# Method and system for improving quality in a service industry

**Field of the Invention:**

The present invention relates to the field of implementing quality improvements in any service sector undertaking. More particularly the invention relates to a comprehensive framework that can be implemented in a service-based industry for its continual improvement.

**Background of the Invention:**

All service sector undertakings strive to deliver the best to their customers. In order to be in the market they not only need to introduce new concepts, ideas and products into the market but also improve upon the quality of the existing processes and systems. Managing quality in service organisations is more complex.

In a manufacturing company, if products do not meet the specifications there is always an opportunity to correct them before they are dispatched to the marketplace. In service organisations this is not possible. The production and consumption of service happens at the same time. In case of service companies, not only should the service offering be of satisfactory quality, the interaction between the representative of the organization and customer should be flawless. This is true for service companies such as banks, consultancies, shopping arcades etc. The focus of service companies is essentially about selling an experience. It requires a much detailed and sensitive attention to meeting the requirements of the end users with an objective to improve the customer satisfaction levels.

Methodology versus Framework:

As we go through the document the terms "Methodology" and "Framework" will appear at a number of places. The former refers to standards, improvement methodologies and excellence models as listed in Table 1 that have a variety of origins. While the latter i.e. framework refers to a holistic approach carved out of medley of methodologies to facilitate business improvement. The Business Transformation Model which is the subject of this document is such a Framework.

It may be noted that the genesis of "methodologies" could be because of work done by eminent practitioners or could have been issued by standard setting bodies. Some of these methodologies are generic in nature while others are meant for specific types of businesses. Quality framework here means a medley of methodologies put together.

In order to achieve better quality in a services organization various frameworks have been invented, tried and tested, implemented over the past few decades. These quality control and improvement methodologies have achieved varied levels of success with different organizations i.e. while one methodology may have worked wonders in a particular organization, it may have failed miserably in other.

The success or failure of application of these methodologies comprises factors such as relevance to the organization, health of the processes, involvement of the teams and maturity of quality in the organization.

Selection of Right Improvement Approach:

Selecting the right approach is not easy given the fact that there are a plethora of Quality Methodologies which are available for adoption. Table 1 is a partial list of Quality methodologies practiced by organisations. The list is so large that it becomes virtually impossible by any means or methods to adopt the right approach from the array of quality frameworks available for application. Whatever is adopted it should be a source of sustained value add to the organization.

Table: 1: Various Improvement Approaches

| **Excellence Model** | **Improvement Philosophies** | | |
|---|---|---|---|
| Baldrige Award Criteria | | | |
| EFQM Award Criteria | Business Process Engineering | Total Productive Maintenance | SMED |
| Deming Award Criteria | Concurrent Engineering | Total Quality Control | Value Engineering |
| **Standards** | Cost of Quality | Total Quality Management | Pull System |
| BS 7799 | Statistical Quality Control | Value Stream Management | Benefit Cost Analysis |
| FS 9100 | Supplier Quality Assurance | Zero Defects | Process Management |
| ISO 9000 Standards | Tagichi Method | Juran Trilogy | Process Performance Management |
| TL 9000 | Theory of Constraint | Just in Time | QEDS Standards |
| QS 9000 | Customer Relationship Management | Kaizen | Quality Circles |
| ISO 14000 | Design of Experiments | Five S | Quality Engineering |
| MIL-Q9858A | Design for Six Sigma | Lean Manufacturing | Quality Management |
| Capability Maturity Model | Six Sigma (DMAIC) | Poka Yoke | |
| COBIT | Hoshin Planning | Process Improvement | |

One line definition of the methodologies mentioned above is provided in Annexure 'A'.

Service organisations have aspirations to become world-class. Different "Quality Methodologies" focus on different aspects of Quality Improvement. While some focus at Workplace Problems, the others are targeted towards Enterprise-Wide Development. There could be some meant for Daily Management while others are meant for large Process Improvements. While each methodology provides value from its perspective, none of them generally provide a holistic value to aid an organization to become World-Class.

The current approach taken by organisations is to adopt a methodology that is prevalent, easily available and popular. For example, companies are currently adopting Six Sigma, as it is the current flavor in the domain of improvements. This decision is taken in isolation without clearly understanding "why are they doing what they are doing". There is no approach that assists in such decision making. Sometimes selling of the existing practices and wares influence the choice of Quality Methodology. This is like convincing a company to adopt ISO when the need was for Lean Thinking. For some organisations the Quality Methodology is imposed by the customer as in case of Software and Business Process Outsourcing Businesses.

The results of these approaches are that the Quality journey becomes methodology centric and does not cater to the larger objective of the organisation to become world-class. Even if each of these methodologies provides some value-add, they do not steer the company to be the best in the world.

It has been observed, especially in large undertakings, that a lack of a common approach to improvements can be quite counter-productive. Some units adopt their own methodologies, which adding incremental value to the unit, it does not add up to deliver the overall objective of the organization to become World Class.

Further, an organisation cannot achieve world class performance by adopting a single Quality Methodology. A journey to World Class level is achieved by leveraging the power of various Quality Methodolgies. This requires managing each of phases of these Quality Methodologies viz. launch, adoption, maturity and decline so that the momentum of improvements can be kept on without sliding back. It is imperative that organisations proactively understand the various stages of Quality Implementation and take steps

before the initiative stagnates and declines leading to an improvement vacuum i.e. a stage when an organisation struggles to look for a Quality Framework, which can keep the momentum of improvements on. During this phase no meaningful improvements happen or improvements just happen as a ritual. Existing Quality methodologies stop delivering value to the organisation. If immediate steps are not taken, benefits reaped so far may get undone.

Accordingly a method is needed to meet the customer's requirements, offer prompt and quality service, reliability and assurance of service and the like. From the organizational perspective it is desirous to have a framework that can look at areas that need refinement so as to make the internal processes smoother, well defined and better organized. There is a need of an apparatus to let them arrive at a decision on the approach to be followed in their journey towards getting into the trajectory of world-class.

**Objectives and Summary of the Invention:**

It is an objective of the present invention to overcome the aforementioned drawbacks and provide a roadmap to an organization for achieving world class performance.

It is also an objective of the invention to arrive at an improved quality framework that can be adopted in a service-driven industry.

It is another objective of the instant invention to determine the right mix of one or more quality methodologies that can be adopted by service organizations irrespective of the industry.

It is a further objective of the present invention to provide a stepwise approach to move an organization up the improvement spiral by using various improvement methodologies and build a hierarchy of improvement systems.

It is yet another objective of the present invention to provide an improvement management framework within which an organisation's improvement system moves to a higher level of maturity so as to facilitate flawless delivery to the customer.

To achieve the aforementioned objectives and to overcome the drawbacks of the prior art, the present invention provides an apparatus and method for continual improvement in an organization comprising the steps of classifying the stages of development of the organization into various levels in a hierarchy ranging from lower to higher, wherein said classification is done by applying a plurality of attributes at each level, and applying one or more of known quality methodologies at each level wherein for lower levels the methodologies selected aim at achieving desired physical improvements, for higher levels the combination of methodologies selected additionally aim at process improvements at that level, for the highest level the combination of methodologies selected aim at achieving customer satisfaction and reduction of defects, said method moving from a lower to a higher level to increase the performance of the organization.

The organization may include business organization, government bodies, educational institutes, research laboratories or any domestic setup.

In the instant invention, the attributes at lower levels are used to define and measure the physical workplace specifications whereas the attributes at higher levels are used for performance measurement.

According to the present invention, attributes at the most basic level substantially include attributes to measure and avoid wastage for managing goods and services used or produced, attributes for prophylactically enquiring into problem causes, for eliminating such problems, policies that define how the organization works and the procedures for implementing such policies, mechanism for receiving and implementing suggestions for improvement from employees to facilitate participation, and attributes for assessing performance of workplace issues by conducting periodic meetings.

The higher levels substantially have attributes for standardization of all processes, identification of core processes in the organization, putting measurement of Quality, Delivery and Cost in each of said core processes, assessment of positive trending in measurement of said Quality, Delivery and Cost for said core processes, ascertaining the key vendors and putting measurement of Quality, Delivery, Cost and Service for the products and services of said key vendors, and assessment of positive trending and

measurement of improvement in said Quality, Delivery, Cost and Service for said key vendor products and services.

The attributes at next higher level include measurement of first pass yield, the said yield be at least 90%; measurement of on time delivery, the said delivery be at least 95%, measurement of quality cost, the said quality cost be 10% of the processing cost, measurement of process efficiency levels, the said proficiency levels be at least 25%, and score in a Business Excellence Model, the said score be at least 30%.

The attributes at the highest levels include measurement of first pass yield, the said yield be at least 99%; measurement of on time delivery, the said delivery be at least 99%; measurement of quality cost, the said quality cost be 5% of the processing cost, measurement of process efficiency levels, the said proficiency levels be at least 40%, score in service satisfaction, the said score be at least 40%; and score in a Business Excellence Model, said score be at least 60%.

The Business Excellence Model may include Malcolm Baldrige National Quality Award, European Foundation of Quality Management, Deming Prize, Australian Business Excellence Framework etc.

The quality methodologies may include 5S, Business Process Management System, Six Sigma, Lean, TRIZ etc

In one embodiment, the classification of the stages of development of an organization is done at four levels.

The instant invention further comprises a computer readable recording medium for storing a computer program to cause a computer to continually improve an organization and perform the steps of classifying stages of development of the organization into various levels in a hierarchy ranging from lower to higher, wherein said classification is done by applying a plurality of attributes at each level, and applying one or more of known quality methodologies at each level wherein for lower levels, the methodologies selected, aim at achieving desired physical improvements, for higher levels, the combination of methodologies selected, additionally aim at process improvements at that

level, and for the highest level, the combination of methodologies selected aim at achieving customer satisfaction and reduction of defects, said method moving from a lower to a higher level to increase the quality level in the organization.

The instant invention further comprises a computer readable recording medium for storing data, said data comprising structures for performing the steps including classifying stages of development of the organization into various levels in a hierarchy ranging from lower to higher, wherein said classification is done by applying a plurality of attributes at each level, applying one or more of known quality methodologies at each level wherein for lower levels the methodologies selected, aim at achieving desired physical improvements, for higher levels the combination of methodologies selected, additionally aim at process improvements at that level, for the highest level the combination of methodologies selected aim at achieving customer satisfaction and reduction of defects, moving from a lower to a higher level to increase the performance levels of the organization.

**Brief Description of the Drawings:**

**Figure 1** is a diagram showing the relationship between the purpose of a quality system and the interested parties.

**Figure 2** illustrates the quality system funnel for improvements.

**Figure 3** illustrates the difference between continuous and continual improvement scenario.

**Figure 4A** shows the PDCA cycle.

**Figure 4B** shows implementation of PDCA in a continual improvement environment.

**Annexure A** gives a one line definition of the various methodologies.

**Detailed Description of the Drawings:**

The instant invention relates to an apparatus and method for creating a world-class organisation, which can be adopted by any service company in the world. Around the

globe, quality implementation in organisations has been centered on methodologies. Companies have adopted methodologies as Lean, Six Sigma, ISO, BPR, COPC, and CMM etc and have tried to get the best out of it. The general approach has been that when the power of one methodology wanes, a new one is adopted.
The above mentioned organization may include business organization, government bodies, educational institutes, research laboratories and a domestic setup as well.

The invention is all encompassing. It is a method that builds quality in workplace, processes, customer experiences and businesses. It has been invented to deliver the mission and vision of an organisation to provide world-class quality in its product and service to the customers and delineate the steps to reach this end. The deliverables of each of the steps have been clearly defined and methodology application is based on the need and context. The key feature of the method is that it builds on solid fundamentals and gradually pushes the organisation up the improvement spiral. The uniqueness of the method is that it provides a holistic script for quality adoption and can help to reach the end-goal in few years.

**Figure 1** is a diagram showing the relationship between the quality system and the stakeholders. All quality systems have a purpose that is generally dictated by its stakeholders. This purpose drives the systems, which delivers the results, which in turn satisfy the stakeholders.

The instant invention creates a hierarchy of systems within the organisation. According to the invention, the development of any organization is divided into four Levels. Each of the Levels is a sub-system of a larger system, which is the next Level. The premise here is that as the level of improvements mature in an organization, it gathers newer dimensions/ elements to the existing systems and takes the organizations to higher levels of performance.

The systems are created in a hierarchy to let improvements grow organically. This also helps in delivering results continually to sustain the organization's interest in quality work. Each of the levels delivers specific results, which keeps the enthusiasm on towards quality. This also helps improvement practitioners who are typically placed under enormous pressure to produce quick results. The invention delivers value to the

organization at regular interval. Without this, the motivation of employees may falter and they may start doubting the value from quality improvements.

The design is to gradually facilitate improvements by sequentially targeting on the givens around the following areas:

- Physical Workplace
- Processes
- Waste Elimination
- Excellence

This requires creating systems around each of the above areas and building on it. This results in creation of a Quality System Funnel along which improvements migrate up. This concept is shown in Figure 2. Figure 2 is an overview of the invention. It is evident from the figure that the Quality Systems at each Level is a super-system of the preceding system. So Level 2 is a super-system for Level 1, Level 3 is a super-system for Level 2, Level 4 is a super-system for Level 3. Conversely, each of the levels is a sub-system of the succeeding quality system. So, Level 1 is a sub-system of Level 2, Level 2 is a sub-system for Level 3; Level 3 is a sub-system for Level 4.

An organization has to rise from a lower level to a higher level to achieve the desired standard. Each level mentioned above has attributes, which are considered to decide whether the organization has reached a particular level.

The levels and the attributes to be considered at each of the levels are as follows:

Level 1

**Broad Objectives**

The broad objectives of Level 1 are as follows:

- Create efficient workplaces
- Build a "own your workplace" mindset and eliminate Orphans
- Involve bulk of the organisation in the quality journey
- Facilitate a culture wherein teams get into root causes for workplace problems

- Install policies, procedures, standards and rules, that can sustain workplace organisation
- Eliminate surface wastes
- Aid quick information retrieval

The attributes at this level includes:

- measurements to avoid wastage for managing goods and services used or produced. This is basically the inventory management of the organization. It takes care of the products or services used or consumed within the organization, so that there is minimal wastage,
- attributes for prophylactically enquiring into problem causes, for eliminating such problems. This takes care that any problems is solved to the root. The problem may concern any issue in the organization. This is also taken care of by distributing responsibilities,
- policies that define how the organization works and the procedures for implementing such policies,
- mechanism for receiving and implementing suggestions for improvement from employees to facilitate participation, and
- attributes for assessing performance of workplace issues by conducting periodic meetings.

Level 2

Level 2 is about building a robust Quality Management System in a workplace. Process Management and Improvement has to be carried out with the overall system performance in mind. The level requires putting in place right measurements comprising lag and lead indicators, which track actual results as well as help in predicting the results.

Other than Processes, the critical elements of Level 2 are Leadership, Continual Improvement, Training, Vendors, Quality Audits and Analysis of Results. It requires clear identification of core-processes and how it helps in achieving the strategic objectives of the Business Units.

The broad objectives of Level 2 are as follows:

- Uniform customer experience
- Define best-known method (Standard Process) to carry out tasks in a workplace
- Help the un-initiated to do their jobs easily
- Facilitate Standardisation of repeated tasks in a workplace (read: Processes)
- Install Measurements and Ownership to manage processes on an ongoing basis
- Promote Systems Thinking (Understand Interaction and Interdependencies of processes)
- Build an architecture which allows continual improvement
- Install processes in areas where traditionally it has not been used (as Sales)
- Avoid local optimisation at the cost of system optimisation

The Critical Elements of Level 2 are as follows:

- Institutionalisation (Management Commitment)
- Process Management
- Continual Improvement
- Quality Training
- Data & Results

The attributes at this level includes

- standardization of all processes,
- identification of core processes in the organization,
- putting measurement of Quality, Delivery and Cost in each of said core processes,
- positive trending in measurement of said Quality, Delivery and Cost for said core processes,
- ascertaining the key vendors and putting measurement of Quality, Delivery, Cost and Service for the products and services of said key vendors, and
- positive trending and measurement of improvement in said Quality, Delivery, Cost and Service for said key vendor products and services.

The key vendors mentioned above include vendors providing the key and the core processes as well as the products.

Level 3

Level 3 is about taking the organization to higher levels of quality maturity by accomplishing the following

(1) Making processes effective by taking process improvement projects in proactive fashion

(2) Removing wastes in all form and

(3) Commence Tracking Cost of Poor Quality (Quality Costs) on an ongoing basis

(4) Involving participation of teams in workplaces in carrying out improvements on an ongoing basis

Making Processes Effective means key processes are delivering an agreed acceptable quality levels (read: Sigma Levels). This would mean we would radically reduce the negative customer experiences by taking proactive steps to improve performance of processes.

While making processes effective, we have to work towards eliminating the unseen wastes in our workplaces. This comprises wastes due to: overproduction, excess inventory, transportation, waiting, motion, over-processing, correction, complexity and bureaucracy.

While wastes get removed and processes become effective, we will be measure the benefits to company by tracking the Cost of Poor Quality Levels.

All these would be possible when teams in the workplace or process owners participate in the movement. Teams in workplaces should not only own up the initiative but also take up projects, which help in elimination of wastes and process effectiveness.

The attributes at this level are:

- Quality, which is a measure to ascertain the quality of output delivered by a process. It could include things elements such as completeness, accuracy, defects and so on. This attribute takes care that first pass yield will be more 90%

- Delivery, which is a measure of lead time of a process. A high lead time indicates process bottlenecks, which may be impeding the process flow. Delivery Lead times should be more 95%

- Cost, which is a measure to ascertain the cost effectiveness of a process. It endeavors to find out the costs incurred for not producing a product or service right first time.

- Quality cost to be 10% of the processing cost

- Process Efficiency Levels which should be more than 25%

- Score in any known Business Excellence Model to be at least 30%.

Level 4

This is the next and final stage of the development. A Level 4 workplace has processes, which are effective and efficient. They should not only deliver what the customer wants but should do so in the most cost efficient manner. The Business should have minimal hidden factories and should have installed all the elements of a Business Excellence Models such as Malcolm Baldrige or European Quality Award. The application of Business Excellence models will enable to track a Business with respect to elements as Leadership, Strategic Planning, Customers, Human Resources, Process Management, Business Results.

The focus of Level 4 is also on customer interaction. All the customer experiences have to be blueprinted and pro-active steps have to be taken at the potential failure points. Critical control points have to be installed all across to constantly gauge the service levels being provided by us. Reaching this level would require the marriage of flawless back-end processes and robust customer interaction processes. Customer needs cannot be fully met completely and economically. Operational Efficiency has to be balanced against effectiveness of the system from the customer's point of view.
The objectives of Level 4 are as follows:

- Install all elements that facilitate Business Excellence

- Focus on performance excellence for the entire organisation in an overall management framework around elements as Leadership, Strategic Planning, Customers, Human Resources, Process Management and Business Results
- Provide Service Guarantee to the customer (pay if we fail to deliver)
- Bulk of the Process within a Business Unit are Efficient and Effective

The attributes at this level are:

- Quality

  First pass yield will be more 99%

- Delivery

  Delivery Lead Times will be more 99%

- Cost

  Quality cost to be 5% of the processing cost

- Efficiency Levels

  Process Efficiency levels to be more than 40%

- Service

  This is a measure of service effectiveness of a process and finds out the quality of interaction between the people involved in the process and the customer of the process. It measures elements as courtesy, empathy, responsiveness, access, credibility, and communication. Service Satisfaction score will be more than 95%.

- Score in any Business Excellence Model should be at least 60%.

  The Business Excellence Model mentioned above includes any such known model such as the Malcolm Baldrige Excellence, Deming Prize, European Foundation of Quality Management and so on.

Underlying Theme of Business Transformation Model

The underlying theme which runs through the Business Transformation Model is continual improvement. This is all about sustaining the benefits and constantly raising the quality bar. This has been explained pictorially in Fig 3.

Improvement specialists often synonymously use the terms "continuous-improvement" and "continual-improvement". However, they are not the same in the context of improvements in our invention.

Continuous-improvement is about constantly carrying out improvements without giving time for sustaining benefits. Here the quality bar is constantly raised without allowing the benefits to seep in. This results in the benefits sliding back after sometime without the organisation coming to know of it.

Continual-Improvement is about carrying out improvements, giving sufficient time for sustaining the benefits and then moving on to the next level. The advantage here is that the improvements that have been carried out get sufficient time to seep deep and wide within the organisation. An architecture for sustenance is proactively installed to institutionalize and sustain the benefits as the organisation moves up the improvement spiral up to the next Level. The major advantage of this approach is that sustained improvement becomes self-sustaining. The improvements get time to change the behavior of employees, which is the ultimate goal of all quality journeys.

PDCA and Business Transformation Model

William Edward Deming proposed the now famous PDCA cycle. PDCA stands for Plan-Do-Check-Act. This philosophy of PDCA is that continuation of four steps (of Plan, Do, Check and Act) leads to a helix of continual improvement. PDCA cycle is a never-ending cycle of learning and improvement that Deming developed, based on what he learned from his mentor, Walter Shewhart. Deming taught it to the Japanese in the 1950. He called it " the Shewhart Cycle" and the Japanese call it: "the Deming Wheel".

The above defined levels in the instant invention are designed on the principles of PDCA cycle. It endeavors to create an improvement spiral, which pushes an organisation towards World Class. It is applied as follows:

**Plan** =

- Define the Improvement Opportunities.
- Firm up goals and define how success will be measured.

**Do** =

- Carry out improvements as planned
- Implement the change
- Use Quality Frameworks and Interventions

**Check** =

- Observe and Analyse Results
- Study the results and signs of progress

**Act** =

- Standardise and stabilise the change
- Review, Recognise and Reward
- Re-establish the target and Begin the cycle again

Figure 4A shows the above pictorially.

Figure 4B shows the PDCA cycle coupled with the continual improvement ladder.

Furthermore like a product or service, all Quality Methodologies have a life. Understanding the lifecycle is critical for sustenance of improvements in an organisation. The visualization of stages of a Quality Framework is required for charting the next Quality Framework that has to be adopted by an organisation. An organisation cannot reach world class just by adopting one Quality Methodology / Framework. It can only be achieved by enmeshing and leveraging the power of various Quality Methodologies.

The instant invention has been established with this objective in mind. It provides a ready recipe for moving to the next Level in time so that the organisation does not land in itself a Decline Stage leading to an Improvement Vacuum. The inherent power of the invention is that the Quality Frameworks have been threaded in such a manner that it does not allow an organisation to land in an Improvement Vacuum. The decay of quality in an organisation is thus prevented by timely intervention through the next Quality Methodology.

Keeping the above points in mind, the invention divides the development of an organization into the four levels of gradual and seamless improvement described above. After analyzing the state of an organization in terms of the attributes of the level where the organization currently stands, it is decided whether the organization needs to work more on those attributes or has it reached the desired state. The standard values of the attributes and the present readings of the attributes can be stored on any computer readable medium for records and ready reference. To achieve a particular level, according to readings of the attributes, the instant invention provides a suitable mix of quality methodologies.

The instant apparatus comprises the means to divide the stages of development of an organization into four levels on the basis of the attributes and means to provide an appropriate combination of the methodologies on the basis of said attributes. In a preferred embodiment, the above apparatus may be any computing or non-computing device.

In another embodiment, the instant invention may be a Business Transformation Model.

It will readily be appreciated by those skilled in the art that the present invention is not limited to the specific embodiments shown herein. Thus variations may be made within the scope and spirit of the accompanying claims without sacrificing the principal advantages of the invention.

## ANNEXURE 'A'

**Baldrige Award**: An award established by US Congress in 1987 to raise awareness of quality management and recognize US companies that have implemented successful quality management system. The criteria include leadership, use of information and analysis, strategic planning, human resources, business process management, financial results and customer focus and satisfaction

**Benchmarking**: An improvement process in which a company measures its performance against that of best in class companies, determines how those companies achieve the performance levels and uses the information to improve its own performance level.

**BS 7799**:
British commerce, government and industry stakeholders wrote BS7799 to address information security management issues including fraud, industrial espionage and physical disaster.

**Business Process Reengineering**:
The concentration on the improvement of business processes that will deliver outputs that will achieve results meeting the firm's objectives, priorities and mission

**Capability Maturity Model**:
A framework that describes the key elements of an effective software process. It is an evolutionary improvement path from an immature process to a mature disciplined process. The CMM covers practices for planning, engineering and managing software development and maintenance. When followed these practices improve the ability of the organisations to meet the goals for cost, schedule, functionality and product quality.

**Concurrent Engineering**:
A way to reduce cost, improve quality and shrink cycle time by simplifying a product's system of life cycle tasks during the early concept stages.

**Cost of Quality**:
The practice of finding out costs associated with providing poor quality products or services.

**Statistical Quality Control**:
The application of statistical techniques to control quality.

**Supplier Quality Assurance**:
The approach to quality improvement to build quality into the products and services provided by a supplier.

**Taguchi Method**:
Quality engineering developed by Genichi Taguchi which calls for off-line quality control, on-line quality control and a system or experimental design to improve quality and reduce costs.

**Theory of Constraint**:
It is an approach devised by Goldratt that that examines the entire system for continuous improvement.

**TL 9000**:
A quality management system for telecom industry built on ISO 9000.

**Customer Relationship Management**:
An approach to learn more about customers' needs and behaviors to develop stronger relationships with them.

**Deming Prize**:
Award given annually to organisations that, according to the award guidelines, have successfully implemented company wide quality control based on statistical quality control.

**Design of Experiments**:
A quality tool that deals with planning, conducting, analyzing and interpreting controlled tests to evaluate the factors that control value of a parameter or group of parameters.

**Design for Six Sigma**:
An approach for designing new products or services and is a part of Six Sigma initiative.

**Sigma (DMAIC)**:
A data driven quality methodology that targets to improve processes as required by customers.

**FS 9100**:
A quality management standard developed for financial services industry.

**Hoshin Planning**:
A Japanese strategic planning process in which a company develops a vision and works out relevant goals and work plans.

**ISO 9000**:
A family of international quality management standards and guidelines that reflects a global consensus on product or service quality in the international context but can be applied by organisations world wide to their particular situation.

**Total Productive Maintenance**:
A quality approach targeted towards upkeep of machine in a manufacturing company.

**Total Quality Control**:
A system that integrates quality development, maintenance, and improvement of the parts of an organization. It helps a company economically manufacture its product and deliver its services.

**Total Quality Management**:
An approach to build quality an organisation enterprise-wide using elements such as; leadership, participation, training, costs and so on.

**Value Stream Management**:
An approach to look at a product family end to end from the time it is conceptualised till it reaches the hand of the customer.

**Zero Defects**:
A quality approach developed by Philip Crosby that states if people commit themselves to watching details and avoiding errors, the can move closer to the goal of zero.

**Juran Trilogy**:
A quality approach developed by Joseph Juran for managing quality which includes quality planning, quality control and quality improvement.

**Just in Time**:
An approach to improvement which ensures optimal planning system for a manufacturing process in which there is little or no inventory on hand at the manufacturing site or no incoming inspection.

**Kaizen**:
A Japanese approach to improvement popularized by Masaki Imai that focuses on doing little things better and achieving higher standards.

**Five S**:
This is a methodology for workplace organisation to improve workplace efficiency.

**Lean Manufacturing**:
Initiative focused on eliminating all waste in manufacturing process to target zero inventories, zero waiting time and continuous flow.

**MIL – Q – 9858A**:
A military standard requirement that describes quality programme requirements.

**Poka Yoke**:
A Japanese philosophy of preventing defects from occurring in processes and machines.

**Process Improvement**:
The application of PDCA cycle principles to improvements.

**SMED:**
An approach for reducing tool changeover times facilitating increased capacity, smaller batch sizes, lower inventory and reduced lead times

**Value Engineering:**
Value engineering is a functional analysis methodology that identifies and selects the best value alternative for designs, materials, processes, systems, and program documentation.

**Pull System:**
An improvement approach which is an alternative to scheduling individual processes, in which the customer process withdraws the items it needs from a supermarket, and the supplying process produces to replenish what was withdrawn.

**Benefit Cost Analysis:**
An approach that facilitates examination of the relationship between the monetary cost of implementing an improvement and the monetary value of the benefits achieved by the improvement, both within the same time period.]

**Process Management:**
The methodology of applying tools and techniques to a process to implement and improve process efficiencies hold the gains and ensure process integrity in fulfilling customer requirements.

**Process Performance Management:**
The overseeing of process instances to ensure their quality and timeliness. This includes both proactive and reactive actions.

**QS 9000:**
A quality management standard developed by the big three automakers for the automotive sector.

**QEDS Standards:**
A quality standard developed by US Standards Group on Quality, Environment, Dependability and Statistics.

**Quality Circle:**
An approach to Quality improvement carried out voluntarily by a small group of by employees.

**Quality Engineering:**
The analysis of a manufacturing system at all stages to maximize the quality of the process itself and the product it produces.

**QUEST Standards**:
A partnership of telecommunication suppliers and service providers with more than 130 members who have developed the quality standard TL 9000 for telecom firms.

**Quality Management**:
Management of all activities through a systematic and determined focus on continual improvement, above minimum levels of performance set by a formal quality management standard.

**CoBIT (Control Objectives for Information and related Technology):**
CoBIT has been developed as a generally applicable and accepted standard for good Information Technology (IT) security and control practices that provides a reference framework for management, users, and IS audit, control and security practitioners.

We claim:

1. A method for continual improvement in an organization, said method including the steps of:
   - classifying stages of development of the organization into various levels in a hierarchy ranging from lower to higher, wherein said classification is done by applying a plurality of attributes at each level,
   - applying one or more of known quality methodologies at each level wherein:
     - for lower levels, the methodologies selected, aim at achieving desired physical improvements,
     - for higher levels, the combination of methodologies selected, additionally aim at process improvements at that level,
     - for the highest level, the combination of methodologies selected aim at achieving customer satisfaction and reduction of defects,

   the said method moving from a lower to a higher level to increase the quality / performance level in the organisation.

2. The method as claimed in claim 1, wherein the organization comprises business organisations, government bodies, educational institutes, research laboratories.

3. The method as claimed in claim 1, wherein the attributes at lower levels are used to define and measure the physical workplace specifications.

4. The method as claimed in claim 1, wherein the attributes at higher levels are used for performance measurement.

5. The method as claimed in claim 3, wherein said attributes at the most basic level, substantially comprise:
   a). attributes to measure and avoid wastage for managing goods and services used or produced,
   b). attributes for prophylactically enquiring into problem causes, with the intention of solving / eliminating such problems,

c). policies that define how the organization works and the procedures for implementing such policies,

d). mechanism for receiving and implementing suggestions for improvement from employees to facilitate participation, and

e). attributes for assessing performance of workplace issues by conducting periodic meetings / reviews

6. The method as claimed in claim 4, wherein the higher levels, substantially, include attributes for:

a) standardization of all processes,
b) identification of core processes in the organization,
c) putting measurement of Quality, Delivery and Cost in each of said core processes,
d) positive trending in measurement of said Quality, Delivery and Cost for said core processes,
e) ascertaining the key vendors and putting measurement for Quality, Delivery, Cost and Service for the products and services of said key vendors, and
f) positive trending and measurement of improvement in said Quality, Delivery, Cost and Service for said key vendor products and services.

7. The method as claimed in claim 1, wherein the attributes at next higher level comprise:

a) measurement of first pass yield, said yield to be at least 90%,
b) measurement of on time delivery, said delivery to be at least 95%,
c) measurement of quality cost, said quality cost to be 10% of the processing cost,
d) measurement of process efficiency levels, said proficiency levels be at least 25%, and
e) score in a Business Excellence Model, said score to be at least 30%.

8. The method as claimed in claim 1, wherein the attributes at the highest levels comprise:
   a) measurement of first pass yield, said yield to be at least 99%,
   b) measurement of on time delivery, said delivery to be at least 99%,
   c) measurement of quality cost, said quality cost be 5% of the processing cost,
   d) measurement of process efficiency levels, said proficiency levels be at least 40%,
   e) score in service satisfaction, said score be at least 40%, and
   f) score in a Business Excellence Model, said score be at least 60%.

9. The method as claimed in claims 7 and 8, wherein said Business Excellence Model comprises Malcolm Baldrige National Quality Award, European Foundation of Quality Management, Deming Prize, Australian Business Excellence Framework. Etc.

10. The method as claimed in claim 1, wherein said quality methodologies comprise Six Sigma, ISO Certifications, 5S and Total Quality Management (TQM).

11. The method as claimed in claim 1, wherein said classification is done at four levels.

12. An apparatus for continual improvement in an organization including:
    - means for classifying stages of development of the organization into various levels in a hierarchy ranging from lower to higher, wherein said classification is done by applying a plurality of attributes at each level,
    - means for applying one or more of known quality methodologies at each level wherein:
        - for lower levels, the methodologies selected, aim at achieving desired physical improvements,
        - for higher levels, the combination of methodologies selected, additionally aim at process improvements at that level,
        - for the highest level, the combination of methodologies selected aim at achieving customer satisfaction and reduction of defects,

said method moving from a lower to a higher level to increase the quality / performance level in the organization.

13. The apparatus as claimed in claim 12, wherein the classifying means, classify the stages of development of the organization into four levels.

14. A computer readable recording medium for storing a computer program to cause a computer to continually improve an organization and perform the steps of:
    - classifying stages of development of the organization into various levels in a hierarchy ranging from lower to higher, wherein said classification is done by applying a plurality of attributes at each level,
    - applying one or more of known quality methodologies at each level wherein:
        - for lower levels, the methodologies selected, aim at achieving desired physical improvements,
        - for higher levels, the combination of methodologies selected, additionally aim at process improvements at that level,
        - for the highest level, the combination of methodologies selected aim at achieving customer satisfaction and reduction of defects,

    said method moving from a lower to a higher level to increase the quality / performance level in the organisation.

15. A computer readable recording medium for storing data, said data comprising structures for performing the steps comprising:
    - classifying stages of development of the organization into various levels in a hierarchy ranging from lower to higher, wherein said classification is done by applying a plurality of attributes at each level,
    - applying one or more of known quality methodologies at each level wherein:
        - for lower levels the methodologies selected, aim at achieving desired physical improvements,
        - for higher levels the combination of methodologies selected, additionally aim at process improvements at that level,

- for the highest level the combination of methodologies selected aim at achieving customer satisfaction and reduction of defects,

- moving from a lower to a higher level to increase the quality / performance level in the organisation.

16. A method for continual improvement in an organization substantially as herein described with reference to the accompanying drawings.

17. An apparatus for continual improvement in an organization substantially as herein described with reference to the accompanying drawings.

18. A computer readable recording medium for storing a computer program to cause a computer to continually improve an organization substantially as herein described with reference to the accompanying drawings.

19. A computer readable recording medium for storing data, said data comprising structures substantially as herein described with reference to the accompanying drawings.