
QUALITY MANAGEMENT SYSTEM (QMS), AN ASSISTANCE FOR NBA ACCREDITATION AT UG ENGINEERING PROGRAMMES

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ABSTRACT

There is always felt a requirement of employable engineers by the corporate sector. There has to be some indicator for quality of a student passing from an Institute. Quality Management Systems (QMS) is a tool for implementing quality standards at an institute. The assessment of the quality for an educational institute is done by different certifying boards like National Board for Accreditation (NBA), Accreditation Board for Engineering and Technology (ABET) etc. In order to assure about the employability of a student passing out of the institute, accreditation is a vital tool. Because of this reason many institutes are opting for the accreditation for their different undergraduate programmes. It is a well known fact that institutions going for NBA accreditation need a lot of documents to be prepared and maintained as per the NBA accreditation requirements. QMS is a system for executing activities in an organisation as per the defined procedures. There are a lot of similarities between QMS and NBA. However NBA requirements are very specific in nature and are restricted to an educational institute while QMS requirements are generic in nature which can be implemented in an educational institute, Manufacturing unit even at a hospital as it is the process certification and not the product certification. Hence for meeting the specific requirements of NBA, the generic requirements of QMS can be fulfilled which will help and assist during NBA accreditation. The current paper discusses the similarities between the two and the assistance that can be taken by implementing the QMS before applying for the NBA accreditation.

Key Words: QMS, NBA, ISO 9001:2008

1. INTRODUCTION

Implementation of quality standards in an educational organisation is always a topic of research. With the introduction of foreign universities it will become more or less compulsory for the engineering institutes to provide the assurance of the high quality of their engineering programmes[12]. Many methods are proposed to

improve the teaching learning process which is an important indicator of the quality standard of the institute. Researchers have used some quality philosophy to let the student learn the problem solving ability and to carry out continuous improvement by analysing the data obtained and putting corrective actions[1]. The students were taught the methodology for determining the causes for a problem then finding the root cause and putting

corrective action to eliminate the root cause[1]. Kevin Scoles et. al. in his paper discussed the strategy followed and the changes incorporated in the formats and evaluation process of students for acquiring ABET accreditation at the Drexel university's college of Engineering[2]. It was seen that by following some well defined, established and accepted method for an activity will not only lead to achievement of the outcome of the programme but also it will help in continually improving the system. The main thrust of QMS is the continual improvement of the system. A few have tried internet as the tool for effective learning of the students[3] while some focus on the use of social networking websites like face book for effective teaching[8]. Most of the time the problem for effective learning of students is tackled by some feed back and control systems[4] while sometimes the students ability is assessed by some online test systems which helps the instructors to decide the strategy for teaching the subject[5]. In some situations the moral and ethical development of the students undergoing professional courses becomes very important which is required to be dealt with very carefully[6,7]. The NBA was constituted to assess qualitative competence of educational institutions from diploma level to post graduate level in engineering and technology, management and related disciplines. NBA conducts evaluation of programmes of technical education as per the laid down norms. The revised NBA accreditation method mainly aims at developing a fair teaching learning process wherein the students will get benefitted and in a broader sense the major stake holders will receive quality product. In addition to this the objectives of NBA are to promote quality conscious system of technical education, to carry out the self evaluation by the institutes providing technical education[9,10,13]. NBA evaluation is based on some predefined criteria which is to be followed by the institute. Institutes have to produce documentary evidence for the norms set in the NBA evaluation sheet[9,10,13]. The Quality Management System (QMS) is based on some set criteria as indicated in the international Standard (ISO 9001) document[11]. QMS mainly aims at writing the procedures for the activities carried at the institute and maintaining records in support of the defined

procedures. It will be a better option for the institutes to define the procedures as mentioned in the International Standard ISO 9001 in the light of the evaluation guidelines of the NBA. In this way the institutes can implement QMS, stabilize the system and then apply for NBA. Thus with implementation of QMS a lot of effort for compiling the records before the NBA committee visit can be saved.

2. QUALITY MANAGEMENT SYSTEM (QMS)

The major aim of the QMS is continual improvement of the defined goals of the organization through evaluations at set interval of time which are referred to as audits.

Quality Management System is based on PDCA (Plan-Do-Check-Act) cycle. In PDCA cycle, planning is first done (PLAN) for achieving specific objectives, next some strategy is made as per the plan, applied to make the product/service into reality (DO). Once the service is brought into reality its effectiveness is checked in the CHECK phase of the PDCA cycle. After checking for improvement, corrective and preventive actions are taken to improve continually (ACT).

Referring to Fig.1 under the Plan phase, the management commitment is taken. In the Do phase the resource allocation is made by the management. In the Check phase the Measurement, Analysis and Improvement is made while in the Act, phase actions are taken to carry out improvements.

As per the ISO 9001:2008 standard there are 8 points referred to as clauses which describe the requirements for obtaining QMS certification

1. Scope
2. Normative references
3. Terms and definitions
4. Quality Management System
5. Management Responsibility
6. Resource Management
7. Product Realization
8. Measurement, Analysis and Improvement

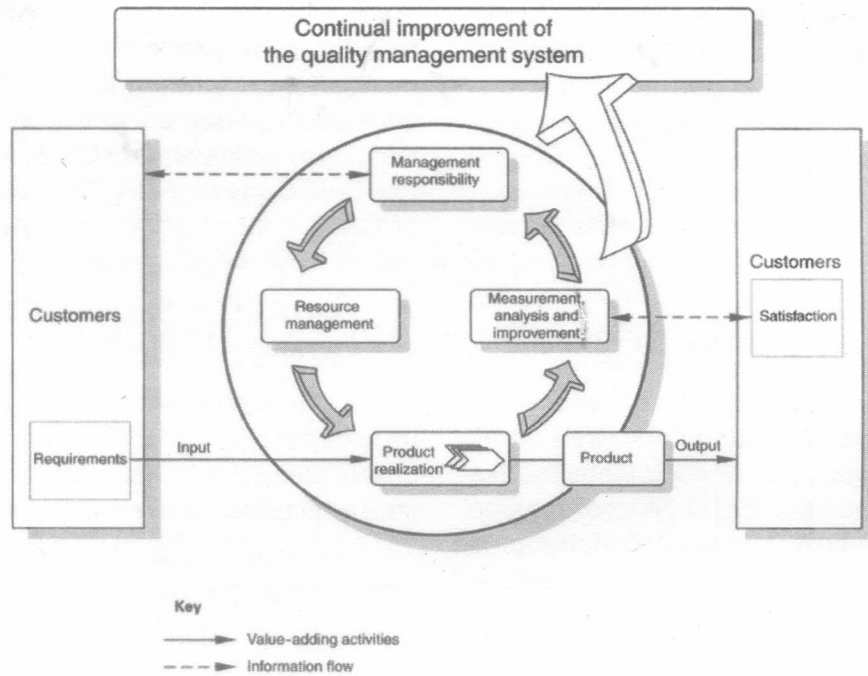


Fig.1 : The Quality Management System

Out of the above the first three clauses are related to description of the QMS system while the "Quality Management System" (clause 4) tells about the General and Documentation requirements for implementing QMS. The "Management Responsibility" is basically to explain the role of management for implementation of QMS in terms of their commitment, delegation of responsibilities, allocation of required resources to the organisation, taking review of the status of QMS implementation. The "Resource Management" section is about provision of resources for the

effective implementation of QMS the resources will be human resources, Infrastructure, good work environment. The "Product Realization" section is all about the realization of the actual system while the "Measurement Analysis and Improvement" section is about monitoring the implemented system so as to get a feel about its effectiveness and to consider the action for improvement of the implemented process.

3. THE NBA SYSTEM

Fig.2 shows the NBA accreditation process

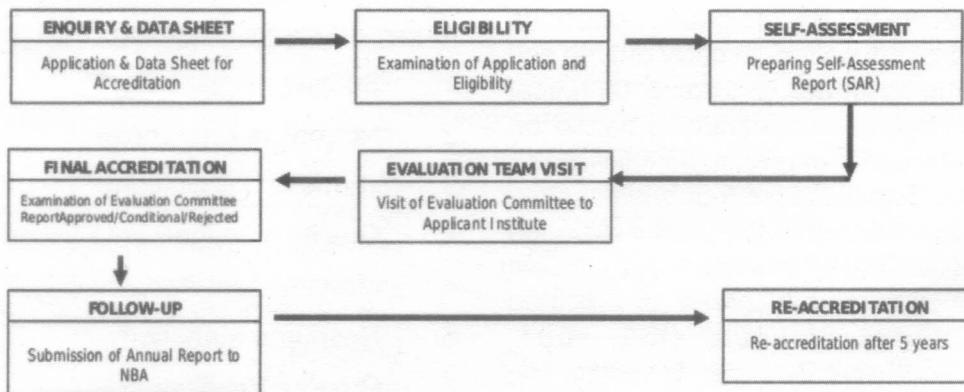


Fig.2 : NBA Accreditation Process Steps

The process starts with the eligibility of the institute. The institute should be eligible based on the following points

- (a) The Institution and its programmes should be AICTE approved.
- (b) The concerned institute should either be recognized by the state authorities e.g. UGC in the case of deemed universities)
- (c) Atleast two batches of the programme should have passed out
- (d) The institute has to pay the requisite fees.
- (e) There is no case or proceedings pending against the institute initiated by agencies such as CBI or the concerned State.

The broader objective of Self-Assessment is to provide the Institution an opportunity for a comprehensive review of its status and bringing in a better clarity of its day to day functioning. The self assessment report should be descriptive to allow an understanding of the Institution's situation and to facilitate the work of the review team. The Institution should avoid promoting itself in the report. Rather, it should be objective in its self assessment against the criteria or standards of the NBA accreditation. On-site visit will allow the Evaluation

Team to assess factors related to the accreditation criteria that may not be adequately described in the accreditation information, and to obtain further clarifications from the educational Institution. The findings of the Evaluation Team and Report of the Chairman of the Evaluation Team will be placed before the Accreditation Evaluation Committee (AEC). If any further clarification is required, the chairperson/evaluators will be called over phone or through video conference. Report of this inspection and the observations of Evaluation Team will then be considered by the EAC which will in turn forward its recommendations to the Executive Committee (AEC) of NBA. The Executive Committee of NBA will make a decision on accreditation status to be awarded by NBA. The Executive Committee of NBA can decide to award or refuse accreditation based on the evidence of whether all minimum standards have been met. After accreditation, the institutions are expected to submit their annual self-assessment report to eNBA online. If any aspect of the programme is found to be sufficiently unsatisfactory and/or does not comply with norms, the NBA reserves the right to revoke the accreditation. There are total 9 criterions on which the NBA team evaluates an institute.

Table 1 : Summary of QMS Clauses and NBA Criterion

Criterion/ point	QMS	NBA	Points
1	Scope	Vision Mission and Programme Educational Objectives	75
2	Normative References	Programme Outcomes	150
3	Terms and Definitions	Programme Curriculum	125
4	Quality Management System	Student's Performance in the Programme	100
5	Management Responsibility	Faculty Contributions	175
6	Resource Management	Facilities and Technical Support	125
7	Product Realization	Academic Support Units and Teaching-Learning Process	75
8	Measurement, Analysis and Improvement	Governance, Institutional Support and Financial Resources	75
9	--	Continuous Improvement	100
			1000

4. BENEFITS OF QMS IN RESPECT OF NBA ACCREDITATION

From the above table a comparative study between the QMS and NBA process can be done which reveals that if an organisation goes for QMS prior to going for NBA they will have all the systems, procedures, formats, records and evaluations of processes in place which will help in obtaining the required points in the NBA evaluation process. As mentioned in the earlier section the fourth clause of the QMS which is about the Quality Management System is about the control of documents, control of records, quality manual etc which is in summary a basis for defining how records are created and maintained in the organisation. All the criterion for the NBA assessment process require some field to be inspected, the basis for many filed is the documentary evidence for example in criterion 1

one of the field is the assessment of the achievements of the programme educational objectives. The assessment can be done only if some system for keeping and maintaining records is defined and followed which is facilitated by QMS process clause 4. Clause 5 of QMS describes the management responsibility in implementation of QMS which can be correlated with criterion 5 of the NBA evaluation process. As an example one of the fields of the NBA evaluation process is student-teacher ratio which depends on the commitment of the management so a committed management will surely proper student teacher ratio which means that if the management is committed to implement QMS, it can further be extended for implementing NBA. The table below depicts the correlation between different clauses of QMS and various criterions of NBA evaluation process.

Table 2 : Similarities between Clauses of QMS and NBA Criterion

QMS Clause No	Related NBA criterion	Related Sub Clause	Related Sub Criterion of NBA
4	1	Control of Documents, Control of records	Records as evidence for assessment
5	5	Management responsibility	student-teacher ratio
6	5	Competence training and awareness of human resources	Faculty Competencies Correlate to Programme Specific Criteria
7	2	Definition and Validation of Course Outcomes and Programme Outcomes	Design and development planning
8	9	Continual improvement	Continual improvement

5. JUSTIFYING EXAMPLE

The criterion 4 is about the student's performance in the programme. 4.1 is about the success index which is the ratio of No. of students who cleared the programme in the stipulated period of course duration to the No. of students admitted in the first year and students admitted in that batch via lateral entry. Fig. 3 explains clearly how QMS activities and their records can be used for a parameter of the NBA evaluation process. If we identify admission of

students as an activity and write a procedure for that, admitted students list can be a record of the procedure which is the denominator of the ratio. Similarly examination can be regarded as an activity and result analysis as a procedure then the passed students of a batch can be considered to be a record of that procedure which constitutes the numerator of the ratio. Thus with the help of the admission and result analysis formats students performance can be evaluated.

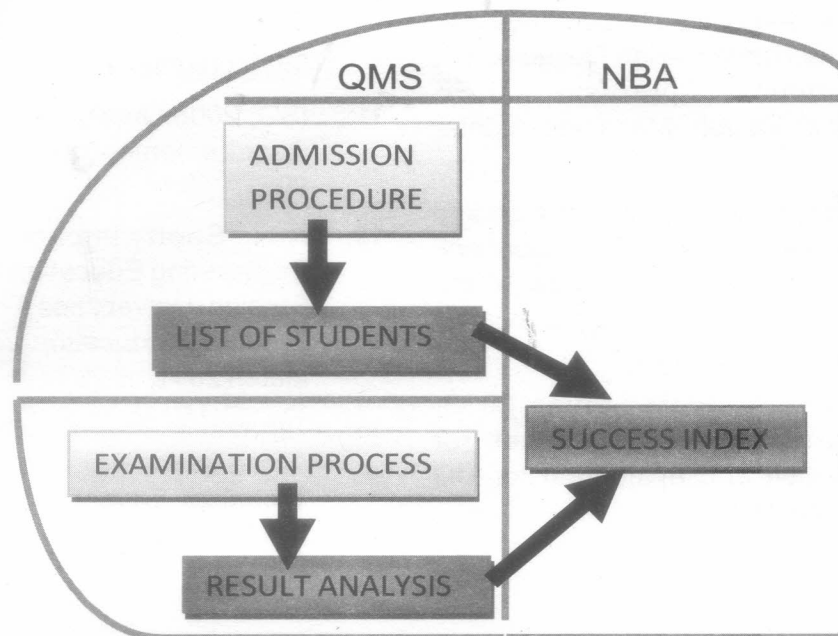


Fig.3 : Example depicting relationship between QMS and NBA

6. CONCLUSION

Based on the discussions it can be said that as the requirement of a QMS is only defined procedures for executing a specific task while NBA is more specific about its evaluation. The institutes can define the procedures in respect of the NBA evaluation points. This will not only lead to automatically maintaining the records as per the NBA evaluation guidelines but also help during the NBA evaluation process. Thus it can be concluded that a properly planned QMS implementation will lead to ease in facing the NBA evaluation process.

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