



National Institution for Quality & Reliability

Chennai Branch

Quality Month Knowledge Tidbits

Six Thinking Hats

Dr. R. Srinivasan, Former Chairman, NIQR Chennai Branch and Management Advisor

20 Nov 2023







Feather 20



Creativity involves breaking out of established patterns in order to look at things in a different way. -**Edward De Bono**

Edward Charles Francis Publius de Bono, a multi-talented individual from Malta. Was a physician, psychologist, and writer. Innovator, philosopher. And advisor. He coined the concept of lateral thinking, authored the renowned work "Six Thinking Hats," and advocated for the inclusion of thinking as a formal Subject in educational curriculum.

You and your team can acquire the skill of breaking down thinking into six clear functions and roles. Each thinking function is identified by a coloured, symbolic "thinking hat." By wearing and changing these "hats" in your mind, you can effectively direct and shift your thoughts, conversations, or meetings as needed.

	The Blue Hat is used to manage the thinking process. It's the control mechanism that ensures the Six Thinking Hats guidelines are observed		The White Hat calls for information known or needed. The facts, just the facts
	The Red Hat signifies feelings, hunches and intuition. When using this hat, you can express emotions and feelings and share fears, likes, dislikes, loves, and hates.		The Green Hat focuses on creativity; the possibilities, alternatives, and new ideas. an opportunity to express new concepts and new perceptions.
	The Yellow Hat symbolizes brightness and optimism. Under this hat you explore the positives and probe for value and benefit.		The Black Hat identifies risks, difficulties and problems - The Risk Management Hat, it spots difficulties and issues of risk with the intent to overcome them.

In summary, de Bono's Six Thinking Hats can be applied to assess and enhance the exciting quality of decisions and solutions by considering various aspects, including data, emotions, risks, benefits, creativity, and process control. This approach can lead to more well-rounded and exciting outcomes in problem-solving and decision-making processes.



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Value added Vs Non-Value added

Shri. K Murugesh, CEO, DyAnsys India Pvt Ltd., Chennai

One of the steps in making improvements is assessing VALUE ADDED and NON-VALUE-ADDED activities / components in the current processes or products. This shall be done from the prospective of Customers (i.e) which adds value to customer and which do not. Though this can be identified or segregated through the concept of Distinction- which is a simple process, but really difficult if the processes have been in place for some time or people involved are defensive / territorial / resistive in nature, which is natural!!!

Value added: Any part of a process for which the customer is willing to pay is considered as VA. In general VA activities would be those involved in producing goods / delivering services.

Non value added: Any part of a process for which the customer is not willing to pay. Generally, NVA activities do little or nothing to satisfy customer directly. Most of the time NVA will add cost to the Customers. This will be main target for elimination. (e.g) Storage of goods, packaging, extensive testing, etc.,

Is it possible to eliminate NVA completely, not in all circumstances / scenarios.

Packaging in product is non-value-added portion (in some cases – based on product criticality some organizations used to spend 2-4% of their BOM cost for packaging). Packaging is to ship the product to customer from manufacturing unit without any transit damages / environmental impacts. Once it reaches the customer place, most of the time all packaging materials will be thrown away. This means 2-4% of product cost, customer is throwing away before start using the unit. In this scenario, will any customer be willing to pay for this? From the customer perspective why, he should pay for the material which he is not going to use, like packaging etc., Hence this is considered as NVA. Though we can't eliminate NVA, we can minimize it.



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CREATIVITY Vs INNOVATION

Shri N. Jagannatha Rao, NIQR Chennai Branch ECM and Freelance Consultant

Innovation is the essence of success and progress of any organisation. Without Innovation a firm continues to do what it has been doing in the past and is a clear formula for stagnation and failure in a competitive situation. In order to attain INNOVATION a firm needs CREATIVE IDEAS.

CREATIVITY is the thinking process that helps us to generate new ideas.

BRAIN STORMING IS THE BASIC PROCESS for creating IDEAS.

INNOVATION is the practical application of such ideas towards meeting organisation's objectives and improvements in a more effective way. Ideas are created by mental faculty of IMAGINATION, which is of TWO TYPES.

1. **SYNTHETIC IMAGINATION:** Consists of arranging old concepts, ideas or plans into new combinations. It works with material, process or steps already established **TOOLS** and **TECHNIQUES**. Several **TOOLS** like Cause & Effect Diagram, Affinity Diagram, Tree Diagram are nothing but **STRUCTURED BRAIN STORMING**.
2. **CREATIVE IMAGINATION:** Through this faculty human mind receives "HUNCHES" or "INSPIRATION" which can be called as **ORIGINAL IDEAS**. Leaders of business, artists, poets, musicians and writers excelled because they used the faculty of creative imagination also popularly known as **LATERAL THINKING**.

EVERY INDIVIDUAL CAN BE CREATIVE:

- Basically, one should have a belief that **THERE IS ALWAYS A BETTER WAY**
- He should have **A DESIRE** to make improvements by thinking differently
- Learn to use **TOOLS** and **TECHNIQUES** relevant to the problem
- He should have an attitude of thinking "**HOW CAN I DO IT BETTER TOMORROW**"

"CREATIVITY is seeing what others see and
thinking what no one else has ever thought"

--Albert Einstein



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10 Commandments of QC Problem Solving Approach

Dr. S. Rajkumar, President, Rane Engine Valve Ltd

In 2004, I attended a month-long TQM training at ABK-AOTS DOSAKAI Centre, at Kansai, Kenshu Centre, Osaka. Yoshio-Kondo, one of the TQM Gurus was my course Co - Ordinator. Along with him, the Deming Prize winner for Individual Mr. Hosotani Katsuya who was a Pioneer in QCC and has written a book titled the “**The QC problem Solving approach**” happened to take two sessions on the above subject, during which he spoke about 10 commandments for workplace leaders, which impressed me and tried to follow in my workplace. This is valid even now and any time. I am sharing the same for the benefit of others.

➤ First Commandment:

It is a lie to Say, we have no Problems. Problems are everywhere. Actively search them out.

➤ Second commandment:

Use accurate data, no guesswork. Observe the workplace carefully and grasp the facts accurately using the data.

➤ Third commandment:

You cannot win empty handed. Study the QC tools well and apply them thoroughly and effectively.

➤ Fourth commandment:

Skill is important. Improve your technical ability by studying specialist skills, techniques and tricks.

➤ Fifth commandment:

It is no good trying to do everything at once. Advance steadily by faithfully following QC seven step formula.

➤ Sixth commandment:

Do not be beguiled by apparently attractive solutions. Analyze the possible causes rigorously and only act after identifying the true ones.

➤ Seventh commandment:

Computers are useful but not creative. Exercise your ingenuity and originality.

➤ Eighth commandment:

Without a rational approach, things will come to a dead end. Move ahead using the QC View point.

➤ Ninth commandment:

It is no good standing back and telling your sub-ordinates to get on with it. Tackle difficulties yourself.

➤ Tenth commandment:

Never give up. Be determined and fight to the last.



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Reliability Roadmap: Navigating Weibull's Waves and the Bathtub Curve

K. Nagaraju – Senior Manager, CQ-Field Quality, Ashok Leyland Limited, EC Member, NIQR Chennai Branch

Reliability refers to the ability of a system, product, or process to perform its intended function without failure over a specified period. We will explore some fundamental reliability concepts. **Reliability** is critical in industries like aerospace, healthcare, automotive, and more, where safety and performance are paramount. Reliability principle ensures consistent product quality and service for customer satisfaction and reputation.

Bathtub Curve

The bathtub curve (Fig-1) is a graphical representation of product failure rates over time. It consists of three phases: an initial high failure rate (infant mortality), a constant low failure rate (useful life), and an increasing failure rate (wear-out period). Understanding this curve helps in designing reliability strategies.

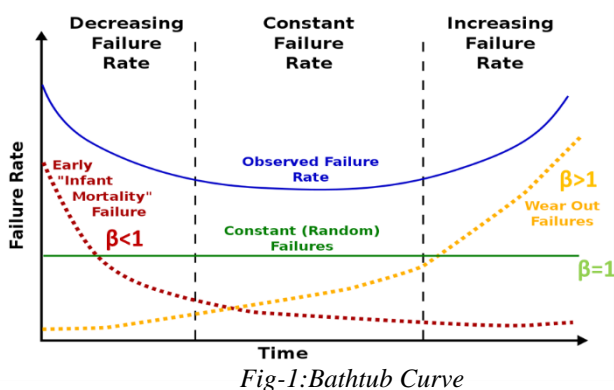


Fig-1: Bathtub Curve

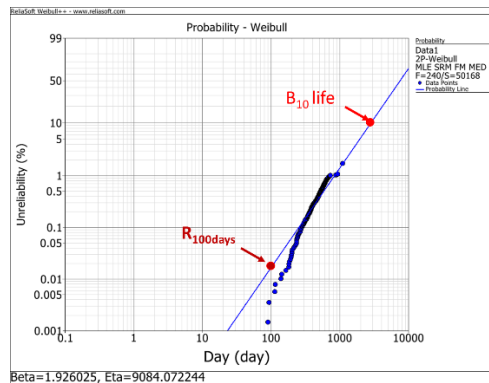


Fig-2: Sample - Weibull probability Plot

Weibull Distribution

The Weibull distribution is commonly used in reliability analysis to model the distribution of time-to-failure data. It's a versatile tool for understanding and predicting failure patterns in various systems. Fig-2 example of an item's Weibull probability plot.

Reliability(t) as the Probability of survival:

$R(t) = e^{-\lambda t}$, Where, $R(t)$ is the reliability at time t , λ (lambda) is the failure rate, which is the number of failures per unit of time. t is the time duration for which you want to calculate reliability. It is expressed as a probability and can range from 0 (certain to fail) to 1 (guaranteed not to fail). In fig-2, $R_{100days} = 0.999831$, for better understanding 0.02% failures expected in 100 days.

Beta (β) and Eta (η)

In the context of the Weibull distribution, the beta (β) parameter influences the shape of the distribution, (Where $\beta < 1$ refers infant mortality or early failures, $\beta = 1$ refers constant failure rate & $\beta > 1$ refers wear out failures) and the eta (η) parameter determines the scale or useful life period. These parameters are crucial in fitting the distribution to real-world data and making reliability predictions.

BX life

BX life is a term often used in reliability engineering to describe the point at which a certain percentage (x%) of a population of items or systems will have failed. For example, B10 life refers to the point at which 10% of the items or systems are expected to fail. In Fig-2, B10 life of item (product) is 2823 days (7yrs 8 months 23 days).

Reliability – Power of Excellence Every Moment



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AI Applications in Quality and Reliability

Shri Jayaram K Iyer, *Founder & CEO, Ganit Science Artificial Intelligence and Analytics*

Artificial Intelligence (AI) has revolutionized various industries, including manufacturing and quality control. Its applications in ensuring product quality and reliability are extensive, leading to improved efficiency and cost-effectiveness.

1. **Automated Inspection:** AI-powered visual inspection systems use machine learning algorithms and computer vision to detect defects or anomalies in products, for e.g., Automotive industries to detect dents and scratches; It reduces human error, increases inspection speed, and enhances accuracy.
2. **Predictive Maintenance:** AI algorithms analyze historical data and sensor readings to predict when equipment or machinery is likely to fail. This enables proactive maintenance, reducing downtime and preventing costly breakdowns.
3. **Statistical Process Control (SPC):** AI algorithms help in analyzing large datasets to monitor and control production processes. They can identify trends, patterns and anomalies allowing for timely adjustments to maintain product quality.
4. **Fault Diagnosis:** Using AI, it's possible to diagnose the root cause of faults or failures in products or processes. This accelerates troubleshooting and aids in implementing corrective measures.
5. **Reliability Modeling:** AI helps in building complex models to predict the reliability of products and systems. This allows for design improvements and optimization to meet or exceed reliability targets.
6. **Supply Chain Optimization:** AI algorithms can optimize supply chain processes to ensure the timely availability of high-quality raw materials and components, reducing the risk of defects.
7. **Fraud Detection:** AI can be used to detect fraudulent products or components, ensuring that only genuine and reliable materials are used in production.
8. **Simulation and Modeling:** AI-driven simulations can predict how changes in production processes or materials may impact product quality and reliability.

Conclusion: AI applications in quality and reliability have significantly enhanced the manufacturing and production processes across various industries. By leveraging advanced algorithms and data analysis, businesses can achieve higher levels of quality assurance ultimately leading to improved customer satisfaction and competitive advantage.



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Six Sigma Vs TQM – A Macro Comparison

Shri Sridharan Balaji, National Council Member NIQR.

HOW DO SIX SIGMA AND TQM DIFFER?

Many times, people are little confused on role and advantages of TQM and Six sigma. There is a very thin line of difference between these systems; it is essential to understand the difference between the two, so as to analyse which one you must implement within your organization.

What's common? Both Six Sigma and TQM are quality improvement systems that look forward to reducing defects and improving the quality of processes. Both Six Sigma and TQM are effective tools for quality management. Six Sigma is the methodology that aims at Performance improvement by reducing the number of defects produced, resulting in profit increase and cost reduction. TQM is concerned with employment, maintenance, and development of the organizational processes, resulting in incremental change in process quality. So, both the tools are aimed at quality improvement and reduction of defects.

Where does the difference lie? The main difference lies in the focus, approach, and scope. Let us look at these differences in detail.

FOCUS: TQM focuses on the goals that are quantitative in nature and related to individual departments with the ultimate focal point being customer satisfaction. TQM ensures that every member of the organization works towards the improvement of existing processes and systems for long-term products/services. Six Sigma utilizes the efforts of multiple departments and has a data-driven and statistical approach that measures and analyses data to determine the number of defects leading to degrading of process quality. Six Sigma focuses on first identifying the defects and eliminating them.

APPROACH: TQM views quality as conformance to internal requirements. Six Sigma improves quality by reducing the number of defects. Six Sigma reduces operational costs by focusing on defect reduction, cycle time reduction, and cost savings. It is different from traditional cost-cutting measures that reduce quality and value, and focus on identifying and eliminating costs that provide no value to customers.

QUALITY: TQM defines quality as the process meeting the standards established by the organization. This is why TQM delivers superior quality manufactured goods. Six Sigma defines it as the process with minimum amounts of defects and delivers better results and customer satisfaction.

SKILLS REQUIRED: Six Sigma requires the skills of well-trained professionals like Green or Black Belts. Six Sigma requires participation of only certified professionals. TQM doesn't require any such extensive training, and is carried out by managers who are not solely dedicated to TQM. TQM is a part-time activity that can be carried out easily by quality managers.

CONCLUSION: So, we can now see that Six Sigma can deliver more effective and better results as compared to TQM, as it is a new approach over the traditional approach of TQM.

The process of Six Sigma is more result-oriented and accurate, which will definitely make it go much further than TQM in the future.



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Defence Avionics Quality Needs

Shri S. Natarajan GM-QAC Data Patterns India Ltd.

Customer focus in terms of requirement, expectation, satisfaction, perception and delight will help us to compete in the international arena on value terms, based on a comprehensive benchmarking system.

We need to have a **profit-project-product-process-plant-people** structure for a sustainable and long term quality culture for the organisation.

Profitability can be driven through productivity improvement, inventory management, ISO 31000 based risk management and value stream mapping VSM.

Projects need to be run through the concept design-product, design-process, design-validation-corrective actions, phase wise time plan and quarterly status reviews

Products need to adhere to a) all the defence quality standards, b) go through validation testing like highly accelerated life testing HALT/reliability testing, c) durability testing/highly accelerated stress screening HASS and d) Environmental stress screening ESS before product release to the customer.

Process adherence based on AS9100D system covering configuration management, product safety, risk mitigation, counterfeit prevention and internal audits is a must.

Plant shall follow a) the ISO 14001 system with a focus on air, water, land, flora and fauna b) ensure that AS9146 foreign object damage FoD prevention programme is in place, c) electro static discharge ESD system is followed, d) 3C-2S system of constant container-constant quantity-constant location-sort-set norms are followed and e) all the government compliance norms are adhered to, based on adequate plant level control mechanisms.

People focus in terms of a) ISO 45001 based system covering security, safety, health and hygiene, b) performance management system PMS based on key result areas KRAs, c) rewards and recognition system and d) suggestions scheme will help to enhance continual human reliability.

In a nutshell a) problem prevention, b) variation reduction towards six sigma quality, c) waste elimination based on lean manufacturing concepts and d) continual improvement based on suggestions/kaizens are the needs of the hour at this juncture for leapfrogging the defence avionics business manifold in India.

We are a vertically integrated Defence and Aerospace electronics solution provider catering to the indigenously developed defence products industry.



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Project life cycle management

Shri P. T. Bharani Perumal, National Vice President, NIQR

Project Life Cycle:

The life cycle of a project is from initiation to its closing. It is the collection of generally sequential phases. Sometimes the phases may overlap. The number of phases and the names of the phases are determined by the management of the performing organization or by the nature of the project itself.

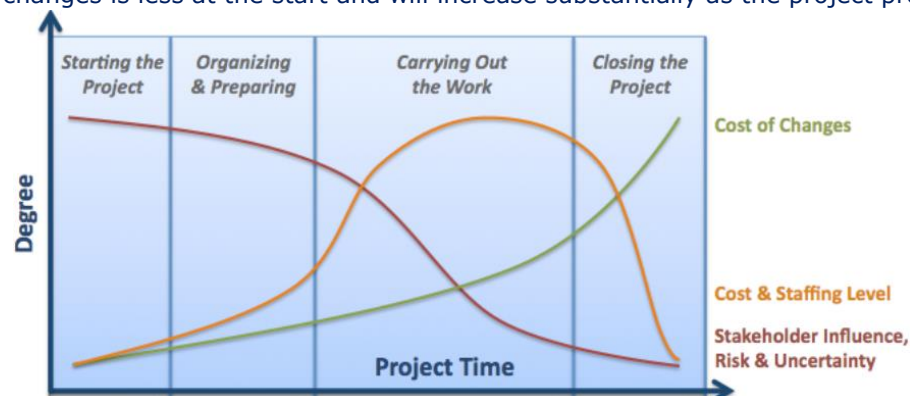
The life cycle provides the basis framework for managing the project. Irrespective of the project size and complexity, all the projects can be mapped to the following lifecycle phases.

i)Initiation ii) Planning iii) Execution & Monitoring iv) Closing the project

Project Lifecycle Stage	Initiation	Planning	Execution	Monitoring & Control	Closeout
Project Management Deliverable Template	3 Project Charter	4 1. Planning Doc 2. Project Schedule 3. Communication Plan	5 Acceptance of Deliverables 6 Optional 7 1. Approval to Proceed 2. Approval to Operate 3. Project Status & Reporting		8 Closeout Document
Approval (Control Gates)	Project Owner Review Initiation Kick-Off	Readiness Review	Acceptance Review	Approval to Operate	Closeout Review
Primary Responsibility	Project Sponsor and/or Project Manager	Project Manager	Project Manager	Project Manager	Project Manager
Project Types	The Project Type Dictates Document & Control Gate Cycle (Standard, Light, Iterative, or Hybrid)				

In the project life cycle

- The cost and resource level will be low at the start and will be at peak when the work is carried out and drop as the project draws to a close.
- The influences, risks and uncertainties are high at the start of the project and will decrease as the project progress.
- The cost of changes is less at the start and will increase substantially as the project progress.





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Quality Tenets – Lessons Learned in Aerospace manufacturing

Shri KR. Mohan Ananthanarayanan, Sr. Vice-Chairman, NIQR Trivandrum branch

Aerospace structures in Launch vehicles form a part of complex launch vehicle system. Once a rocket is launched it cannot be repaired or recalled and it has to prove its performance within a short period of time. Hence Quality of structures are of paramount importance. **Building a launch vehicle is like building a beehive. Everyone in the team contributes with leader in the front, a benchmark in Quality Management.**

Quality tenets learned through the supplier development for aerospace hardware are given below:

1. Simple things make perfection but perfection is not a simple thing

When we see a rocket rise up in the sky we are delighted and when it bursts into pieces in midair we are disheartened. Many failure analysis have shown that the cause of failure was due to simple deviations which were overlooked. O-rings that failed leading the bursting of the Space Shuttle Challenger and our own GLSV F02 failure due to slightly oversized fuel injector regulator nozzle are good examples. All parts are critical and not to be overlooked.

2. Dial before you Dig

No arbitrary changes are allowed in established and qualified processes. Changes needed to be approved by the designers before implementation. Flight 32 A380, a fatigue crack in the HP/IP oil feed stub pipe allowed oil to leak into a high temperature buffer space and ignite; fire damaged engine integrity. When the engine moved from design into manufacturing, the stub pipe needed to be machined after being fitted to an assembly; Manufacturing Engineers introduced a new manufacturing datum for the counter bore without approval.

3. Follow the Lane

It is found that schedule pressure prompts to skip process or inspection steps leading to surprises after delivery. Skipping of intermediate protection of components in the assembly lane or reducing time for baking in the case of plating are certain examples.

4. Training is not a Ritual

When there are many sub systems and the total integration is done at launch site, a supplier of a sub-system may not be fully aware of the next process. Formal training to hear the customer voice is required and has to be attended by the concerned.

5. Spending four hours in sharpening the axe to cut a tree in one hour

Time spent in planning at the beginning of a work order to understand the customer needs that aids correct processes and above all communicating to the concerned down the lane including subcontractors is very important to prevent reworks.

6. Visual Observation is the key

Visual thinking, the ability to think and analyse what you have seen, leads to stitch in time. When you observe a process you can improve it. NDT is an example.



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Taguchi loss function

Dr. C. Uthayakumar, Director, Arjun College of Technology, Coimbatore

In the 1980s, Dr. Taguchi proposed a statement relating to the quality of a product: "**Quality is the financial Loss to society after the article is shipped**". We can rearrange the above definition and retain the basic concept of Quality to denote a positive attribute as: "**Quality is the avoidance of financial loss to society after the product is shipped**". There are two major categories of loss to society concerning product quality:

- The 1st category relates to the losses incurred due to harmful effects on society. (E.g., pollution).
- The 2nd category relates to the losses arising from variations in functional performances.

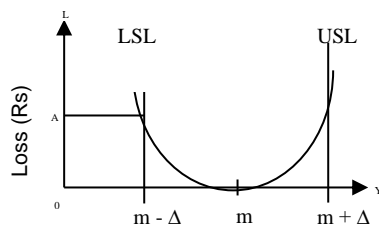
Taguchi states that even a small variation away from the nominal (target) performance will begin to incur customer dissatisfaction. As the variation increases, the customer will gradually (exponentially) become dissatisfied.



A real-life example of the Taguchi Loss Function would be the quality of food compared to expiry dates. If you purchase an orange at the supermarket, there is a certain date that is ideal to eat it. That would be the **target date**. There will also be limits for when to eat the orange (within three days of the target date, Day 3 to Day 5). For this example, Day 3 represents the target date to eat the orange. That is when the orange will taste the best (**customer satisfaction**).

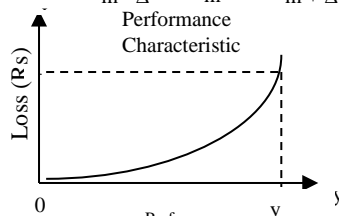
There are three common quality loss functions:

1. NOMINAL-THE-BEST



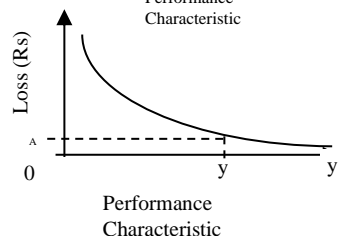
Although Taguchi developed many loss functions, many situations are approximated by the quadratic function called the Nominal-the-best type. **A characteristic with a specific target value**. Examples of this type are dimensions, viscosity, clearance etc.

2. SMALLER-THE-BETTER



The following figure shows the Smaller-the-better concepts. The target value for smaller-the-better is 0. There are **no negative values for the performance characteristic**. Example: The radiation leakage from a microwave appliance, the response time for a computer, pollution from an automobile, etc. are the performance characteristics of this concept.

3. LARGER-THE-BETTER



The following figure shows the concept of the Larger-the-better. In this concept, the target value is ∞ (infinity), which gives a zero loss. There are no negative values and the worst case is at $y = 0$. Actually, Larger-the-better is the reciprocal of Smaller-the-better. Example: The performance characteristics in Larger-the-better are bond strength of adhesives, welding strength etc.

Taguchi loss function is used to measure financial loss to society resulting from poor quality. His philosophy of off-line quality control, designing products and processes so that they are robust to parameters outside the design engineer's control.



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09 Nov 2023

Feather 09

Electric Vehicle Battery Overview

Shri Sanjay Kulshrestha – Ex Mahindra & Mahindra Ltd.

An electric vehicle battery is a rechargeable battery used to power the electric motors of a battery electric vehicle (BEV) or hybrid electric vehicle (HEV). The price of electricity to run an electric vehicle is a small fraction of the cost of fuel for equivalent internal combustion engines, reflecting higher energy efficiency.

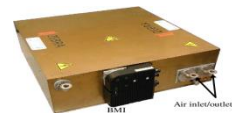
Electric vehicle batteries are typically lithium-ion batteries that are designed for high power-to-weight ratio and energy density. Other types of rechargeable batteries include lead-acid, nickel-cadmium and nickel-metal hydride. Compared to liquid fuels, most current battery technologies have much lower specific energy, and this often impacts the maximum range of all-electric vehicles.



Lead-acid



Nickel-metal hydride



Zebra batteries



Lithium-ion

Types of EVB

Lead-acid: There are two main types of lead-acid batteries: automobile engine starter batteries and deep cycle batteries. Automobile engine starter batteries are designed to use a small percentage of their capacity to provide high charge rates to start the engine, while deep cycle batteries are used to provide continuous electricity to run electric vehicles like forklifts or golf carts.

Nickel-metal hydride: Nickel-metal hydride batteries are now considered a relatively mature technology. While less efficient (60–70%) in charging and discharging than even lead-acid, they have a specific energy of 30–80 W·h/kg, far higher than lead-acid.

Zebra: The sodium nickel chloride or "Zebra" battery uses a molten sodium chloroaluminate (NaAlCl_4) salt as the electrolyte. A relatively mature technology, the Zebra battery has a specific energy of 120 W·h/kg. Since the battery must be heated for use, cold weather does not strongly affect its operation except for increasing heating costs.

Lithium-ion: With their high energy density and long cycle life they have become the leading battery type for use in EVs. Recent EVs are using new variations on lithium-ion chemistry that sacrifice specific energy and specific power to provide fire resistance, environmental friendliness, rapid charging (as quickly as a few minutes) and longer lifespans.



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Feather 08

Quality Slogans and Quotes

Dr V Swaminathan, Deming Consultant

- "Quality means doing it right when no one is looking." ~**Henry Ford**
- "Quality is not an act. It is a habit." ~**Aristotle**
- "Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skillful execution; it represents the wise choice of many alternatives." ~**William A. Foster**

By Dr V Swaminathan:

- Think Quality: Be Proud of the Job You Do!
- "Do it right first time, every time and all the time for achieving the Quality of products or service"
- Prevention is better than inspection. It is better to design the product or system in such a way that the possibility of error is reduced or eliminated for defect free Quality.
- Quality improvement should be customer focused. There are both internal customers and external customers and all of them are equally important (TEI).
- There are no short cuts or quick fixes to Quality.
- Quality Improvement requires full commitment and support from the top and extensive participation of all employees needed or must.
- Set personal Quality goals and establish own personal quality account.
- Be committed, be ethical and Demand or achieve Quality
- Continuous Quality Improvement / Cost Reduction are necessary for staying in business.
- Do Quality Vaccine - prevent Non-Conformance in product or service.
- If you succeed from Inspection to Quality to prevention and perfection, you can win the race in business.
- High Quality leads to more customers and Greater profitability.
- TODAY, SURVIVAL OF BUSINESS DEMANDS QUALITY.
- Innovation through Quality to create great value for the world-NOW-NEW and NEXT.
- Let us Develop Our Own Company Specific Quality Strategy for Customer's Delight as a continual improvement.
- Product Quality is the best Key driver for Sustenance and Growth of Business.
- We need to be the Best to get Quality.



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07 Nov 2023

Feather 07

Lean ... Next Step to Quality

Shri G Rangarajan, CEO, CEO Consultants

A lot of things are changing in the world in a much faster pace. Progress which took hundred years are happening in less than ten years. Who would have expected the importance of internet and digital means, a couple of decades back?

However, digital practice and widespread internet applications have become part of life and people have adopted and made way of life very quickly – probably become indispensable.

Apart from the above, lifestyle changes, many perceptions have also changed, a significant one is the belief that India is an exporter of raw material and semi- finished leather goods. Now global customers are accepting the quality of goods exported from India on par with any advanced economies. Added to quality of goods, the skills of Indian engineers are also acknowledged as the best in the industry.

Quality is no more a separate subject, but part of manufacturing practice leading to process excellence and customer delight. India has reached – can be safely assumed – a stage where quality is assured without specific demand. This is borne out by the fact that many of the well-established brands are manufactured and exported from India. Global customers do not have any reservation of Indian made products & services. This level of maturity is brought out by Indian industries, mainly due to knowhow inflow, knowledge sharing by global experts, Government encouragement and above all commitment coupled with self-belief.

Have we reached the goal? - not at all. The journey is continuous and competition is never ending requiring constant vigil and upgradation. In the early stages, the Japanese concept was '**Quality at any cost**' and immediately next was '**why at this cost?**'. In the global market immediately after quality standards, cost comes up next. Compared to advanced economies manufacturing cost in India is less, yet much more to be done as in the near future cost is bound to increase. While Indian industries overcame the initial hesitation for quality, cost reduction becomes paramount, after all the bottom line is what an organization is interested. Probably next thrust has to be on Lean Manufacturing Practices (LMP). Indian industries both large and MSMEs have not realized the potential of LMP even though a fair beginning has been made by many. Our successful space program is a shining example.

Having established a reliable quality system, survival and flourishing of Indian industries will depend on the success of LMP. Similar to quality, LMP needs to become way of life, not an add-on. Incidentally LMP systems are already formulated and what are required are belief, training, implementation, monitoring, fine tuning and sustained efforts. The day is not far off when Indian products, both traditional and high tech, will match and exceed in both quality and cost from any advanced nation. **TOGETHER WE CAN.**



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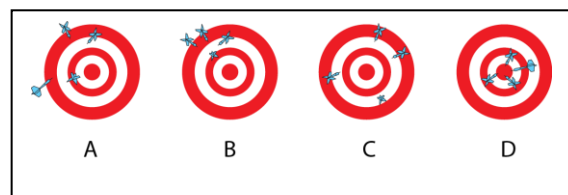
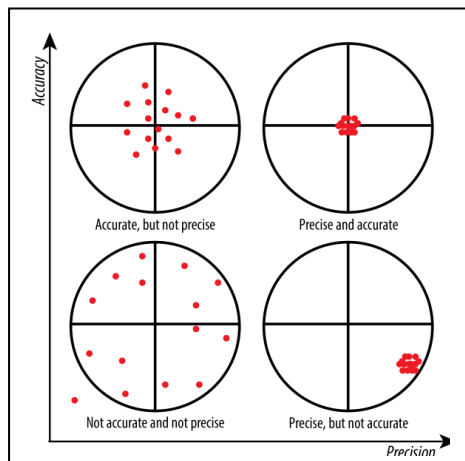
Quality Month Knowledge Tidbits

06 Nov 2023

Feather 06

Accuracy Vs Precision

Shri K Murugesh, CEO, DyAnsys India Pvt Ltd., Chennai



Accuracy and Precision are the methods by which an engineers can think about correcting the errors of a process outcome.

Accuracy refers to how close a measurement is to the true or accepted or target value.

Precision refers to how close measurements of the same with each other. In other words, it's how closely we hit what we are aiming for.

Precision measures how close your results are to one another. While accuracy can be used in one instance, precision will be measured over time. This is because Precision requires repeatability to determine the degree of closeness between each set of measurements. High Precision is when the results are similar to each other, while low Precision is when they are spread all over the Dart. (How close the measurement values to each other)

A most common way of demonstrating the difference between accuracy and precision is with a dartboard. Think of the bulls-eye (center) of a dartboard as the TARGET value. The closer darts land to the bulls-eye, the more accurate they are.

- If the darts land close to the bulls-eye and close together, there is both accuracy and precision (D).
- If all the darts land closer together, but far from the bulls-eye, there is precision, but not accuracy (B).
- If the darts are all about an equal distance from and spaced equally around the bulls-eye there is mathematical accuracy because the average of the darts is in the bulls-eye. This represents data that is accurate, but not precise (C). However, if you were actually playing darts this would not count as a bulls-eye!
- If the darts are neither close to the bulls-eye, nor close to each other, there is neither accuracy, nor precision (A).

Precision is independent of accuracy. That means it is possible to be very precise but not very accurate, and it is also possible to be accurate without being precise. The best quality scientific observations are both accurate and precise. Precisely accurate, or accurately **precise**: At the outset, we shall need both Accuracy and Precision to ensure our best output, being a process outcome or product outcome.



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Quality Month Knowledge Tidbits

05 Nov 2023

Feather 05

Employee empowerment for enhancement of quality perspectives

Dr N Rangaswamy, Corporate Trainer & Specialist in Behavioral Science

Employee empowerment is giving employees responsibility and authority to make decisions within the workplace. Good managers are now being called coaches, advisors, or even facilitators. Good managers and good “coaches” are expected to help employees improve their job achievements by encouraging, instructing, guiding, and giving them the valuable advice, they need to succeed in their work setting. Managers have the power and capacity to influence the behaviour of their employees. Responsibilities must be shared through trust, assurance, motivation and support. Work-related decisions and full control of the work is being pushed down towards the lowest operating levels in most businesses.

Meeting the challenges of a rapidly changing and increasingly diverse world is becoming a necessity. Employee empowerment can be a powerful tool. This new form of administration challenges the hierarchical forms of leadership where the final authority was at the top of the tower watching over the working mass. The now advanced leadership style can increase efficiency and effectiveness inside an organization. It increases productivity and reduces overhead. Overhead expenses are those needed for carrying on a business such as salaries, rent and advertising. Empowering employees gives managers the freedom to dedicate their time to more important matters. Managers can highlight the talent efforts of all their employees.

Empowerment is also the best way to promote a good long-lasting employee-customer relationship. Empowerment brings many benefits to employees. It makes them feel better about their inputs to the company, it promotes greater productivity, and provides them with a sense of personal and professional balance. It exercises employees' minds to find alternative and better ways to execute their jobs satisfactions. Empowerment results in personal growth since the whole process enlarges their feelings or confidence and control in themselves and their companies.



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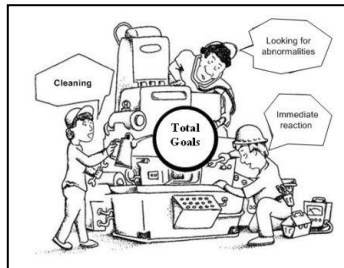
Quality Month Knowledge Tidbits

04 Nov 2023

Feather 04

Autonomous Maintenance

Shri S. Murugan, TQM Expert & Freelance Consultant



Autonomous Maintenance is one of the important pillars of TPM out of 8 pillars in TPM activities originated by JIPM, Japan.

This pillar is otherwise called as **Jishu-Hozen or Self Maintained work place.**

Out of 8 pillar activities in TPM, all the other 7 pillars are supporting pillars of this Autonomous Maintenance Pillar; without this pillar, other pillar activities will be inadequate. With this pillar, the TPM activities are getting completed; without this pillar and with other pillars the TPM activities will be incomplete.

There are 7 important steps in this Autonomous Maintenance Pillar. Each step is having 3 levels of audit by various levels of people in the organisation; the minimum score should be 80% to get this audit passed in the final level (i.e.) third level and final authority to put audit passed seal for each step.

Following are the seven important steps of autonomous maintenance:

1. Initial Cleaning
2. Taking Counter Measures for forced deterioration and making all hard-to-access-areas to easy-to-access-areas.
3. Preparing tentative standards for CLIT (Cleaning, Lubrication, Inspection and Re-tightening)
4. General Inspection
5. General Process Inspection
6. Systematic Autonomous Maintenance
7. Practice Full self-management



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Quality Month Knowledge Tidbits

03 Nov 2023

Feather 03

SPREAD OF INDUSTRY 4.0 IN DIFFERENT SECTORS

Shri. C. V. Gowri Sankar, TQM Consultant

Industry 4.0 is more than just a flashy catchphrase. A confluence of technologies and trends promises to reshape the way things are made. Mention "Industry 4.0" to anybody, especially most manufacturing executives and eyebrows will be raised.

If they've heard of it, they are likely to be confused about what it is. If they haven't heard of it, they're likely to be skeptical of what they see as yet another piece of marketing hype, an empty catchphrase. And yet a closer look at what's behind Industry 4.0 reveals some powerful emerging currents with strong potential to change the way EVERY SECTOR of Industry work.

But call it whatever you like; the fact is, Industry 4.0 is gathering force, and everybody should carefully monitor the coming changes and develop strategies to take advantage of the new opportunities. Industry 4.0 is nothing but Smart Manufacturing or rather Smart Way of Living.

Almost all walks of life have immensely benefitted by the new opportunities; shown briefly by visuals about different sectors showcasing evolution from 1.0 to 4.0





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Quality Month Knowledge Tidbits

02 Nov 2023

Feather 02

PRACTICE OF KAIZEN

Shri. N. Jagannatha Rao, Freelance Consultant

KAIZEN is successfully practiced in many organisations in our country, especially in Manufacturing units, resulting in IMPROVEMENTS in Quality, Productivity and Performance. As is widely known KAIZEN means CHANGE FOR THE BETTER.

This is based on the basic AXIOM of WORK STUDY "THERE IS ALWAYS A BETTRE WAY"

Normally KAIZEN is understood as a SMALL IMPROVEMENT made by 2 or 3 Employees in an Organisation. However, the practice of KAIZEN is not limited to only small improvements, as generally perceived. Quality is everybody's responsibility in an organization. Therefore, KAIZEN is everybody's JOB. A well-planned PROGRAMME of KAIZEN can be broken down into segments depending on the complexity of the problem and level of involvement.

1. **SUGGESTIONS: INDIVIDUAL LEVEL:** Individuals give their ideas for improvement through suggestions, which is processed by a team of suggestion box scheme. In this case the suggestions may be implemented by the individual or Management.
2. **KAIZEN: JOINT EFFORT:** Two or three employees working in similar jobs join together, select a small problem and find a solution through small improvements. This is generally known as KAIZEN
3. **QUALITY CIRCLES: SMALL GROUP:** Small group activity is normally initiated and organized by Management by giving them training in problem solving using 7 QC TOOLS. These groups are generally named as Quality Circles. Small groups of employees working in the same work area meet regularly, --- identify, analyse and solve work related problems in their work area.
4. **CROSS FUNCTIONAL TEAMS:** Certain complex problems cannot be solved by QUALITY CIRCLES. In such cases, Management assigns the problem to a team of employees at higher level – Supervisory / Executive selected from different functions depending on the type of problem. These teams are known as CROSS FUNCTIONAL TEAMS.
5. **SRTATEGIC TEAMS: MANAGEMNT LEVEL:** Managers and Professionals join together as a team, depending on the FOCUS and work on achieving improvements in TECHNOLOGY, PROCESSES, SYSTEMS AND PROCEDURES to enhance the competitiveness of the organization.

Thus, we find the entire workforce is involved in the KAIZEN PRACTICE, participating in different segments of the organisations. Making improvements is a continuous activity necessary to achieve COMPETITIVE SUCCESS. Several organisations have well planned KAIZEN PRACTICES in place and achieving immense benefits. Some of such organisations in the vicinity are Ashok Leyland, TVS Group of companies, Carborundum Universal and Amalgamation group companies and many more to quote.



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Quality Month Knowledge Tidbits

01 Nov 2023

Feather 01

Steps towards Self-Sustainability

Ms. Neeta Sharma, Freelance Consultant

To be self-sustainable, one has to aim to overcome all kinds of challenges with holistic healing. Yoga and meditation practices described in our Vedas go a long way to control the mind fluctuations, self-awareness and self-development, thereby facilitating self-transformation. The priorities of life change as one grows old. However, after retirement, one's health might not be at its best, that's when the guilt starts pouring in. The big question stands in front of you, 'what did I do with my life?' It's time to think and correct whatever we can. It's never too late. So, let's start with health!

Our body is extremely unique. I find it magical and visualise how it is built with the fundamentals of civil, electrical, and mechanical engineering. Various organs and systems run our body, and we usually never feel their existence or acknowledge them until they decide to give us some pain or discomfort.

The human body was made to heal itself and be self-sustainable. From renewing cells to emotional healing, our body is capable of self-healing in many ways. We can learn to augment our natural self-healing mechanisms by learning to tune into the process. By using some very simple steps, we can bring a feeling of peace into our body. We can take the energy and positive waves from the Universe into our body and use our thoughts and emotions to change the frequency and flow of the energy, bring in a calming easiness, a joyous energy flow, and even witness powerful miracles.

Practicing yoga asanas on a mat with the mind being astray, or the focus being away from breathing does not bring in any real benefits, unless it is done with full awareness, consciousness and faith. As professionals, we often do 'Performance Analysis & Evaluation' of projects. It is equally essential to do such self-analysis and check how we behave, and how we feel physically, mentally, and emotionally in times of distress. Are our preventive actions well in place? I invite you to experience this amazing inward journey that illuminates life beyond pain and suffering.

Healing through AUM: Of all the self-healing techniques I practice, I find humming 'AUM' the best. It works wonders for me, de-clutters my mind, and energizes it. I feel the vibrations all over my head. This is very useful and effective to combat headaches as well. In fact, I experience no jet lag by constantly humming on long flights. I encourage you to try the self-healing techniques which interest you and decide for yourself what suits you the most.

**Please do not stop regular treatment or medication as advised by your Physician while adopting self-healing practices.
Remember these practices are to help improve the impact of the treatment.*