



# Newsletter

## Indian Society for Quality

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Dear Readers ,

### Greetings from ISQ !

We are pleased to bring this 2<sup>nd</sup> Edition of 2022 of ISQ Newsletter.

I must start with a sad news in the first place. Our mentor , guiding light and founding Father Padma Vibhushan Dr V Krishnamurthy left for his heavenly abode on June 26<sup>th</sup>, 2022. We pray for peace to the departed soul.

His mentorship will always remain in our fond memories.

On a positive note, I am pleased to share that ISQ as an organization is growing from strength to strength after calibrating our vision and mission and restructuring the organization structure.



Ved Parkash

Knowledge sharing sessions have become a regular weekly feature now. Jamshedpur Chapter , our latest addition to the chapters, has been a great boost on this initiative. You can keep looking at our website for notification of such sessions as well as other activities like conventions, symposiums at chapter level as well as national level.

There has been a breakthrough of sorts on "Industry Academia Connect" initiative with RV College of Engg ( RVCE ) coming forth to partner with ISQ on this journey. We profusely thank Dr K.N. Subramanya, principal of RVCE for wholehearted support in bringing this partnership together. We are in the process of giving a final shape to this initiative under the able guidance of Mr. Ramanathan , our mentor and guru. Persistence and patience of Bengaluru Chapter has finally paid off since the efforts for such a connect started right after the formation of Bengaluru Chapter, thanks to all the members.

Rise in Covid cases is a worry, situation in other parts of the world is also a matter of concern.

So, mask up and stay safe !

Best Regards,

Ved Parkash

## Vignettes from Ram

### PDCA



I experience unending annoyance over the inability of many managers and engineers to internalize the meaning of PDCA, the well-known Plan-Do-Check-Act cycle. Contrastingly, having heard descriptions of thousands of individual kaizens and QC circle presentations, I find that many workers intuitively grasp PDCA and often outdo professionals in articulating coherent improvement stories.

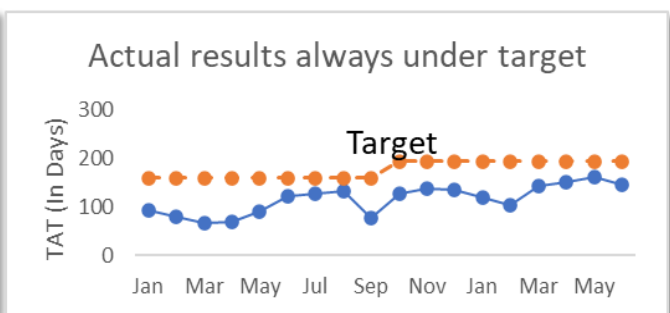
How does one know whether a person or organization has cultivated PDCA thinking or not? It is simple really. Listen to anyone talking about his or her department, projects, or improvements, or read a report. In a minute, some patterns might show up.

One common habit is to narrate a string of things that have been done. This is the D-D-D-D cycle – it’s all about doing. You get to learn nothing of what the objective was, how the action was planned and executed, what the results were, or what problems remain – which, in combination, would constitute a natural expression of PDCA thinking.

Another template is to state a problem or an objective in some way, and then provide an account of what was done – and the rest is assumed to be self-evident. This is the PD cycle, missing out on effects and countermeasures.

There is also the DC cycle wherein something is done – say, a roadshow for mechanics of two-wheelers – and then some subjective results are touted, perhaps with a little data too. But the program itself never had a stated objective, so the result cannot be judged at all, and of course the last steps of standardization or carried-forward problems remain unaddressed. This pattern is made worse by presenting results in output rather than outcome terms – say, number of mechanics trained, rather than upgraded skill levels.

KPI data in companies are presented usually in tables of numbers, without run charts that can show temporal patterns and possible abnormalities. Even where run charts are used, many reports fail to show targets. That effectively rules out all possibilities of a CAPD cycle, because if the result cannot be compared with plan, there can be no gaps, and hence no countermeasures. Sometimes one sees graphs where results are either consistently below or above target for a long succession of data points. This should have thrown up red flags all along the way, which have been missed. Sometimes I am given a justification – that the practice of the company is to set ‘stretch’ targets which are not really achievable, and hence the seeming underperformance. It is in effect a declaration that no PDCA will be practised.



There is also the practice of showing a horizontal target line, which means that no improvement is targeted. Also witnessed is the practice of setting the next period's target lower than the actual result of the previous period. These examples are proof of PDCA not being understood in the organization. They are also proof of ineffective management.

Here are just three examples of lack of understanding of PDCA from different company reports I have read.

**Example 1:** Dashboards have been developed for the sales force. This will help frontline teams take data-based decisions. [*The second sentence is the objective. The first is action. At best it is a PD cycle*]

**Example 2:** The goal is to train on digitalization through virtual methods and tools. [*Vague goal. Vague Action.*]

**Example 3:** Practices implemented: 1. Deployed our new value framework; 2. Restructured the rewards and recognition system; 3. ... [*DDDD cycle. Only actions.*]

In the 1950s, Deming's Design-Make-Sell-Research cycle for continuous improvement of products was modified in Japan into the more generic management cycle – PDCA. In Japan, it continued to be alluded to as the Deming Cycle. When told about it during the American quality-renaissance in the 1980s, Deming preferred to call it PDSA, 'S' standing for Study. In PDSA one conducts experiments (D) to make improvements, and then 'studies' the results. The PDSA cycle may therefore be viewed as a particular case, a subset, of the more universal PDCA cycle, though that is not how Deming followers might see it.

TQM should be credited with inventing the first really universal improvement methodology in the form of a QC Storyline, which evolved in the 1960s as a reporting and presentation aid for QC circles but is the same as the problem-solving methodology. Over the decades, many alternative procedures have been put forth, including from the Six Sigma stable. However, many methodologies tend to short the PDCA cycle by ignoring the step of 'A'.

The QC Story is an analytical methodology, but from the 1980s, a design-oriented methodology for achieving objectives evolved alongside in companies such as Xerox, leading to many routes in the 1990s under the DFSS banner and the Task-Achieving QC Story from Japan. Both types of QC Stories deal with situations where solutions are not known in advance. But many tasks in management need just good execution, which also needs PDCA, and therefore a formal Execution method in parallel to the other two sequences also got developed. This last approach is not much visible in the western world.

PDCA applies not only to micro-cycles as in day-to-day management and in kaizen projects, but also to macro-cycles with which senior management is concerned. For example, improving the next annual planning cycle based on previous learning coupled with new needs would require the use of PDCA. Or improving ramp-up of a new plant by applying what was learnt from setting up plants previously.

**Finally, for an anecdote:** It was 1995. I was accompanying Dr Kume to our factory in Manali, north of Chennai. As we neared the plant, the road had a cratered look, and our ride became bumpy. With a characteristic smile on his face, Dr Kume asked a string of questions, to no one in particular. "Who is responsible for maintaining this road? What is his system? How does he check? What countermeasures does he take?" Like an artist sketching a portrait with just a few deft strokes he had, in a simple way, taught us the meaning of PDCA.

#### 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. He is the recipient of the Edwards Medal 2021 for outstanding leadership from American Society for Quality (ASQ). Mr. Ram has received the Dronacharya Award in 2018 by ISQ for his contributions to teaching and counselling on quality. Mr. 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.

# Homage to Padma Vibhushan Dr. V. Krishnamurthy

Former Chairman BHEL, Maruti Udyog, SAIL and Secretary, Heavy Industries, Government of India

**1925 – 2022**

With deep sorrow, the Governing Council of ISQ mourn the passing away of Dr. V. Krishnamurthy, Chairman of ISQ on 26<sup>th</sup> June 2022. He has been a doyen of Indian Industry and legendary leader of quality movement in India. ISQ has lost a mentor and a benefactor.

We pray for his soul to rest in eternal peace.



## Homage to Padma Vibhushan Dr. V. Krishnamurthy

Dr. V. Krishnamurthy, the doyen of Indian industry and legendary leader of the Quality movement in India for over 40 years, passed away on June 26, 2022. It is a sad day for all of those who came in contact with him directly or indirectly, and we pray for his soul to rest in eternal peace and fortitude to his family to bear the loss with equanimity.

Passing away in any case is inevitable, when the soul of an individual merges with the Whole, leaving a legacy behind. It is time for us to celebrate the life of Dr. V. Krishnamurthy (Dr. VK), that could inspire many to follow his ways.

His contribution to the Indian economy has been immense. He has been the only individual to have been the Chairman and Managing Director of 3 large corporations in India i.e. Bharat Heavy Electricals, Maruti Udyog and Steel Authority of India. Executives in these organizations remembered his contribution even years after he demit that office.

Dr. VK has mentored many people may be more than 25 to become CEOs of various companies. He served in many other positions including the Chairman of National Competitiveness Commission, Secretary Heavy Industries and Member Planning Commission.

At Indian Society for Quality (ISQ) he mentored and guided us since 2002. His simple ways endeared him to all of us and we are indeed, indebted to him for being our guide.

I met Dr. VK first time in 1984 and since then he has been kind enough to mentor and guide me in my endeavour to bring Quality to the mainstream of business organizations. He took Quality to the Board Rooms.

We pay our homage to Dr. V. Krishnamurthy for his contribution to the nation in many ways and forms. I will share my experiences with Dr. VK in my subsequent posts.

### Janak Mehta

President, Indian Society for Quality (ISQ)

Chairman & Managing Director TQM International Pvt. Ltd.

Honorary Member of the International Academy for Quality (IAQ)

Honorary Director of the Asian Network for Quality (ANQ) June 26, 2022

### **Homage to Padma Vibhushan Dr. V. Krishnamurthy**

Dr Krishnamurthy, Dr VK affectionately, has left us. He was, by any yardstick, an extraordinary person who wore his fame lightly.



His wisdom was palpable. He was always soft-spoken and seemed to have all the time in the world for the person he was talking to, though his day was packed with events and meetings. His schedules would have taxed many younger persons.

That he built BHEL, turned SAIL around, and set up Maruti are well known. Any one of them could individually be counted as lifetime achievement. But then Dr VK can also be credited as the original industrial leader who led the Quality Movement in India. In 1986, CII started the National Committee on Quality, a forum for CEOs. It was chaired by Dr VK and met regularly to discuss quality. We can safely assert that CEO involvement in Quality in India peaked in the next three years, a level never reached since.

Dr. VK was a key figure in organizing the cooperation of our higher educational institutions in setting up a Visionary Leaders program. Unobtrusively, Dr VK was also mentor to many industrial leaders of India.

ISQ was extremely fortunate that he agreed to be its Chairman. He believed in the cause and was willing to devote his time to it. He got a number of large companies to become Foundation members of ISQ – so great was the respect he commanded from CEOs, and the trust they had in him.

What is not known widely about him is the effort he made to set up an Indian Network for Quality, federating all our Quality Bodies, so that Indian Quality could present a united face in the world.

This endeavor did not succeed, but that does not in any way lessen the value or importance of the mission, even today. Perhaps the greatest tribute we quality professionals can pay Dr VK is to be united across all our organizations, and work together for the fulfillment of a dream – A Quality India

#### **N. Ramanathan, Former President ISQ**

Dr. V. Krishnamurthy's contribution to Indian economy and especially in the area of quality movement is unparalleled. His passing away is a huge loss to the Indian Industry and all of us in the Indian Society for Quality which looked up to him as a Mentor. May his soul Rest In Peace.

#### **Sunil Sinha, Chair, Awards Committee ISQ, Former Resident Director, Tata Sons, MENA**

Sad to know this. He has been a true Visionary. He single handedly led India's quality journey. The Nation has lost a great leader and the quality community their inspiring spirit. May the departed soul rest in peace.

#### **Kiran Deshmukh, GC Member ISQ, CTO Sona Group**

Sorry to hear the news. Dr VK undoubtedly left an Indelible imprint on the Indian manufacturing industry. May his soul rest in peace.

#### **Ravikant J. GC Member ISQ, Senior VP and Head – Corporate TQM at SRF Limited**

A great loss to the Quality fraternity and the industry as a whole – remembering his work, may his Soul rest in peace 🙏

#### **Uday Mahajan, President, NCR Chapter, Vice President at Indus Towers**

The period of April to June saw announcement of many programs, contests for the year 2022.

## TOPS Convention 2022 – Chennai Chapter

A Happy to announce successful completion of TOPS Convention 2022 conducted by Chennai chapter on 18th June 2022 at Jerusalem College of Engineering, Chennai

The Principal of Jerusalem College of Engineering Dr. Ramesh Sengottuvelu inaugurated the event along with the executive team of Chennai Chapter. A record 33 teams participated in the event. (110 participants and Student volunteers from the college). Dr. Ramesh Sengottuvelu, Principal, Jerusalem College of Engineering inaugurated the event with executive committee members of ISQ Chennai Chapter headed by Dr. S. Rajkumar and team members Sudararajan, Vishwadeepak Khandelwal and B. Raajkumar.

Dr. Ramesh spoke about the much-needed interaction between students and the industry to get them updated about the current scenario in the industry. Mr. Chandra Mouli, Vice President, Bengaluru Chapter who came all the way from Bengaluru gave a brief introduction to ISQ. The event also helped students and the participants in learning through knowledge sharing on the application of Quality Management and effective usage of Quality Tools used.

110 participants participated in the event. Students from the college assisted ISQ as volunteers.

Mr. N. Ravichandran, former CEO of Lucas TVS Limited was the Chief Guest in the evening during the Prize distribution ceremony. He delivered a lecture which gave an insight on status of quality in India and areas where actions needed to be quality competitive.

### And the Winners are:

#### Category: Basic Problem-Solving Projects

Results	Organisation	Project
<b>Winner</b>	Rane Engine Valve Limited	To reduce internal rejection in Forge shop
<b>1<sup>st</sup> Runner Up</b>	Ashok Leyland Ltd, Ennore Mfg plant	Reduction of cycle time in chassis line - Ashok Leyland, Ennore plant
<b>Special Jury Award</b>	Waycool Foods & Products Pvt. Ltd.	Packing Productivity improvements in Chennai DC.
<b>2<sup>nd</sup> Runner-up</b>	Apollo Tyres Limited	Reduction of loss due to Sidewall (S/W) Folding in PCR Tyre Building Machine (TBM)

#### Category: Advanced Problem Solving Projects

Results	Organisation	Project
<b>Winner</b>	ZF Rane Automotive India Private Limited, Pudukkottai,	Enhancing the Productivity in Sealed Quench Furnace (SQF)
<b>Special Jury Award</b>	Sundaram Clayton Ltd, Oragadam	Reduce Overall rejection in KIA CCL – Crank Case Lower from 11.5 % to <7%
<b>1<sup>st</sup> Runner Up</b>	JSW steel Limited, Salem	Reducing the decarb level in Annealed Wire Rod Products
<b>2<sup>nd</sup> Runner-up</b>	Amara Raja Batteries Ltd., Nunegundlapalli, Chittoor	Reduction of formed battery scrap due to Negative plate lug cut in 65Ah model

# ISQ News

Quality for Prosperity

ISQ thanks The Principal of Jerusalem College of Engineering Dr. Ramesh Sengottuvelu for providing the venue and the support by staff and the students in ensuring smooth conduct of the program. Congratulations to Executive Committee of ISQ Chennai Chapter headed by Dr. S. Rajkumar for the meticulous planning and execution of the event.





## Industry and Institute Interaction

On 28<sup>th</sup> May 2022, team from Bengaluru Chapter headed by Mr. N. Ramanathan, former President of ISQ met the Principal of R V College of Engineering Dr. K. N. Subramanya and Prof. Narahari, Dr. Vijayakumar and team to discuss on collaboration to promote Quality in academia. Happy to share that Dr. Subramanya and Professors of the college have enrolled as Life members of ISQ and were happy to get associated with ISQ. It was decided to conduct a seminar on Quality 4.0 jointly at the college..

## ISQ Symposium 2022

**Theme:** Driving excellence through Quality Management

Call for technical papers for the first ISQ Symposium 2022 received good response. The evaluation process is on to select the abstracts.

**Venue:** R V College of Engineering, Bengaluru, thanks to Dr. K. N. Subramanya Principal of the College.

**Date:** 23, 24 – September 2022.

**Symposium Program Committee:** Anil Sachdev with Dr. Pankaj Kumar, Tata Steels, Prof. R. Jayaraman, S P Jain Inst of Management, Dr. Ashis Chakraborty, Indian Statistical Instt, Dr. S. G. Deshmukh, IIT, Delhi, Sachin Goel, Foundry Business, Ashok Leyland, Rohit Pathak, Mahindra & Mahindra, Prof. Narahari, RVCE and G. Prakash, TKAP



**Quality Earth Forum** organized a lecture for Quality and Sustainability enthusiasts.

## HOPE THROUGH QUALITY

HEALTH OF PLANET EARTH

Faculty: Mr. N. Ramanathan



23rd April 2022

### Objectives

To learn about

- The types of concerns about the health of planet earth, and their sources.
- Approaches to countermeasures to prevent harm, such that humanity can thrive.
- Quality-based management approaches to making improvements to sustainability.
- Provide some guidance for those applying for the Quality Sustainability Award 2022.

220 participants attended the program got benefited from well known Mr. N. Ramanathan. The participants were awarded the certificate of participation.

### Knowledge sharing sessions – Q1 2022 – 23

Date	Event	Organized by	Speaker
03 04 2022	Human side Challenges of Implementation of QMS in a large Manufacturing Organisation	ISQ Jamshedpur Chapter	A. M. Misra, former Vice President, Tata Steels
07 05 2022	World Class Quality Systems	ISQ Jamshedpur Chapter	Basabduutta Jana, Plant Quality Head – Tata Motors, Jamshedpur
14 05 2022	How winning a Deming Prize improve Business Performance	ISQ Pune Chapter	Manohar Sethpalani, Vice President – QBM (Business Excellence) CEAT Ltd.
04 06 2022	Daily Management	ISQ Pune and Jamshedpur Chapter	Dr. Pankaj Kumar, Chief – T Q M & CQA – Tata Steel Jamshedpur
06 05 2022	An Innovative Approach to Service Quality Improvement (The Importance of the Smile of the Nurse)	ISQ Chennai Chapter	Willy Vandenbrande Quality thinker, Founder – QS Consult
25 06 2022	Sustainability Journey of VECV	ISQ Quality Earth Forum	Aditya K Shrivastava -EVP/ Head of Operations, Vishwas Farkya - Head Technical Services

# Virtual Reality in Automotive Quality Assurance

Pradeep Chandrasekaran



Virtual Reality(VR) is computer-generated environment of a three-dimensional image that can be interacted with in a seemingly real or physical way by a person using special electronic equipment/Gadgets, such as a pair of VR Glasses or a Headset. **VR is** an artificial environment which is experienced through sensory stimuli (such as sights and sounds) provided by a computer and in which one's actions partially determine what happens in the environment also. Unlike [augmented reality](#), virtual reality is a fully digital experience that can either simulate or differ completely from the real world.

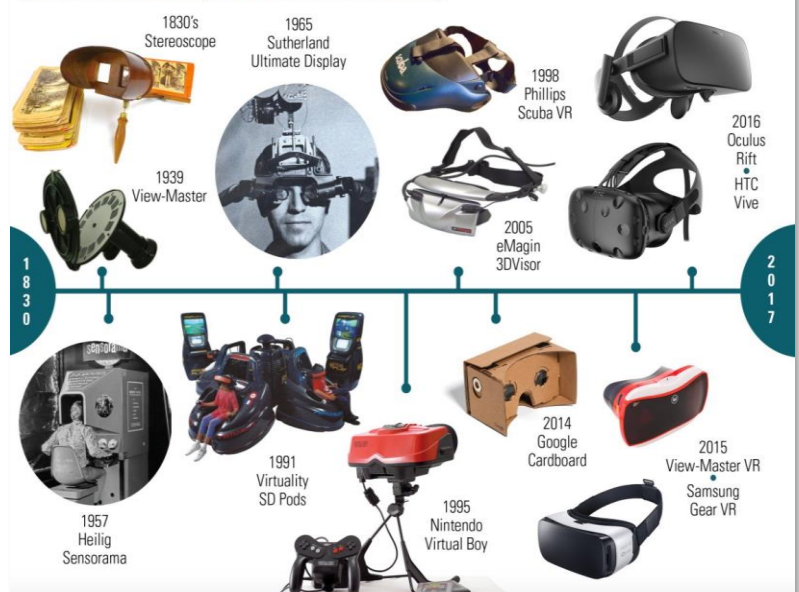
Virtual reality technology can become a sales-boosting mechanism for car manufacturers and dealers. They have the opportunity to raise online sales via virtual showrooms, where potential customers will inspect 3D cars' exterior and interior and have a test drive – all without leaving their homes.

**Many people are yet to clearly understand the difference between concept of Virtual Reality and [augmented reality](#).** Main difference between the two is that VR builds the world in which we immerse ourselves through a specific headset. In VR, **it is fully immersive and everything we see is part of an environment artificially constructed through images, sounds, etc.** On the other hand, in **augmented reality (AR), our own world becomes the framework within which objects, images or similar are placed.** Everything we see is in a real environment and it may not be strictly necessary to wear a headset. However, there is also a combination of both realities called mixed reality. This hybrid technology makes it possible to **see virtual objects in the real world and build an experience in which the physical and the digital are practically indistinguishable.**

## Quality Assurance

Quality assurance briefly explained is set of "all the planned and systematic activities implemented within the quality system that can be demonstrated to provide confidence that a product or service will fulfill requirements for quality. "The Quality Assurance is part of the total Quality system. It may be necessary to control product quality in a service organization to ensure that the service meets customer requirements. Taking out a standard definition from ISO 9000:2015 standard, [clause 3.3.6](#) defines Quality Assurance as: *"part of quality management (3.3.4) focused on providing confidence that quality requirements (3.6.5) will be fulfilled"*

## A Brief History of Virtual Reality



**Fig 1: Brief History of Virtual Reality (Source : CoSpaces Edu)**

Put differently, Quality Assurance (QA) relates to a set of planned activities within the product manufacturing process that ensure the safety and the quality of the product. So, to ensure high quality Assurance, the customer focus issues should be captured in the earliest stage as far as possible.

This requirement has been fulfilled by Virtual Reality (VR) in various scenarios. **Explaining the application in Automotive Industry.**

Hyundai/Kia Motors has made great strides in all aspects of vehicle quality. Behind such massive advancements lies the design quality assurance process that takes advantage of the latest VR technology. The 3rd-generation Kia K5 was built through the cutting-edge VR design quality assurance process. VR quality assurance essentially creates a digital car in a VR environment to facilitate quality checks. Putting on the HMD(Head Mounted display), engineers use the controller to 'slice' the cross-sections of the vehicle to explore the parts inside and their assembly.

Before the advent of the VR design quality assurance, engineers had to cut the vehicle open in reality to do the same. The VR design quality assurance process thus makes it easier than ever to evaluate the essential factors for vehicle quality: structure and the assembly of the components, the sense of space and visibility from the driver's seat, and the ease of operation of all parts by the driver.

In the Development of the Kia K5, VR Technology was used in different locations and to explore various details in the development stages. It all started in fourth Quarter of 2015, when the Team started talking VR with hopes of applying it to the quality assurance process. The process till then followed basically had a big digital model of the car placed on the screen, and Team zoomed in and out to discuss the parts. Putting a 3D digital model on a flat 2D screen limited the potential for a more meticulous evaluation process.

People have two eyes, which allow us to perceive depth. But putting the digital model on the screen basically takes away that capacity. On a screen, the digital model gives no sense of depth, space, or perspective. When there were no alternatives, they had to put up with these limitations in design evaluation. They were constantly plagued by distortions in the screening processes, though, and even after creating the prototype vehicle, problems manifested because of the on-screen, 2D evaluation process. With VR, such issues disappeared. They could finally evaluate the digital model with a sense of depth and space, and the VR experience very closely approximates the reality of viewing a car. A big chunk of the problems stemming from the old method was addressed as a result.

VR helped to identify and fix the design problems before they got into the final design and start the preparations for mass production. Designs got verified much earlier. They got more rigorously checked and improved the accuracy of the design from the very start. These reduced contingencies like mid- or late-development



**Fig 2: Quality Assurance and Quality Control** (Source:<https://decode.agency>)



**Fig 3:** There was a limit to the old method of putting digital models on-screen (Source : metrology.news)



**Fig 4:** VR design quality assurance process allows engineers to vividly see various cross-sections of the Car digital models on-screen (Source : metrology.news)

The ability to overcome physical limitations was another big advantage of the process. They could cut the digital model and look at the cross-sections before, but the sensory burden of having to translate the information on the screen into an image with depth made the more subtle checks very difficult. Using VR, they could use the controller to cut the vehicle in however many ways we want. The cross-section that opened up allowed to check the assembly and the operation of the individual parts as well. Lot of such iterations of such processes were done to assure the design quality of the entire vehicle. The Digital Car Verification Team receives the CAD blueprints and 3D modelling data from various design teams and consolidates them into the modelling of a single digital car. In doing so, first screening for problems in the blueprints were done. Then VR was used to see if the parts were assembled correctly in the digital model, considering structural changes if necessary. The completed digital modelling data was then sent back to the design teams, who did their own checks to see if the parts they designed would function as planned. Their feedback was then reflected in the model.

Then there was a general marketability evaluation. Interior/Exterior color and texture were added to the digital model to make it look as close to the real thing as possible, and then starts evaluation of the quality. Does the parts match well? Were there any visually awkward places? Were the internal switches and controllers placed well and usable? Were there any blind spots in the driver's field of view? These were some of the questions we would put forth during the marketability evaluation.

The new K5 has a fastback design where the rear windshield appears to cover the bulk of the trunk lid; it breaks new ground for rear glass and lid design. Now, if the old method without VR would have been followed, the design assurance process would not have been able to review these parts from various angles or at the real eye-level. Because the lid and the rear glass both had their own inclines, the way in which they connected to each other was expected to have a host of problems. It was needed to observe it in a condition that closely approximates reality. VR allowed them to do that, so they were able to discover the expected issues in time and work them out with the design teams.

The 3rd-gen K5 profusely adopted metallic or black, high-glossy materials in its interior, particularly near the dashboard and the AVN. They contributed to the general high-quality feel of the interior, but their reflective nature could cause issues when they were exposed to sunlight. So it was necessary to have the vehicle undergo tests on light exposure, recording information like the amount of light reflected or the angles of reflection. Previously, it was possible to do this after the mock-up model or the prototype was complete. The test was highly reliable as a result, but building a prototype took too long, and the problems found at that juncture could not be instantly resolved

But VR helped to overcome all these space-and-time constraints. The digital vehicle was kept in a VR environment under the Sun. The evaluator now could get into the virtual car and quite literally see to what degree the reflections from high-glossy or metallic materials impact his view. They could also alter the location of the Sun and the strength of the Sun's rays, both of which were obviously impossible in real life. Having such ability made the assurance processes more accurate than ever before. The 3rd-gen K5's interior was littered with minor tweaks that benefited from such VR-aided evaluations.



**Fig 5:** The K5's high-quality fastback design was made possible largely due to the VR design quality assurance process (Source : metrology.news)



**Fig 6:** VR design quality assurance process had a major role in resolving the light reflection issues of the metallic and high-glossy material used for the K5's interior (Source : metrology.news)

The 2nd-gen K5 had its side mirrors on the bottom part of the A-pillars on either side, but the 3rd-gen shifted their position to the doors. This design-structural shift required them to check the new side mirror location's impact on the driver's view. This, too, required to build the prototype in the past. But VR allowed them to evaluate the various side mirror positions and the subsequent impact on visibility from the early stages of vehicle development. The digital vehicle ran the virtual highways, inclines, tunnels... and the quick feedback and corrections allowed for a more precise design quality evaluation.



**Fig 7 :** VR was also used for checking how the new side mirror location affected the driver's view (**Source : metrology.news**)

**There are other organizations who are effectively deploying VR in the Automotive product development.** key drivers of the increasing automotive VR popularity are **technological advancement** and the **need to reduce engineering costs**.

Ford has created a virtual laboratory that allows its engineers and designers to collaborate and work on car designs in real-time even when they are located in different countries. The company's **FIVE (Ford's Immersive Vehicle Environment)** uses motion capture markers and sensors in order to understand how the users and drivers interact with the vehicle. Volkswagen also uses VR technology in order to help designers and engineers collaborate on car designs remotely. The German car company uses immersive VR technology to improve the training process of its employees by providing them with a virtual environment that replicates the real-world. Toyota has a VR car driving simulator called **TeenDrive365** which leverages the Oculus Rift to help teens and new car drivers in learning to drive the car through virtual reality. It has realistic 3D animations, graphics, noises, and road traffic simulations which teach new drivers how to focus on the road without getting distracted.

### **The future of virtual reality**

On the way forward , Virtual reality(VR) continues to find new applications. The most extraordinary thing about VR is that it allows people to experience the real world in a virtual and incredibly immersive way possible VR Software is advancing just as fast as its compatible [hardware](#). The competitive environment on the business side and Pricing will be key to the consumer market. VR which started as an gaming experience has created [Mixed reality](#)(MR) experiences, or interactive experiences that are part [augmented reality](#) (AR) and part virtual reality, which provide a nice gateway into full VR adoption. The tangible future virtual reality predictions would be VR interactions will occur with handhelds and more slim headsets which are more like sunglasses. The automotive industry can greatly benefit from virtual reality technology in several aspects – it just depends on how we implement it.

### **About the author:**

**Mr. Pradeep Chandrasekaran** M.E(Automobile) MMS(Master of Management science) is currently working as Associate Director - Vehicle Engineering , OLA Electric Technologies Pvt Ltd. He Has 21+ years of rich experience in Automotive Industry with 2 Six Sigma Black Belt Certification. He had been associated previously with EICHER Tractors Ltd, JCB India Ltd , TATA Motors Ltd , Mahindra & Mahindra Ltd , FORCE Motors Ltd on various roles and responsibilities in New Product development and Engineering. His areas of expertise include New product Vehicle development , Electrification of Vehicles, Quality improvements, NG Vehicle development to mention a few. He is a professional Member in Indian Society of Quality from 2019. He has 10 Technical paper publications in various International and National Forums /conferences. His paper was chosen as Best Paper Award @ 18<sup>th</sup> Asian Network of Quality (ANQ2020) conducted by Korean Chamber of Commerce and Industry(KCCI) , Korean Society for Quality Management(KSQM) for Application of 6 sigma for Product Improvement. He is a Management Committee Member in SAEINDIA Southern Section for 2020-2022

## International Events - coming up:



### ANQ CONGRESS 2022

**Theme: Together for a Shared Future of Quality**

*Digitalization, Sustainability and Ecosystem*

**Host organisation:** China Association for Quality (CAQ)  
26- 28, October 2022

CAQ, one of the board members of ANQ like ISQ, will be hosting the ANQ Congress 2022. Call for abstracts from ISQ in India has received good response. The abstracts received are under assessment.



International Academy for Quality

### ISQ Quality Earth Forum (QEF)

presents



International Academy for Quality

## Quality Sustainability Award 2022

Quality Earth Forum of Indian Society for Quality is pleased to announce Quality Sustainability Award 2022 in the second year of partnership with International Academy for Quality. Applications are invited on the Sustainability case studies with the application of Quality methods and tools.

The award recognizes projects that have led to positive results in sustainability in line with the UN Sustainable Development Goals, through the use of quality management principles and methodologies. For Indian contestants, ISQ will hold a domestic contest towards the Quality Sustainability Award 2022. The winners at the national level will be eligible to contest at the International level.

You may download the brochure for more information, the application form and format for one page from <https://isqnet.org/category/events/international/index.html>.

Last date to receive the application is **15<sup>th</sup> July 2022**.

## Quality Innovation Award

ISQ participated as a national partner from India to the international Quality innovation award, for two successful years.

In the third year of association, ISQ now calls for applications from Indian organisations and professionals for the Quality Innovation Award 2022.

#### Important Dates:

Last date to receive QIA 2022 applications	<b>20.07.2022</b>
Declaration of national winners in each category	<b>17.09.2022</b>
Submission of National winning papers to International level	<b>24.10.2022</b>
QIA Gala –international event ( will be announced later)	



TO know more please write to [info@isqnet.org](mailto:info@isqnet.org) or call 7892516177

## National Events - coming up:

July 2022	Aug 2022	Sept 2022
CEO through TQM, by N Ramanathan Gurugram (21-23, July 2022)	TOPS Convention Bengaluru Chapter	Symposium 2022 –RV College of Engineering, Bengaluru 23-24, Sept 2022
Oct 2022	Nov 2022	Dec 2022
ANQ Congress 2022 Quality Innovation Award 2022, Quality Sustainability Award 2022 National finals	Quality Month Lectures	Annual Conference 2022 9-10, December 2022

### Congratulations to the new Executive Committee, ISQ Pune Chapter

ISQ Pune Chapter during its meeting on 7th June 2022 selected the following new committee members to succeed the founding committee after a very successful 2.5 years.

Mrs. Sarika V. Joshi, Facilitator, Coach QM as President – Pune Chapter

Mr. Devraj Chattaraj, GM, Tata Business Excellence group as Vice President

Mr. Santosh Bandal Sr. Manager – Business Excellence & Six Sigma MBB, Bharat Forge as Hon. Secretary

Following are the new EC members

Mr. Parag Auty, Head TQM, CVBU Tata Motors

Dr. Ajai Kumar Bajpai, Head of Quality – PV&EV Tata Motors

Mr. Manohar Sethpalani, Vice President – QBM, CEAT Ltd

Mr. R. S. Kannan, Consultant- Quality



Devraj Chattaraj  
Vice President



Sarika V. Joshi  
President



Santosh Bandal  
Hon. Secretary

#### Executive Committee Members



Parag Auty



Dr Ajay Bajpai



Manohar Sethpalani



R. S. Kannan

The first Executive Committee 2019 to 2022 headed by Mr. Sunil Kaul as Chairman and Mr. Mahesh Hegde as President, gave a strong foundation to Pune Chapter and leap to ISQ. It organising many events in the first year of inception like Annual Conference 2019, TOPS Convention, CEO through TQM, knowledge sharing sessions, MSME connect, Industry Institute interaction and development of membership base increasing the width of ISQ.

Out sincere thanks to the outgoing committee members who worked with passion to promote the mission and objectives of ISQ and put a strong base to ISQ Pune Chapter.

Executive Committee – Jamshedpur Chapter launched on 12<sup>th</sup> March 2022

Avneesh Gupta  
Chairman  
(VP- TQM and Engg & Projects – Tata Steel)



Pankaj Kumar  
President  
(Chief TQM & Corporate QA – Tata Steel)



Basabudutta Jana  
Vice President  
Plant Q Head at Tata Motors



Subhrajit Basu  
Vice President  
(GM, Business Excellence Group, Tata Sons)



Nishit Kumar Sinha  
Hon. Secretary  
Head Statutory Compliance Mgt & Societies, Tata Steel

## 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.

## Welcome to the new Life Members

Dr. K. N. Subramanya	Principal & Professor	R V College of Engineering,
Shubham Pandey	Asst. Manager QMS	Tega Industries, West Bengal
Anjan Kumar Gupta	DGM-QC & QA	Tega Industries, Kolkata, West Bengal
Sachin Singh Kushwaha	HEAD OF QUALITY MANAGEMENT	WIRTGEN INDIA PVT LTD ( A JOHN DEERE COMPANY), Pune
Dilip Satyawan Modak	Advisor - Business Excellence & Leadership Coach/ Mentor	Ceat Limited, Worli, Mumbai
Sunil Mali	PROCUREMENT SUPPLIER LEADER	SCHNEIDER ELECTRIC INDUSTRIES SAS
Dr. Narahari N. S.	Professor, Industrial Engg & Mgmt, R V College of Engg,	Dept of Engg & Mgmt, R V College of Engg, Bengaluru
Dr. Vijaya Kumar M. N.	Associate Professor,	Dept of Engg & Mgmt, R V College of Engg Bengaluru
Dr. Ramaa Ananthamurthy	Associate Professor	Dept of Engg & Mgmt, R V College of Engg, Bengaluru
Lokesh Venkataswamy	CEO & Managing Director	Innomantra Consulting Private Limited Bengaluru,



## Welcome to the new Annual Members 22-23

Mohammad Arif Kamaruddin Bagban	Manager	Mindarika Pvt. Ltd
Shivaraju C. G.	Quality Manager	Rajamane Industries Pvt Ltd, Blre – 48
Pratyush Mandal	Quality Manager	Ryse Energy UK Ltd
Rajendra Mhalgi	Freelance professional	Nila Madhava Consulting
Abhijit Sunil Shinde	Asst Manager	Track Components Ltd Pune
K. Guru Saran	Sr Partner & Manufacturing Vertical	Easy Problem Solving P Ltd Udaipur
Saravanan K.	Senior Manager TQM, TPM and Management systems	CARBORUNDUM UNIVERSAL LIMITED Hosur
Sudheendra G.	Deputy Manager	Toyota Kirloskar Auto Part Ltd, Bidadi, Bengaluru
S. Sivaraman	Manager Lean Sigma	Carborandum Universal Ltd, Chennai
Rohit Pathak	Dy. General Manager	Mahindra Institute of quality, M &M
Umesh Kulkarni	Senior Manager	Tata autocomp hendrickson suspensions pvt. Ltd.Chakan pune
Vinay Prabhakar	Trainee Engineer-1	Bharat Electronics limited. Haryana
Vivek Talwar	FOUNDER DIRECTOR	Chrysalis
Sunil Kumar S. A.	Associate General Manager	SEG Automotive India Pvt Ltd, Bengaluru
Prasad Vijay Sawant	Manager sqa	Mahle Anand Thermal Systems Pvt Ltd. Chakan, Pune
Chidambar V. Dixit	Assistant manager	Toyota Kirloskar Auto Part Ltd, Bidadi, Bengaluru
Akash Diwakarrao Somkuwar	GM Quality	VST tillers tractors ltd. Hosur
Vivek Gupta	Head Engineering	TVS Srichakra LTd, Pantnagar
Prabhakar Meher	Corporate & Legal Counsel, Prabhakar & Co New Delhi-110001	Prabhakar & Co Olive Group, Mumbai
Amresh Kumar	Consultant	National Council for Vocational Education and Training, New Delhi
P. Kumar	Dy. Manager	JSW Steel Ltd, Pottanaeri, Mecheri, Salem
Ranjeet Kumar Gupta	Superintending Engineer (Instt),	ONGC, New Delhi 92
Pradeep Chandrasekaran	Associate Director - Vehicle Engineering ,	OLA Electric Technologies Pvt Ltd
Mr. Anil Kumar M	Dy. Manager	Toyota Kirloskar Auto Part Ltd, Bidadi, Bengaluru
Sanjay Misra	Senior Vice President,	Economic Explosive Ltd
Vineet Tyagi	General Manager	Tata Consultancy Services
Krishnamurthy Nagesh Prakash	Consultant	Self employed
Soumyadeep Biswas	Deputy General Manager	Tata Motors Limited, Pimpri Plant, Pune
Kumari Puja	Senior Manager	Tata Motors Ltd, Jamshedpur
Amit Sharma	A V P & Head - Corporate Quality Excellence (Mechatronics Division)	Minda Corporation Limited (SPARK MINDA),- Noida.
Mayank	Senior Manager	Tata Motors Limited, Pune
Virendra V. Surana	GM, Plastics Engg & Production	General Industrial Controls Pvt. Ltd, T-107, MIDC, Bhosari Pune