

Newsletter

# Indian Society for Quality



**HAPPY NEW YEAR**

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Newsletter

# Indian Society for Quality



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## Dear Readers,

Greetings !

I have great pleasure to bring this last Newsletter for 2020.

We completed a very successful one year of the Newsletter and in that way we can call this as our anniversary edition.

Thank you, dear readers, for your patronage and encouraging us to bring the newsletter to this stage. We bring you regular updates on ISQ activities in addition to providing articles of professional wisdom and knowledge.

My sincere thanks to the contributors, it now looks much better from where we started a year back.

It seems to be a relief of sorts that 2020 is finally coming to an end. The pandemic has taken close to 1.7 million lives across the world and still counting. It has caused much pain and suffering to the people, disrupted many businesses , worst impacted ones being travel and hospitality , and changed working paradigm for many sectors permanently e.g. WFH is likely to stay in IT industry for a significant workforce resulting in substantial cost reductions and improving margins. In manufacturing sector too concepts of remote auditing are becoming popular. These are some of the beneficial outcomes of the chaos created by COVID-19 .

Good news is that several vaccine candidates are at advanced stages of approvals while some are already released for mass usage. That brings much needed relief from the gloom and uncertainty prevailing for most of the year.

At ISQ we have reason to cheer this year as the organization comes out from dormant phase to a vibrant body. We have seen all the 3 chapters viz Delhi -NCR, Pune and Bengaluru organizing activities throughout the year. Now Bombay chapter is taking shape to add to the initiatives.

At our flagship event of Annual Conference held on 11<sup>th</sup> and 12<sup>th</sup> Dec 2020, we saw very illustrious speakers sharing their thoughts and knowledge. It was a first-time experience for us to hold The Conference in virtual mode. We had huge participation of over 200 participants, the event was very successful and appreciated even though Panel Discussion session had some disturbance due to technical issue of a cross connection , which is still being investigated.

Our sincere thanks to our 7 sponsors who came forward and contributed in making this event successful, in spite of having a bad year financially. That was a huge positive for us.

Going into 2021, I hope we will overcome the COVID-19 completely and normalcy will return in all operations.

I wish , on behalf of IQS and my own personal behalf , all the readers a very happy, healthy and successful 2021 COVID-19 is still very much around, so follow safety precautions and enjoy reading !

**Ved Parkash**

## Vignettes from Ram

### Quality and The New Age: Reciprocal Adjustment

When we listen to New Age music – of Enya, Yanni or Kitaro – we experience relaxation. But here we are talking of New Age businesses and technologies. These we may perceive as creating an exciting future but they are also tumultuous and vaguely intimidating.

The New Age encompasses not only the growing digital world, often described as Industry 4.0, but also stirring new technologies in bio-, medical, materials and nano-, and even transportation (hyperloop) arenas. Then there is the crisis of environmental sustainability and the approaches proposed to avert a catastrophe.



Every day, quality professionals are exhorted to adapt to Industry 4.0, and thus create Quality 4.0. This advice is unexceptionable because if a profession lags behind the evolution of the world then it would soon be obsolete. (It is clumsy to have to say ‘quality professional’ every time. We need a new word to describe ourselves. I propose *Qualitist* coined by the consultancy firm QIMPRO. Yes, like economists and scientists, we are *qualitists*.)

Wherever *qualitists* have succeeded, they have brought into the work of the technical or functional experts the imperatives of fulfilling customer needs, being economical, and involving all concerned. They have also successfully introduced techniques – whether for gathering customer needs and developing products or generating manufacturing efficiencies and service excellence, or simply preventing failures. Creating Quality 4.0 involves the same approach. Already there is a proposal for seven tools for Quality 4.0. Let us also develop pathways to deal with technologies other than Digital, and for sustainability concerns.

Thus, Quality must be a partner in the New Age which has been spawning unprecedented features - in plentiful numbers. Many of these are recognized as *attractive* qualities, in the Kano sense. An unknown number would of course turn out to be duds. It is not the standard practice of most professions to deeply understand the needs of those whom they serve before designing or developing their offerings. We *qualitists* can help avoid this pitfall and improve the hit rate.

There is a deeper problem, however. New Age technologies and businesses often seem to lack a vocabulary for delivering quality. If you dive into search engines looking for data on quality failures in the New Age, you may find precious little. They have a different lexis. At the same time, the average user of these technologies – from plain emailing to mobile banking, transactional websites, embedded software, or IoT applications – experiences trouble every day. When we search the Net for help, we run into co-sufferers, lots of confusing advice, and opaque company ‘Help’ and ‘Support’ desks that feel like cruel jokes.

It's simple; the New Age has consistently demonstrated deficient 'must-be' qualities. In most cases, these malfunctions, bugs, 'glitches', errors, are merely annoying. Sometimes they are exasperating, even scary. Unfortunately, despite billions of dollars invested into depersonalized contact centres and helpdesks, the user is often left unheeded. Organizations justify snags as inevitable when releasing new products early, which would be understandable with so many attractive features offered, except for the sheer quantum of the troubles. So ubiquitous are hassles that a generation has come up expecting them. This is our *new normal*.

For all the talk of Big Data and analytics, problems arising from poor data quality, its pedigree and its integrity can be destabilizing. Dashboards are pervasive now, but most are designed by IT professionals without inputs from qualitists. They rarely distinguish between special and common causes, and fail to call improvements or their lack correctly. IoT alerts pop up in high frequency not just to the operator but to supervision, accentuating the growing attention deficit syndrome in society. Management is not about reacting to numbers minute to minute.

The damage done is not merely from annoyances, conceptual flaws, or inconveniences. After all, people *have been* swindled not only of money but even identity through cybersecurity loopholes. Some have lost life savings in the financial crash of 2009 which was made possible by technology.

Then there is loss of life. The two crashes of the Boeing 737 Max aircrafts killed 346 people. It is said that an automated system known as the Manoeuvring Characteristics Augmentation System, or MCAS which is triggered without pilot input, was fed faulty information from a sensor, forcing the aircraft nose to point down. Other analysts write about the gradual erosion of Boeing's engineering culture by a cost-cutting culture. This tragic failure is of the New Age, and not of the era of mechanical or electrical faults. Can you imagine the consequences of new warfare conducted through AI, something already in the discourse?

Emphatically, the New Age needs to practice quality, as much as we qualitists need to work with the New Age. Mary Parker Follett, speaking in 1925, urged us professionals

“not to adapt ourselves to a situation – we are all more necessary to the world than that; neither to mould a situation to our liking – we are all ... of too little importance for that; but to take account of that reciprocal adjustment, that interactive behaviour between the situation and ourselves which means a change in the situation and in ourselves.”

Whether it is digitalization or sustainability, that's our clarion call: *Reciprocal adjustment*. It has to be a movement from and into quality.

### About the author:

**Mr. N. Ramanathan is a senior counsellor and advisor of TQM. He is a Mechanical Engineer with Masters from IIM, Ahmedabad(1969) with 50 years of experience in industry, and in teaching and counselling. Ram has received awards internationally for his work, as well as receiving the Dronacharya Award in 2018 by ISQ for his contributions to teaching and counselling on quality. Ram has been associated with twelve successful Deming Prize challenges, and has taught and advised Ashok Leyland, Ceat, SRF, Indus Towers, JSW, Mahindra group of companies, Tata Quality management Services, Tata Steel, and other organizations.**

## The Quality Manager and Customer Experience

By Usha Rangarajan

Whether you in a B2B or a B2C business, in a high value business, or a mass, volume driven scenario, your customer is the true driver of growth, success, profitability and brand value.

The customer's decision to continue to do business with you, grow or shrink the value of business with you, or switch to competition, is strongly influenced by her perception of your quality, responsiveness, value for money and how well your product or service meet his needs. The quality manager has a strong grasp of the tangible customer deliverables; he defines and monitors CTQ metrics primarily around defects, cost and time, and focus largely on internal operational processes, except in few service-oriented domains such as hospitality or airline or BPO.

But research has shown that customer's perception of how your business 'treats' him and values him, is a critical driver of engagement and retention.

This perception is driven by tangible outcomes, and also by intangible experience.

***The customer experiences your organization in the multitude of touchpoints, direct and indirect, every day, every time they come into contact with you. Every instance of customer experience, every touchpoint, defines your brand to the customer.***

A Bain & Co study revealed that companies that excel at customer experience grow revenues 4-8% about the market.

Clearly, this is the reason behind 72% of businesses stating that improving customer experience is their top priority (Forrester)

But the Quality function has traditionally been kept away from customer experience in some organizations.

It is worse in a B2B scenario and in product-oriented businesses- it is as if Quality is an 'internal' function, while customer experience is the Marketing or Sales department's baby.

A wrong belief that that customer experience is very ambiguous, and subjective, and cannot and does not benefit from process rigor is behind this state. To make it worse, there is a wrong belief that process rigor is detrimental to customer experience and comes in the way of front-line activity. It is not uncommon for the quality manager to hear comments such as,

'You want me to follow your process, or engage with customers?'

'My franchise operates out of a small room, is not high-tech. I cannot force him to follow your process standards'



The service engineer is hassled enough as it is. I cannot expect him to focus on completing your process steps, let him focus on fixing the issue and making the customer happy'

'Come on, these process documents and standards are to keep quality folks busy and get those certifications. My team and I are better off doing our work the way we know best, that is what makes customer happy'

Not unfamiliar isn't it? Big or small, high tech or no technology, many leaders and managers, especially those who lead customer facing teams, find it unnecessary to focus on adherence to SOPs and process standards, filling in data into the requisite system, go from step A to step B in a certain sequence, or complete all steps as per the laid down procedure in activities that have a direct customer touch or that support the customer. Even where the standards are built into an IT workflow, the tendency is to find ways to do it outside the system or to side-step some of the actions which the team believes are 'internal quality standards'

So, why focus on process and standards for customer-facing teams? In your heart, do you agree with my friend who says it is for the quality team and to satisfy certification concerns?

The elephant in the room that everyone misses is the fact that customers expect good brands to deliver a consistent, transparent, responsive and honest experience across all touchpoints. Their journey with the brand starts from discovery, goes on to the buying experience, the experience of using the product or service, the installation experience where relevant, the experience of upkeep/breakdown support / service, billing and payment and the experience with the brand when something goes wrong and they raise a concern. Different departments handle the customer touchpoints across these journeys – from sales and marketing, to service teams to even the finance/billing and collections teams.

Different people with different views and attitudes involved in the touchpoints means the customer experience can vary from very good to very bad. The only way for the brand to minimize this variance and ensure a minimum acceptable level of customer experience is to set standards, monitor, measure and improve them.

Most brands set customer facing standards and monitors them. The missing link that weakens the effective achievement of standards is that of aligning all relevant processes and procedures including internal processes, put in metrics and measures – that support and ensure consistent delivery of customer facing standards.

Vaguely defined processes, not defining processes for critical activities or poor process adherence anywhere in the chain impacts customer experience and becomes the cause for variance. The experience is then dependent on the individual employee providing the service, his or her attitude, competence, and state of mind on that particular day to deliver a great or a poor moment-of-truth.

Let me illustrate this with an example, that shows the interface of customer experience and process standards.



Let us take the case of a customer who needs his water purifier serviced.

His experience starts with the call to the customer care number. He completes a set of transactions with the agent who handles his call, experiences many touchpoints – the agent’s response and competence, as well as his attitude to the customer; the accuracy of the customer data in the system; the receipt of the service request number.

When the engineer goes to the customer’s location, the customer has the ‘service experience journey’ – the step by step service procedures and standards followed by the service engineer form a critical part in this journey. The closure of the service call and collection of feedback are also touchpoints here. The underlying processes in this example are both direct, customer-facing, as well as indirect and supporting in nature.

Call handling is usually a well-defined, documented and closely monitored activity. The weak links are usually the supporting processes and standards.

In this example, processes for capturing, updating and managing the customer data may not be well defined, or closely monitored to check if they are working. Result? The system may have an old invalid address and cause a break-down in the entire chain, resulting in customer dissatisfaction, delay in service, breaking the trust and loyalty to the brand. So, we see that the standards and protocols that are set at every stage in the underlying processes are critical to delivering a consistent and adequate level of service to the customer.

It may be a small one – such as tagging every service request to a request number that is used throughout the duration of the service cycle, till successful closure. This ensures that there is traceability and continuity across the transactions that change hands from customer care to the service franchise to the service engineer. Any gaps, delays, quality issues, even parts replaced – are all clearly identified. The customer too has a way to express satisfaction or dissatisfaction against the specific service instance, reopen the case till it is solved.

Who is better placed than the quality manager, as a boundary-spanner, someone who can step into the customer’s shoes and take a holistic view of the inter-functional flow of processes that create the customer experience, and define appropriate standards and processes? He is also the right person to monitor the performance and support in improvement and correction.

A good quality manager can even enhance customer experience and keep the brand ahead of its competitors with the strength of the processes and standards he helps to define, the controls and corrective mechanism he recommends.

The erroneous belief that great customer experience is only about the attitude and courtesy of the people involved needs to be examined. So is the belief that 'competence' is something that comes only from training, and competent employees are enough to deliver a great experience, consistently. A well-defined set of procedures, with good checks and controls, go a long way, and the brand can even deliver a good level of customer experience with less competent people.

There are few techniques that the quality manager can adopt while designing processes that will ensure he keeps the brands promise to its customers and the customer's experience of the brand at the center of his process design.

1. Step into the customer's and the frontline employee's shoes while designing your processes.

Understanding the customer's priorities, mindset and anxieties at each stage in his/her journey is critical to designing the process and defining standards right. To do that, you need to get to the Gemba first.

At the Gemba, you will also see where you need to build controls.

Some good quality manager did this well, and so at most good automobile service centers, you will see the process design that address the customer's mindset at that stage in his journey – from the check-list that captures the condition of your car at the start, to the briefing of the work being proposed and taking your concurrence, to returning the old parts where they have replaced it, the design builds trust, displays transparency, creates credibility for the brand.

I am sure that if we ask the service engineers or the service center head, they will not think of these as processes that help enhance customer experience. They may even complain that it is adding to their workload.

But think about it – every step builds assurance in the experience, ensures traceability, offers the customer transparency and builds trust in the brand.

So, clearly, great quality processes enhance and ensure great customer experience – consistently, without the need for people to use their judgement or individual ideas.

1. Look outside the industry to benchmark best practices and standards that add trust and consistency to the customer experience of your brand. I always see the opportunity for service centers dealing with electronics to copy some of the processes and standards from the automobile industry. Then, you the customer will not be left wondering if the motherboard was truly replaced or you were swindled; the service engineer and you wouldn't be arguing that the scratch on the cover was put by them or by you.

If you copied practices from another industry, and none of your competitors are doing it today, whoever does it first differentiates and stands out.

In summary, it is clear that the role of the quality manager is far from being an inward facing one, divorced from the customer's experience. In fact, a great quality manager is someone who adds tremendously to the customer's experience of your brand

#### About the author:

**Ms. Usha Rangarajan is a Leadership and Transformation Consultant with rich experience of over thirty years across functions and industries. Her longest stint has been with IT and IT-enabled services, hospitality and Telecommunications. She was a Chief Transformation Officer at Tata Teleservices before she ventured out on her own and set up a consulting firm called 'UnLEASH' (<https://unleash.co.in>). Through UnLEASH, she has consulted with a wide range of industries ranging from hospitality, real estate, educational institutions, full-service airline, telecom, and ITES. She supports her clients in designing and implementing transformational programs in customer experience, human resources, and business processes. While She runs organization and leadership development programs; Usha is pro-bono expert and an advisor to an NGO named Sevalaya ([www.sevalaya.org](http://www.sevalaya.org))**

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## When Millennials meet TQM

### Part 2

B.Sundara Rajan,  
Partner & Principal Consultant ,BSR's peepal tree Consulting



#### Preamble :

In the prequel of this article published in Sep 2020 , we had covered the points about the changing business scenario due to the emergence of the Millennial generation in key positions . We had tried to explore the specific traits of this Generation which is roughly captured in the collage below ;



We also tried to glean an idea of how these will impact TQM adoption and practice. As a continuation , given below are some thoughts on how the conventional practices of various TQM Methods have to be re thought of.

#### **Impact of the mindset :**

On a positive note the world has learnt to see the Millenials as digitally proficient, adaptable, confident, creative, knowledge-seeking catalysts for accelerated business change. Using this knowledge , definitely changes have to be made in the way we train , implement and review the Millenials practicing the different management systems .

Given below I have outlined a few possibilities in the TQM domain. These are mostly experiential , some of which working to good effect . Some of the actions cut across the practices which I am capturing as common points . Points specific to individual TQM systems are reflected upon later :

#### **The Common points:**

- 1. Ensure the workplace is peppered with technology . Digitize work 360 degrees :** Manual is out and don't make it as a "holier than thou" point. Millenials scream for smart work , and definitely don't shy away from hard work . Make data capture , computation to indices , popping up outliers , call for action everything digitized. Remember . the key outcome is data and analysis not manual or auto.

**2. Keep roles flexible with due competence building** : Multi tasking is their cup of joy. Do not deny it. If shop floors should multi skill , why not offices too. Transfer the skills from matrix to action. Flexibility should be beyond “timing”. Give freedom for them to workout on their own to interchange jobs/tasks if they want to.

The rule of Competence is sacrosanct . This would give a strain on monitoring individual specific performance , but why sweat over it . Give higher weightage to Team Performance , so they will shore up each other .

**3. Reviews and Meetings : Physical is passe.** ( COVID-19 only precipitated it). Virtual rooms (like how you play mobile games) are the way to go. Gamify the meetings. Make them fun. Within expected norms (like Time management ) choose options to make them participative and productive. Always give sincere , hard and impactful comments on feedback. Remember Gen Y respects knowledge not just age & hierarchy

Some specifics :

1. **Daily Work Management(DWM)** – Don’t “ paint it” as dull and routine. Make roles crisper and focussed to the contextually important points. Keep changing the focal points from quarter to quarter to keep up freshness . Standards are a must no doubt but not to be seen as “blinkers”. Ensure brevity with controls only on “risky “points. Give flexibility to imagine and implement on the go. . . Praise for compliance is not a delight factor for the Millenials . Pay more compliments to the ability to prevent outliers and the ability for a pull back with alacrity . Data for all simply because it’s digital is very risky . Ensure that data visibility and review options go with the Org Structure and role needs chosen . Do not allow layers of comments to be heaped upon every outlier .

2. **Policy Management** : Presumably a very interesting challenge for the Millenials. With traits like Confidence & Creative they do make a mark in PM. The way they lap up opportunities like “Shadow Board “ and come up with some radically practical ( oxymoron !!)ideas is a testimony to this . We need to emphasise the connect to the “Big Picture “ and not to make the Means and CPs as a hand down !!. We need to keep the teams highly charged and keep reviews at an “ON Demand “ basis . Specify outer limits for time and lower limits for targets . Let them get that sense of superior achievement . Design for some quick finish means by which the progress is rapid and visible. Mini Celebrate every success . Challenge shortfalls and push for results .

3. **Continuous Improvement** : Teams are what millenials enjoy . Leverage that . Hierarchy is neither feared nor gloated upon by the Millenials . We have experienced it as Parents .So put this to good use. With Millenials barriers of QCC/ QIT can be broken . Make teams seamless and task/target oriented . Any one deemed to contribute is welcome . Training on Systematic problem solving is a must . Shun quick fixes . Ensure technological enablement of navigation through a QC story , including Tool selection if required . Poka Yoke the urge to skip steps . Projects and meetings need not be rigid in time lines . Ensure digital visibility of progress and public praise .

4. **Cross Functional Management** – Millennials' natural tendency to co create and cowork, make CFM an enjoyable system. The greatest preparation is to make them see the value of Process and System and if that's done well things will be on a roll. Seeing the big results through small ones is a very important connect worth investing time on.

As mentioned it's challenging but not impossible to keep the Millennials interested in TQM . The question is are the Gen X and may be a bit of the Gen BBs ready for the challenge ??

Abbreviations unravelled :

- 1.DWM – Daily Work management .
2. CFM- Cross Functional Management
- 3-PM- Policy Management ( Hoshin Kanri)
- 4.CI- Continuous Improvement.

#### About the author:

**Mr. Sundara Rajan has guided more than 30 clients in the Medium and Large-scale organizations in the implementation of any one or a synergistic framework of the major business excellence systems viz TQM/TPM or TFM(Lean). His clients' sector span includes Automotive, Component Manufacturing , Consumer Goods, Chemical Process & Service Sectors and are spread across India.**

**He has been an associate consultant with Senior Japanese & Indian Counsellors and facilitated 5 Companies in the successful challenge of Deming Prize or Deming Grand Prize. He has conducted more than 250 Training sessions on TQM and nearly 60 sessions on "Systematic problem Solving & Improvement."**

**Mr. Sundara Rajan is a regular trainer with CII during Open House programs across a span of locations and has been Jury Panel member for various Kaizen Competitions held by CII- Southern Region. He has also been associated with ILO in their "SCORE" program to build capability at MSME level**

## Gearing up for Zero Defect Manufacturing

By Sarika Joshi

Manufacturing around the globe has gone through enormous changes in the past several decades. We can trace it back to ancient times when skilled artisans manufactured products with complete manual operations. Later, the industrial revolution proved pivotal to the manufacturers because of the discovery of mechanization (Industry 1.0). Manufacturers could thus mass-produce and laborers were more efficiently used. The industrial evolution moved on to the electrification of machines era (Industry 2.0), and consequently the computer applications/electronics/robotics era (Industry 3.0). During this journey, expectations of quality requirements were enhanced, and knowledge in quality deepened. Acceptability of tougher specifications like defect rates increased in the organization. In industry 1.0 and 2.0 era, quality was evaluated within the boundaries of tolerance; defect rates used to be calculated in percentage. With the progress of the technology from mechanization to electrical, electronics /computers, that is from industry 1.0 and 2.0 to industry 3.0, customers started expecting finer quality criteria such as defects per million to measure the quality performance.



In its next phase of the revolution, the industry is now looking into a convergence of IT and OT, total digitization, big data analytics, and AI based smart factories. Naturally, with this state-of-the-art manufacturing techniques, customers now go beyond defects in PPM and expect flawless quality with absolute zero-defect products. Thus, zero-defect requirement is no longer a buzzword but another “must-have” requirements from the customers and their end-users.

### Evolution of Automotive Industry:

Automotive industry has developed through similar phases to that of overall industry has grown from handcrafted products to machine manufactured mass- products. Like overall industry, the automotive industry has undergone transitioning from handcrafted to machine manufactured products. Automotive companies were earlier shops selling handmade cars. The innovation of steam engine led manufacturers to build steam cars and later the gasoline ones. The Automotive Industry witnessed a breakthrough transformation because of mass production. This era of automotive manufacturing was characterized by assembly lines with interchangeability and standardization. Gradually, cars became popular and global players started competing in the market. Slowly, styling started becoming prudent in car design. Cars adopted aerodynamic shape over a boxlike and square shape. As time passed, auto manufacturers introduced several car variants, including luxury ones. High-performance cars with improved aesthetics started gaining popularity. Manufacturers focused on continual improvement by adopting several concepts like lean manufacturing and Six Sigma. The automotive industry has really transformed in this era as compared to what it was at the genesis. Digitization will bring many more changes in the automotive industry with the usage of sensors, computerized controls, and modern technology. Automobile technology is poised for total disruption when a sizable number of vehicles will get converted to hybrid, plug-in hybrid, and battery operated electric and fuel cell electric ones. Through Industry 4.0 disruption in fuel technology, automakers are all set to bring zero-emission, flawless, luxurious, safe, enjoyable, and hi-tech experience in their cars to the users.

## Evolution of Quality

A prime reason for metamorphosis in the auto industry is the changing needs and demands of customers revolving around quality. As we contemplate over the history of the Industrial revolution in manufacturing, quality has evolved hand-in-hand, with industrial growth. In the 21<sup>st</sup> century, with the fourth industrial revolution, manufacturing technology has gone far more beyond imagination. A total paradigm shift in Quality has happened, and what we see now is a matured system of Quality assurance. Customer expectations now are much higher than those 10 years ago.

In the automobile sector, advanced technology and features with flawless quality in aesthetics and performance have become a norm. Features that were available only in luxury cars, like ambience control, power-windows, power-steering, ABS, auto-adjusting mirrors are now standard features available in most of the cars. Faster delivery times, higher service levels, seamless performance, flawless designs, are “must-have” expectations by the end-users.

These ever-increasing customer expectations by end-users are reflected in OEM’s requirements and subsequently in the entire supply chain. OEM customers have started demanding zero defect in the products from their suppliers. Such a trend in challenging requirements has compelled automakers to think that Quality can no longer be limited to products or processes, but the horizon of Quality has to be enhanced to encompass the entire supply chain and after-sales service.

However, transitioning from the in-house defect rates in percentages, and customer end defects in PPM, to absolute zero-defect products, is not an easy journey. A thorough analysis of 5M conditions in the current manufacturing process viz. men, machines, methods, material-handling, and measurement systems, will easily showcase the enormous opportunities of producing defects throughout the value chain. Zero defect is neither achievable in sustained manner with human-operated or intervened processes nor by adopting to multiple rounds of 100% inspections.

It can be possible in a closed loop, predictive, self-sufficient ecosystem where hundreds or thousands of process, product and machine parameters are captured, controlled in a real time manner; auto correcting themselves based on self-learning algorithms.

### Smart factories and Zero-defect Manufacturing

Emerging trends in sensor and information technology can bring almost total digitization and are near to close to the way human beings operate. Connected machines, continuous acquisition and processing of data, decision making without human interaction, also known as artificial intelligence, and transactions happening over cloud computing and IoT based systems will bring fundamental changes in which the industries operate. Considering this, smart factories built on the foundation of Industry 4.0. can play an inevitable role in living up to zero-defect expectations of customers and end-users.

Smart factory as illustrated in picture on the next page (as an example), suggests far beyond automation; integrating day-to-day decisions on the shop floor to the rest of the supply chain through IT/OT connectivity to form a complete ecosystem with real-time data exchange, analysis, and self-correcting optimized closed-loop systems.



[Ref: Complete guide: 10 smart factory trends to watch in 2019, Internet of Business]

According to Capgemini Research institute's report of February 2020, the automotive sector is the most enthusiastic industry about smart factories. It is making larger investments and setting higher targets for its digital manufacturing operations than any other sector. By the end of 2022, automotive manufacturers expect that 24% of their plants will be smart factories and 49% of automakers have already invested more than \$250 million in smart factories.

Though the digitization initiatives are speeding up across the industries, it is also seen that only a few organizations have completely mastered the digitization of manufacturing processes. This is because the disruptive initiative requires strong foundation of vision, execution, and skilled workforce to succeed.

But I think, over and above particularly zero defects cannot be achieved unless the company's belief system is aligned to zero-defect philosophy. Although the name is self-explanatory, it is imperative to understand what the significance and deeper perceptive of "Zero Defect" is in a true sense.

Zero defect, to begin with, is a mindset change and a complete paradigm shift from not accepting defect to not producing defects. Production of zero-defect products will mean, all activities and all elements of these activities, throughout the business processes, across the entire value chain, and with the involvement of all people across the business cycle must be performed in a flawless and error-free manner. Some great thinkers like Mr. C. Narasimhan in his book, Indian production system, call Zero defect as zero-waste manufacturing which implies that it is important to reduce nonvalue-added activities throughout the supply chain; as zero defect also means efficient, optimized autocorrected manufacturing with sustained results. Zero defect ideologies lead us to think of an integrated approach of manufacturing where principles of traditional manufacturing must be well supported by "smart" Industry 4.0 features in a synchronized, cohesive and an accurate manner.

Discussing detailed strategies, tools, or methodologies to achieve zero defect is beyond scope of this write-up. What we really need to reflect upon is the essence of flawless and errorfree manufacturing lies in the mental framework within organizational structure and its value chain.

In short, to meet high quality standards consistently and to stay competent yet profitable in their businesses, it is time for the manufacturers to be ready to accept myriad of transformations across their own organization, their supplier partners in terms of technology, human resources, machinery, operational systems, IT/OT capabilities most importantly a true zero-defect mindset.

#### About the author:

**Ms.Sarika Joshi has twenty years of experience in the Quality field. She has completed BE from India & MS in Industrial & Systems Engg from USA. During her tenure as an Engineer & technical trainer in the largest North American Die caster, she closely worked with Japanese mentors, American team & completed Six Sigma Black Belt . After ten years in USA, she joined Force Motors Ltd , India in Supplier Technical Assistance dept. Sarika is a certified Lead Auditor for IATF 16949; as Head of STA she developed & led several initiatives for supplier improvements. Ms. Sarika has been driving Six-Sigma yellow, green & black belt programs for past 8 years & has facilitated more than 200 projects. She has delivered 2500 plus man-days of trainings on various topics in Quality. Ms. Sarika has published & presented several technical papers & articles in technical conferences including International conference by ANQ. She is one of editorial team members of ISQ newsletter & Governing Council member of ISQ, Pune chapter.**

17<sup>th</sup> Annual Conference 2020 – a report

## Theme: Quality for Sustainable Development

(social, economic and environmental)

December 11<sup>th</sup> & 12<sup>th</sup>, 2020 through Virtual Media

COVID-19-19 has constrained all of us in having a face to face annual conference this year. Hence 17th Annual Conference in 2020 of Indian Society for Quality was held virtually. Duration of the conference, also had to be trimmed keeping the limitations of online conferences and the span of attention it draws. Case study/ paper presentations could not be part of current virtual conference.

Conference Program Committee put all the efforts to make this first virtual annual conference is as interesting and value adding as the past ones.

## Programs at a Glance

### DAY 1 11 12 2020

	Inaugural Session
14 00 to 14 20	Welcome Remarks & Theme Address by Mr. Janak Kumar Mehta – President, ISQ
14 20 to 15 05	Presentation of Harsha Award. Dr. Kovaichelvan Venugopalan, Director – TVS Institute for Quality and Leadership, Acceptance Speech and address on the topic “Re-inventing TQM for VUCA and Digital revolution”
15 05 to 15 50	Address by Chief Guest – Mr. Kamal Bali, President & Managing Director, Volvo Group, India Bengaluru
16 05 to 16 50	Address by overseas speaker – Dr. Mats Deleryd, President & CEO of the Swedish Institute for Quality, SIQ.
16 50 to 17 55	Panel discussion “Quality for sustainable development in changing world-Challenges & opportunities”

### DAY 2 12 12 2020

09 00 to 09 15	Introduction to Day 2
09 15 to 10 00	Address by Invited Speaker, Mr. T. R. Parasuraman, Dy. MD, Toyota Industries Engine India, President BCIC.
10 00 to 10 50	Case study presentation- Sustainability at Mahindra Auto
11 05 to 11 50	Address by Prof. Deshmukh S. G, Professor, Indian Institute of Technology, Delhi
11 50 to 12 35	Address by invited speaker - Ms. K Hemalatha, GM Strategic Planning, BEL
12 35 to 12 45	Quality Innovation Award presentation
12 45 to 13 00	Summing up – Mr. Uday Mahajan & Vote of thanks (Mr. Ved Parkash)

## Conference Program Committee: Ved Parkash – Program Chair (Advisor at Ather Energy)

Anil Sachdev  
President TQMI

Uday Mahajan  
VP at Indus Towers

Chandra Mouli  
Sr. GM at  
SEG Automotive

Dr. E. V. Gijo  
Professor  
Indian Statt Instt

Prakash G.  
GM at TKAP

Devraj Chattaraj  
DGM at Tata Sons

Rajesh Raman  
Head Quality at  
TTK Prestige

## Guests of honour & Invited Speakers



### Chief Guest

**Mr. Kamal Bali, President & Managing Director, Volvo Group, India, Bengaluru** has been spearheading reputed Indian & multinational organisations as President & CEO for two decades now.

He is based in Bengaluru, is an alumnus of IIT Roorkee, and had an illustrious career spanning 40 years, largely in automotive and engineering industry.

## 17<sup>th</sup> Annual Conference 2020

through virtual media 11-12; December 2020

**Theme: Quality for Sustainable Development**

Social, Economic and Environmental

### Overseas Speaker



**Dr. Mats Deleryd**  
President & CEO of the Swedish Institute for Quality, SIQ

**Topic:**  
"Quality 5.0 – Sustainable Success"



### Harsha Award

Harsha Award is meant for Professionals who have contributed in India either as individuals, in their own organizations or through quality bodies or other organizations to the promotion of quality management principles, concepts, techniques and practices leading to the improvement in performance of the organizations they have helped.

ISQ is happy to honour **Dr. Kovaichelvan Venugopalan, Director – TVS Institute for Quality and Leadership**, a true inspirational leader and TQM believer with this year's Harsha Award.



**T. R. Parasuraman**  
Dy. MD, Toyota Industries Engine India, President BCIC.



**Dr. Deshmukh S. G.**  
Professor, Indian Institute of Technology, Delhi



**K. Hemalatha**  
GM- Strategic Planning BEL, Bengaluru



**Himadri Mukherjee**  
VP & Head Group Excellence in Mfg. & Environment, Health & Safety at Anand Group



**Rajinder Singh**  
Vice President Mahindra Institute of Quality



**Raghuraman Ramakrishnan**  
Head, Supply chain Strategies ITC Limited



**Venkata kuppaswamy**  
GM-Key Account (South West Asia) Lloyd's Register Quality Assurance



**Sudipto Sarkar**  
Chief- Product Application Group Tata Steel Ltd

## Our Sponsors



## Feedback:



- Exceptional
- Very Good
- Good, Could have been better
- Not bad, fair
- Best

- Good and knowledgeable speakers
- Most of the speakers were good and insightful. Sharing was in depth.
- Panel discussion and case study from M&M Ltd were good.
- Good and eminent speaker selection.
- Good Knowledge sharing and appreciable content of the program.
- Nice coordination between team members organizing the event
- This event was well organized and very useful

**To improve:** Few technical issues with the media  
Should bring out more specifics on how conventional QM can contribute to sustainability in all three Ps.

**Note: For the presentations made by the Guest Speakers during the conference click on the link <https://www.isqconference.org/speaker-presentations2020/index.html>**

# QUALITY MONTH CELEBRATIONS – November 2020

ISQ is pleased to conduct series of four online lectures by top Quality leaders, one every Saturday in November 2020 as part of Quality Month Celebrations for an hour between 11 to 12 PM with Q&A time.

Entrance was free for Quality Professionals.

800+ participants registered to attend the program.. It was an opportunity to learn from the experts and make quality happen.

November 7, 2020



**Anant Goenka**

Managing Director, CEAT Ltd

November 14, 2020



**N. Ramanathan**

Senior Counsellor, Advisor - TQM

November 21, 2020



**Janak Mehta**

CMD TQM International

November 28, 2020



**Avneesh Gupta**

Vice President, TQM and Engineering & Projects

Date	Speaker	Theme of address
07 11 2020	Mr. Anant Goenka	CEAT's TQM Journey and the mindsets and challenges that we had to overcome towards the Deming Prize.
14 11 2020	Mr. N. Ramanathan	100 years of Quality
21 11 2020	Mr. Janak Mehta	Quality – The Essence of Being
28 11 2020	Mr. Avneesh Gupta	Survival of the fittest - Quality: A key business imperative.

The first ever Quality Month series of four lectures received overwhelming response. 800+ participants registered for the series of four online lectures.

ISQ thanks the guest speakers who kindly consented to ISQ's request to speak during quality month, November 2020. The event was conducted through virtual platform of Webex.

Participants gave good feedback on ISQ's initiative on organizing the 4 lectures from eminent speakers in the Quality Month. The lectures were knowledge enriching for the quality professionals.

Visit <https://www.isqnet.org/category/events/reports/national/index.html> for the presentations by the distinguished speakers.



## News:

## TOPS CONVENTION 2020



October  
9, 10 2020



Virtual media

TOPS Convention - I was conducted on 9-10, October 2020 as planned as the first of 2-event series of TOPS Convention 2020. 22 teams participated in this first contest.

The teams were divided into IT/ Service stream ( 6 teams) and Manufacturing stream ( 16 teams).

Each stream had 3 each of Jury members who were well experienced and from the mix of manufacturing, service, IT and academia.

In both the streams one each of Winner, 1<sup>st</sup> Runner up and 2<sup>nd</sup> Runner up were selected based on the evaluation by the Jury members.

And the winners are

### Manufacturing Stream

Awards	The team	Project title
Winner	Prashant Mishra & Team , Tata Motors Ltd, Jamshedpur	Reduce rework in paint shop on Signa and Hybrid models from 25% to 5%
1 <sup>st</sup> Runner-up	Manas Ranjan Mallick & team, Mahindra & Mahindra Ltd D. Sakkiah & team	To reduce 80% of the PPM for TUV platform seats under MSES –A drive
2 <sup>nd</sup> Runner-up	JSW Steel Ltd, Salem	Ferroalloy Cost optimization in Rail steel grades

### IT/ Service Stream

Winner	Nandu Pawar, & team, Wipro Technology, Mayank Jain & team	Reduce business downtime by Revitalizing High Visibility Incidents management in the IT Infrastructure services
1st Runner-up	Indus Towers Limited, Gurugram, Haryana Bhanu Pratap Singh & team	DG Repair TAT Improvement Zero Intervention Site for Network Operations
2nd Runner-up	Indus Towers Limited, Gurugram, Haryana	

## International News:



18<sup>th</sup> ANQ Congress 2020 (annual event of Asian Network for Quality) was held through webinar on 22-23, October 2020 by Korean Society for Quality Management (KSQM) from Korea Chamber of Commerce and Industry, Seoul, Korea.

Call from ISQ for papers for the ANQ Congress 2020 received good response. A team of experts from ISQ, shortlisted 47 abstracts from India for submission of final papers to ANQ.

Following are the three winners from India.

- Reducing idle freight payout and carbon footprint through application of operations research at Tata Steel India – TATA STEEL INDIA Deblin Chakraborty, Praveen Dubey, Anil Kr. Singh Harshana, Manoj Kumar Chatterjee, Amit Kumar Chatterjee, YN Rao, Surjit Laha, Bijan Mishra
- Improvement in Gear Shifter Cable Assembly of a Van Using Six Sigma Methodology – FORCE MOTORS INDIA (Makarand Kanade, Pradeep Chandrasekaran and Madhukar Bagalkot)
- Engineering World Class Quality: R&D's Way of Life – TATA MOTORS INDIA - Amol Wagh, Kishor Patil, Farhad Gocal, Mohit Modi, Kaushik Biswas and Udayan Pathak

Congratulations to all the participants and the winners.

## Quality Innovation Award

ISQ was glad to be the national partner to the coveted international Quality innovation award from 2020. The call of applications for QIA by ISQ in India received very encouraging response in the first year of its association with the award..

For updates visit <http://www.qualityinnovation.org>



The 47 papers received in 5 categories were evaluated by the expert assessors and jury members as per the comprehensive process prescribed by QIA through assessors, Jury members as mentioned below. Through this process, one National Winner was selected in 4 categories and following the National Winners.

Category	National Winners
Business Innovations (Large)	Tata Power Delhi Distribution Ltd, Gracote: The organic Earthing
Potential Innovations	Tata Motors India Limited, Pimpri Pune, Modular Gear Shift lever
Education Sector Innovations	Global Indian International School, Qutuhal – The Journey of Curiosity
Circular economy and carbon neutrality innovations	Manufacture of Paver Blocks using Steelmaking Slag-Waste to Wealth Project – JSW Steel Ltd Salem

Congratulations to the National Winners. The applications of national winners will go the international competition.

## International News:

### Ashok Leyland Limited wins the prestigious international Quality Sustainability Award 2020.

The international Academy for Quality (IAQ) is pleased to announce the winners of the **Quality Sustainability Award 2020**. This award recognizes projects that have led to positive results in sustainability inline with the UN Sustainable Development Goals, through the use of quality management principles and methodologies. ISQ is happy to see that project from Ashok Leyland Limited from India is one of the two winners of this award amidst tough international competition. The other winner is the project from NorDan AB, Sweden.

A brief of the two projects are given below.



**Name of the Project:** Phosphate Sludge (hazardous waste) generation reduction in Cabin pre-treatment line

**Name of the Organization hosting the project:** Ashok Leyland Ltd. (India)

**UN Sustainability Development Goal affected:** Goal 12: Responsible Consumption and Production

#### Introduction:

In Commercial Vehicle manufacturing, painting is one of the important process which generates sludge (hazardous waste). At Ashok Leyland, we comply with all transportation and disposal rules related to the waste management standard (prevalent in the country). While adhering to compliances, being a responsible organization, we are continually innovating to reduce waste generation. One such project at our Hosur-2 plant is explained here.

#### Essence of the project and Problem statement:

In its regulation, State has given the authorized limit for waste generation which is 300MT/annum for paint sludge and 24 MT/annum for phosphate sludge. At Hosur plant, Paint sludge generation was well within the authorized limit whereas, Phosphate sludge generation (Hazardous Waste) was a concern nearing to the authorized limit. Going forward, there was a risk to cross this limit as production volumes were predicted to be higher by 20% in FY20. Project has been started with the objective of reducing Mean Phosphate sludge generation from 6.92 g/sq.m to 4 g/sq.m.

**Methodology used:** Six Sigma DMAIC

**Observation and Analysis :**

We performed Measurement system analysis (MSA) for titration checking method (Phosphate sludge measurement process) to verify whether the measurement system is capable. Results suggests that the measurement system is capable as Gage R&R is 0.66% and No. of distinct categories (NDC) are 214 i.e. project metric data is accurate & precise.

Nine probable causes are identified for high phosphate sludge generation. Detailed cause validation reveals that moisture content present in Phosphate sludge is very high (61% of sludge weight).

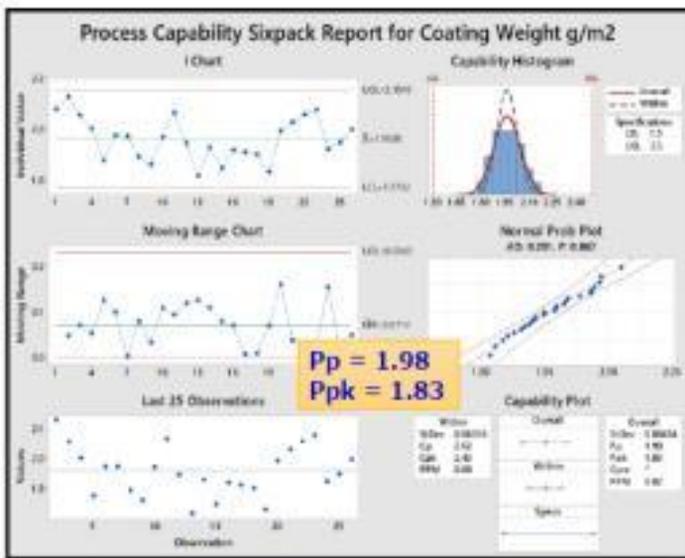
**Improve (Finding, Implementing the solutions with resource used):**

1. To address this issue of high moisture content in Phosphate sludge, drying bed is installed, and drying process is continued. As a result, Mean Phosphate sludge generation reduced from 6.92 g/sq.m to 5.22 g/sq.m.
2. Even with improved performance, projected annual sludge generation level will be 26 MT against the Govt. regulation of 24 MT considering 20% higher production volumes.

To further reduce sludge generation, we went for an innovative solution of using less coating weight, which was possible with usage of a different 'Pre-treatment Chemical'.

Source	StdDev (SD)	Study Var (6 * SD)	%Study Var (%SV)
Total Gage R&R	0.0765	0.4588	0.66
Repeatability	0.0591	0.3544	0.51
Reproducibility	0.0486	0.2914	0.42
Part-To-Part	11.6405	69.8429	100.00
Total Variation	11.6407	69.8444	100.00

Number of Distinct Categories = 214

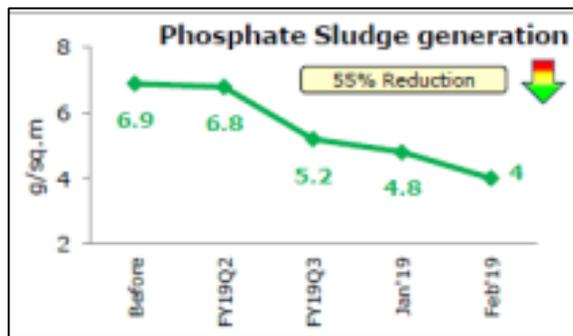


From our research, 'compact & fine phosphate coating chemical' was found most suitable for this process. After implementation, Mean Phosphate sludge generation is reduced to 4 g/sq.m. With this, estimated annual sludge generation will be 20 MT against the Govt. regulation of 24 MT even for 20% higher production volume.

**Results and Effects (few):**

1. Mean Phosphate sludge generation reduced from 6.92 g/sq.m to 4 g/sq.m
2. Phosphate coating weight process is stable and capable as Ppk is 1.83.
3. Phosphating process time reduced from 90 sec. to 60 sec. Productivity improved by 12%.
4. DM water requirement reduced from 180 KL to 120 KL per annum.
5. Financial benefit of INR 5.25 Million.
6. Reduction of carbon footprint because of energy consumption reduction.

**Resources used:** Expenditure of INR 0.1 Million for Phosphate sludge drying bed construction.



**Locking & Cloning the Improvements:** Operation controls procedures are changed, and training has been given to all associated members. Detailed case study is shared and communicated to **all plants of Ashok Leyland.**

**Tools used in the project:** Variable MSA (GRR study), Pugh matrix, Test of Hypothesis (2 sample t-test), Process capability studies, Variable Control charts, Risk analysis.



International Academy for Quality

Quality  
Sustainability  
Award

International Academy for Quality

### Attachment 1: Summary for publication

#### Title: NorDan AB Commercial Selling of 3D Printed Windows in Modern Sustainable Biomaterial Applying PDCA Methodology and Quality Tools

In 2018 and 2019 NorDan AB conducted a highly successful R&D project applying Quality Management philosophy, methodology and tools in order to achieve significant results regarding Sustainability. The NorDan project developed a production technique, material solution, product documentation and marketing concept for 3D printed windows in bio-composite material, with a Scandinavian market product launch in October 2019. The company has gained momentous attention and recognition for their pioneering efforts in 3D printing within the building industry, especially from a sustainability perspective.

Throughout the entirety of the project, the PDCA Cycle (Plan-Do-Check-Act Cycle) was applied in an agile way and with many iterations to make progress towards the overall project goal; to be the first window manufacturer start commercial sales of 3D printed windows in a modern, sustainable material. As an integrated part, root cause analysis and cause-effect diagrams were applied numerous times in order to better understand the challenges in the project and agree on necessary actions to move the project towards its overall goal. Also, the application of the Pareto principle helped the project team to scope the project efficiently and identify “the vital few from the trivial many”.

In the PDCA cycle work, it was often found that the ‘Plan and Do’ phases were relatively easy to undertake. However, the team believed that the real power of improvement and learning came from the work conducted within the ‘Check’ phase. This is where data was gathered from testing in the 3D printer followed by analysis, which meant that the team could better understand the causes and make a good basis for the ‘Act’ phase where main learning and action points were concluded, forming the basis for subsequently moving into a new PDCA cycle.

Additionally, during the early phases of the project, NorDan explored numerous options for printing materials, which included the likes of ABS thermoplastic polymer granulates. If NorDan had decided to continue with that specific and readily available material in the market, then the project would have been completed much earlier than it did. However, NorDan’s focus on Sustainability directed the project to concentrate more greatly on finding the most sustainable material possible so that the 3D printed windows would remain in alignment with the other products in NorDan’s timber range. Introducing the bio-composite materials into the 3D-printing process caused significant variation in the material properties, printing process and the surface finish of the printed product. Moreover, the data-driven and fact-based approach with the PDCA cycle meant it was possible to reach a stable and well-working printing process for circular windows. To ensure that the performance of the 3D printed windows within a building façade was maintained, product tests were performed at RISE using the same testing parameters as practiced with traditional timber products. The test results were very good, and the product was granted approval.

# Indian Society for Quality

The innovation highlighted by NorDan, with the 3D-printer project, is part of NorDan's 'ecoDigital ready' strategy. This is the trade-marked initiative of the NorDan Group, which highlights the company's commitment to sustainability and digitalisation. As part of this strategy, the company has worked actively with the UN Sustainability Development Goals and have made concrete plans for improvements and initiatives within six of the SDG goals. The following three UN Sustainability Development Goals have been focused on in the 3D-printer project:

- GOAL 9: Industry, Innovation and Infrastructure
- GOAL 12: Responsible Consumption and Production
- GOAL 17: Partnerships to achieve the Goal

Based on the degree of success achieved through this project, the company has launched various additional schemes testing the 3Dprinting of entrance doors and square windows. Furthermore, in collaboration with their biggest customer, NorDan AB have established a process for recycling used windows. This highlights the potential for companies in developing new services and business models, within the sustainability remit, that are geared towards customers.

A key learning takeaway for NorDan AB is that Quality Management and Sustainability should be applied at a strategic level within the company. Quality Management is vital to ensure that there is a key focus on customers and high-quality outputs, whereas Sustainability ensures conscious choices are made regarding the environment and resource utilization. Furthermore, Quality Management with its methodologies and tools offers a very strong supporting frameworks in project management execution and fact-based decision making in an agile way.

## International News

The **Flemish Institute of Quality (VCK)** from Belgium organized its first 100% digital conference, the VCK Quality Day 2020 – on Thursday 19 November. Mr. N. Ramanathan, founder member, former President of ISQ, renowned senior counsellor of TQM was one of the speakers in the Quality Day.

## Be a member of ISQ

[Download the membership form here](#)

ISQ look forward to you to introduce professionals with passion for quality, align with its objectives willing to contribute; as members of ISQ. Those whose membership has ended in March 2020, it is time to renew the same.



**Networking**  
(share & learn)



**Volunteer/lead**  
Activities/events



**Concessional fee**  
for conference, seminars  
training, contests



**Get Newsletters**  
Articles, update from experts  
Enhance writing skills



### Annual Conference

A flagship event of ISQ with Eminent invited speakers,  
Best of case studies/ papers



### Local chapters

Organise events, Knowledge sharing sessions,  
Bench mark factory visits, as member of local chapters



### Showcase your talent

through case studies, papers, project presentations at member  
concessions in Annual Conference, Symposium,  
Contests and Asian Congress



### Network with international community

like Asian Network for Quality,  
Quality innovation award etc.

## Welcome to the new Life Members

Sudhir Kumar Pandey	Retired as Quality System Head	Anu Industries Ltd, Gurgaon
Rupam Bhaduri	VP Corporate - TCIL	Tata Steel deputed in TCIL
Abhishek	Manager – Corporate Quality	Apollo Tyres Ltd, Gurugram
Akshay Bhargav	Group Manager – Corporate Quality	Apollo Tyres Ltd, Gurugram
Deepak Gupta	Head - Corporate Quality	Apollo Tyres Ltd, Gurugram
Saurabh Tripathi	Group Manager - Corporate Quality	Apollo Tyres Ltd, Gurugram
Sunil P. Mathew	Div Head- Quality Assurance	Apollo Tyres Ltd, Cochin
Vijay Kalra	Head	Mahindra Institute of Quality

## Welcome to the new Annual Members

Madhusmita Choudhary	Quality Professional	Siemens Healthineers
Akashay Panchal	Deputy Manager	SEG Automotive India Pvt Ltd
Arunkumar K M	Sr. Engineer	SEG Automotive India Pvt Ltd
Harisimha HN		SEG Automotive India Pvt Ltd
Rear Admiral Sanjay Misra,	Director General of Naval Armament Inspection	Directorate General of Naval Armament Inspection New Delhi
Vijender Singh Naniya	Commander, (Armament production & Indegenisation	Directorate of Armament Production & Indegenisation, New Delhi
Capt Harpreet Singh	Captain ( NAI)	Directorate of Armament Production & Indegenisation, New Delhi
CMDE M Ashok Kumar Shetty	Commodore, NAI	Directorate of Armament Production & Indegenisation New Delhi
K V S Indigenization Iyer	Sr. Consultant	Quality Evaluation and Systems Team Pvt Ltd, Bengaluru
VENKATESHA PUTTASWAMY	Account Quality Manager	Wipro Ltd, Mysore
PRASHANT ALEKAR	Self Employed	QLeNPro Consulting & Training, Pune
Sunil Kumar S. A.	Dy. General Manager	SEG Automotive India Pvt Ltd, Bengaluru
Usha Rangarajan	Founder, Managing Consultant	Unleash