 ‘S’ as one of the strongest tools for enhancing the success factor in implementing TQM (Ho and Cicmil, 1996).

In nutshell, 5 ‘S’ is a participative program and is an effective approach for improving the work environment and implementing TQM. The 5 ‘S’ name stands for five Japanese words, i.e., *Seiri*, *Seiton*, *Seiso*, *Seiketsu*, and *Shitsuke* (Osada, 1991; Ho, 1998). Each ‘S’ has been explained in detail by Khanna (Khanna, 2009).

2.2.2 Kaizen

As per Imai, (1986) Kaizen means improvement. Moreover, KAIZEN means continuing/continuous improvement in personal life, home life, social life, and working life. When it is applied in the workplace, KAIZEN means continuing improvement involving everyone – managers and workers alike. The term Kaizen is the combination of two Japanese words (Kanjis), Kai, which means change and Zen, which means to improve. Therefore, the meaning of KAIZEN is gradual and continuous improvement. The KAIZEN business strategy involves everyone in an organization working together to make improvements ‘without large capital investments.’

Kaizen has been successfully implemented in manufacturing as well as in service organizations (Imai, 1986). Some authors attribute its beginning to the work of William Deming and Joseph Juran (Mizuno, 1988), whereas others relate it to the

improvement of processes in the Toyota Motor Corporation during the 1950s and 1960s (Bessant and Caffyn, 1997). Critical factors underpinning in Kaizen is the importance of self-development, discipline, and pride in one's work (Suarez-Barraza *et al.*, 2011).

The bosses should encourage their subordinates, but in real life, the wet blankets put out the "fire" of improvement suggestions. The list of wet blankets, basic tips for kaizen, fundamental of improvements, and success conditions for implementing Kaizens have been compiled and shown in Table 6 (Imai, 1986).

Table 6 Successful Conditions for Implementing Kaizens

	The Wet Blanket List	Basic Tips for Kaizen Activities	Fundamental of Improvements	Successful conditions for implementing Kaizens
1.	I am too busy to study it	Discard conventional fixed ideas.	Start with small improvements	Top Management commitment
2.	It's a good idea, but the timing is premature	Think of how to do it, not why it cannot be done.	Start with our problems, not others Start with easy area	Top Management commitment
3.	It is not in the budget	Do not make excuses. Start by questioning current practices.	Improvement is a daily part of routine Collect group wisdom	Top Management commitment
4.	Theory is different from practice	Do not seek perfection. Do it right away even if for only 50% of target.	Never accept status quo. Dissatisfaction is mother of all improvements	Setting up an organization dedicated to promote Kaizens
5	Isn't there something else for you to do?	Correct it right away, if you make mistake.	Never reject any idea before trying. Openness of mind is the prerequisite to kaizen.	Appointing the best available personnel to manage the Kaizen Process
6.	I think it doesn't match corporate policy	Do not spend money for KAIZEN, use your wisdom.	Highlight problems don't hide them. Don't be afraid.	Conducting Training and education
7.	It isn't our business; let someone else think about it	Wisdom is brought out when faced with hardship.		Establishing a step by step process for Kaizen introduction
8.	Are you dissatisfied with your work?	Ask "WHY?" five times and seek root causes.		
9.	It's not improvement, it's common sense	Seek the wisdom of ten people rather than the knowledge of one.		
10.	I know the result, even if we don't do it	KAIZEN ideas are infinite.		
11.	I will not be held accountable for it			
12.	Can't you think of a better idea?			

2.2.3 Problem Solving Process (PDCA Circle)

Most firms actively engaged in continuous improvement focus on giving training to all work teams to use the PDCA circle for problem-solving. Another name for this approach is the Deming Wheel, named in the honor of Dr. Deming who is credited for developing this tool (Khanna *et. al.*, 2008).

PDCA circle means continuously looking for improvements and setting new standards, and new standards should also be challenged continuously for further new

standards (Imai, 1886). The PDCA circle is equally effective in doing a job and managing a program. The PDCA circle ensures two types of corrective actions – temporary and permanent (Juran, 1990). The temporary action is aimed at practically tackling and fixing the problem. The permanent corrective action consists of investigation and eliminating the root causes and thus targets the sustainability of the improved process (Louis, 2001).

Figure 2 shows this cycle, which lies at the heart of the continuous improvement philosophy.

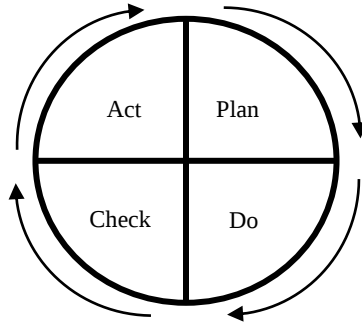


Figure 2 Plan-Do-Check-Action Circle

Plan: The team selects a process (e.g., activity, method, machine, or policy) that needs improvement. After assessing the benefits and costs of the alternatives, the team develops a plan with quantifiable measures for improvement. **Do:** The team implements the plan and monitors its progress. Data are collected continuously to measure the improvements in the process. **Check:** The team analyzes the data collected during the Do steps to find out how closely the results correspond to the goals set in the plan step. **Action:** If the results are successful, the team documents the revised process so that it becomes the standard procedure for all who may use it. Even before the PDCA cycle is employed, it is essential that the current standards be stabilized. Thus, as per Imai (1986), Standardize-Do-Check-Action (SDCA) and PDCA cycles work in concert all the time. The interaction of PDCA (Kaizen) and SDCA (Maintenance) has been shown in Figure 3.

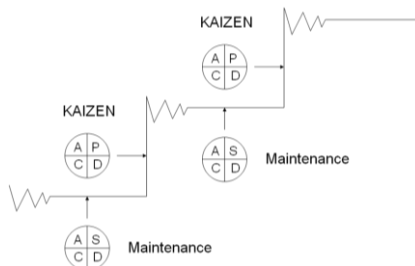


Figure 3 Interaction between PDCA and SDCA

2.2.4 Total Productive Maintenance (TPM)

Total Productive Maintenance is to achieve maximum profit, and to minimize maintenance costs. The Japanese approach to TPM is promoted by the Japan Institute of Plant Maintenance (JIPM), and in particular, credit goes to the Vice Chairman of the JIPM, Siiechi Nakajima for its development and propagation. Tajiri and Gotah, (1992) and Shirose, (1992) regard Nakajima as the Father of TPM. JIPM has suggested implementation of TPM in two phases as shown in Figure 4. The first phase of TPM covers the production department and in the second phase of TPM, it extends to the entire organization.

Nakajima, (1988) has summarized TPM philosophy as: “Productive maintenance involving total participation in addition to maximizing equipment effectiveness and establishing through a system of Preventive Maintenance (PM)”, where PM is a comprehensive planned maintenance system.

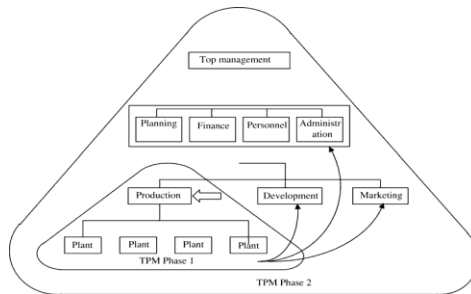


Figure 4 Two Phases of TPM

2.2.4.1 Methods of Implementing TPM

First and the foremost step is the selection of a critical machine to make it a TPM model machine (Khanna, 2008). Some of the criteria for selection of the critical machine are enumerated below

1. Select the worst or bottleneck machine from a customer point of view
2. Complaints coming from customers regarding a delay in deliveries
3. More rejection or rework coming from the machine
4. Frequent breakdowns
5. High Set-Up time delaying the delivery and compromising productivity

After selecting such a machine multi-functional team should be formed to make it a model. The main criteria to be successful are daily meetings of the team as per schedule for cleaning of the critical machine to expose abnormalities and solve those problems. Formulate an effective standard for cleaning, lubricating, inspecting, and re-tightening to avoid coming back to starting stage. Regular Kaizens should be done for improvements along with the implementation of 5 “S”. Big problems should be solved through design changes. A team must continue its sincere efforts till the glory of the machine is restored, all its problems are solved and the machine is working optimally. After tasting success, take up more machines for TPM then. Continue till the total plant is covered under TPM with the involvement of everyone in the plant for sustaining the standard achieved. The involvement of each and every person in the process of TPM is a key to success.

2.2.5 Benchmarking

The success of TQM depends upon taking decision to fill gaps in performance by putting in place best practices, thereby establishing superior performance. Three distinct types of Benchmarking can be used by an organization progressively to stimulate the improvement process. These are internal benchmarking, competitive benchmarking and comparative benchmarking (Evans, 2007). Towards the end of the 1970s, Xerox was confronted by formidable competition from Japanese firms. The Japanese were selling copiers at a cost comparable to Xerox's manufacturing cost. Xerox's market share was plunging. After years of disregarding its Japanese competition, Xerox had to confront reality. Although Xerox launched several programs in its counterattack, perhaps the most crucial was Benchmarking. With Benchmarking, employees in the organization determined the best practices in the industry. They learned about these best practices, implemented them, and became the best at them (Underwood, 2002; Murphy, 2005).

There is no singular conventional definition of benchmarking, but it is usually considered to be a method of making enhancements by making evaluations, and learning the lessons through comparisons. Benchmarking is also an instrument to support organizations to identify processes that need to modify to attain precise strategic goals (Hacker and Kleiner, 2000; Rigby and Bilodeau, 2007; Krishnamoorthy and D' Lima, 2014).

3. Methodology for the Case Studies

There have been numerous seminars on TQM by various experts in India to increase the level of understanding of the participants. TQM tools have also been covered during TQM seminars or separately. There have been consistent efforts by The Automotive Component Manufacturers Association of India to propagate this philosophy (ACMA) (<http://www.acma.in>). Federation of Indian Chambers of Commerce and Industry (FICCI) is also working in promoting TQM throughout the country (<https://ficci.in> >about-us). Understanding and monitoring of Enablers and Results relationship has resulted in effective implementation of TQM in various industries. Whichever organization has implemented TQM and its tools have been benefited in Quality, Productivity, Cost, Delivery, Safety, and in morale.

Since TQM has yielded much desired results in manufacturing and service industries, it was decided to undertake a case study of a renowned TQM consultant who was using this philosophy to improve his singing performance.

3.1 TQM Consultant Profile

This case study is based on leading TQM consultant Dr. V K Khanna, who was aspiring to use TQM philosophy for improving his singing performance. He is a Graduate Engineer (Mechanical) with Hons. from Banaras Hindu University, M.E. (Production Engineering) from I. I. T. Roorkee, MBA with distinction from Xavier's Institute of Social Service, Ranchi, Ph.D. (TQM) from I.I.T. Delhi. Total working experience has been around 48 years ranging from M/s H.E.C. Ranchi, Escort Ltd., Stallion Shox, Hero Honda (DGM – Manufacturing) and Mark Auto Industries Ltd. (Vice President - Operations & TQM), Mayur Uniquoters Ltd. (Sr. Vice President Operations), Institute of Management Technology, Ghaziabad (Professor Operation Management), Galgotias Institute of Management Technology (Director General),

Greater Noida Institute of Technology (Director). He is having hard core experience of implementing TQM and its tools like 5 “S”, Kaizen, TPM etc. So far more than 42 technical papers have been published in National and international Journals. He has presented many technical papers in the international conferences. He received Highly Commended Award for a paper titled ‘Managing the transition phases in the TQM journey: a system dynamics approach’ from Emerald Literati Club U. K. for the year 2005.

He received Best Ph.D. Thesis Award from Prestige Institute of Management and Research (Indore) on 30th January 2006 & his book along with co-authors on TQM has been well received by both academics and industry.

3.2 Motivation for Improving Singing Skills Through TQM

While implementing TQM in various industries, one thing is always emphasized and believed that if you don’t get ideas for improvement, start cleaning and new ideas will start flowing in the mind. Another thing TQM consultants usually emphasize is that before taking up bigger areas, try to make one area as a model with all the dedication, hard work, and sincerity involving all core team members. Selection of core team is the key to success. Select such team members who are wedded, self motivated and are ready to plunge and achieve the stipulated target/goal entirely and quickly. Dr. V K Khanna wanted to experiment this principle for self development. He wanted to confirm whether TQM principles will work in improving and developing one’s skill. After pondering on couple of personal weak areas, he decided to try TQM principles in improving his singing capability. Family members were also involved in the selection of final target, which was unanimous and supported by all for singing as a case study. Therefore, Dr. V K Khanna decided to make this weakest and critical area as a model using TQM philosophy.

First of all, the following Mission, Vision, and Goals were set for effective direction in line with TQM:

Mission: Committed to entertain audiences with the best selection of songs at any occasion.

Vision: To strive hard to continuously improve singing in line with best singers, step by step as per Short-term, Medium-term, and Long-term Goals.

TQM was introduced to achieve following goals in singing:

1. Short Term Goals (1 to 2 years)

- 1.1 Understand his inherent qualities and do SWOT analysis (Identify Strengths, Weaknesses, Opportunities, and Threats)
- 1.2 Prepare the list of singers whom he would like to benchmark
- 1.3 Involve family members to act as team members to suggest ideas and for genuine feedback
- 1.4 Use karaoke from Google for practicing
- 1.5 Trying singing in front of family members
- 1.6 Achieve some degree of acceptability

2. Medium Term Goals (3 to 6 years)

- 2.1 Download Star Maker for practicing and analyzing feedback
- 2.2 2.3 Prepare the list of songs for probable singing

- 2.2 2.4 Download Karaoke from Google on smart mobile phone and in laptop
- 2.3 Segregate and identify Karaoke in four categories i.e.; A, B, C, and D. A category karaoke for immediate practice, B category to try little later, after getting sufficient command in singing of A category of songs
- 2.4 Arrange good quality Bluetooth Karaoke speaker
- 2.5 Formation of small like minded 5 couples as singing group (Hum Panch) for fortnightly dinner meet and trying songs
- 2.6 To be recognized as singer in Hum Panch group

3 Long term Goals (7 to 10 years)

- 3.1 Try C category songs and attain sufficient knowledge for perfect delivery. D category is to be discarded to avoid wasting much of energy
- 3.2 Daily Practice of songs for at least 3 hours
- 3.3 Joining new groups for opening avenues for singing like Mitter Mandal, Retired Persons Association, and Fun Samarth Group
- 3.4 Singing in family functions and in restaurants as per the opportunity. Singing during national importance days in front of big gatherings
- 3.5 To establish himself as a singer and sing songs with ease as professional singers

3.3 TQM Singing Process

A TQM singing process was set up with family members. Dr. V K Khanna acted as Top Management, other senior family members acted as Middle Management and children acted as bottom management.

Six Phases of TQM implementation, with Eighteen Major Steps, were selected to be used during TQM singing process and actions were taken accordingly (Khanna *et al.*, 2008). Six phases of TQM, Eighteen Major steps, and action taken are shown in Table 7.

Table 7 Eighteen Major Steps and Actions Taken

Six Phases of TQM implementation	Eighteen Major Steps	Action Taken during TQM singing Journey
Start up and Commitment Phase 1	Develop Mission and Vision of the company	Mission and Vision were deliberated at length and decided
	Constitution of steering committee members	Steering committee comprising family members was formed
	Awareness Workshop for steering committee members	TQM Awareness training was given to all steering committee members
Strategy Phase 2	Developing TQM Goals for the Company	Short-term, Medium-term, and Long-term goals were decided
	Carryout macro level Self Assessment based on TQMI	SWOT analysis and self assessment was done initially on designed questionnaire
	Carry out Gap Analysis based on Industry Best Practices as well as TQM Goal	Gap analysis was done against best of locality singers to start with

	Formulate Strategy for Implementation based on Gap Analysis	Strategy was formulated to reduce the gap after discussion with local best singers
Systems and Protocols Development Phase 3	Develop organization wide TQM implementation plan based on Gap Analysis	Plan was chalked out for implementation to bridge the gap
	Develop action plan for improvement using QC Tools & various team approach	Five QC tools were selected for improvement
	Develop micro level monitoring and evaluation system	Monitoring system was decided based on P-D-C-A circle
Practice Phase 4	Launching of first phase of the TQM program for implementation based on Action plan	In First phase A category of songs were selected to be taken up for implementation
	Use QC tools and analysis for quality improvement	Religiously Five QC tools were used for quality improvement in singing
	Institutionalize continuous improvement through PDCA circle	Improvement as part of P-D-C-A circle was used as a matter of discipline
Monitoring Phase 5	Monitor plan v/s actual achievements	Regular monitoring was done through feedbacks from various sources
	Evaluate impact of successful activities on business and analyze failures	Impact of implementation process was assessed on growing audiences
	Conduct review by the steering committee and endorse corrective measures	Feedbacks from Star Maker and from other sources were also used for correction
Growth Phase 6	Expand areas of success and try other approaches	After tasting success, songs were expanded to B category of songs
	Draw up plan for next phase of TQM based on learning from the successes and failures	Plan was finalized for further C category of songs.

Seven enabling variables and five results variables were the basis while implementing TQM in six phases ((Khanna *et al.*, 2003; Khanna *et al.*, 2008).

To drive quality in singing, sixteen key quality characteristics of singing were identified as: 1. Being in Control: means staying “on pitch” 2. Good tone: means “the overall sound of the voice” 3. Clear Enunciation: means “words are not mumbled” 4. Strong Support: means “solid vocal support” 5. Suitable Volume means “singing at a suitable volume” 6. Suit the Style means “sing in a style which suits the song” 7. Consistency means “good voice throughout a song” 8. Musical Phrasing means “combination of pitch, volume, tone, enunciation” 9. Versatility means “adopt to any style of music and try confidently new things” 10. Self-awareness: means “being aware of your voice as you sing” 11. Use your Ears: means “hear and check your own pitch” 12. Know your range: “important to stick to your own range and notes” 13. Breathing: means “breathe properly” 14. Make it seem easy: “good voice makes it seem easy” 15. Love your voice; means “improve your own voice after

recording and listening” 16. Look after your voice: means “warming up before singing” (<http://www.musical-u.com> > learn).

3.3.1 5 “S” Process

To fulfill goals as per time bound plan, Steering committee initiated 5 “S” activities, as “S” is considered to be foundation for building block of TQM. Following activities were performed as per 5 “S” as compiled and shown in Table 8.

Table 8 Action Taken as per 5 “S” Activities

5 “S”	Action Taken
<i>Seiri</i> is about sorting out between necessary and unnecessary items in the workplace and discard unnecessary items.	Necessary and unnecessary songs based on SWOT analysis were done and the list of necessary songs was prepared.
<i>Seiton</i> means a place for everything and everything in its place. It is to make the arrangement of necessary items in good order so that they can be easily picked up.	Downloaded all relevant Karaoke for A, B, C, & D category songs. Indexing of each Karaoke was done for easy retrieval with colour codification.
<i>Seiso</i> means cleanliness; which should be the concern of everybody in the organization. Cleaning should be done with purpose.	Based on P-D-C-A circle, polishing and improving of songs was done regularly. Songs were thoroughly researched for its pitch, tone and delivery.
<i>Seiketsu</i> means maintaining of 1 “S”, 2 “S” and 3 “S”. Regular 5 “S” audits should be done. The emphasis here is on visual management and 5 “S” standardization	Sorting (Removing unnecessary songs), Seiton (Indexing and categorization into A, B, C, and D category), and Seiso (Polishing of songs) was a part of continuous process. D category of songs which were beyond reach was removed.
<i>Shitsuke</i> means instilling the ability to do things the way they are supposed to be done. Following 5 “S” should be part of the self-discipline..	Strict schedule for daily practicing was followed. Discipline only comes with motivation, hard work, dedication, and sincerity.

3.3.2 TPM Process

As in implementing TPM, it is always emphasized that team should select a critical machine to make it as a TPM model machine before trying other machines.

Same way based on SWOT analysis, one song was selected by team to make it a model and it was tried during grandson’s first birthday party. However, it was reasonably well accepted by the audience. Tasting one little success, team was involved in selecting another 25 songs to make them as model songs slowly and steadily one by one.

In these songs all out efforts were made for perfection after listening umpteen times of original songs. This is akin to the importance of providing education and training in implementing TPM, This is one of the very important pillars of eight pillars as suggested by Japan Institute of Plant Maintenance, and same is shown in Figure 5.

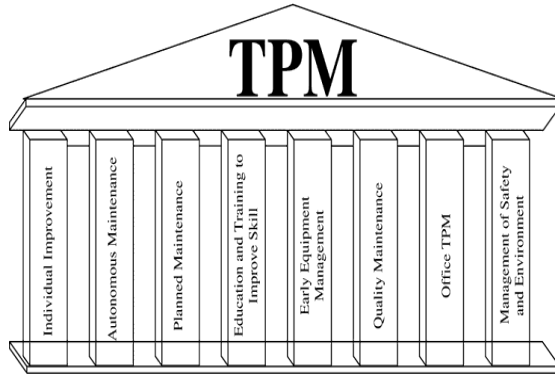


Figure 5 Eight TPM Pillars

After getting relevant feedbacks from different groups and audiences, these songs were further perfected. Subsequently, more songs from A category were selected for practice and perfection.

As in TPM process, making a critical machine as model requires daily cleaning of machines by all team members at designated time and period, same way strict schedule was followed for daily practicing of songs for at least 4 hours. Regular follow up meetings were held with family members and Hum Panch group and P-D-C-A circle was followed for perfection. Religious efforts were made to follow and practice sixteen quality characteristics of songs.

Regular practice of songs was done on StarMaker (vinod khanna 1950 ID: 13376848649) and after getting sufficient proficiency, 3 to 4 songs were regularly posted on StarMaker for getting feedback. These songs were also forwarded to Hum Panch members and in various other groups for evaluating feedback. Singing during Hum Panch meeting, which was conducted every fortnightly by rotation, was taken up very seriously. Before delivery of songs during Hum Panch meeting, regular practice and perfecting of those songs were done. Hum Panch meeting apart from singing was fun, which was followed by a sumptuous dinner. It acted not only as a catalyst in improving singing proficiency but improving personal relations as well. Videos of songs were also regularly posted in YouTube and Facebook for getting effective feedback.

3.3.3 Problem Solving Process P-D-C-A Circle

As P-D-C-A circle is extensively used in industries for solving problems, same way Plan-Do-Check-Action was followed in improving singing skills. P-D-C-A was done based on self listening, listening from StarMaker, listening from you tube or recordings from various functions/occasions/ Hum Panch. Paragraph by paragraph P-D-C-A was done in case of comparatively difficult songs within broader P-D-C-A of overall song. Religiously, integrated PDCA was followed as shown in Figure 6.

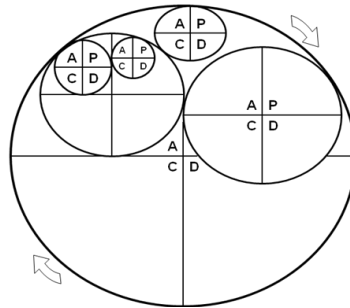


Figure 6 Integrated PDCA

While implementing Kaizen in improving singing skills journey, the wet blanket list as described in Table 6 was avoided. Basic tips for Kaizen activities, fundamental of improvements, and successful conditions for implementation of Kaizen were followed as listed in Table 6.

3.3.4 Benchmarking

The success of TQM depends upon taking decision to fill gaps in performance by putting in place best practices, thereby establishing superior performance through benchmarking. Internal benchmarking was done with best of singers in Hum Panch group to understand, learn, and practice. To improve further, benchmarking was done with best singers in the locality as well as with best in the country, understanding their strong points and delivery, It helped in improving sixteen key quality characteristics for improving singing voice (<http://www.musical-u.com> > learn).

Combination of 5 “S”, Kaizen, TPM, Problem Solving Process (P-D-C-A), and Benchmarking helped in improving sixteen key quality characteristics and improved singing performance. As in TQM it is very common to say that TQM is an endless journey towards becoming world class organization. Same way TQM is endless journey for improving sixteen key characteristics of singing.

To a greater extent, with intent, discipline, commitment, and Top Management involvement, TQM philosophy can be implemented, but at some stage, consultant’s involvement helps in fine tuning TQM journey and enhances the total process of implementation. Same way, you can attain great height in improving singing skills through TQM, but further perfection can be done with the involvement of consultant (Guru) to match best of singers in the country.

3.4 Performance Indicators

A Questionnaire was designed to evaluate the progress of singing using TQM philosophy on the basis of Caravatta (1997) and Siow *et al.*, (2001) Tables as shown in Tables 3 and 4, respectively.

The survey questionnaire helped to understand the progress made during 5 years of TQM singing journey i.e. from 2016 to 2021. The survey questionnaire was validated on close family members and relatives to establish its efficacy and based on feedback, it was modified and finalized.

Questionnaire was sent through e-mails/WhatsApp to all family members, relatives, and friends. The respondents were regularly followed to give their feedback and given needed clarification if required.

The survey questionnaire was sent across to over 184 targeted respondents in India and abroad. The analysis is based on the survey and responses are from 64 respondents out of targeted 184. The 64 responses were received after couple of reminders and personal phone calls, giving a response rate of 34.7 per cent. As the response rate is low, there is a possibility of non-response bias in the mail surveys. However, this issue was validated by using χ^2 -test with 95 per cent confidence level and found that:

- The distribution of the response group, category wise, shows no significantly different pattern relative to the population data.
- There are no significant differences in responses received before reminder and after reminder. This facilitated analysis and also increased the number of responses in each category of groups. As a result, the representation of the response group was improved; that is, the non-response bias probability was managed.
- Further, the characteristics, experiences and opinions of the respondents after reminder are not significantly different to those obtained by the first mailing.

3.4.1 Survey Results and Analysis

It should be noted that the analysis and interpretation of findings is based on the 64(34.7 percent) responses received out of 184 respondents. The category wise questionnaire was sent and responses received are compiled and shown in Table 9.

Table 9 *Category Wise Questionnaire Sent and Received*

Category	Questionnaire sent	Percentage of total sent	Responses received	Percentage of total responses received
Family members	28	15.2	16	57.1
Relatives	53	28.8	21	39.7
Friends	103	56.0	27	26.2
Total	184		64	34.7

The response was markedly better from “Family Members” category with 57.1 percent response against 39.7 and 26.2 percent of “Relatives” and “Friends” category groups, respectively.

Category wise Response analysis of a questionnaire (2016) is shown in Table 10. Based on 2016, total response analysis is compiled and shown in Figure 7.

Score wise Response analysis of each category (2016) has been compiled and shown in Table 11 and average score of each category along with total average is also shown in Figure 8.

Category wise Response analysis of a questionnaire (2021) is shown in Table 12 and also total response analysis is compiled (2021) and shown in Figure 9.

Table 10 Category Wise Response Analysis (2016)

Category	Responses Received	Very Bad	Bad	Satisfactory	Excellent quality	Superior Quality	Best of singers
Family members	16	5	8	3	0	0	0
Relatives	21	7	10	4	0	0	0
Friends	27	10	13	4	0	0	0
Total	64	22	31	11	0	0	0

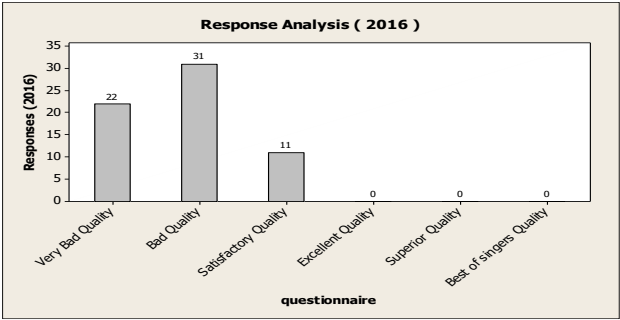


Figure 7 Total Response Analyses (2016)

Table 11 Score Wise Response Analysis (2016)

Category	Total Responses (Score)	Very Bad (Score)	Bad (Score)	Satisfactory Quality (Score)	Excellent quality (Score)	Superior Quality (Score)	Best of singers (Score)	Avg. (Score)
Family members	2800	0	1600	1200	0	0	0	175
Relatives	3600	0	2000	1600	0	0	0	171
Friends	4200	0	2600	1600	0	0	0	155
Total	10600	0	6200	4400	0	0	0	166

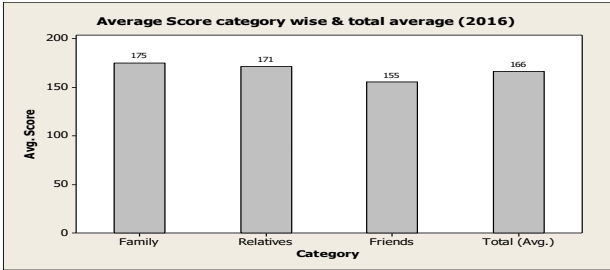


Figure 8 Average of each Category and total Average Score (2016)

Table 12 Category wise Response Analysis (2021)

Category	Responses Received	Very Bad	Bad	Satisfactory	Excellent quality	Superior Quality	Best of singers
Family members	16	0	0	1	1	14	0
Relatives	21	0	0	1	2	18	0
Friends	27	0	0	1	4	22	0
Total	64	0	0	3	7	54	0

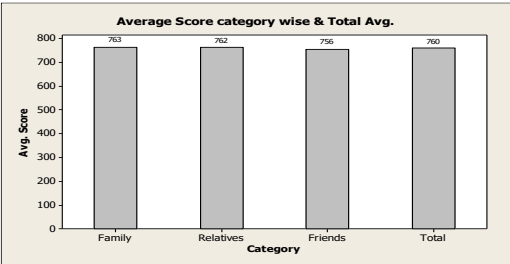


Figure 9 Total Response Analyses (2021)

Score wise Response analysis of each category (2021) has been compiled and shown in Table 13 and average score of each category along with total average is also shown in Figure 10.

Table 13 Score wise Response Analysis (2021)

Category	Total Responses (Score)	Very Bad (Score)	Bad (Score)	Satisfactory Quality (Score)	Excellent quality (Score)	Superior Quality (Score)	Best of singers (Score)	Avg. (Score)
Family members	12200	0	0	400	600	11200	0	763
Relatives	16000	0	0	400	1200	14400	0	762
Friends	20400	0	0	400	2400	17600	0	756
Total	48600	0	0	1200	4200	43200	0	760

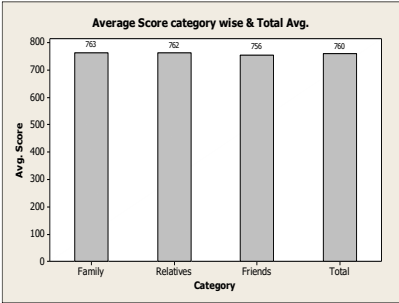


Figure 10 Average Score of each Category and total Average Score (2021)

A comparison of the average score of singing (2016) and an average score of singing (2021) is shown in Figure 11.

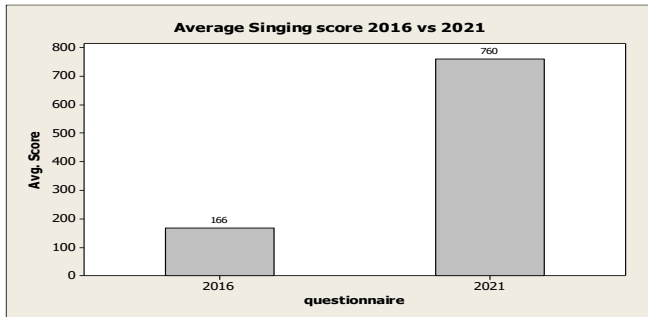


Figure 11 Average Singing Score 2016 vs. 2021

Two-Sample T-Test analysis of before (2016) and after (2021) implementation of TQM. Two-sample *t* for Avg. Score before vs after

N Mean StDev SE Mean
Avg. Score (2016) 3 167.0 0.6 6.1
Avg. Score (2021) 3 760.33 3.79 2.2

Difference = μ (Avg. Score (2016)) - μ (Avg. Score (2021))
Estimate for difference: -593.333
95% CI for difference: (-621.255, -565.412)
T-Test of difference = 0 (vs not =): T-Value = -91.43 P-Value = 0.000 DF = 2

Since p-value is less than 0.05, it can be concluded that singing performance is significantly different after implementation of TQM. This is evident through boxplot Figure also, which is shown in Figure 12. Singing performance has significantly improved after TQM implementation.

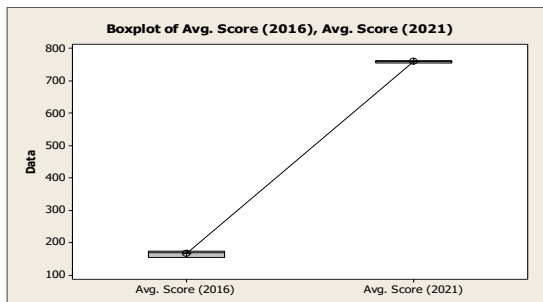


Figure 12 Two-Sample *t*-Test Analysis of Singing Score after TQM Implementation

The average score of 166 in the year 2016 states that singing performance was somewhere between very bad and bad category. After using TQM philosophy,

singing performance shows dramatic improvement in the year 2021. In the year 2021, the average score improves from 166 in the year 2016 to 760. As per the questionnaire, 760 score means that singing performance has been very close to Superior quality.

When score of 760 is compared with Carvatta (1997) and Siow *et al.*, (2001) Table, the performance of singing has been very close to Superior quality accomplishment and higher than Award winners respectively. Therefore, the average score of 760 shows a great mark of improvement in singing performance.

It is evident from Table 5 that TQMI with the highest effectiveness of enablers reaches to 829 levels under weak market scenario after the tenth year and reaches to TQM maturity level after 13 years. Since 760 singing score has been achieved in around five years of time period, there is every possibility of achieving the same level in ten years or ahead of time, provided highest effectiveness of enablers continues using TQM philosophy. Singing performance data corroborates that this kind of achievement has been possible because of TQM philosophy and almost all goals were achieved during 5 years of time.

4. Observation on Implementation Strategy and Recommendation

Based on analysis of questionnaire data, it is concluded that the concept of TQM can be used in improving singing process. Complete implementation of TQM philosophy and its tools as per requirement can lead to individual's performance to a greater height and in the shortest possible time. Based on case study, strong and weak areas have been identified and there is a need to institutionalize strong points and take countermeasures on weak areas for achieving still better and earlier results.

The observations and recommendations have been compiled and discussed below for achieving effective and fast results.

4.1 Observations

1. Education and training of TQM and its tools should have been given more structurally and systematically in initial stages to Steering Committee members and Hum Panch family members and purpose of using TQM for improving singing should have been more elaborated.
2. P-D-C-A circle should have been used more effectively and not getting true feedback is a big hurdle. Negative feedback should have been encouraged more positively. As Japanese consider negative feedback as goldmine for further improvement in the organizations and encourage negative feedbacks.
3. Using of StarMaker was quite late due to absence of knowledge.
4. Focusing and polishing of model songs initially should have been done more religiously.
5. Consultant help should have been sought in the initial stages that might have enhanced singing performance even further.
6. More avenues for singing should have been explored.

4.2 Recommendation

Since competition among various aspiring singers is very high, therefore singing profession falls in the category of External enabler weak market scenario. Therefore,

for aspiring singers to become successful more effectively, following points are recommended.

1. Utilize full potential of TQM during singing journey.
2. Education and training on TQM philosophy is a must to have an edge over others.
3. Use StarMaker or similar apps for continuous improvement and listen to songs very critically. Listen original songs enthusiastically and observe minutely.
4. Always monitor your goals. If need arises, reformulate goals.
5. Always explore more avenues for singing. Be ready for competition among best of aspiring singers.
6. Make use of consultant i.e., guru for perfecting singing process.
7. Always be positive to negative criticism and be ready to learn. Devote 4 to 5 hours daily on practicing, without fail.
8. Always try to improve sixteen key quality characteristics of singing, while benchmarking best of singers.
9. To be competitive, organizations must start TQM initiatives right in the initial stages. Same way, to be competitive in singing profession, TQM initiatives must start right from the beginning.
10. After achievement of goals, next round of goals must be decided as a part of continuous improvement.

5. Conclusion

This case study has been done to investigate the utility of blending TQM philosophy during singing journey. It is evident from the compilation of data that TQM can be instrumental for improving anyone who is aspiring to be among top singers. However, any individual can achieve higher heights in shortest possible time provided they follow all six phases and eighteen steps of TQM implementation, along with 5 very important TQM tools. The analysis of TQM journey highlights the importance of getting better results with the highest effectiveness of enablers. The observation of weak points of the case study has been discussed and recommendation has been suggested to have edge over other aspiring singers who go without TQM knowledge. The paper gives an insight regarding TQM and its tools and the case study gives an insight how to improve the singing process through TQM and attain new heights among best of the singers. After the success of model songs, the TQM activities must be extended to other category of songs and singers. The lack of regular interaction with steering committee members and lack of analysis of feedbacks may retard the speed of improvement and hence must be avoided. Daily practice, education and training, and setting new goals are the keys to success and always remember that there is no short cut in implementing TQM.

6. References

1. About FICCI. Available at: <https://ficci.in/about-us> (accessed 28 June 2021).
2. Bessant, J. and Caffyn, S. (1997), "High Innovation through continuous improvement", *International Journal Technology Management*, Vol. 14 No. 1, pp. 7-28.

3. Brown, M. G. Hitchcock, D. and Willard, M. (1994). *Why TQM fails and what to do about it*. Burr Ridge IL: Irwin Professional Publishing.
4. Caravatta, M. (1997), "Conducting an Organizational Self-Assessment using the 1997 Baldrige Award Criteria", *Quality Progress*, Vol. 30, No. 10. pp. 87-91.
5. Charantimath, P. M. (2004), *Total Quality Management*, published by Pearson Education (Singapore) Pte. Ltd., Indian Branch, Delhi.
6. Chiguvi, D. (2016), "Impact of Total Quality Management on Customer Satisfaction in the Retail Sector: Case of indigenous Supermarkets in Botswana", *European Journal of Business and Management* www.iiste.org ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online), Vol. 8 No. 28.
7. Deming, W. E. (1992), *Out of the crisis*, Productivity & Quality Publishing Private Limited Madras, India. DOI:10.1108/02656710210429582
8. Editorial, G. (2018), "20th Excellence in Services International Conference (EISIC) (formerly Toulon–Verona Conference)", *The TQM Journal* Vol. 30 No. 5, pp. 442-443.
9. Evans, J. R. (2007), *Total Quality management, organization, and strategy*, fourth edition, printed & bound in India by Anubha printers, Noida, India.
10. Evans, J. R. and Lindsay, W. M. (2004), *The Management and control of quality*, sixth edition, printed in India: Chennai Micro Print Pvt. Ltd.
11. Frazelle, E. H. (2002), *World-Class warehousing and Material Handling*, Tata McGraw-Hill Publishing Company Limited, New Delhi, India.
12. Gorantiwar, V. S. Shrivastava, R. L. (2014), "Identification of critical success factors for quality-productivity management approach in different industries", *International Journal of Productivity and Quality*, Vol. 14 No. 1, pp. 66-106.
13. Grandinetti, R. Ciasullo, M. V. Paiola, M. and Schiavone, F. (2020), "Fourth industrial revolution, digital servitization and relationship quality in Italian B2B manufacturing firms. An exploratory study", *The TQM Journal*, Vol. 32 No. 4, pp. 647-671.
14. Gunasekaran, A. Marri, H. B. and Menci, F. (1999), "Improving the effectiveness of warehousing operations: a case study", *Industrial Management & Data Systems* 99/8, pp. 328 -339.
15. Hacker, M. E. and Kleiner, B. M. (2000). "12 steps to better benchmarking", *Industrial Management*, 42(2), pp. 20-23.
16. Harrington, H.J. Voehl, F. and Wiggin, H. (2012), "Applying TQM to the construction industry", *The TQM Journal*, Vol. 24 No. 4, pp. 352-362.
17. Ho, S.K.M. (1998), "5-S practice: a new tool for industrial management" *Industrial Management & Data Systems*, Vol. 98 No. 2, pp. 55-62.
18. Ho, S.K.M. (1999), "Japanese 5-S - where TQM begins", *The TQM Magazine*, Vol. 11 No. 5, pp. 311-20.
19. Ho, S.K.M. and Cicmil, S. (1996), "Japanese 5-S practice", *The TQM Magazine*, Vol. 8 No. 1, pp. 45-53.
20. Ho, S.K.M. Cicmil, S. and Fung, C.K. (1995), "The Japanese 5-S practice and TQM training", *Training for Quality*, Vol. 3 No. 4, pp. 19-24.
21. Imai, M. (1986), *Kaizen the Key to Japan's Competitive Success*, McGraw-Hill Publishing Company- Europe.

22. Imai, M. (1997), *Gemba Kaizen: A Common Sense, Low Cost Approach to Management*, McGraw-Hill, London.
23. Ishikawa, K. (1985), *what is Total Quality Control? The Japanese Way*, Prentice-Hall, INC. Englewood Cliffs, N. J.
24. Juran, J. M. (1986), "Quality trilogy", *Quality Progress*, August, pp. 14-24.
25. Juran, J. M. (1992), *Quality by Design: The News Steps for Planning Quality Goods and Services*, Thomson Learning, New York, NY.
26. Juran, J.M. (1990), "China's Ancient History of Managing for Quality", *Quality Progress*, July 1990, page 32.
27. Kalu, J. C. Obi, J. N. Ekeagbara, J. A. Odejebi, T. Obiri J. E. Oloruntoba, A. Kolawole, A. and Beckley, B. C. (2021), "Total Quality Management and its effects on Organisational Performance: a study of PZ Cusson Plc. Lagos, Nigeria, *International Journal of Productivity and Quality*, Vol. 32 No. 2, pp. 203-215.
28. Khanna, V. K. (2008), "Total productive maintenance experience: a case study", *International Journal of Productivity and Quality Management*", Vol. 3 No. 1, pp. 12-32
29. Khanna, V. K. (2009), "5 "S" and TQM status in Indian organizations", *The TQM Journal*, Vol. 21 No. 5 pp.486-501.
30. Khanna, V. K. and Gupta, R. (2014), "Comparative study of the impact of competency-based training on 5 "S" and TQM: a case study", *International Journal of Quality & Reliability Management*, Vol. 31 No. 3, pp. 238-260.
31. Khanna, V. K. Shankar, R. Vrat, P. and Sahay, B. S. (2002), "Developing causal relationships for a TQM index for the Indian automobile sector", *Work Study*, Vol. 51 No. 7, pp.364-373.
32. Khanna, V. K. Shankar, R. Vrat, P. and Sahay, B. S. (2003), "TQM modeling of the automobile manufacturing sector: a system dynamics approach", *Work Study*, Vol. 52 No. 2, pp. 94-101.
33. Khanna, V. K. Vrat, P. Sahay, B.S. and Shankar, R. (2008), *TQM Planning, Design & Implementation*, New Age International Publishers, India.
34. Kondo, Y. (1999) *Companywide Quality control*, printed by 3A Corporation, Tokyo, Japan.
35. Krishnamoorthy, B. and D' Lima, C. (2014), "Benchmarking as a measure of competitiveness", *International Journal of Process Management and Benchmarking*, DOI: 10.1504/IJPMB.2014.063240, pp.1-17.
36. Kristianto, Y. Ajmal, M. and Sandhu, M. (2012) "Adopting TQM approach to achieve customer satisfaction A flour milling company case study", *The TQM Journal*, Vol. 24 No. 1, pp. 29-46.
37. Learn Musicality and Ear Training/ Musical U available at: <http://www.musical-u.com> > learn (accessed 28 June 2021).
38. Louis, M. (2001), *the Metaphysical Club – A Story of Ideas in America*, Farrar, Straus and Giroux, New York.
39. Mizuno, S. (1988), *Company Wide Quality Control*, Asian Productivity Organization, Tokyo.
40. Murphy C. (2005), *Competitive Intelligence: Gathering, Analysing and Putting It to Work*. Gower. Aldershot.

41. Najmi, A. Ahmed, W. Uddin, S. and Zailani, S. (2021), "Enhancing Performance through Total Quality Management in the Pharmaceutical Manufacturing Industry of Pakistan", *International Journal of Productivity and Quality Management*, Vol. 33 No. 1, pp. 21-45.
42. Nakajima, S. (1988) *Introduction to TPM*, Cambridge, MA: Productivity Press.
43. Oakland, J.S. and Tanner, S. J. (2006), 'Quality management in the 21st century-implementing successful change', *International journal of Productivity and Quality Management*, Vol. 1, Nos. ½, pp.69-87.
44. Osada, T. (1991), *the 5-S: Five Keys to a Total Quality Environment*, Asian Productivity Organization, Tokyo.
45. Pannirselvam, G. P. and Ferguson, L. A. (2001), "A study of the relationships between the Baldrige categories", *International Journal of Quality & Reliability Management*, Vol. 18, No. 1, pp. 14-34.
46. Pradhan, A. Mauryakufa, F. T. (2017), "Strengthening Quality Management in Zimbabwean Film Industry", *Proceedings of the International Conference on Industrial Engineering and Operations Management* ,Bogota, Colombia, October 25-26, 2017.
47. Rigby, D. and Bilodeau, B. (2007), Selecting management tools wisely. *Harvard Business Review*, 85(12), 20-22.
48. Shingo, S. (1982), *Study of Toyota Production System from Industrial Engineering, View Point*, Japan Management Association, Tokyo.
49. Shirose, K. (1992), *TPM for Workshop Leaders*, Cambridge, MA: Productivity Press, Inc.
50. Siow, C. H. R. Yang, J. B. and Dale, B. G. (2001), "A New Modeling Framework for Organizational Self-assessment: Development and Application", *Quality Management Journal*, Vol. 8, Issue, 4, pp. 34-47.
51. Suárez-Barraza, M.F. Ramis-Pujol, J. and Kerbache, L. (2011), "Thoughts on Kaizen and its evolution: three different perspectives and guiding principles", *International Journal and Lean Six Sigma*, Vol. 2 No. 4, pp. 288-308.
52. Tajiri, M. and Gotah, F. (1992), *TPM Implementation: A Japanese Approach*, New York, NY: McGraw-Hill.
53. Talib, F. ; Rehman, Z., (2009), "An exploratory study of total quality management practices in service industries", *Conference: 3rd Annual International Conference on Management and Social Welfare* , organized by Indian Institute of Social Welfare and Business Management (IISWBM), Kolkata, India.
54. Terziovski, M. and Samson, D. (1999), "The link between total quality management practice and organizational performance", *International Journal of Quality & Reliability Management*, Vol.16 No. 3, pp. 226-37.
55. The Automotive Component Manufacturers ...available at: <http://www.acma.in> (accessed 28 June 2021).
56. Ulrich, K. Choudhry, RS. And Rana, K.S. (2000), *Managing Corporate Culture: Leveraging Diversity to Give India a Global Competitive Edge*, Macmillan India, New Delhi.

57. Underwood J. (2002), *Competitive Intelligence*, Oxford, Capstone publishing.
58. Wilkinson, A. and Witcher, B. (1991), "Fitness for Use? Barriers to Full TQM in the UK", *Management Decision*, Vol. 29 No. 8. <https://doi.org/10.1108/EUM00000000000086>.
59. World Class Manufacturer (2007), available at: www.referenceforbusiness.com/management/Tr-Z/World-class-Manufacturer.html.

About Our Author

Vinod Kumar Khanna has done Masters of Engineering from IIT Roorkee and PhD (TQM) from IIT Delhi and presently, he is giving consultancy to various organizations for the implementation of world-class practices. Earlier he worked as Director at Greater Noida Institute of Technology, Greater Noida, India, and at Galgotias Institute of Management and Technology, Greater Noida, India. He has rich experience in implementing world-class practices like 5 “S”, Kaizen, TPM, TPS, Poke-Yoke, IATF 16949, ISO 9000, ISO 14001, and OHSAS-18001 in various organizations. He has been credited with the publication of more than 42 research papers in international and national journals. He has also presented many papers at national and international conferences as well. He received a Highly Commended Award for a paper titled ‘Managing the transition phases in the TQM journey: a system dynamics approach’ from Emerald Literati Club U. K. for the year 2005. He also received the Best Ph.D. Thesis Award from Prestige Institute of Management and Research (Indore), India on 30th Jan’2006 & his book along with co-authors on TQM has been well received by both academics and industry. Vinod Kumar Khanna can be contacted at: qems70@hotmail.com.