



Q-ZINE

Bimonthly Newsletter

National Institution for Quality & Reliability

Chennai Branch

MAY - JUNE 2017

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From Chairman...



My hearty Ramzan Greetings to all of you.

I have been writing to you about Quality For Industry 4.0, Digitizing NIQR, Creating dashboard for NIQR activities, the evening lectures etc. In each of this area we have made considerable progress with all your Support. Quality For Industry 4.0 program is reaching out very well, the recent program in Delhi was attended by 300+ participants and well received by all of them. With this, so far we have been able to touch 3500+ hearts across the Nation with our QFI message. While this awareness program is continuing, we are planning for a NIQR Industry 4.0 Expo also. This will be a mega event with all your support. As a next step we are planning to involve our Government also in our Mission by creating Industry 4.0 clusters similar to Lean Clusters run by QCI. We should be able to succeed in this with all your Support.

As far as Digitizing NIQR is concerned, we have made a very good progress in terms of defining all NIQR Processes, identifying the Software developer etc. After this digitization, NIQR will be well ahead of other similar organizations in terms of adopting technology and more importantly, most of the NVAs that have crept into our system will get eliminated and thereby will drastically improve our speed with which we are marching towards our Mission. Evening lectures, we have been quite successful in conducting this every month and the participation levels in these evening lectures have improved drastically.

I am very sure, with all your active Participation, we will achieve all our Missions very soon!

K Manikandan

From Secretary...



Hope all of you had a comfortable summer this year!

Mission 20K of Industry 4.0 has attained excellent momentum which is reflected in the success of our 14th program in New Delhi. Under the guidance of our Chairman, the young and energetic Ashok Leyland team excelled in organising a mega event in a short notice of one month. Kudos to the team from NIQR Delhi NCR Branch for their support. And the highlight is getting two organisations involved in Industry 4.0 as sponsors and arranging for sharing their technical knowhow and experiences in Industry 4.0 thereby adding additional value to our program.

We are planning a National Conference on Industry 4.0 with Dr. M. G. R. Educational & Research Institute University and a series of programs in Institutions in the coming months. In the evening lectures front, we had lectures on 'Swachh Bharat' and 'Disruptive Innovation'; our sincere thanks to the members for making the Conference Hall full; this gives satisfaction and motivation to the speaker and organisers. NIQR is on the verge of becoming digital; it is also becoming younger; this is well reflected in the articles by students and forthcoming lecture by a young engineer from CTS.

Mr. Satish Borwankar, Chairman of NIQR Pune Branch & Executive Director (Quality), Tata Motors Ltd has been appointed as Chief Operating Officer of Tata Motors Ltd. Please join us in congratulating him and wishing him all the best in his new assignment.

Dr (Ms.) K. S. Babai, NIQR National Committee Member & Principal, Meenakshi Sundararajan Engineering College, will become the first woman Governor of Lions Club District 324 A1 in July 2017. Advance congratulations.

My hearty Ramzan Greetings to all of you.

C V Gowri Sankar



NIQR welcomes the new members who joined during May June 2017



Individual Life Members

- Mr. Pradipta Kumar Rath - Bajaj Auto Ltd., (Retd)
- Mr. Marathe Shrikant Raghunath - Director ARAI (Retd)
- Mr. Vikram Salunkhe - M D, Accurate Sales & Services Pvt. Ltd.
- Dr. Sanjay Arole - DGM, Quality Assurance, Volkswagen India Pvt Ltd.
- Mr. Kamalakar Takavate - Vice President HR, Volkswagen India Pvt. Ltd.
- Mr. V. R. Ramesh - Divisional Manager (CQ - Supplier Quality), Ashok Leyland Ltd.
- Mr. S. Yuvaraj - Divisional Manager, Process Excellence (Q, S&SC), Ashok Leyland Ltd.
- Mr. S. V. Narasimha Rao Rallabhandi - Ex. MD, Burkhard Compression (India) Pvt. Ltd.
- Mr. Dattatraya Navalgundkar - Head Corporate Strategy, Kirloskar Pneumatic Company Ltd.

and 2 Individual Annual Members

Chennai Branch Activities

Monthly Evening Lecture Programs

April 2017

On 28th April 2017, Mr. P. Basheerullah Khan, Founder & President, Railmarg India Org (NGO) delivered a lecture on "Swachh Bharat Abhiyan" at NIQR Conference Hall. Mr. C. V. Gowri Sankar introduced the speaker and narrated the way he established contact with the speaker through an Uber pool trip. Mr. P. Basheerullah Khan started the proceedings with details about the NGO Rail Marg and various activities he is involved with. He showed the video of the song on Swachh Bharat which has won him the Excellence Award from Govt. of India. The video showcased the cleanliness movement from Mahatma Gandhi's days and how Modi's campaign has taken root in various parts of India especially villages and the involvement of school children in it.



He detailed the various components of the campaign highlighting the importance of clean mind; we have to start from self, home, street, town to have impact on the entire nation; planting of trees in millions reducing the pollution is the need of the hour.

Almost all participants joined in narrating some incidents, wherein children have led the way in self discipline, most important for Swachh Bharat. Two of the participants invited the speaker to deliver a speech and interact with their local association members for propagating Swachh Bharat. Mr. Khan expressed his desire in joining with NIQR in planting of saplings in the needy areas.

Mr. P. R. Iyer, NIQR Life Member honoured the speaker with a shawl and a memento and praised the speaker for having taken up very noble and difficult task. Col K S Chakravarthi (Retd), former Executive Committee Member of NIQR HQ released the March - April Newsletter of Chennai Branch.

Mr. C. V. Gowri Sankar proposed the vote of thanks.



Mr. P. Basheerullah Khan, a B. A. Graduate worked in Indian Railways in various positions and retired as Station Manager. After retirement he has started the NGO Rail Marg and focuses on various activities of Railways including safety & cleanliness. He has been awarded 'Certificate of Excellence' for his short film on Swachh Bharat by the Ministry of Information and Broadcasting, Government of India.



Monthly Evening Lecture Programs

May 2017

On 24th May 2017, Mr. Mr. T. S. Rangarajan, Enterprise Risk Officer, TCS delivered a lecture on "Disruptive Innovation" at NIQR Conference Hall.

Mr. K. Manikandan, Chairman, NIQR Chennai Branch presided over the function and welcomed the members. Mr. C. V. Gowri Sankar introduced the speaker.

Mr. Rangarajan quoted the Production Function of Mr. Cobb Douglas wherein he has established 60 years ago that Labour and capital contributed only 12% towards improvement of Standard of Living of Society and balance 88% by Technology. According to Ranga, only Japan made use of this and prospered immensely acquiring technology from the West.

He then explained the Emerging Technology Hype Cycle 2016 by Gartner – how innovative technologies (a few: Machine Learning, IoT, Smart Robots, Brain-Computer Interface, Virtual Reality, etc.) trigger Innovation to achieve Plateau of Productivity over time.

He then explained the 3 models of Innovation namely, Platform Innovation. Derivative Innovation and Disruptive Innovation. He then gave a lot of disruptions expected in the following sectors.

Oil prospecting, refining and marketing | Manufacturing | Banking | Trading | Research, Training | Life Sciences

He underlined that many of the things we are doing are automatable with lot of Data Analytics. He sensitised the audience with real time disruptions like, Internet growth, Smartphone penetration, Uberisation, Reliance Jio free calls – the list was endless. He allayed the fears of the audience about job loss and ended his lecture projecting that people will become more and more responsible for society and disparity in wealth will come down.





The Q&A session was very interesting and broke the normal time controls of lecture meeting; there were many emails flooding in the next week praising the usefulness of the lecture. Mr. K. Manikandan summed up the proceedings and thanked the speaker for his illustrious research on the subject and the apt use of videos. Mr. C. V. Gowri Sankar proposed the vote of thanks.



Mr. Rangarajan has been with TCS Ltd for the past 28 years. He has handled several assignments such as Enterprise Architect for next generation systems, Practice head for RFID Solutions, Project Manager for Hospital Management System, Practice head for Retail Industry based in New York, Onsite Engagement Manager for a large retail project in Minneapolis and Group Leader for Management Consulting. He has worked on a large number of consulting engagements spanning manufacturing and service sectors. Ranga worked as a Shop Floor Production Engineer in Gear Shop, Machine Shop 1, Ashok Leyland, Ennore.

Quality For Industry 4.0 Program: No. 13

The 13th program on Quality For Industry 4.0 was conducted on 5th May 2017 at the premises of M/S Bridgestone India Automotive Products private Limited, Oragadam. There were 35 participants from Bridgestone India and their vendors.

Mr. S. Kumar, GM of the Plant and Joint Secretary, NIQR Chennai Branch welcomed the participants. He stressed upon the participants about the importance of preparing now for Industry 4.0. The program started with Mr. Presannakumar - Asst. General Manager (Purchase) introducing the Chief Guest, Mr. S. Rajasekaran, National Vice President - NIQR & MD, Infant Engineers Pvt. Ltd. to the audience.

The Chief Guest, Mr. S. Rajasekaran, advised the young Indian minds not to be chasers of global technological developments as in the past but be the forerunners of Industry 4.0. He gave a brief account of how to prepare one to embrace Industry 4.0. He showcased some of the developments in his organisation to make the participants feel at home about embracing the next Industrial Revolution.

C. V. Gowri Sankar, Secretary, NIQR Chennai Branch addressed the participants and explained about the activities of NIQR and asked the participants to make use of them. He explained how the program is structured in 4 modules and the mission set by NIQR Chennai Branch Chairman to sensitise 20000 minds this year.

Mr. G. Pandurengan, ECM, NIQR Chennai Branch started the program with the first module 'Industry 4.0 - Need of the Hour', in which he analysed the economic status of India and the challenges and opportunities today. In the second module 'Industry 4.0 - What is in it?' he explained in detail the components of Industry 4.0.

C. V. Gowri Sankar, Secretary, NIQR Chennai Branch, handled modules 3 & 4 wherein he explained how the major Quality Tools will be impacted in Industry 4.0 and the way forward for individuals and organisations.

The Valedictory Function started with Mr. Antony Prakash - Asst General Manager - HR introducing the Chief Guest, Mr. K N Krishnamurthy, Past National President, NIQR. The Chief Guest gave an overall scenario of Indian Industries with respect to Quality, Cost & Delivery and explained how it is important for Indian MSMEs to prepare themselves for the next Industrial revolution. He also distributed the Participation Certificates.

Mr. S. Kumar, GM of the Plant proposed the vote of thanks in which he made a special mention of NIQR which has taken a massive task of sensitising 20K minds this year.



Quality For Industry - 4.0 Program: No. 14

In line with our Chairman's mission of sensitising 20000 minds this year, we have moved north to Delhi NCR belt. Our 14th program was organised at Hotel Crowne Plaza, Gurgaon on 27th May 2017. It was a grand success with 300+ participants.

The young and energetic Ashok Leyland team under the guidance of our Chairman was well supported by NIQR Delhi NCR team in organising such a mega event in a short notice of one month. Kudos to them for arranging two sponsors for the event namely, M/S Siemens and M/S Marshall Machines (P) ltd. and arranging for sharing their technical knowhow and experiences in Industry 4.0.

Mr. K Sridharan Balaji, National Secretary, NIQR welcomed the Eminent Guests and Participants. Mr. K. Manikandan, Chairman, NIQR Chennai Branch elaborated on the need to sensitise minds to enable India to embrace Industry 4.0 and described NIQR's mission.

Mr. A.K. Tomer, Chairman NIQR Delhi NCR Branch briefed the audience about the present Global Scenario in Manufacturing sector. India which is lying in the 11th position in the Global Manufacturing Competitive Index is projected to be No 5 by the year 2020.

Mr. P.K. Aggarwal, National President – NIQR in his presidential address appreciated the overall progress made by Indian Mfg. Industry in the new millennium which is reflected in the fact that out of 56 Deming Awards, India has bagged 22. The Chief Guest, Dr. K. Kumar, former Director – Engg, Maruti Suzuki India Ltd, Gurgaon outlined the continuously changing TQM and the ever-changing expectations of the customers. He made a mention of the contributions made by Quality Gurus in this aspect.

Mr. C. V. Gowri Sankar, Secretary NIQR Chennai Branch invited all the participants to become Life members of NIQR and announced that NIQR is pleased to make all the participants as Individual Members for one year. The four modules were presented by the faculties Mr. P. T. Bharani Perumal, Mr. G. Pandurengan, Dr. V. M. Gunasekaran, Mr. C. V. Gowri Sankar and Ms. K. Geetha.

Mr. S. Rajasekaran, National Vice President NIQR explained the progress made in his plant to make it a smart factory. Siemens Representative Mr. Rakesh Pandey, Automotive Solutions made a presentation on "Journey on Industry 4.0 with Closed Loop Quality". He explained the 'RAMI 4.0 - The Reference Architectural Model for Industry 4.0'; it breaks down the complex processes into easy-to-grasp packages, including data privacy and IT security.

Mr. Gaurav Sarup, MD of Marshall Machines gave an interesting presentation on "THE ART OF TURNING...intelligently". He explained the three pain points in turning with CNC machines namely Rejection/Rework of Jobs, Poor Tool Life and Unexpected Breakdowns of Machines and how their IoTQ - "Internet of Things for Quality" addresses them.

The Q&A session was very lively and was extended due to lot of interest shown by the participants. Mr. Lokesh Pandey, Secretary NIQR Delhi NCR Branch summed up the proceedings and proposed the vote of thanks.





Head Quarters Activities



NIQR Fellowship Award Function

National Institution for Quality and Reliability confers NIQR Fellowship on Quality Professionals in recognition of the outstanding services rendered by them for the Quality Movement and NIQR.

Instituted in the year 2014, so far 17 of leading Quality Professionals have been conferred the NIQR Fellowship Award. On 6th May 2017, NIQR Head Quarters organised the NIQR Fellowship Award Function at Hotel The Westin Chennai.

Shri P. Kaniappan, Managing Director, Wabco India Limited, Chennai was the Chief Guest for the function. Dr. A. Sanjeeva Rao, Past National President, NIQR addressed the audience and explained about the Fellowship Awards.

Mr. P. K. Aggarwal, National President, NIQR welcomed the august gathering and the Fellowship Awardees. He then announced the Fellowship for the following senior members of NIQR.

- * Mr. T. R. R. Rao - Past Chairman - NIQR Bengaluru Branch & Executive Director (Retd.) of BEML
- * Mr. G. R. Janarthanan, Past National President - NIQR & Director of India Pistons Ltd
- * Mr. S. Ramachandran, Past National Secretary - NIQR & Executive Director of Super Auto Forge Pvt. Ltd.
- * Dr. V. Swaminathan National Vice President - NIQR, & Director of VSAM Associates
- * Mr. G. Rangarajan - Past National Secretary - NIQR & CEO of CEO Consultants
- * Mr. T. Eapen Koshy - Past National President - NIQR & Director (Retd.) of MRF Ltd

The Chief Guest Shri P. Kaniappan conferred the Fellowship Awards to the Awardees. The highlight of the evening was the Awardees received the Award with their spouses.

Mr. T. Eapen Koshy could not come to the function as he was not in town.

Mr. T. R. R. Rao in the acceptance speech on behalf of all Awardees highlighted the struggle one had to face during their time in promoting Quality.

Mr. K. Sridharan Balaji, National Secretary, NIQR proposed the vote of thanks.

Memorandum of Understanding with ASQ

National Institution for Quality & Reliability had signed an MOU with American Society for Quality India Pvt. Limited (ASQ India), a 100% owned subsidiary of ASQ Inc (USA) on 12th May 2017. It was due to unstinted efforts of Dr. V. Swaminathan, NIQR National Vice President for the last six months that had paved the way for the coming together of two premiere Quality Organisations.



In a colourful function at NIQR Conference hall on 12th May 2017, Mr. Pradeep Kumar Aggarwal, National President - NIQR and Mr. Anindaya Sarangi, Director APAC - ASQ signed the MOU.

The intent of this MOU between the ASQ India and NIQR is to outline the way in which the two parties will collaborate and be able to leverage complementary capabilities i.e. ASQ's globally recognised Body of Knowledge (ASQ-BoK) based portfolio, content, structure and global best practices with NIQR's local understanding, reach and visibility to enhance the common mission of quality through the facilitation of establishing of a quality based knowledge system and culture in India. The scope of activities would focus on enhancing capacities for deployment of quality and reliability based education across all industries. The scope will also look at developing India centric international best practices on reliability to drive NIQR's program for continuous improvement.



Felicitation Function for Deming Prize Winner

NIQR takes pleasure in felicitating eminent personalities and organisations which have contributed much for the promotion of quality and TQM. Over the years, NIQR has felicitated both Individuals and Organisations for winning the coveted Deming Prize. On 6th May 2017, it organised a Felicitation Function at Hotel The Westin Chennai for Ashok Leyland Limited Pantnagar Plant for having won the Deming Prize for the year 2016.

Mr. P. K. Aggarwal, National President, NIQR welcomed the august gathering which included Industry Heads and NIQR Members and Special Invitees and congratulated the Pant Nagar plant of Ashok Leyland for having become the first truck and bus plant in the world and also the only Commercial Vehicles manufacturer outside of Japan to win the Deming Prize.

He made a mention of the fact that out of 56 organizations that have won the Deming Prize from 2000 to 2016, India is on top of the list with 22, followed by Japan with 16 and Thailand with 12.

Praising Ashok Leyland for its commitment to Quality, he referred to the message by Mr. Vinod Dasari, MD of Ashok Leyland Limited while addressing the media after receiving the Deming prize "Consistent quality, technology, innovation and robust processes are the pillars which have helped us garner international recognition, customer satisfaction, and help us deliver on our brand promise of 'Aapki Jeet, Hamari Jeet'.

Shri P. Kaniappan, Managing Director, Wabco India Limited, Chennai was the Chief Guest for the function. In his address to the audience, he mentioned about the commitment of AL Management in drawing up a long term roadmap and meticulously following it in winning the Deming Prize for its Pantnagar Plant. He was confident that other Plants of AL will soon win the Award.

He then felicitated Ashok Leyland Limited represented by Mr. R. Sivanesan, Sr. Vice President, Quality, Sourcing & Supply Chain, Mr. P. Harihar, Sr. Vice President, Manufacturing & Project Planning and Mr. Alok Gupta, Plant Head - Pantnagar with mementos.

In the acceptance speech, Mr. Alok Gupta thanked NIQR for the felicitation function arranged in a grand manner. He then made a presentation about the roadmap emphasizing on the development of Pantnagar and its people as the starting point. He made a mention about the proud moments which included transforming people who have not even seen a train till entering AL becoming well versed in English and programming and operating CNC machines. He concluded that bottom up approach in policy deployment as the focal point of Pantnagar winning the Deming Prize.

Mr. K. Sridharan Balaji, National Secretary, NIQR proposed the vote of thanks.



The Deming Prize is a Global Quality Award, the oldest and mostly recognised Quality Award in the world that recognises both Individuals for their contributions in the field of Total Quality Management and Businesses that have successfully implemented TQM.

Know the Quality Gurus - 8 Shigeo Shingo (1909 ~1990)



Shigeo Shingo is a Japanese industrial engineer considered as the world's leading expert on manufacturing practices and Toyota Production System.

Shigeo Shingo is strongly associated with Just-in-Time manufacturing (JIT), and was the inventor of the single minute exchange of dies (SMED) system, in which set up times are reduced from hours to minutes, and the Poka-Yoke (mistake proofing) system. In Poka Yoke, defects are examined, the production system stopped and immediate feedback given so that the root causes of the problem may be identified and prevented from occurring again.

He distinguished between "errors", which are inevitable, and "defects" which result when an error reaches a customer, and the aim of Poka-Yoke is to stop errors becoming defects. Defects arise because errors are made and there is a cause and effect relationship between the two.

He introduced the concept of Zero quality control in the ideal production system and this requires both Poka-Yoke and source inspections. In source inspection, errors are looked at before they become defects, and the system is either stopped for correction or the error condition automatically adjusted to prevent it from becoming a defect.

His famous quotes include

- * "Those who are not dissatisfied will never make any progress"
- * "The most dangerous kind of waste is the waste we do not recognize"
- * "When you buy bananas all you want is the fruit not the skin, but you have to pay for the skin also. It is a waste. And yet the customer should not have to pay for the waste".

There are four methods of improvement and they appear in this order of priority: Easier, Better, Faster and Cheaper.

Shigeo Shingo has written 14 major books and hundreds of important papers on manufacturing. He is perhaps the greatest contributor for modern manufacturing practices. He was able to provide better life for both the operators and the corporations. The Shingo Prize is awarded for excellence in manufacturing as a tribute to Dr. Shingo and his lifelong work.

Strategic Quality framework -8

How to measure the Quality of Product and Services?

In recent times, all the companies have tried to upgrade the product quality and services through various programs like cost of quality, reliability engineering, First time right etc, using 7 QC tools and Design of Experiments. But some of the organizations have failed because of lack of seriousness and perceived these programs as defensive measures to remove defects. So the concept called Strategic Quality Framework (SQF) emerged. Dr. Garvin developed this framework of 8 dimensions to measure the quality of product / services.

- * Performance
- * Features
- * Reliability
- * Conformance
- * Durability
- * Serviceability
- * Aesthetics
- * Perceived Quality

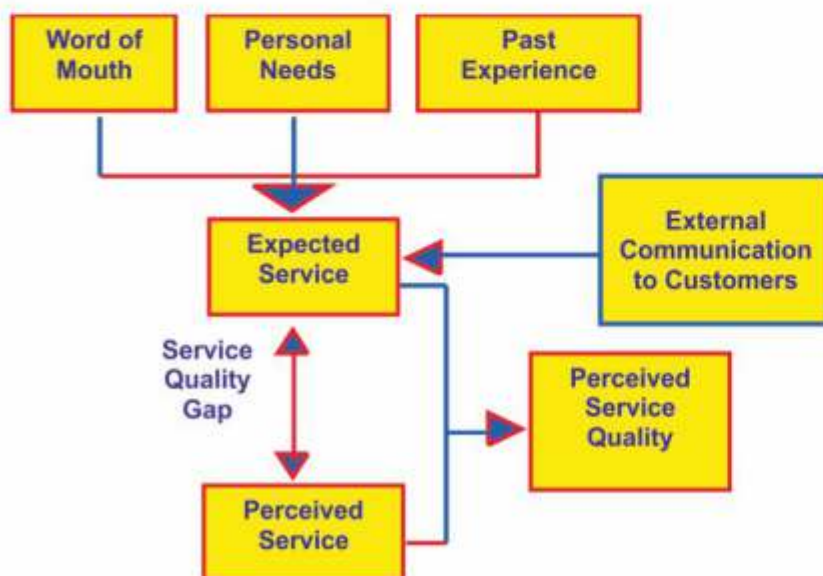
In the previous newsletters, we have studied the importance of the first seven dimensions. In this issue, let us concentrate on the last but very important, difficult to measure Perceived Quality dimension.

Perceived quality dimension relates to the customers' perceptions of the product's quality and value received for monies paid. This dimension integrates the previous seven dimensions with the customers' sense of value for them. Market research is one of the most important means for determining the customers' perceived quality.

Quality is as the customer perceives it. Customers imbue products and services with their understanding of their goodness. This is perceived quality. Perceived quality is the feel, finish and manner in which the customer is dealt with using five senses.

The term "Perceived Quality" refers to the quality that customers acknowledge through the look, touch, and feel of a product. For example, in a showroom, the customer would first take a glance around the car, then open the door, sit on the seat, and check the quality of the details.

An example of Perceived Quality in a Service station



Perceived quality is an intangible, overall feeling about a brand. However, it usually will be based on underlying dimensions which include characteristics of the products to which the brand is attached such as reliability and performance.

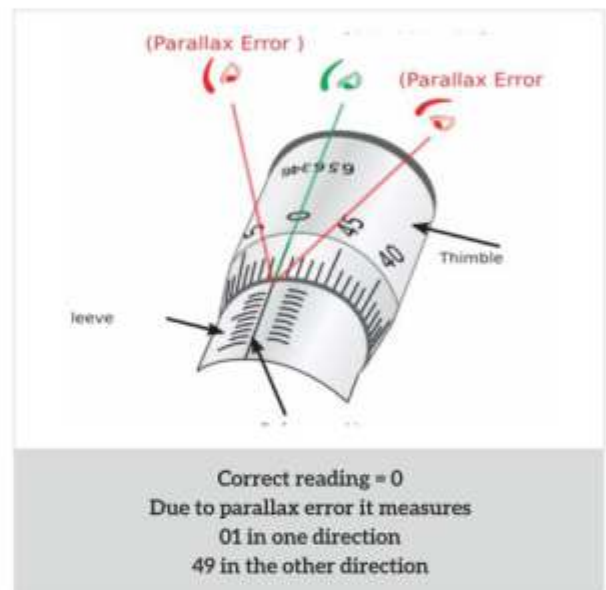
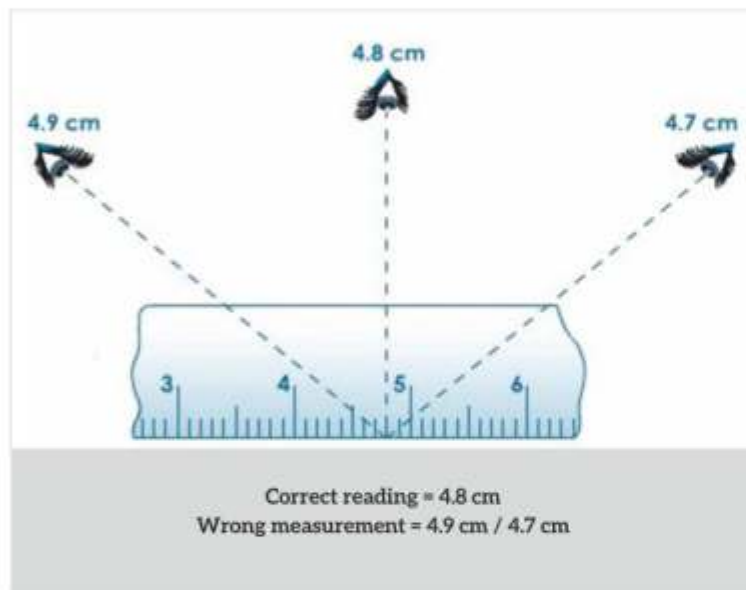
Parallax Error

This is one of the measurement errors which is caused during measurement using mechanical instruments like Scales, Vernier Caliper, Micrometer, Dial indicators, Speedometer, etc., but it is often overlooked by the appraiser.

Parallax error occurs when the measurement of an object's length is more or less than the true length because of your eye being positioned at an angle to the measurement markings. For example, a person viewing a car's speedometer from the driver's seat will get an accurate reading because he has a direct line of sight. A person viewing the speedometer from the passenger seat will overestimate the reading because of the angle between his eye, the meter and the arrow.

Parallax Error is a displacement or difference in the apparent position of an object viewed along two different lines of sight and is measured by the angle or semi-angle of inclination between those two lines.

Whenever there is a gap between the scale and the mark to be read, parallax error is present. We may use instruments such as mirrors on the dial so that you can line up the pointer with its own reflection, to make sure that your reading is exactly at right angles to the scale.



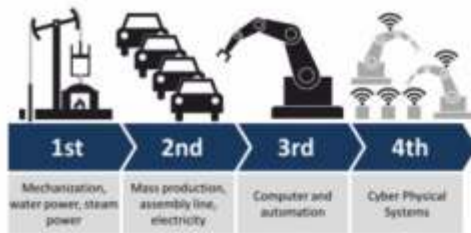
How to avoid Parallax error during measurement?

- ★ Orient your line of sight directly above the measurement marking on a ruler or similar device so that an imaginary vertical line connects your eye, the marking and the object.
- ★ Place the measurement device on its edge so it is level with the object being measured.
- ★ Seek out the finest possible edge of the measurement device, or use a device with finer edges.
- ★ Ask other people to take measurements. Because parallax error is a type of random error, you can average multiple readings taken by different people to cancel out most of the parallax angle.



These series of very informative and useful articles were compiled by Mr. S. Kumar, General Manager - Operations of Bridgestone India Automotive Products Pvt. Ltd. He is currently Joint Secretary of NIQR Chennai Branch. The first set of articles in the series was published in our Jan-Feb 2015 issue. We had been receiving positive and encouraging feedbacks from our life members time and again to continue the series. We place our heartfelt thanks to Mr. Kumar and hope to receive further such useful articles.

Delhi Branch Activities



Industry 4.0

Industry 1.0 was the invention of mechanical help-water(fluid) and steam power. It was initiated in 1784. Human effort was reduced with the help of mechanisms and machines. It caused the growth of coal, iron, railroad and textile industries.It ended in mid 19th century.

Industry 2.0 was a phase of rapid industrialisation and mass production, pioneered by Henry Ford, with the help of Assembly line. It was first used in a slaughter house. It was initiated in 1870 and it witnessed the expansion of electricity, petroleum and steel industries.

Industry 3.0 integrated the concepts of electronics and software with manufacturing to increase rates of production. Electronics and IT was integrated with the manufacturing industry for the first time. Production was automated to increase safety, reliability and speed. It was started in 1969. Enormous growth was witnessed during this revolution.

Industry 4.0 is peer-to-peer communication between products, systems and machines enabling mass production and reduction in human effort simultaneously. It will enable machinery to do smart work along with the hard work. It is the current trend and it is continuous unlike other industrial revolutions.

Way Towards The Future

Need of the hour "Industry 4.0"

The term Industry 4.0 refers to the current trend of automation and data exchange in manufacturing technologies. It includes cyber-physical systems, the Internet of things and cloud computing. Exponential growth will be achieved in production processes during the fourth revolution of industry.

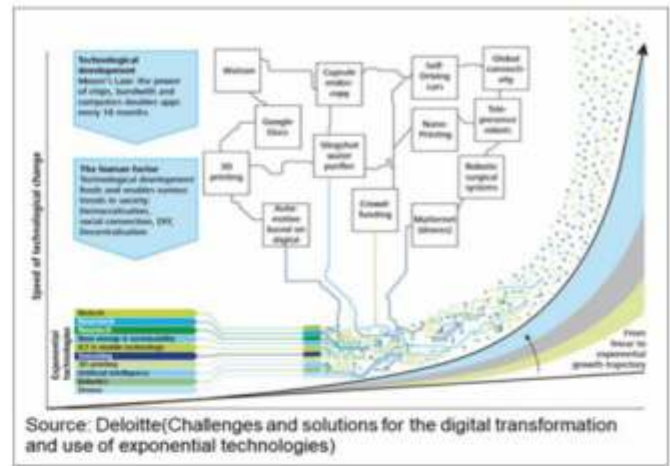
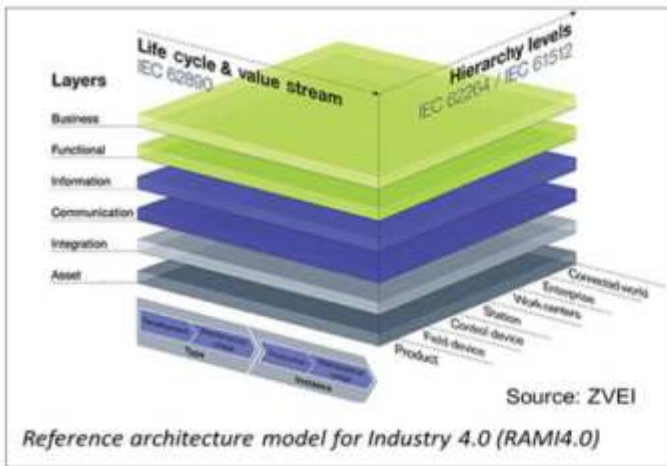
What's new?

Industry 4.0 creates a "smart factory". Within the modular structured smart factories, cyber-physical systems monitor physical processes and make decentralized decisions. The physical systems become the Internet of Things which communicate and cooperate with each other and with humans in real time via the wireless web i.e. the order management, the products, the manufacturing execution systems, the supervisors (humans) and the service providers are all connected on a common network and have the ability to automatically send and receive the required data. In a smart factory, the parts know what they are. They have Radio Frequency Identity Chips (RFID) which allows each part to transmit its identity wirelessly to a computer. Therefore, the Manufacturing Execution Systems can perform the required operations. Some examples for Industry 4.0 are machines which can predict failures and trigger maintenance processes autonomously or self-organized logistics which react to unexpected changes in production.

But why is it required to adopt a new approach for production?

- * The machines used today can do a specific process repeatedly for very long durations but they are not able to differentiate the products. Therefore if varying products are to be produced on the same line, the machines are inefficient on their own and need some human help to differentiate those products and operations which are to be carried on them. Whereas smart machinery can interact with different products through RFIDs and can take decisions on its own. Thus, a smart factory can do smart work along with the hard work.
- * As less number of humans is required to operate those factories, more brains will be available to carry out the Research and Development processes.

Thus, it is necessary to survive and thrive in competition.



Vision

The vision of Industry 4.0 is to achieve higher productivity, efficiency, and self-managing production processes where people, machines, equipment, logistics systems, and work-in-process components communicate and cooperate with each other directly. The order management system and the production control may be integrated with the application of Industry 4.0 i.e. absolute automation of manufacturing.

Characteristics of Industry 4.0

- * Vertical networking of smart production systems such as smart factories and smart products with networking of smart logistics, production and marketing and smart services, with a strong needs-oriented, individualised and customer-specific production operation.
- * Horizontal integration by means of new generation of global value-creation networks, include integration of business partners and customers, and new business and cooperation models across countries and continents.
- * Acceleration through exponential technologies that, while not really new in terms of their development history, are only now capable of mass-market application as their cost and size have come down (e.g. sensor technology) and their computing power has risen massively.

Pre-requisites of Industry 4.0

- * Harmonised software architecture is required to create virtual physical systems. Design enhancements can be done with gradual increase in complexity - from data acquisition to adaptive, self-learning control loops.
- * Manufacturing Execution System (MES) is required to evaluate data and carry the intended operations.
- * International standards are required and should be adopted by every institution which intends to use the new technology.

Design principles of Industry 4.0:

- * **Interoperability:** Machines, devices, sensors and people should be able to connect and communicate with one another.
- * **Information transparency:** The ability of information systems to create a virtual copy of the physical world through sensor data in order to contextualize information.
- * **Technical assistance:** The ability of the systems to support humans in making decisions and solving problems and the ability to assist humans with tasks that is too difficult or unsafe for humans.
- * **Decentralized decisions:** The ability of cyber physical systems to make decisions on their own and to perform their tasks as autonomously as possible. Only in the case of exceptions, interferences, or conflicting goals, are tasks delegated to a higher level.

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Advantages:

1. Reliability and continuous productivity: The production can be carried out continuously which is not possible with large number of operators. Also automation improves the reliability and uniformity upto a very large extent.
2. Early detection of compromises with quality: The compromises with quality i.e. faults in the products can be identified at an initial level. Handling the faulty products with special care (whenever possible) or sending them to scrap almost eliminates the faults in the final products.
3. Product lifecycles: As the number of faults is reduced, product lifecycle is appreciably improved.

Industry 4.0 and Quality Assurance

- * Quality testing is done on random samples for most of the products. It does not ensure proper working of all of the products. However, with the execution of Industry 4.0, 100% testing can be done for all critical parameters.
- * Metrology is integrated with production i.e. measurements are done along with production. It saves space, infrastructure and time which were earlier required for separate measurement processes. Moreover, improved accuracy is obtained in operations.

Industry 4.0 and manufacturing

- * Various companies have designed self-learning tool making systems- technology for stamping operation on press lines. These can automatically adjust to optimise how much material is fed into a press. Moreover, the sensors measure the force exerted on steel and aluminium blanks, and adjust pressure by raising or lowering stamping dies. This also contributes to sustainable production by lowering the number of reject parts.
- * The concepts of smart working can be used to increase the environment safety at the production sites. For example - At the Bosch plant in Stuttgart-Feuerbach, humans work together with automatic production assistants (APAS), which are equipped with sensors that stop the APAS working if the human and the APAS get too close to each other. Through this system the production assistants (the machine) can take decentralised decision and does not require humans to control it all the time. As a result, much faster and safer production environment becomes feasible even in compact space.

Challenges to overcome:

- * Reliability and stability needed for critical machine-to-machine communication, including very short and stable latency times.
- * Need to maintain the integrity of production processes.
- * Need to protect industrial knowhow (contained also in the control files for the industrial automation gear).
- * Lack of adequate skill-sets to expedite the march towards fourth industrial revolution.
- * General reluctance to change by stakeholders.



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Pune Branch Activities

EC Meeting of NIQR Pune Branch

On 17th June 2017, the EC of NIQR Pune Branch had their monthly meeting. This was made special by the presence of Mr. P. K. Aggarwal, National President, Mr. S. Rajasekaran, National Vice President and Mr. K. Manikandan, Chennai Branch Chairman. This was organised at Ashok Leyland Pune office.

Members congratulated Pune Branch Chairman, Mr. S. B. Borwankar for being appointed as COO of Tata Motors Ltd. Mr. P.K. Aggarwal mentioned that it is a matter of pride for entire NIQR.

President advised the EC Members to kick start activities of Pune Branch. He added that they have to keep the momentum generated by the Industry 4.0 event conducted in February. The EC decided to host their first event sometime in 2nd week of August 2017.

Mr. Vikram Salunkhe & Mr Dattatraya Navalgundkar briefed members about the progress on '**SL Kirloskar Centre for Industry 4.0**' being setup in Pune. This will be a unique centre being developed with Industry - Institute partnership. Proposal for the centre is under assessment with Department of Heavy Industries, Govt. of India. The Institute is in the final phase of discussions with Fraunhofer University, Germany & IIT Bombay for becoming knowledge partners. This centre will support auto and engineering Tier 1 & Tier 2 vendors in training and implementing pilot projects related to Industry 4.0.

President Mr. Aggarwal mentioned that NIQR has set out a target of touching 20,000 professionals in the area of Industry 4.0 this year. This centre will definitely complement NIQR's efforts.

Members present - Mr. S. B. Borwankar, Mr. P. K. Rath, Dr. Sanjay Arole, Mr. Vikram Salunkhe, Mr. D.S. Navalgundkar, Mr. S. Yuvaraj and Mr. V. R. Ramesh
Meeting concluded with vote of thanks by Mr. S. Yuvaraj

Mr. P.K. Aggarwal, Mr. S. Rajasekaran and Mr. K. Manikandan visited M/S Kirloskar Pneumatic Company Limited for detailed discussions on the project - S L Kirloskar Centre for Industry 4.0. A detailed presentation on the concept of the centre and its current status was made by Mr. Dattatraya Navalgundkar. Later a visit to Accurate Gauging & Instruments Pvt Ltd was organised for demonstration of new CMMs being built for critical applications.



Machine Learning

Have you been hearing this word far too often in the recent times? Have you been hearing people say that this is the next big thing in the world? It wouldn't be surprising at all if your answer is yes because it is indeed the next big thing that is going to bring some undgodly technological advances on this earth. So what is it exactly? According to Wikipedia, Machine Learning is the subfield of Computer Science that gives computers the ability to learn without being explicitly programmed. I'll explain this from the context of human learning. We never touch fire because we know it hurts. Now, how do we know this? We know this because we all have had the experience of touching fire at least once as a child. This experience taught us the fact that if we touch fire, it causes pain. This is how we humans learn. We learn from our past experiences and the more experiences we have, the more we learn. The same process of learning when applied to a machine or a computer is called Machine Learning.

One of the most popular applications of Machine Learning is the Google Search. When you search for something in Google, it shows up the most relevant web pages related to that search. But how does Google know how relevant a page is to you? The Google's machine learning algorithm learns from your previous clicks and understands which pages are more relevant and which aren't and displays them accordingly. Another application of Machine Learning is spam detection. Have you noticed how spam e-mails have almost disappeared from your inbox? That's Machine Learning.

Similar to how humans learn from our memories and experiences, machines and computers learn from data. In today's world, millions of data are being generated every second and the amount of data available is unimaginably huge. This is one of the reasons why the field of Machine Learning and Data Analytics is booming since highly optimized and scalable machine learning algorithms that can handle huge amounts of data is the need of the hour. To give you an idea of the scale of data I am talking about here, let me again go back to my example of Google Search. Note that Google's algorithm has to work for everyone and it has to learn from all the searches that have happened all over the world. **Google processes over 40,000 searches every second** on average which translates to over 1.2 trillion searches a year!

Broadly, Machine Learning can be classified into two categories: Supervised and Unsupervised Learning. Supervised learning is learning from labeled data. That is, it contains the input as well as the desired output. Unsupervised learning is learning from raw unlabeled data. Here learning is usually done by finding patterns in the given data. Let me explain this by taking a real life scenario. Suppose you have a basket filled with four types of fruits namely banana, apple, cherry and grape and your task is to arrange them into groups. If you already know from your previous experience or knowledge about the physical characteristics of these fruits and its name, then it will be easy for you to group them. This is Supervised Learning. So if you take a fruit from the basket, you will know what fruit it is since you have been trained with the answer. Now, let us say that this is the first time you are looking at these fruits in your life and you have no clue about them. In this case, you would probably try to group them based on some pattern (maybe color). This is a case of Unsupervised Learning where you are not trained with the answer.

Machine Learning is a vast and an interesting field that is gradually shaping the world we are living in and being aware of it is a great asset. I hope I was able to give you an insight into what it really is. Thank you.



By V. Adithya

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Members in News

Mr. P. K. Aggarwal, NIQR National President was the Chief Guest in the annual event of the Indian Society for Non-destructive Testing (ISNT) on 21st April 2017. He highlighted the significance of Industry 4.0 to the Indian industry, and explained how NIQR has been making efforts in this direction by conducting several workshops on the subject 'Industry 4.0' at various industries and institutions. He also cited how NIQR is the training partner to the Quality Council of India, which has been selected as nodal agency for the ZED program.



Dr. G. Saravanan, Life Member of NIQR participated as the Chief Guest in the 11th Annual Day function of Jaya Sakthi Engineering College, Thiruninravur on 26th April 2017 and motivated students on the importance of education and requisites of Engineers being placed in industries after completion of studies. He also distributed prizes and certificates to the students who excelled in Semester exams and Professors who produced good results.



Mr. V. K. Venkataramani, CEO - Across World Quality International and ECM, NIQR Chennai Branch delivered the key note address in the "Quality Forum" on "Outcome Based Education in Higher Educational Institutions" conducted by Dr. M.G.R. Educational and Research Institute University on 5th May 2017. He spoke about the role and importance of Program based Outcomes in Higher Education and requirements of Education 4.0 matching Industry 4.0.



Mr. R. Anandakumar, NIQR National ECM and G.M - Quality Control- Schwing Stetter (India) Pvt. Ltd was the convener of the First CII TQM forum conference on 3rd June 2017 at Hotel Hilton, Chennai. Professor Yasutoshi Washio was the Chief Guest and he has predicted in 2020 Indian Manufacturing Industry will overtake Japanese Manufacturing Industry in Quality.





CERTIFICATE PROGRAM IN AUTOMOTIVE QUALITY MANAGEMENT

COLLABORATIVE PROGRAM
by LIBA and RNTBCI
(Renault Nissan Technology & Business Centre India)

**Eight Months comprehensive Certificate Program
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SALIENT FEATURES OF THE PROGRAMME

- Program aimed at “Pro-active quality management” rather than a “Reactive quality management”
- Fulfills a unique need for a management program that revolves around the automotive manufacturing
- Program focus is on instilling “Global Quality Mindset” among the working population
- Program will be conducted in “week-end” mode for eight months, from 22nd July 2017
- All the participants will be issued with LIBA-RNTBCI joint certificate.

Anyone working at Supervisory level or above in Auto components Manufacturing Sector/Ancillaries is eligible.

* The original fee for this eight months program is Rs 1,50,000/-. After subsidy, the contribution per participant is Rs 10,000/- only.

M.Gurunathan, LIBA-RNTBCI Program Coordinator,
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