CASE STUDY

Designing Organizational Infrastructures for World Class Quality
Designing Organizational Infrastructures for World Class Quality

by

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BACKGROUND

The field of Quality Management emerged from metrology (measurement technology) about fifty years ago, when it was called Quality Control. Its theory has since been further built on concepts of statistics, operations management, economics, behavioral sciences, and religion. However, in most companies in developing countries, it is still being practiced within its original scope of mere metrology, and is being called Quality Control. In such companies, inspection and testing are the major contents of their quality control programs. A measured product (or service) is being considered as “Quality Controlled”. Measurement of products alone, does not change or improve the quality of the organization, its products, the process capability, product design, human competence, or motivation. Nor does it provide enough quality assurance to the customers.

INTRODUCTION

Quality Management is an integral part of management, and encompasses every function of all types of organizations. Inspection and testing of products during every stage of production is only one of its elements. Due to a lack of its proper understanding and effective practice, most organizations are unable to excel in the right direction and compete effectively. The aim of Quality Management is to continuously maximize the quality of its products and services. This can be achieved only by improving the quality of the whole organization. ISO 9000 certification is being considered by many to be the magic solution to world-wide competition. There is no evidence to prove that it alone results in a world-class quality level. There is no doubt that it improves certain aspects of quality in an organization, but it does not provide a complete infra-structure for excellence. It provides only a foundation for Quality Assurance activities. On the other hand, transformation of an enterprise to a world-class competitive position requires a much higher level of practices in quality management, which is not possible without first establishing a basic framework of quality assurance, like that of ISO 9000.
The aim of this paper is to identify the basic components and levels of Quality Management, including the transformation processes from an existing level to a higher level, within the environment of a developing country, like Pakistan. It discusses:

1. QUALITY’S MOVING TARGET

Quality is a common word in business language, but without a common meaning. It is clear to a customer when (s)he uses it. The problem lies with suppliers and manufacturers when they try to interpret the customers’ meaning of good or bad quality. Different customers provide different ratings to the same product or service. They change their ratings with the passage of time. What used to be good quality yesterday, may be seen today as poor. Moreover, the customer may still not like a product or service even though the manufacturer has produced it in accordance with his/her stated requirements. Likes and dislikes in Quality are also dependent on the un-stated, and even un-visualized expectations. A computer which was perceived to be of the highest quality only months ago may today be perceived as inadequate. The word quality is not used in absolute terms. It is a relative term which differs from person to person, country to country, and time to time. With such variation, it is difficult to provide GOOD or EXCELLENT quality at all times, and for everyone. The life span of an organization in the open market is usually proportional to the time in which it can maintain the quality of its products and services as good or excellent. As soon as the preferences of the customers change, due to relative improvements of some quality values of similar products produced by other supplier(s), the organization’s decline is initiated. Quality is, therefore, a dynamic phenomenon and has a moving target.

2. THE THREE BASIC ELEMENTS OF QUALITY

Overall Quality is a result of its three basic elements: (1) Design Quality, (2) Process Quality, and (3) Human Quality. These are described as follows:

(1) Design Quality is the company’s capability to design and improve products as well as processes. The quality of R&D (Research and Development) is the foundation on which to build design quality of products and production processes. The designed product must be of
value to the customer, and result in a demand. Excellence in design quality can be achieved by developing an infra-structure for R&D, both in manufacturing and service organizations. This will include: (a) enhancing the core competence and resources for product and process know-how, (b) establishing closer contacts with customers (markets) to identify their changing expectations and needs (this will involve quality tools such as market surveys and feedback systems), and (c) equipping the R&D teams with appropriate resources to design products and services effectively and efficiently. Mere product design is not sufficient. Organizations must also build a Process Design infra-structure, which most companies ignore. Production processes must be regularly developed and upgraded which are capable of providing better process capability. This includes the introduction and supply of improved products and services either before the competitors do or to become at par with them in competition.

![Figure 1: The Three Basic Elements of Overall Quality](image)

(2) Process Quality must ensure that the required quality is produced most economically, reliably and effectively. This includes the capability to manufacture according to the design specifications, or the customers requirements. There must be a continual: (1) reduction in every type of nonconformity, customer complaints, rejects, defects, and errors in delivery and service, and (2) improvement in the process capability. Process quality can be improved only with effective process controls and operations management. In addition to the basic good design of the core processes, they need to be collectively controlled and improved by utilizing quality tools, like: Quality Control and Foolproof testing, Quality Assurance (ISO 9000), SPC (Statistical Process Control), and Quality Circles/Self-Managing Teams. In poor quality companies, the rates of defectives and rejections may be to the tune of 5-20%, and may be more than their total profit. Zero defect approach is the target for process quality, with the elimination of the sources of defects. Process control includes establishing effective procedures for the minimization of: (a) employees errors, (b) machine errors, (c) materials defects, (d) sub-contractors errors, and (e) service and delivery faults.

(3) Human Quality includes the Skill, Will, and Attitude of the owners and employees. It effects the collective strength of the organization in terms of its quality, productivity, and
competitiveness. Human Quality can be controlled and improved through effective leadership, competency development, ethical and professional values, Human Resource Development, teamwork, genuine concern for the community, and a God-fearing attitude. It determines relationships within the company and with the customers and suppliers. High performance companies always maintain high performance employees and environment within the company. This aspect is developed through good quality leadership and effective Human Resource Development (HRD) program.

3. THE FOUR LEVELS OF QUALITY MANAGEMENT

It is difficult to classify companies in terms of their practice levels in quality management. Like human beings, if someone has to classify them in order to determine how good they are, it becomes confusing. Even in bad people, there are good characteristics, and in good people there are bad characteristics. Likewise, to identify the various levels of practice in Quality Management, even bad companies have some high level characteristics and vice versa. In spite of this difficulty, an effort is made to clarify the situation. The following identification is based on the three research findings. The first is the author’s own [Ref 1]. The second is the research findings of McKinsey & Company of Germany in the automobile sector, which was carried in Europe, the USA and Japan, based on a survey of 167 companies [Ref 2]. The third is the European Foundation for Quality research [Ref 3]. Companies can be classified in the following four (plus a ‘zero level’):

![Figure 2: Four Levels of Quality Management](image-url)
Zero Level (No QC/Inspection): These companies do not measure or control the quality characteristics of their products and services. In open competition, such organizations exist for a very short while and then die. Those who remain are usually in the government sector or those who enjoy monopoly. Examples include most of the government organizations, utility suppliers, revenue collection departments, courts, police departments, and universities. In countries like Pakistan, the State has traditionally been the center of power. There is no accountability for poor quality. The consumer, including industrialists do not possess any political power. Poor quality to the extent of torture to consumers is common. Most of the government organizations in developing/underdeveloped countries are rated extremely poor. Even in developed countries their ratings are also usually lower than those for private companies. No inspection mechanisms exists for the assessment of quality of their services. Irrespective of their poor quality, their survival is always guaranteed by the state.

Level I: (Traditional Quality Control/Inspection Based). These organizations have a reasonable laboratory, and carry out inspection and testing in different stages of production. Testing and measurement by itself makes the people reactive to non-conformities. Traditionally, Quality Control is known as testing of products; whereas QC people are the ones who do the testing. Most manufacturing companies in Pakistan, and in many other developing countries, usually fall under this category. This means that they consider QC as the job of testing department, and production staff is usually not effectively involved in problem solving and in taking corrective actions. Corrections and repairs are considered as Corrective Actions. Defect detection in products and related repairs remain their focus in Quality Management. (Compare this to Modern Quality Control which includes production process measurements and control, and the production people).

Level II: (Quality Assurance/Corrective Action Based). These companies understand that product is the result of many processes; and unless these are controlled effectively, quality cannot be delivered. Therefore, they try to control all those processes which affect product quality. ISO 9001/2/3 Standards are basically Quality Assurance Standards. These companies, therefore, try to standardize the core processes of their organization and include Internal Audits to check the standardization and their conformance. The popularity of ISO 9000 in Pakistan, is essentially an era of up-gradation of companies from Quality Control (Level I) to Quality Assurance (Level II). Most of the companies who implement these standards realize the importance of Quality Assurance and usually accept it as an essential element of their quality management activity. However, most of the efforts in ISO 9000 are directed towards improving Process Quality. Very little direction is provided for improving Design and Human Quality.

Level III: (Continuous Quality Improvement with Integrated Quality Management Programs). These companies go farther ahead from mere quality assurance towards quality improvement. They use many quality tools and techniques to regularly identify and measure customer needs and satisfaction; and then plan and change their organization procedures accordingly, to make sure that they are capable of providing the required products and services. They use many quality tools to control variation, defectives, and to identify improvement tasks (e.g. statistical process control, quality circles, self managed quality teams, benchmarking, process simplification, fool proof testing, employees satisfaction and career development, and the latest technologies for production and testings). These companies also focus on Design and
Human quality, in addition to Process Quality. They provide better value to their customers and achieve better profitability and sustainability, compared to companies focused only on quality assurance. Few companies fall under this category in Pakistan.

**Level IV: (Perfection/Champions).** These companies are the global champions and dominate markets with their products and services. They show long-term survival. Others follow them. Some examples are: Toyota, IBM, Toshiba, National, Boeing, Motorola, Oxford University, Massachusetts Institute of Technology (MIT), and Caterpillar. These companies show their superiority in all the three qualities, i.e. Design, Process, and Human Qualities. They provide benchmarks to others. Perfection here, does not refer to the absolute perfection in products, rather complete satisfaction and trust of markets in their products and organizations. Their management practices are highly effective and efficient. No company in Pakistan falls under this category.

4. CHARACTERISTICS OF EACH QUALITY MANAGEMENT LEVEL

It is important to look at the indicators which are useful to design the organizational quality infra-structures. The findings shown in Table 1 are taken from the research carried out by [Ref 2] and represent the findings of automobile manufacturing companies in Japan, USA, and Europe. They provide useful insight to companies in developing countries from the global competition point of view.
<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Level I</th>
<th>Level II</th>
<th>Level III</th>
<th>Level IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rate of defectives delivered to customers (in ppm)</td>
<td>&gt; 4800 (0.48%)</td>
<td>&lt;900 (0.09%)</td>
<td>&lt;300 (0.03%)</td>
<td>&lt;100 (0.01%)</td>
</tr>
<tr>
<td>2</td>
<td>Rate of Cumulative internal rejections/errors</td>
<td>&gt;5%</td>
<td>&lt;3%</td>
<td>&lt;1.5%</td>
<td>&lt;0.8%</td>
</tr>
<tr>
<td>3</td>
<td>Rework Rate</td>
<td>&gt;3%</td>
<td>&lt;2.7%</td>
<td>&lt;1.7%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>4</td>
<td>Process Capability Index ($C_{pk}$)</td>
<td>&lt;1.0</td>
<td>&lt;1.3</td>
<td>&lt;1.6</td>
<td>&gt;2.0</td>
</tr>
<tr>
<td>5</td>
<td>Quality Costs as percentage of growth</td>
<td>&gt;10%</td>
<td>&lt;5%</td>
<td>&lt;3.4%</td>
<td>~1.0%</td>
</tr>
<tr>
<td>6</td>
<td>Percentage Return per annum</td>
<td>0.6%</td>
<td>4.6%</td>
<td>6.7%</td>
<td>9.1%</td>
</tr>
<tr>
<td>7</td>
<td>Training Costs US$/year/person</td>
<td>~100</td>
<td>~200</td>
<td>~300</td>
<td>&gt;400</td>
</tr>
<tr>
<td>8</td>
<td>Quality Objectives</td>
<td>usually not defined</td>
<td>usually defined for production only</td>
<td>usually defined for all departments</td>
<td>company-wide defined up to individual levels</td>
</tr>
<tr>
<td>9</td>
<td>Incentives</td>
<td>None</td>
<td>usually piece rate</td>
<td>competitive</td>
<td>fair pay + personal recognition</td>
</tr>
<tr>
<td>10</td>
<td>Organizational hierarchy</td>
<td>7-8 levels</td>
<td>same</td>
<td>simpler and flat up to 5 levels</td>
<td>simpler-up to 5 levels (less managers)</td>
</tr>
<tr>
<td>11</td>
<td>Quality Assurance Function</td>
<td>none</td>
<td>independent QA Dept. Up to 10-15% of total manpower</td>
<td>reduction in QA specialists- 2-10% of total manpower</td>
<td>QA Dept. Loses its central role, becomes mentor/promoter, responsible for promoting Quality tools, its application to training, and organizational consulting 2-10% of total manpower</td>
</tr>
<tr>
<td>12</td>
<td>Inspection</td>
<td>by the inspection department</td>
<td>by the inspection department</td>
<td>reduces final inspection</td>
<td>eliminate final inspection, encourage self inspection</td>
</tr>
<tr>
<td>13</td>
<td>Research &amp; Development</td>
<td>None</td>
<td>some modifications in products are occasionally carried out</td>
<td>organized new product designs, some use of CAD</td>
<td>also include process capability design and extensive use of CAD/CAE</td>
</tr>
<tr>
<td>14</td>
<td>Subcontractors/suppliers relations</td>
<td>always hunting, procurement by inspection</td>
<td>through qualified vendors, too many vendors, give priority to vendor process control</td>
<td>lesser vendors, demand SPC, product audit, and system audit from vendors</td>
<td>a few highly selected vendors, demands SPC, product and system audit, and FMEA from vendors</td>
</tr>
</tbody>
</table>
It is important to critically study this table. It provides data to companies for self assessment. Creating excellence is a step by step approach. Most companies will not find all of their quality indicators listed under one level. It will be common to find different indicators of a company under different levels, which should not confuse the readers. The objective of this table is to provide a general overview of different levels in a consolidated form. This should provide guide to companies to identify their weak areas and define their quality targets more objectively.

5. TRANSFORMATION TO THE NEXT HIGHER QUALITY MANAGEMENT LEVEL

Every journey starts from the first step in the right direction; and ends-up with persistency in traveling in the right direction. Wishful thinking, even with considerable intellectual know-how, without taking practical steps, is worthless. Every organization can transform its overall quality level to a higher quality management level, by identifying the weakness in its specific type of quality, i.e. Design, Process, or Human Quality; and then making itself more competitive by improving it. Whatever the current level may be, from zero level to “perfection”, the most important point is to identify the need for, and establish and maintain a transformation process in the right direction. Only right guidance leads to success; and success leads to competitiveness. The transformation steps of each company may differ from others, however a few principles are as follows:

a. From Zero Level to Level One: Establish accountability for Quality and the need for product (or service) measurement. Identify the critical parameters of your product and then find out if they are measured appropriately. If not, then establish a function in the organization for their measurement (inspection and testing). Seek help from general industrial practices and/or commonly available industrial and industry specific standards. Make sure that you have properly identified or defined your product (including service) standards. For example, the university may identify its service standards, and then develop procedures to measure them (e.g. measuring teachers performance, teaching quality, its inquiry handling quality, delays in exams, verifying the examination results, auditing during courses etc.).

b. From Level I to Level II: This is the transformation from Quality Control to Quality Assurance, i.e. from inspection oriented to process standardization and controls. ISO 9000 Quality Assurance standards can be of good help in this transformation. Identify the core processes of your organization which affect product quality. ISO 9001/2/3 is a good framework of Quality Assurance, which defines such processes, i.e. contracting and dealing with customers, design, production, post production, vendors and purchasing, testing, and stores. The parameters of Quality Assurance in each department are provided in these standards. In addition to product measurement, Quality Assurance also includes assessment of all organizational procedures and the way they are implemented by different individuals in different department (Quality Auditing). Finally, a strong procedure of taking corrective
actions and reviews of quality related activities must be established. Such Quality Assurance
measures, if implemented effectively, result in better process controls, thus minimizing
rejections, defectives, rework, and reducing market complaints. Training of management and
other company staff is crucial in this transformation. The most critical Quality Tools which
are extensively used in this transformation are:

1. ISO 9000 Quality Assurance Standards
3. Foolproof testing
4. Effective Design Reviews
5. Effective corporate planning and monitoring of quality

c. From Level II to Level III: This transformation is essentially expanding the focus of
Process Quality itself, and expanding to Design and Human Qualities. In other words,
changing from the management of quality to the quality of management. Process Quality is
further improved by using SPC in most processes, establishing and expanding quality circles,
and improving the maturity level of Quality Assurance by itself. Design Quality is upgraded
through effective R&D; whereas Human Quality through effective HRD. Design and Human
Quality Development are both long-term processes. Human quality creates a quality culture.
This culture by itself, drives the company towards better focus on customers’ stated and
implied needs, thus enhancing competitiveness and excellence. Many organized programs of
quality management are run initially on a trial basis and then standardized by regular company-
wide activities. The most critical Quality Management programs are the following:

1. Changing individual approaches to collective approach for quality improvement by
   establishing Quality Circles (Quality Teams, and self management teams); incorporating at
   least 50% of employees
2. Identifying unidentified quality indicators by using Quality Function Deployment Tool
   (from customers’ needs to identifying processes and systems that fulfil their changing
   needs) in the R&D of every new product/development.
3. Improving the reliability of products/services by using Failure Mode and Effect Analysis -
   FMEA (identifying the probability of product or service failure at the design stage and take
   appropriate preventive actions) in the R&D.
4. Capturing customers’ expectations by Customer measurements and survey programs
   (usually carry out by the Marketing/R&D departments). Poor quality company are either
   ignorant of these techniques, or if aware of, never attempt to use them.

Each of the above Quality Tools, though sounding simple in theory, is a difficult project to
practice, which usually takes from six months to a year per tool to implement. Many try such
tools on one-off basis and after an initial failure, consider these tools as valueless. In order to
convince themselves, they blame these proven tools as useless. Some companies learn these
tools and realize their importance, but never develop the momentum and resources to
implement and standardize them. In most failure cases, the top management is to be blamed for their ignorance and proper patronage.

d. From Level III to Level IV: This is essentially the transformation towards real creativity and making perfection as everyone’s goal in the organization. It involves creative designs of products and services, design of efficient processes, technological breakthroughs, and design of creative practices of quality and productivity systems (and sub-systems). It is not possible to gain this level by imitation of other good companies. The pre-requisite to this transformation is a highly motivated top management, highly developed quality culture, high competence level of management and the workforce, long term planning and vision, plenty of resources, and high level of product and process know-how and design capability. Companies at this level create their own marks and symbols of quality. The value of the products to the customers at this level is the maximum. Imitators are thrown out of competition by such companies. Brand names acquire the status of the biggest company resource. This transformation is preparing companies for competition with the global champions.

6. INVESTMENTS IN QUALITY

Achieving a better quality level may be a key policy decision through which an organization seeks competitive advantage. Investigation of the current position and future prospects of quality, reliability and costs of others already in market is an important part of policy matter. It provides appropriate information for the desired quality level. Certain products are to be manufactured to the relevant national/international standards (e.g. cement in Pakistan). Adherence to such standards is often mandatory. Even in such circumstances price and quality will often change as a result of market pressures.

For the purpose of investment and saving on Quality Management, one must look at the three principal costs:

1. **Systems** cost, associated with setting up the operating system to aim to provide goods or services of appropriate quality
2. **Control** costs incurred in monitoring, checking and correcting activities during the operations
3. **Consequent** costs, incurred after completion of operations, i.e. after delivery of the goods, or completion of the service

There is a general sequential relationship between these costs as shown in the diagram below. The greater the systems costs become, the control costs reduces, and subsequently more benefits is achieved in the consequential costs. Most of the companies of Level I (Quality Control) bear more control costs and lesser system costs. The Level II companies invest in systems and thus reduces control and consequent costs. The Level III and Level IV companies
invest in a balanced way in both the system and control costs, in a quest for the elimination of the consequent costs.
### Figure 3: System, Control and Consequential Costs incurred by various levels of companies

<table>
<thead>
<tr>
<th>SYSTEM COSTS</th>
<th>Level Zero</th>
<th>Level One</th>
<th>Level Two</th>
<th>Level Three</th>
<th>Level Four</th>
</tr>
</thead>
<tbody>
<tr>
<td>INVESTMENT</td>
<td></td>
<td></td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Facilities and resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Design/development</td>
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<td></td>
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<tr>
<td>Training</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Quality System</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>PREVENTION</td>
<td></td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
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<tr>
<td>Maintenance</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Quality Campaigns</td>
<td></td>
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<tr>
<td>APPRAISAL</td>
<td></td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Testing and measuring</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>checking</td>
<td></td>
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<tr>
<td>inspection</td>
<td></td>
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<tr>
<td>CORRECTION</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>X</td>
</tr>
<tr>
<td>Rectification</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
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<tr>
<td>Rework</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
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<tr>
<td>Repetition</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
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<tr>
<td>Wastage</td>
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<tr>
<td>MANAGEMENT OVERHEAD</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>X</td>
</tr>
<tr>
<td>Dealings with</td>
<td></td>
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<td></td>
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<tr>
<td>customers, rescheduling, reorganization</td>
<td></td>
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<td></td>
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<tr>
<td>USAGE</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XX</td>
<td>X</td>
</tr>
<tr>
<td>Replacement</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XX</td>
<td></td>
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<tr>
<td>Failure</td>
<td></td>
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<td></td>
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<tr>
<td>Disruptions</td>
<td></td>
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<tr>
<td>MARKET</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XX</td>
<td>X</td>
</tr>
<tr>
<td>Reputation</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XX</td>
<td></td>
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<tr>
<td>Future demand</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Customer loyalty</td>
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</tbody>
</table>

7. **THE TRUE VALUE OF ISO 9000 AND ITS POSITION IN QUALITY MANAGEMENT**
ISO 9000 has two series of standards. Firstly, ISO 9001/2/3 which are subject to third party audits. These standards are basically Quality Assurance standards as defined in Level II. The other sets of standards are available through guidelines, i.e. ISO 9000 and ISO 9004 series, which are not subject to audit by third party auditors, and are called Quality Management Standards. These guidelines approach Level III. Unfortunately more than 95% of the certified firms ignore or reject these guidelines for implementation purposes. This restricts their transformation from level II to Level III.

Due to various malpractices by the management of companies, auditors, and consultants, considerable variation in the level of Quality Assurance exists even among the ISO 9000 certified firms. Many companies, though certified by some low quality certification agencies, do not even fully qualify for Level II. Thus, though labelled as ISO 9001/2/3 certified firms, they do not posses a good Quality Assurance program. Their competitive value does not rise to a better level, even after years of certification. To them, the certificates only provide an initial acceptability and new clients; but do not provide better customer retention. Better retention of customers and market competitiveness has to do with the degree of excellence in Quality Assurance Program, and in all the three Qualities of Design, Process, and Human.

The present status of ISO 9000 implementation in Pakistan and many other countries has shown considerable variation in practice. Some of the most common errors in ISO 9000 implementation are as follows [Ref 4]:

1. **Immature Sub-Systems of the ISO 9000 QMS**: e.g. Production Planning and Control, Maintenance Management, Stores and Inventory Management, Statistical process Control, Customer Service, Document and Data Control, and Calibration Control. People develop the subsystems according to the competence, skills, experience, and knowledge of either themselves or their consultants. Their sub-systems usually remain inefficient and incomplete.

2. **Quality Policy without Commitment**: The process of defining and establishing the quality policy, objectives and targets is usually weak. High sounding empty slogans are used. Policy Deployment (Hoshin Kanri) is a useful technique for this purpose. However, it is hardly known or used. The result: quality policies are stated, printed and posted everywhere, but they are not deployed properly.

3. **Incompetent Internal Auditors**: Most Internal Auditors lack: technical competence (product and process know-how and experience), personalities, and a reasonable seniority to be able to effectively audit the senior management. Their findings usually revolve around and on the surface of the quality issues. They never identify and tackle the real and deep rooted quality nonconformities and issues.

4. **Corrective Actions Without Solving the Root Causes**: When a nonconformity is discovered, its root causes are not investigated properly and extensively. Most employees lack problem-solving skills and are unaware of the QC Tools. No analytical work is carried
out by the auditees. The result is that the actions taken do not prevent the recurrence of the nonconformity.

5. **Insufficient Management Review on Quality:** The management review on quality usually takes the form of a casual routine meeting. The QA Manager does not do his/her homework to provide good inputs through effective reports. The top management never demands proper information and reporting, and usually merely preaches others to do their jobs more efficiently and effectively. There is a lack of a thorough monitoring of the system, meeting the quality objectives, and a regular setting of improved objectives and targets.

6. **Statistical Process Control (SPC):** Most people lack effective knowledge of SPC tools; so they implement only a limited minimum. The statistical knowledge of many Lead Auditors of certification agencies is insufficient to audit effectively.

7. **Training:** The requirements of the ISO 9000 to identify the training needs of employees is usually treated superficially. Only a few courses are put on the training list. Identification of proper needs is not carried out.

8. **Excessive Documentation:** Documentation is a considerable portion of the objective evidences for external auditors. Therefore, it is usually given a very high priority. Only a few companies really consider them as real guides for their day to day operations. Due to this concept, most people tend to make excessive documentation from the point of view of practical implementation.

9. **The Management Representative:** He/she is sometimes selected without considering the job requirements. Appropriate relevant skills and personalities are usually lacking. As a result, the monitoring and establishing of the system is not forceful.

10. **Quality Plans:** These are usually incomplete and invalidated. This results in poor inspection and testing methods being standardized.

11. **Integration of ISO 9000 with Actual Operations:** The way this standard is introduced in companies, people tend to think its implementation as an additional burden to their real jobs. They perceive this standard as something which has little or no relation to the business processes. Integration of the QMS with the actual processes is essential so that the procedures of ISO 9000 become part of the work environment.

12. **Calling it “ISO 9000” and not a “Quality Assurance” Project:** The project is usually named as ISO 9000, which by itself has no meaning. Many people consider it as an ISO 9000 project and not a Quality project. ISO 9000 is associated with a lot of criticism, e.g. European standards, imposed by certain lobbies, a marketing tool, just documentation, not TQM, and being unproductive. Declaring it as an Quality Assurance/Management project eliminates such criticism.
8. THEORETICAL KNOWLEDGE VS PRACTICAL SKILLS

Knowledge and skills differ in nature, and are not equal. A big gap exists in managers between what they read and listen, and what they practice. Knowledge based on theory is insufficient for practice. Repeated doing, under the right guidance is the fastest way to learn skills. Those who teach theories without practice convey knowledge without skills. There is an abundance of managers in business and industry with plenty of theoretical knowledge, but with very limited practical skills in management. This not only includes Quality Managers, but also the primary functional managers, including production control, marketing, inventory control, finance, planning, MIS, and productivity. In the UK, about 6% of all 18 year olds leave school with a technical or vocational qualification, compared with 50% in Germany. The result is that Germany has the investment in education to develop production systems [Ref 5].

In order to solve the issues, companies will have to change their learning strategies from concentrating on just attending courses and training programs, to acquiring practical skills. Any training which does not improve company processes or products is worthless. The activity of R&D should be expanded to include management systems design and development, as shown in the following diagram. Good companies always carry out a balanced R&D in all the three qualities.

![R&D Practice Diagram]

Figure 4: R&D practice should be carried out in all the three areas of Quality

9. LESSONS LEARNED

1. Quality Management is an integral part of management, and encompasses every function of an organization, whereas Inspection and Testing is only one of its elements.
2. The aim of Quality Management is to continuously maximize the quality of its products and services. This can be achieved only by improving the quality of the whole organization.
3. Quality is not static. It is dynamic, and has a moving target to aim at.
4. Overall Quality is a result of its three basic elements: Design Quality, Process Quality, and Human Quality. Only an integration of all three will result in Total Quality.

5. The Four Levels of Quality Management are:
   - **Level I:** Traditional Quality Control/Inspection Based
   - **Level II:** Quality Assurance/Corrective Action Based
   - **Level III:** Integrated Quality Management Programs/Improvement Based
   - **Level IV:** Perfection/Champions

6. Average of Pakistani industries is at Level I (i.e. inspection based), and Pakistani Government organizations at Level zero. The popularity of ISO 9000 in the country is in fact a transition phase from Level I to Level II.

7. Each company should identify its current level, and continually upgrade its Quality Management to a higher level in order to increase its competitive position in the local and foreign markets and long term survival.

8. ISO 9000 deals with Quality Assurance, and is at the Second Level. After achieving this level, companies need to further develop to the third level for better competition. Considerable variation is found among the companies being certified. The most common errors in its implementation are: immature sub-systems, quality policy without commitment, incompetence internal auditors, corrective actions without solving the root causes, insufficient management reviews on quality, weak application of SPC, lack of training directly resulting in product and process improvements, excessive documentation, incompetent and junior management representative, lack of proper quality plans, ISO 9000 not integrated with actual operations, and calling the project ‘ISO 9000’, instead of ‘Quality Assurance’

9. Knowledge based on theory is insufficient for practice. Learning strategies must change from concentrating on just attending courses and training programs, to learning practical skills which result in improvements in processes and products.

**REFERENCES**


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