18. OVERVIEW OF ISO 9000 BASED QMS BENEFICIAL FOR ENGINEERING EDUCATIONAL INSTITUTIONS

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Abstract

With an increasing concern about the quality of engineering education being offered to the students, there is a need for a system of quality assurance in an educational Institution. The establishment of ISO 9000 compliant quality systems represents one such methodology. This paper presents an overview of the ISO 9000 standards and provides information of the latest version of ISO 9000 (ISO 9001:2000) and how it is more acceptable to education. A general methodology for implementing ISO 9000 QMS in an educational Institution is presented. The reasons for certification, benefits and limitation faced in getting the ISO 9000 certification have been discussed ,based on experience and the research literature available which can help Institutions going for ISO 9000 certification to progress on this path .

Introduction

The liberalization and globalization has taken place in all sectors all over the world. Foreign and multinational players are entering the local markets in a big way. This has been introduced in India ever since 1991. Today it is a 'customer' driven market rather than sellers' . Education is no exception to this phenomenon. There has been a considerable rise in the number of educational institutions offering education at various levels. There are about 2,000 training Institutions and polytechnics. about 12,000 general colleges including about 300 universities, deemed universities and institutions of national importance and also 1500 engineering Institutions with at least one technical University in almost every state.

Today, customers expect quality in all aspects of their lives. Companies are doing everything possible to assure their customers of high quality of their products and services. The same is true with education. Students,their parents,user industries and society at large being the main stakeholders in the education field, want institutions to offer quality service.

Various tools and techniques are being adopted by industries worldwide to achieve and improve quality of their products and services. One internationally popular tool is the set of ISO 9000 standards. Total Quality Management (TQM), Benchmarking, Business Process Re-engineering (BPR) etc. ISO 9000 standards are a series of standards which have evolved in order to avoid confusion due to numerous and varied national and international standards. International Organization for Standardization (ISO) had issued these standards in 1987 and ever since there has been an increasing awareness about quality worldwide. If we look at the worldwide total of certification based on the latest version of IS0:9000 standard namely

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ISO 9001:2000 quality management system (QMS) standard, at the end of 2004, it was 6,70,399, an increase of 64 % over 2000, the year before the transition to ISO 9001:2000 began (www.iso.org). By looking at the kind of response one can easily conclude that there are no two opinions about its universal acceptability as far as quality management is concerned.

Since ISO 9000 standards are generic in nature, they are equally applicable to service organizations such as software companies,transportation, health care, hotel management and education. There has been a steady increase in the number of educational Institutions obtaining ISO 9000 certification worldwide and it is true in India also. Many private educational Institutions have adopted this, particularly technical institutions, as it increases their social acceptability by the customers in comparison with other institutions.

This paper attempts to highlight the efforts behind QMS drive based on ISO 9000 for engineering educational Institutions. The paper provides an overview of ISO 9000 standards and about the latest version (ISO 9001:2000), which is more relevent to educational Institutions. A general methodology for implementing ISO 9000 standards in an educational institution is presented. The reasons for certification in terms of its benefits, limitations and difficulties in implementing ISO 9000 are discussed.

ISO 9000 Standards

The ISO 9000 international standards are a set of written guidelines that make up a non-specific quality management system that can be applied to an organization regardless of the product or service being provided. According to its design, ISO 9000 simply provides a framework, without changing how the organization operates, "that ensures that nothing important is left out and that everyone is clear about who is responsible for doing what, when, how, why and where (www.iso.org).

While during the post world war era. BS 5750 standards were gaining popularity, 25 national standardizing associations established the International Organization for Standardization (ISO) for a 'fresh start' in developing international quality standards. The founding of ISO was part of a global action to "rationalize the thousands of conflicting standards of the various nations" and "to promote standards in international trade, communications and manufacturing".

In 1987, ISO created the ISO 9000 quality standards, which were almost an exact copy of the successful British standard BS5750. Between 1987 and 1994 the standards underwent changes that were intended for clarification. The revised version released in 1994 was adopted by most of the countries in the world in place of their own national standards. The standards were revised again in the year 2000 as ISO 9001: 2000

The 1987 and 1994 versions comprise of ISO 9000, ISO 9001, ISO 9002and ISO 9003. ISO9001 covers all activities in all stages of an organization's operations, starting from the design and development to servicing customers. ISO 9002 was more suitable for organizations engaged in production and installation only, while ISO 9003 was the proper choice for organizations engaged only in final inspection and testing

The most recent version, the ISO 9001:2000 standard is a revised version of earlier standard improved in order to be better applied to a wider variety of organizations. The objective of ISO 9000 has changed from a model for quality assurance to a set of standards for effective quality management.

ISO 9001:2000 standard is different from previous versions in terms of three major changes -

- There is a shift from 20 clauses of requirements to a plan-do-check-act (PDCA) type of structure.
- There is a reduction in the number of

technical requirements directed at operational level of the organization. However, greater weight is placed upon top management by assuming more responsibility in the QMS.

- There is a wider coverage of quality by shifting from a focus of quality assurance system to a combination of continuous improved quality assurance and QMS which will enhance customer satisfaction

This latest revision of ISO 9000 focuses on the aspects of the management system that will deliver customer satisfaction and continual improvement of the system through objective evaluation. With this new focus on continuous improvement, it has become similar to the TQM philosophy

ISO 9000 in Education

There is pressure from from the changing global environment and diminishing resources and pressure for educators to meet the needs of industry and other stakeholders with a better skilled and quality workforce . There is an increasing demand for educational Institutions to get certified or registered for various reasons like facing competition, obtaining social acceptability, getting a stamp of quality and such others. This is particularly true for technical education, as it contributes in a large way in the development of a nation's economy. ISO 9000 can also act as a pillar in an organization's approach to TQM. And TQM is very relevant for education because quality in education is a continual process. Even then only a few Institutions have registered and this varies from country to country. Many people from education and training world wonder whether adopting ISO 9000 standards is the best way to improve quality in education and training. For many, they are taking it as it is a very costly process . Though ISO 9000 was originally intended as a quality system for the manufacturing industry, it is now being applied to education, and there has been controversy associated with it in terms of its suitability and applicability to the teaching-learning process. The efforts are made in both USA and Europe to make ISO 9000 standard or its adopted variant applicable to education and training.

Currently, the latest developments on ISO 9000 in education are happening at ISO. It is supporting the development of guidelines for the implementation of the ISO 9000 standards in education and service organizations. The guidelines are called the International Workshop Agreement to Quality Management Systems Guidelines for the Application of ISO 9001:2000 in Education. The guidelines have been published by ISO as an International Workshop Agreement (IWA2). These guidelines were created by the participants at a workshop, held during October 2002 in Acapulco, Mexico and attended by 400 people from 20 different countries. The objective of the IWA is "to provide guidelines to assist organizations that provide educational products to implement an effective QMS that meets the requirements of ISO 9001:2000... and to help educational organizations to relate the concepts in ISO & QMS standards to education practices (IWA2)

Applicability of ISO 9001:2000 to Education

The IWA2 variant of ISO 9001:2000 is more user friendly in terms of reduction in the number of clauses from the early 20 to only 8 and an emphasis on a Plan-Do-Check-Act structure. They have a generic applicability and can be applied to non-manufacturing firms also. The newer version places greater weightage upon top management as they have more responsibility in the quality management system. This version gives wider coverage to quality by shifting from a focus of quality assurance system to a combination of continuous improved quality assurance and quality management system which will enhance customer satisfaction.

A General Methodology for Implementing ISO 9000 in -an Educational Institution

The methodology for establishing an ISO 9000 quality system depends on a number of factors such as the nature of business, current status of quality control and market requirements. Since educational Institutions are in the business of delivering education to students, the kind of QMS they should have, are slightly different from that of a conventional manufacturing industry, as education is a form of service organization. Quality Gurus have mentioned at many places that university is a manufacturing system, with defined customers and suppliers. The university receives its students from high schools and colleges. After passing the admission tests and other formalities, the students go through a prescribed duration of education, by taking different number of courses each year. Their knowledge is enhanced by the faculty, which include Professors, lecturers, lab technicians etc., with the teaching-learning process and examination process being supported by the university administration. At the end of each year. the students have to meet certain requirements in order to pass to next year or graduate. The customers (industry, government' and society) should be assured that their requirements for quality are met on a continuous basis and the students passing out will acquire the specific quality characteristics like employability, ability to solve real life problems etc. ISO 9000 can play a major role in assuring this quality In this respect, the management of educational Institutions has to make a beginning by initiating the necessary steps for its effective implementation. There are some steps which have to be taken as a part of a general methodology for implementing ISO 9000, which are as given below:

Commitment from Senior Management - The top management should demonstrate a commitment and a determination for implementing ISO 9000 based QMS in the Institution. Top management must be convinced that registration and certification will enable the Institution to demonstrate to its customers a visible commitment to quality. It should appoint a management representative (MR) to coordinate quality system activities.

Formation of Steering Committee and a Task Force - A steering committee should be set up. It should be headed by the Principal and its members should include the various department heads, along with the Management Representative. A task force with MR as its coordinator should also be set up for the preparation of documentation (manuals, procedures, forms etc.). The members of the steering committee and coordinators of task force committee should be trained on ISO 9000 quality systems by a professional training organization.

Appointment of a Consultant(If necessary) - The steering committee should determine whether a consultant is required. Many times people found that consultant is necessary and worthwhile who will generate and set the documents and also train the people in the organization. The appointment of consultant will facilitate speedy implementation and will guide the organization in overcoming the obstacles, through their knowledge and experience and will help the Institution in achieving certification in a time bound frame Cost is an important factor while hiring the services of a consultant.

ISO Awareness Programmes in the Institution - ISO 9000 awareness programmes should be conducted to communicate to the people working in the institution, the aim of the system, the advantages it offers to the employees, customers and the Institution, how will it work and their roles and responsibilities within the system. These programmes generally will be conducted by the top management with the help of the consultant. Steering committee can take important role in implementing employee orientation program which can be possible through System familiarization form where newly joined person can come across various departments and can meet with heads of the

departments

Training - Training programmes should be structured for different categories of employees -teaching and non-teaching and supporting staff and again among teaching staff- senior and junior level staff. The training may be about basic quality concepts. culture implications, writing quality manuals. procedures, forms etc., carrying out internal audit etc One of the main aims of this training is to have a group of internal auditors, which include teaching staff. whose assistance is very much essential in the regular audits to be carried out for assuring quality through ISO 9000 QMS.

Action Plan - This will help in establishing a time table for implementing ISO 9000 QMS in the Institution. This should define the responsibilities of different departments and personnel and set target dates for completion of activities.

Develop Quality System Documentation - This is the most important activity in the implementation process. Quality system documentation is generally prepared at three different levels - Quality manual, Quality system procedures and Quality documents(forms,work instructions,working guidelines etc.)

Implementation - In this phase, the QMS developed is implemented in a phased manner and when done like this, the effectiveness of the system in selected areas can be evaluated. It would be good idea initially to evaluate areas where the chances of a positive evaluation are high, in order to maintain the confidence of both the management and staff in the merits of the QMS.

Internal Quality Audit- As the system is being installed, its effectiveness should be checked by regular internal quality audits. Internal quality audits are conducted to verify whether the documented system is being actually implemented as laid down. Even after the system stabilizes and starts functioning, the process of internal auditing should be planned and performed as part of an ongoing strategy.

Management Review - When a documented quality system has been operating for three to six months, an internal audit and management review should be conducted and corrective actions can be implemented through this activity. Management review is the activity where all top management persons along with steering committee representative MR, and Head of the organization come together with common interest of maintaining and thus improving activities of the education process .

Pre-assessment Audit - When system deficiencies are no longer visible, it is now time to go in for certification. But before that, a pre-assessment audit can be arranged either by the consultant with the help of an independent and qualified auditor. This can provide some kind of a confidence for formally going ahead with an application for certification.

Certification - Once the quality system has been in operation for a few months and has stabilized, a formal application for certification could be made to a selected certification agency. The certification agency first carries out an audit of the documents. If the documents conform to the standard, then an on-site audit is carried out. If the certification body finds the system to be working satisfactorily. it awards the Institution a certificate, which is generally for a period of three years.

During this three year period, it will carry out periodic surveillance audits to ensure that the system is continuing satisfactorily. At the end of three years renewal audit is required to be done to continue the certification for further three years.

Reason for Certification, Benefits and Limitations

With a need to ensure consistent and standardized processes that will yield products or deliver services that meet or surpass customer needs ISO has developed standard with latest change from the number of available quality system models (ISO 9001,9002,9003)from three to only one (ISO

9001:2000) and the number of major requirements from 20 to only 4 namely:

- Management responsibility,
- Resource management,
- Product realization and
- Measurement, analysis and improvement.

Educational Institutions interested in implementing an ISO 9001:2000 compliant QMS would have to address issues like identification of the need for the programs and courses being offered, design the program to meet the stated and implied needs of the customers, adequate program delivery, maintenance and improvement. A significant difference from the older versions of the standard is reflected in the new requirement by joining all processes to PDCA cycle for quality improvement.

Reasons for Certification

The reasons for seeking certification from a certifying agency are numerous and vary from institution to institution but similar to companies they can be broadly classified as developmental ,non-developmental and mixed . Developmental reasons mainly include desire to improve the organization's internal processes and desire to enhance the overall competitive performance of the organization. Non developmental reasons and mixed reasons, which are a combination of the first two, are more oriented towards companies than educational Institutions.

Some of the general reasons include market acceptability: provide confidence to the profession. students and their parents, employers and various other stakeholders that the requirements for quality education and research are continuously met .

Benefits

Some of the significant benefits of ISO 9000 QMS for an educational Institution include:

- ISO 9001:2000 quality system documentation will guide activities of teaching, learning in a convenient, predictable and generally acceptable way.
- The documentation provides a guide for the faculty and staff to improve their understanding of the processes and also train newly hired staff.
- The QMS helps in identifying problems during quality audits (both internal and external). QMS also helps in correcting and preventing problems from recurring, thereby improving quality in a consistent manner.
- The quality system provides for a clearer articulation of the rights and responsibilities of students, faculty and supporting staff.
- An external and independent evaluation by the registration authority provides an outsider's point of view, which is often advantageous for quality improvement. Strengths and weaknesses are identified and potential for improvement uncovered.
- An adequately implemented ISO 9000 system will focus on the reduction of quality related problems. including student and research project failures and foster an environment of continuous improvement.
- A few more benefits, which are general in nature include - recognition, improvement in quality and productivity, greater standardization, fewer mistakes and less defective work, fewer customer complaints. more business and lesser operating costs

Limitations and difficulties

There are a number of limitations and difficulties in implementation of ISO 9000 QMS for the education process like -

- Fears of increased bureaucracy and paperwork.
- There are some misconceptions prevalent in the minds of the people about these standards, which can be a hindrance to its proper understanding. implementation and adoption like -
- It produces more documentation
- Lack of top management support and commitment.

- Lack of understanding of the ISO 9000 QMS.
- Inability of faculty members of understanding scope of ISO 9000 QMS and its relation with education process.

Conclusion

With an increasing concern about the quality of education being offered to the students, there is a need for a system of quality assurance in an educational Institution. The establishment of ISO 9000 compliant quality systems represents one such methodology. This paper presents an overview of the ISO 9000 standards and provides a glimpse into the latest version of ISO 9000 (ISO 9001:2000) and how it is more acceptable to education. A general methodology for implementing ISO 9000 QMS in an educational Institution is presented. The reasons for registration, benefits and limitation and the difficulties faced in getting the ISO 9000 certification have been discussed in detail, based on experience and the research literature available which can help Institutions going for ISO 9000 certification to tread a cautious path and understand the difficulties involved and the benefits they can get.

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