

**A MODEL FRAMEWORK FOR DEVELOPING INDUSTRY SPECIFIC QUALITY
STANDARD FOR EFFECTIVE QUALITY ASSURANCE IN
GLOBAL SUPPLY CHAINS IN THE NEW MILLENNIUM**

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ABSTRACT

The most important element of a quality assurance system is the quality standard, which is considered as the guideline for comparing the performance of a system for monitoring and control. The quality standard often involves a series of requirements set by customers, and stakeholders which must be met for their total satisfaction. Over decades, multitudes of companies belonging to various industries have developed numerous quality standards and quality systems requirements for their quality assurance activities until in early 1990s ISO -9000 series of standards was developed for harmonization of quality assurance activities in global supply chains. However, ISO-9000 was designed as a generic standard using prevention based total quality management approach and failed to address specific requirements of many industries, including automotive, aerospace, defense, chemical, and electronics. Consequently, within a few years from the emergence of ISO-9000 series of quality standards, QS-9000 series of quality systems requirements was introduced by US automaker, and from a Delphi survey of practicing quality auditors the author foresees that many other industry-specific standards are going to emerge in this new millennium. This paper attempts to provide an model framework for facilitating the process of developing an industry-specific quality standard for effective quality assurance in a global chains.

INTRODUCTION

A quality system requirement, commonly known as quality standard is an essential element of a quality assurance system. and forms the basis for comparison of the performance of an organization . Quality systems requirements are sets of requirements expected by the customers and stake holders of their suppliers. The earliest known such requirements were the ten commandments inscribed on rocks and delivered by Moses to his followers. However, for suppliers in construction, fabrication and manufacturing industries, design specifications and tolerances had been considered for decades as the quality requirements to be met by their customers. Even today many customers run inspection and quality control activities using conformance to design specifications and tolerances. During the second world war MIL or Military standards were developed by US and other country's Military using very tight design specifications and very precise tolerance requirements for inspection and quality control activities in the manufacturing and procurement of weapons and arsenals of the war.

In the past decades, numerous standards and quality systems requirements had been developed for suppliers quality assurance by individual companies, From Automobile assemblers, to Appliance manufacturers, all developed their own standard. For example, all three auto maker's developed their own individual standards such as *Chrysler's Supplier Quality Assurance standards*, *Ford's Q-101 Quality Systems Standards*, and *General Motor's NAO Target of Excellence standards* (15).

Moreover, in the past decade, globalization of the market and tough competition in the world market place have brought a tremendous thrust for achieving higher quality and productivity and a tremendous need for development of global quality standards for quality assurance in all kinds of global supply chains [13]. At the same time, many companies have been moving through early stages of quality and productivity management, using quality as narrowly defined design specifications, tolerances, and quality control function at lower level. and replacing with customer focused, prevention based approaches to total quality and productivity improvement [9].

Thus, in early 1990s, in order to bring harmony among all customers standards in world market places, representatives of the Institutes of Standards of various countries including U.S.A., Canada, U.K., France, Germany, Netherlands, and Switzerland , gathered together in Geneva, Switzerland, and created a new common international standard for all quality systems around the world, known as "ISO-9000 Series of Quality Standards"(8). ISO-9000 series of quality standard uses a prevention based approaches to total quality management covered by its twenty core element requirements (3).

Thus, in 1990s, ISO-9000 became the predominant quality standards implemented by many suppliers with the expectation of supplying multiple customers in world market place. However, ISO-9000 had been perceived by many customers as a generic standard with wide range of flexibility for applicability to all kinds of companies belonging to wide spectrum of industries.(3) Because of its wide flexibility, the big three automakers of the United States viz. G.M., Ford, and Chrysler, refused to accept ISO-9000 as their suppliers' quality audit standard, instead, they jointly developed a new set of more rigorous Quality Standards, known as QS-9000 which however, includes all twenty elements of ISO-9000 as the core requirements.(5)

Thus, QS-9000 was introduced in mid -1990s as the fundamental quality systems requirements by the big three auto makers, General Motors, Ford, and Chrysler, the Truck Manufacturers, and other subscribing companies for quality assurance in their global supply chains. They strictly applied QS-9000 to all internal and external suppliers of raw materials, components, sub-assemblies, and service parts in their global supply chains.(5) General Motor Corporation mandated that all of its suppliers be registered by a third party (independent) QS-9000 Quality Systems Registrar no later than December 31, 1997. For all new suppliers General Motors also started performing potential supplier audit starting January 1, 1995 based on Quality Systems Assessment (QSA) document. and by January 1, 1996 third party registration to the QS-9000 Quality Systems Requirements had also been required of all new

suppliers by General Motor.(4) Ford Motor Company also required all its suppliers to be registered to QS-9000 Quality Systems Requirements on or before December 31, 1996. However, Ford had not only extended this deadline on case by case basis, but also had announced that it would also perform second party audit, instead of third party audit, on exception basis.(4) Chrysler Corporation had also laid down a demanding schedule for QS-9000 implementation by its suppliers. All Chrysler's suppliers were asked to complete a self-assessment to QS-9000 by July 7, 1995, and all production and service part suppliers to Chrysler were asked to register to QS-9000 by a third party registrar by July 31, 1997. However, they also had been closely reviewing their suppliers and extending the deadline on case by case basis.(4).

The evolution of QS-9000 as Automotive industry's quality standard, has been a clear evidence of nonacceptance of ISO-9000 series of quality standard for meeting requirements of the US automotive industry. ISO-9000, had been designed more like a generic standard using prevention based total quality management approach to meet the needs for suppliers quality assurance in the fast growing era of globalization of business and industry. In reality, however, it has been perceived by many companies to be too generic to meet the specific needs of any specific industry. In a recent Delphi Survey of international Quality Auditors, a significant percent of the auditors agreed that ISO-9000 series of standards are too generic in nature and they preferred to have more industry-specific standard such as QS-9000 for Quality Audit of suppliers belonging to a specific industry(12).

No doubt, quality assurance practices in global supply chains has evolved significantly over the past decades, and has been taking a new direction in this new millennium. As compared to inspection and quality control, the current practices are becoming more quality system audit oriented registration of suppliers using ISO-9000 or QS-9000 series of quality standard(12), and the author believes that there exists a tremendous need for developing more industry-specific quality standards for quality assurance

activities of multitudes of companies doing business in world market place. The author presents a model framework for facilitating the development of such industry-specific standards in this new millennium.

A MODEL FOR A INDUSTRY-SPECIFIC QUALITY STANDARDS:

In Figure 1. author presents a graphical representation of the model framework for developing a industry-specific quality standard which includes three layers of quality systems requirements as follows:

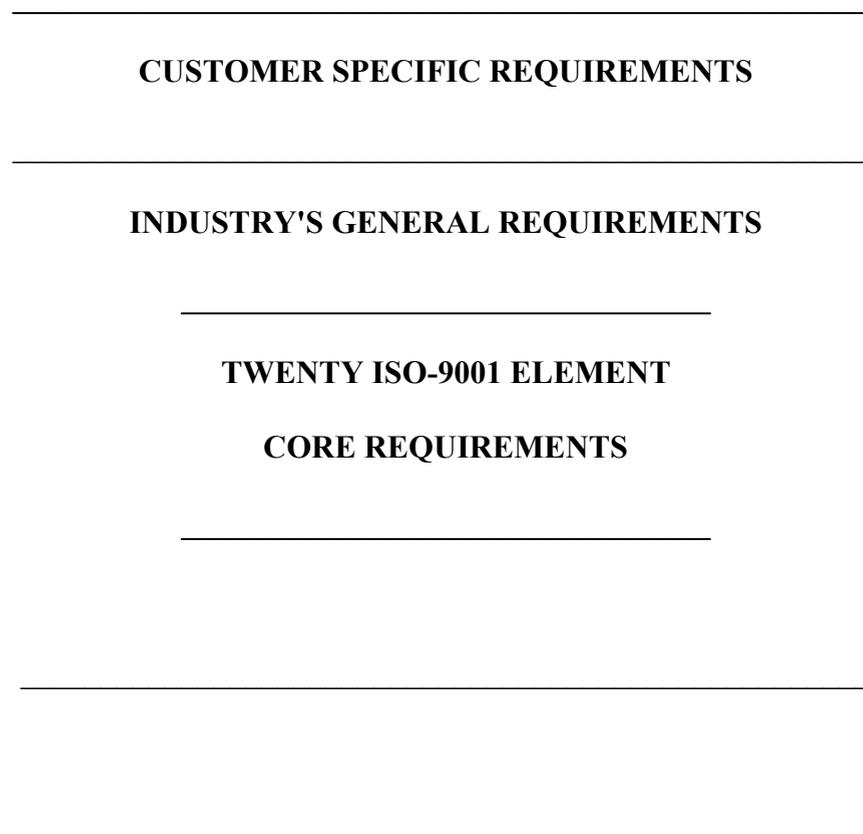


Figure 1. Graphical presentation of the model framework

1. Core requirements; which include twenty elements of ISO-9001 standard since they are the basic requirements for any customer focused, prevention oriented total quality management approach, and are considered by many quality auditors as the essential elements of any quality standards.

2. Industry-specific requirements: include elements particularly important for the industry, such as, Advanced quality planning (AQP), and Failure mode and effects analysis (FMEA,) for Automotive industry, and possibly for appliance and other manufacturing and fabrication and assembly type of industries.

3. Customer-specific requirements: include elements particularly important for the specific needs of a customer, such as various stamping of logo, and specific surface finish requirements on parts by individual customers.

The author strongly believes that this model will facilitate the development of suitable and effective quality standard to fit the needs of one or more customers belonging to a specific industry for their suppliers quality assurance in their global supply chains.

CONCLUSION

Although ISO-9000 series of quality standard provides a basis for prevention based total quality management approach to quality assurance, and has been accepted by many companies around the world in the past decade, it failed to address the specific requirements of any specific company or its industry. Consequently, companies such as auto assemblers of the United States, developed QS-9000 as their quality systems requirements for suppliers quality assurance and audit. Based upon his Delphi opinion survey of quality auditors, the author foresees that this trend of developing industry-specific quality standard is going to continue in this new millennium. The model for developing an industry-specific quality standard will no doubt, facilitate this process.

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