A New QMS Model for Sustainable Growth

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Abstract
Japan has studied a new QMS model that can help companies to enhance their competitive advantages and to achieve sustainable growth in today's dynamic business environment. After four years of study, we developed a pair of national standards,
- JIS/TR Q 0005 "Quality management system - Guidelines for sustainable growth", and
- JIS/TR Q 0006 "Quality management system - Guidelines for self-assessment".

The new QMS model presents advanced concepts that go beyond the conventional ones within ISO 9004, including:
- Sustainable growth based on learning and innovation,
- QMS design for implementing business strategies based on identification of the organizational capability profile,
- Dynamic QMS model (Three-layers QMS model),
- Enhancement of self-assessment,
- Enhancement of customer value creation (marketing, R&D and sales),
- Enhancement of understanding all stakeholders’ perception, and
- Adoption of the twelve quality management principles.

The documents were presented in ISO/TC 176/SC 2 and were recognized as one of the important source documents for the next revision of ISO 9004. The documents are now being revised to be upgraded to the Japanese Industrial Standards. The leader of the committee that developed the documents presents the new QMS model and the results of the applications, and facilitates discussions with the audience.

1. Introduction

In January 2003, a couple of new QMS (quality management system) Guidelines were published as JIS/TR (Japanese Industrial Standard / Technical Report);
- JIS/TR Q0005 Quality management system – Guidelines for sustainable growth, and
- JIS/TR Q0006 Quality management system – Guidelines for self-assessment

At the last stage of the revision of ISO 9000s:2000, Japan conducted a survey on the need for a new QMS model. The results made it clear that most companies are not interested in ISO 9004. The main reason was that it does not seem to help with their business. This was especially true among excellent companies. All such companies we surveyed answered that they had not adopted ISO 9004.

At the same time, however, the results of the survey indicated that the companies are not necessarily interested in these kinds of standards at all. Rather, they show strong interest in a QMS model that enables them to improve their competitiveness and to realize dynamic innovations in their management, and thus to survive in today’s volatile business environment.

What kind of model, then, can meet their needs and what is lacking in ISO 9004? In short, the current
ISO 9004 model lacks the point of view of improving business performance of an organization and achieving sustainable growth by reforming the organizational structure in tune with the changes in its business environment. It is clear that there is a strong needs for advanced concepts of QMS that goes beyond the conventional ones within ISO 9004, which merely follow the concepts of ISO 9001.

Based on this survey, we decided to challenge for development of a QMS model beyond ISO 9004:2000. After four years study, we published the two JIS/TRs. Table 1 shows the history of the project. Chapter 2 describes fundamental concepts of the new QMS model, JIS/TR Q 0005, and Chapter 3 describes the guidelines for self-assessment based on the QMS model, JIS/TR Q 0006. Chapter 4 discusses the validation of the QMS model, a questionnaire survey and pilot application study. Finally Chapter 5 stresses the importance and significance of plan and implementation of QMS seeking for competitive advantages.

<table>
<thead>
<tr>
<th>Year</th>
<th>Activity</th>
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| 1999 | Committee – established  
Survey – status of quality management and need for its standardization |
| 2000 | Survey and study – quality management methods, tools and techniques, and assessment of quality management system |
| 2001 | Study and draft – new QMS guidelines |
| 2002 | Publication – Draft JIS/TRs  
Validation – Questionnaire survey and pilot application study  
Workshop – TC176 Acapulco meeting |
| 2003 | Publication – A set of JIS/TR Q0005+0006  
Circulation – TC176/SC2 documents  
Workshop – TC176 Bucharest meeting  
“An important source document for the revision of ISO 9004:2000” |
| 2004 – 5 | Publication – Revised TRs or upgraded to JISs |

2. QMS Model for “Sustainable Growth”

2.1 Features

The key concept of the new QMS model, *JIS/TR Q0005 Quality management system – Guidelines for sustainable growth*, is “a guidelines for sustainable growth by responding to any changes in business environment and upgrading total performance effectively and efficiently.”

The QMS model focuses on “quality of the organization’s products and services.” The purpose of the QMS is to provide a good quality of products and services. In order to achieve this objective effectively and efficiently, it focuses on systems producing its products and services. Also it focuses on “value” of all the outputs of the organization including its products. This will result in upgrading the organization’s brand value and its financial results.

The new QMS model has the following features, and it stresses the significance of “autonomy” of an organization:

- Sustainable growth based on learning and innovation,
- QMS design for implementing business strategies based on identification of the organizational capability profile,
- Dynamic QMS model (Three layers QMS model),
- Enhancement of self-assessment,
- Enhancement of customer value creation (marketing, R&D and sales),
- Enhancement of understanding all stakeholders’ perception, and
- Adoption of the twelve quality management principles.
The QMS guidelines consist of 12 clauses as shown in Table 2. The structure is similar to that of ISO 9004:2000, except adding clauses of new concepts, clauses 4, 5, 11 and 12.

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<td>3.</td>
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<td>Annex</td>
<td>Example of definition of organizational capability profile</td>
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</tbody>
</table>

Table 2. Clauses of JIS/TR Q 0005

In the following sections, the fundamental concepts of the new QMS model are discussed.

2.2 Sustainable growth

The committee had a long and hot discussion on “what is a good organization?” Finally we concluded that a good organization has a “long life” that can show a sustainable growth responding to any changes in business environment and can innovate itself as needed to respond to changes.

The current version of ISO 9004:2000 is a model of QMS seeking for business performance focusing on continual improvement based on internal and customer feedback information. The new QMS model emphasizes the concept of sustainable growth in any business environment, and stress the importance of organizational capability of learning and innovation. To survive in any business environment for a long time, any organization must not be conservative. The organization must have a keen sense to external environment to learn a lot from it, and have a positive attitude to innovating itself as necessary.

The organization should be a “learning organization” in the following two meanings;
1) Learning ability of an organization – Abilities of an organization to collect information on, analyze and gain an insight from external events including business environment, and
2) Incorporation of personal competence to organizational competence – Fusion of value system of the organization with knowledge and thinking/behavioral patterns of its people.

Based on such learning ability, the organization should innovate its competitiveness and constitution, and also its QMS framework

2.3 QMS design for implementing business strategy

For what shall we plan and implement a QMS? In what sense can we say that a QMS is a good one? We believe a QMS can be said adequate if it makes it possible to implement business strategy effectively and efficiently. In general, management strategy can be considered in three layers, corporate strategy, business strategy and product strategy. A QMS should be designed and established to implement business strategy, which is a strategy to be prepared for a business domain. Along this line, the organization will analyze its business environment and understand what aspects of the organization should be strong to be successful in that business domain. Then it should identify the organizational capability profile (appropriate organizational profile), and essential QMS elements.
Based on the analysis, the organization should establish its QMS that supports the realization of the business strategy. (See Figure 1.)

**Figure 1. QMS for what?**

The most essential point in this way of QMS design is the identification of important QMS elements according to products features, business category, business situation and environment. In order to identify important QMS elements adequately, we have to identify the organizational capability profile giving due consideration on competitive advantage factors and business success factors in that business domain.

In order for an organization to implement its business strategies by providing customers with satisfaction, it is effective to utilize QMS as a tool designed to be the most appropriate for the organization. It is effective:

- to recognize its own positive and negative characteristics by analyzing its business environment, internal resources and capabilities,
- to identify the organizational capability profile,
- to prioritize each QMS element based on that identification, and
- to customize the most appropriate QMS for the organization.

The study will also help for adequate self-assessment, in planning the assessment items.

### 2.4 Three layers QMS model

ISO 9004, as well as ISO 9001, presents a QMS model that focuses on continual improvement of product realization processes and systems, and on customer satisfaction. For an organization to allocate business resources appropriately responding to the changing in business environment, to achieve business strategies and to secure a competitive edge in the market, a dynamic QMS model, based on its vision and business strategies, also becomes necessary. The new QMS model presents three-layer QMS model consisting of product realization, QMS operation and QMS innovation. Both the PDCA cycle and the input and output mechanisms within each level support the organization’s sustainable growth through management improvement and innovation.

**Figure 2** shows the dynamic QMS model presented in the new QMS model. In the three layers QMS Model, the organization identifies its proper picture from the viewpoints of competitive advantage factors, according to clause <6. Quality management system>. Then it establish its QMS being best fit to the organization based on its business strategy, identifying crucial areas of its QMS, according to clauses <5. Leaning and innovation>, <7. Management responsibility>, <8. Resource management>, <9. Product/service realization>, <10. Improvement of QMS> and <11. Understanding of perception among customers and other interested parties>. The organization plans and implements, and improves and innovates QMS continually in the three layers as follows:

- Continual improvement of products – Plan and implement <9. Product/service realization> and rotate PDCA cycle,
- Continual improvement of QMS – Analyze problems arising from <8. Resource management>, <9. Product/service realization>, <10.2 Internal audit>, <10.3 management review> and <11. Understanding of perception among customers and other interested parties>, and take appropriate actions, and
- Innovation of QMS – Determine need for innovation of QMS based on strategic management review based on results of QMS improvement, management review, <11. Understanding of perception among customers and other interested parties>, <12 Innovation of QMS>.

**Figure2. Dynamic QMS model(Three layers QMS model)**

The three layers QMS model emphasizes the importance of innovation. Wide variety of changes is likely to occur in business environment, to which the organization should respond appropriately. And, there may be some instances in which the QMS must be changed from its foundation. In order to find
a need for change, we have to rotate PDCA cycles, which can take many complicated directions and cycles. It is necessary to conduct assessment of all levels, which may lead us to an innovation of the current QMS.

2.5 Self-assessment

The new QMS model regards the self-assessment as an opportunity to study the QMS by the organization itself and determine the necessity of the QMS innovation. It provides opportunities for audit/assessment of the QMS in the following form:

- Internal audit – Systematic review the effectiveness and efficiency of the QMS as planned.
- Management review – Systematic review for continual improvement of the QMS, based on internal audits as necessary.
- Self-assessment – Comprehensive assessment made by the organization to obtain information on necessity for drastic changes of its QMS.
- Strategic management review – Systematic review for the need of innovation in business, product, organization, and QMS, based on internal audits, management reviews, and self-assessments, as necessary.

It is necessary for an organization to assess the appropriateness and the effectiveness of the QMS that is designed for the organization and which the organization operates according to its own objectives and the situations it faces. The model places the self-assessment in the key tool to determine the need for changes of its QMS.

2.6 Customer value processes

The new QMS model enhances customer value creation including marketing, R&D and sales. ISO 9001/9004 can be said QMS models for providing products whose customers (both specific customers in contractual situations and general customers in market type products) are determined. And, the current ISO 9001 and 9004 models do not cover the quality functions of marketing and R&D.

The primary mission of an organization is to keep creating and providing customer value. For that purpose, it is necessary for the organization to understand the needs and expectations of the customer and to link such understanding to the well-timed development of new products, services and business models. In order to achieve this, the organization needs to promote marketing to analyze and understand the market environment and customer needs and expectations, and R&D to accumulate technologies. It also needs to incorporate a sales management process based on marketing performance into QMS. The new QMS model includes “Marketing” and “R&D” in clause <9. Product/service realization>.

2.7 Understanding all stakeholders’ perception

The new QMS model enhances the better understanding of all stakeholders’ perception. Items regarding customer satisfaction, employee satisfaction, collaboration with partners, confidence of investors and shareholders, and impact on society are described comprehensively in the clause <11. Understanding of perception among customers and other interested parties>. Also, the organization’s mission as one of the member of the society is emphasized.

2.8 Twelve Quality Management Principles

The current version of ISO 9004:2000 is based on the eight quality management principles. These principles may not be sufficient to survive in unstable business environment, where an innovative process to change the organization’s constitution is needed. In order to cope with this, the new QMS model proposes twelve quality management principles as shown in Table 3.
Table 3. Twelve Quality Management Principles

- a) Creating customer value
- b) Focus on social value
- c) Visionary leadership
- d) Understanding core competence
- e) Involvement of people
- f) Collaboration with partners
- g) Total optimization
- h) Process approach
- i) Factual approach
- j) Organizational and personal learning
- k) Agility
- l) Autonomy

Also, a structured presentation of the twelve quality management principles is shown in Figure 3.

Figure 3. Twelve Quality Management Principles

3. Guidelines for Self-Assessment

3.1 Features

The key concept of the other document, JIS/TR Q0006 Quality management system – Guidelines for self-assessment, of the set of JIS/TRs is guidelines for self-assessment of a QMS, understanding the strengths and/or weaknesses from the viewpoints of competitive advantage and verifying the necessity for improvement and/or innovation of the current QMS.

A specific feature of the guidelines is in the organizational capability profile (appropriate organizational profile), where assessment items and criteria will be customized based on identified overall picture of appropriate organizational capability profile. The guidelines provide a maturity model of an organization’s QMS with five levels, where Level 2 is an ISO 9001 certification/registration level and Level 5 is a worldwide best practice level.

The guidelines for self-assessment consist of 12 clauses as shown in Table 4. Main body is clauses 6 – 12, where assessment guidelines are given according to the new QMS model. Clause 4 gives a framework of self-assessment, including determination of organizational capability profile. Annex gives examples of definition of organizational capability profile.

Table 4. Clauses of JIS/TR Q0006

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</table>
3.2 Customize the assessment criteria

Guidelines for self-assessment normally provide a set of assessment items and criteria. An organization will generally assess its QMS against all of the assessment items, and sum up the “scores” for those items to get total scores. However, the new self-assessment guide does not follow this way.

The new guidelines for self-assessment encourage organizations:
- to identify the organizational capability profile based on the understanding of important QMS elements from the viewpoints of competitive advantage factors or business success factors, and
- to customize self-assessment criteria, including assessment items, assessment metrics and weights, based on the identified organizational capability profile.

3.3 Maturity level

The new self-assessment guide uses concept of “maturity level of an organization’s QMS”, and make it a base for the assessment. Number of levels is five, as usual. Level 2 is an ISO 9001 certification/registration level and Level 5 is worldwide best practice level. Table 5 shows a general maturity model.

<table>
<thead>
<tr>
<th>Level</th>
<th>Plan/Implementation</th>
<th>Performance</th>
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<tbody>
<tr>
<td>1</td>
<td>Whether there are shortcomings in the plan and/or plan is not executed as planned.</td>
<td>Anticipated results are not produced. Ranks are low among competitors.</td>
</tr>
<tr>
<td>2</td>
<td>Procedures pertaining to requirements of ISO 9001 are established and implemented.</td>
<td>Anticipated results are generally produced. Ranks are in the middle among Competitors.</td>
</tr>
<tr>
<td>3</td>
<td>The organizational profile is clearly established, and effective plan, targeted to items for which action was identified as necessary, is planned and Implemented.</td>
<td>Anticipated results are produced. Ranks are in the middle among Competitors.</td>
</tr>
<tr>
<td>4</td>
<td>The organizational profile has been clearly established, and effective and efficient plan for the action items is planned, recognized as important, and implemented.</td>
<td>Anticipated results produced efficiently. Ranks high among competitors.</td>
</tr>
<tr>
<td>5</td>
<td>Innovative plan capable of adapting to environmental changes is planned, knowledge gained in the planning process is shared, knowledge is created, and reform implemented.</td>
<td>Anticipated results are produced efficiently regardless of management environment. Ranks are among the top excellence models compared to competitors.</td>
</tr>
</tbody>
</table>

3.4 Descriptions

The new self-assessment guide provides guidance on assessment for each process described in sub-clauses X.Y of the new QMS model, JIS/TR Q 0005. For each process, the guide provides:
- Viewpoints for assessment, and
- Examples of performance indicators.

4. Evaluation of the QMS guidelines

A set of new QMS model was evaluated through a questionnaire survey and trial application of the model.
4.1 Questionnaire survey

A questionnaire survey was conducted in October and November in 2002 for draft Technical Reports. The questionnaires are sent to 181 companies, which had replied to questionnaire survey conducted in 2000 on need for standardization of total quality management. We have received replies from 77 companies (response rate: 43%).

The questionnaire form is designed as shown in Table 6.

Table 6. Questionnaire From

[Question 1]
Relating to the basic concept that an organization that is able to realize “sustainable growth” is a “good organization”;
1) Do you understand the intention of this concept?
   A. I understand it very well.
   B. I understand it mostly.
   C. I don’t understand it so well. (Please mention portions where you can’t understand.)
   D. I can’t understand it at all. (Please mention the reason.)
2) Do you agree to this concept?

Questions on the followings are made:
- Sustainable growth
- Adapting to environmental changes based on learning
- Appropriate organizational profile
- QMS three layers model
- Addition of “Marketing” and “R&D”
- All interested parties
- Strategic management review
- ............

From the questionnaire survey we have got a lot of useful information including;
- The fundamental concepts behind the guidelines is understood and agreed for the most part,
- There are some difficulties with the concept of “learning”, “required organizational capability (appropriate organizational profile)” and “perception of all interested parties”,
- Top management supports the concept of “learning”, but not so well for staffs from QA/CS sections,
- In small and medium-sized companies, the concept of “appropriate organizational profile” is highly supported, and
- In non-manufacturing industry “QMS three layers model” and “strategic management review” are not accepted so much.

Also, questions on the followings are made for the self-assessment guidelines;
- Self-establishment of assessment standards
- Assessment of not summing up assessment scores
- Identify problems, strengths and weaknesses of the organization
- Two kinds of assessment indicators (Planning and execution / Performance)
- ............

Similarly, information we have on the self-assessment guidelines include;
- The intention of the guidelines is understood for the most part, but applying concepts and identifying problems seem to be a little bit difficult.
- In non-manufacturing industry people have difficulties in applying self-establishment of assessment items and criteria.
- In small and medium-sized companies, “Assessment without summing up assessment scores”
4.2 Trial applications

We conducted trial application of a set of JIS/TRs to get feedback from organizations that actually apply the QMS guidelines. In 2002, four organizations in the following applied the new QMS model:
- SONY Corp., Core Technology and Network Company,
- Sumiden High Precision Co., Ltd.,
- NTT DoCoMo Hokkaido, Inc., and
- Mito General Hospital

The steps of the trial application for the four organizations are as follows:
1) Clarify appropriate profile of the organization considering the followings,
   - Scope of QMS,
   - Organizational capabilities,
   - People in the organization, and
   - External environment,
2) Identify key areas of QMS,
3) Implement self-assessment utilizing “Guidelines for self-assessment”,
4) Grasp issues and identify strengths and weaknesses of the organization, and
5) Summarize what are difficult to understand and to be improved for the QMS guidelines.

Since 2003 two organizations have applied the new QMS model in full-scale and in depth. The company X focuses on the determination of the organizational capability profile, along with the steps;
- Products – understanding of “values” provided to its customers,
- Technology – understanding of technology (organization’s capability) needed to provide the products,
- Core technology – identification of crucial technology to be successful in business,
- Competitive advantage factors, business success factors, and
- QMS elements to be prioritized from the viewpoints of competitive advantages.

The company Y focuses on the self-assessment, including;
- Planning process for a self-assessment,
- Understanding problems, issues and opportunities for improvement and innovation, and
- Detailed action plans for improvement and innovation of organizations QMS constitutions

5. QMS for competitive advantage

We may design and implement our QMS without any clear objectives. At least the purpose of the QMS should be customer satisfaction. How shall we satisfy our customer? Of course we have to identify needs and expectation of our customers. In addition to this, in a severe business environment with cutthroat competition, we must be competitive in the business domain. Our QMS must be established to achieve competitive advantages.

The followings will be steps to establish quality management system that realizes a competitive advantage of an organization surviving in a business domain;
(1) Product, customer and value
   - What (product) is provided to whom (customer)?
   - What aspects of the product (values) does the customer buy?
(2) Technology needed
   - What technology (reproducible methodology, organization’s capability) is needed to provide the products.
(3) Competitive advantage factors, business success factors
   - Consider a business success scenario leveraging the organization’s characteristics
(organization’s strength and weakness).
- What are important out of technology identified in (2) from the viewpoints of competitive advantage factors or business success factors?

(4) Essential QMS elements, important activities
- What are essential QMS elements and important QMS activities from the viewpoints of competitive advantage factors identified in (3).

(5) Planning for self-assessment
- Plan a self-assessment based on (4).

(6) Implement self-assessment
- Understand problems, issues and opportunities for improvement and innovation.
- Study structure of the problems, issues and opportunity.

(7) Action program
- Action program for improvement and innovation of organization's QMS constitutions.
- Detailed action plans for improvement and innovation of the QMS.

There are many successful organizations. If you analyze those organizations you will find common features for those successful organizations. They have competitive products. Their products, values provided to customers, outputs of the organization, or source of profit is the best among the competitors. What is important is there are common characteristics with those organizations that possess competitive products.

First, they have a keen sense to customer needs and business environment. They provide products demanded by customers, listening to customers’ voice. They understand changes in business environment, knowing changes in social needs and values. Second, they have “core competence”. They know what should be their core competence and focus on maintaining such capability. Third, they have excellent people. They have a sound management system to make it possible for people to improve their ability.

Among these three aspects, the second one, competitive competence, is essential to be successful in business. Any organization should have a source of business profit, which is based on core capability that can be competitive advantage factors. Therefore, when we study our QMS, we should give due consideration on competitive advantage factors.

The success of an organization's management innovation in adapting to the rapid changes of its environment depends on the accumulated knowledge within the organization. Human resources and knowledge are the most important resources for business. It requires “autonomy” (the ability to determine its own criteria and values and to take actions based on its own judgment) of the organization. There are a lot of QMS models in the world. However, those models are general ones. Only yourself can establish your own model best fit to your own organization.

References
JIS/TR Q 0005 Quality management system – Guidelines for sustainable growth (in Japanese)
JIS/TR Q 0006 Quality management system – Guidelines for self-assessment (in Japanese)
ISO/TC176/SC2/N643 TR Q 0005 Quality management system – Guidelines for sustainable growth
ISO/TC176/SC2/N690 Revision to the Japanese TRs on Sustainable Growth (circulated as document SC2/N643) and Self-Assessment (SC2/N644)
Corporate strategy

Business strategy

Products/services strategy

Management strategy

Analyze business environment. Understand what should be strong.

Identify organizational capability profile. Identify important QMS elements.

Establish QMS supporting to the implementation of business strategy.
4.1 Sustainable growth
4.2 Developing a QMS to implement business strategy
4.3 Twelve quality management principles

Figure 2. Dynamic QMS model (Three layers QMS model)
Figure 3. Twelve Quality Management Principles