

THE HISTORICAL CHANGES OF JAPANESE QUALITY CONTROL AND TRENDS AND TASKS OF QUALITY ISSUES

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ABSTRACT

TQC (Total Quality Control), the features of Japanese QC (Japanese Quality Control;JQC), is forced to change now. There are many problems related to the QC field, such as magnification of quality objects, social quality, thoroughness of CS (Customer Satisfaction), enforcement of PL (Product Liability) law, applications of ISO (International Organization for Standardization) standards concerning the QA (Quality Assurance) system and the environmental management system, and still the more recent American industrial tendency which attaches importance to TQM (Total Quality Management) and so forth, On the 50th anniversary of JQC, I would like to look back upon its QC history and discuss the meaning of the recent changes in QC concepts and the theoretical framework of JQC.

1. Introduction

JQC at the beginning was taught by American QC, and since then, Japan has overcome economical and social difficulties both at home and abroad, and constructed a unique QC the so-called TQC. It is said that Japan has developed to become an economic super power because of TQC. In the 1990s, on account of internationalization, informatization, globalization, and environmental problems, TQC was forced to establish a new concept. I would like to discuss what JQC should be and recent QC problems, as well as the shift of TQC to TQM, etc.

2. JQC history

JSA (Japanese Standards Association) was established in 1945 and JUSE (Japanese Union of Science and Engineering) in 1950. Both are JQC promoting organs. At the same time, SQC (Statistical Quality Control) was introduced from America, and regular QC started.(Table 1)

2. 1 Introduction of QC (SQC)(1945~1955)

In 1946, the QC concepts and methods were introduced from America. And then, seminars of SQC were held by QC organs which contributed to the foundation's making. In 1950, Dr. Deming came to Japan to introduce SQC. For the memory of this event, the Deming Prize system was started in 1951, and this system has

Table 1 History of Japanese QC

Age	Features	Phenomenon Activities	Social & Industrial Tendency
1945~ 1949	Inspection age	Mass-production "Made in Japan" Product Out QC	1945 the end of the 2nd World war Established JSA 1946 Established JUSE 1949 JIS Mark Started
1950~ 1954	"	Select, by Inspection Introduction & Development of SQC	1950 Dr. Deming came to Japan 1951 Deming Prize started 1954 Dr. Juran came to Japan
1955~ 1959	Spread of QC	diffusion of SQC Attach importance to process QC Birth of TQC Concept Fixing of Compensation System	1958 1st National Conference of Standardization opened
1960~ 1969	Fixing & Developing of QC	Creation & Development of TQC Birth of QA concept Introduction of Target Control	1960 1st QC Month 1961 Creation of TQC concept by Feugen Bume 1962 Birth of QC circle 1967 1st National Conference of Q-S 1968 Consumer Protection Law started 1969 1st ICQC'69 Tokyo
1970~ 1979	Attach impor- tance to Design Quality	Consumer Oriented QC Birth of Reliability Concept Glovalization of TQC Environmental Polu- tion occured Consumer' problems occured Introduction of Mana- gement by policy	1971 Establishment of JSQC 1973 Opening of PL seminar 1976 East Asia International QC Conference (Seoul) 1979 Signing of 1st Gatt Tokyo Round
1980~ 1984	Attach impor- tance to QM Quality & Cost	TQC almighty age Internationalization of JIS QC in 3rd Industry QM Revolution by F. B. Crosby	1980 Openning JIS Mark System for foreign Countries 1981 IQC System Stared (MITI) 1983 IEC Conference Tokyo opened 1984 JIS seminar in USA opened
1985~ 1989	International- ization of QC QC of Customer Satisfaction	Counterattack of American TQM Attach importance to CS in America Social QC Internationalization & Informatization	1985 General Meeting of ISO Tokyo 1987 ICQC '87 Tokyo opened 1987 ISO QA Standard established 1988 MBNQA established 1989 FPI, USA received Deming Prize
1990~ 1997	International- ization of QC Renovation to TQM	Match, JIS with ISO International Stan- dard in Quality International Stand- ard in Environment Renovation of from TQC to TQM Attach importance to PL Preservation of Earth Environment Fixing of CS	1990 Study of ISO QA System 1991 Established JIS Z 9900s Stndards 1993 Established JAB 1994 PL Law proclaimed 1996 JAB Naming changed JUSE changed TQC to TQM Enactment of ISO 14000s & JIS Q 14000s

contributed to the progress of JQC. At the beginning, many enterprises adopted SQC, and obtained good results in the QC process and the reduction of faults.

2. 2 Base making of TQC (1955~1969) and Establishment of TQC (1970~1979)

In 1954, Dr. Juran came to Japan, and stressed that QC should contribute to the improvement of management, and established the base of TQC.

From 1955 to 1964, QC activities expanded to assembly industries. QCC (QC Circle) activity was advocated by Dr. Ishikawa, and it became the feature of later JQC and was looked at by the world. After the 1st grand meeting in 1963, it contributed to the mutual enlightenment of workers. The QCC expanded country - wide gradually. At the first stage, the JQC was aimed at the restraint of scattering in manufacturing to assure the quality of products. The time changed from the age when Japanese products were called "made in Japan" to an age when consumers selected quality products. The QC concept changed from "product out" to "market in" of consumer orientation. Thus, QC activity gradually changed from SQC at manufacturing spots to company-wide QC, and the foundation of TQC was established. To promote TQC systematically, many QC methods were enforced. QC enlightenment activities were promoted in various ways.

Thus, this period was an epoch-making age, because of the base making of JQC, and the establishment of TQC. JQC was looked at by the world.

In the 1970s, economical and violent social shocks occurred in the world. Similarly, in Japan, the environment for enterprises was severe. Japanese enterprises were confronted with such difficult tasks, as the enforcement of management constitution, restructuring, productivity, cost reduction, saving of resources and energy and so on. For the purpose of recovery from business depressions, QC methods and activities have been developed and applied. The features of QC in this age were the importance attached to QC in the development & design stage, development and application of new QC tools, and expansion of QC from manufacturing enterprises to other enterprises.

2. 3 Expansion of QC object and Internationalization (1980~1989)

TQC in this age was completed and fulfilled in its functions. Notable QC activities were TQC for business, sales, service, the software field, etc. and the expansion of QCC activities. On the other hand, the increase of export caused frictions of trading. This gives proof of the high quality of Japanese products. Consequently, people from many countries visited Japan for the purpose of inspection and study of JQC. Thus, JQC and QCC gradually permeated the world through the internationalization of QC.

2. 4 Socialization and internationalization of QC-renovation of TQM (1990~)

Entering the 1990s, the environment of enterprises has been influenced greatly by social and international matters. Various problems of international QC have brought JQC to a turning point. For the new age what JQC/JTQC should have is quality renovation.

3. Recent QC tendency in foreign countries

3.1 Introduction of JQC activity

As mentioned above, JQC is admired by foreign countries. From the point of view that JQC events and the Deming Prize System contributed to the diffusion and promotion of JQC greatly, America decided that October is QC month. There are all kinds of QC events, and efforts to promote QC.

3.2 Establishment of the QC prize system in foreign countries

In America, after the model of the Deming prize, Malcom Baldrige National Quality Award (MBNQA) system was enforced in 1988, to promote QC and to improve quality.

The object of this prize is to commend enterprises which obtain good results. Another object is to promote QC by announcing successful practices. Other countries, for example, the EC and Korea have also adopted this system.

3.3 American enterprises learn the JTQC system

American enterprises, in the 1980s, lost their competitive force, because of the hollowing out of industry, undervaluation of manufacturing, the attitude of profit first, etc. Then, they studied Japanese competitive force, and reserched them sufficiently. They studied TQC thoroughly, and gained results gradually.

The attitude to study JQC and productivity is connected to the joint efforts of governments and industries to recover manufacturing power and bring about the restoration of industries and competitive force.

4. Reconstruction of the quality concepts and the renovation in JQC

JQC has been influenced by recent changes in the management environment, JQC should be obliged to shift the paradigm. Recent revolutionary waves of the industrial society has brought various problems and changes of concept to Quality and JTQC.

Recent changes in management included social quality, harmony with the environment, security for consumers, etc. Accordingly, certifications of Quality systems by ISO 9000s, environmental management systems by ISO 14000s and enforcement of the PL law are examples of new QC concepts and tendencies.

5. Transfer from TQC to TQM

5.1 Background of Transformation to TQM

It is said that TQC was the cause of high quality Japanese products, and diffusion to the world market. Nowadays the age of TQC, including QA concepts, has changed to the age of TQM as a management activity. Concepts and activities of QC and QA as mere activities to keep quality and to insure reliability are developing into concepts connected to management. In succession to America, a new quality

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paradigm, which is CS - oriented management and the transformation of TQC to TQM, was born. When we observe American success in TQM and the recovery of their industry, we feel the necessity of activation of TQC keenly. We feel that in the long TQC history, it fell into mannerism or uniform activities by the workers in charge of QC. In order to promote the expansion of TQC, it is necessary to restart as means which contribute to management activities dealing with environmental change. JSQC (Japanese Society for Quality Control) and JUSE changed the name of TQC to TQM in 1996. Originally, because of the view that TQC was a management activity by nature, TQC was also named TQM for a time. JUSE stated that usual TQC adhered to the application of management resources, while TQM expand object to reconstruction and renovation, making a part of support management policy with the cooperation of the top management and workers in charge of QC. TQC is one method of management, and on the contrary, TQM is management itself. Under the condition that there are many management problems such as restructuring, BPR

(Business Process Reengineering) and CE (Concurrent Engineering). TQM responds to ISO 9000s and PL law. Thus, TQM is going to break down the mannerism of TQC. (Figure 1)

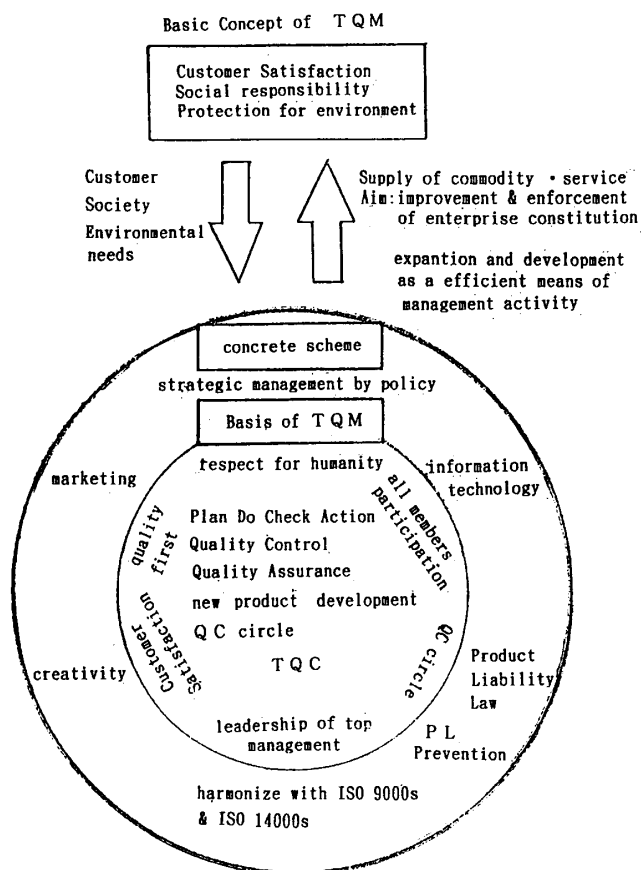


Figure 1 TQM aims at the 21st Century – to TQM from TQC
quote from 「TQM aims at the 21st Century」
JUSE QC MAY 1996

5. 2 Causes for change to TQM

- (1)TQC activity was called TQM in foreign countries.
- (2)Real function of QC activity corresponds to the name of TQM.
- (3)This was a chance to break down mannerism of TQC.

5. 3 Fundamental ideas and policy of TQM

Base : TQC activity-humanity, Quality first, CS, leadership of top manager, QCC, etc.
Aim : improvement of enterprises constitution as a method of management activity
Plan ; to contact with management policy and make powerful tools for management

- (1)Planning of management strategy, establishment of tools
- (2)Fusion with marketing for new product development
- (3)Positive application for IT (Information Technology) to elevate quality of information
- (4)bringing up creative talented people based on respect for humanity
- (5)Countermeasure corresponding to global standard, Fusion with ISO 9000s & 14000s

6 . New method of American management renovation

In the 1990s, the reason for the remarkable rebirth of American enterprises is that they recognized that CS (Customer Satisfaction) -oriented management policy keeping quality is the foundation competitive force.

They adopted the TQM method which was advocated by "Made in America" . They researched JTQC completely. Clear differences were found in understanding the meaning of quality and its development. B.T.Gail, who is the author of "Managing Customer Value" , proposes that we should recognize the progress of quality concepts as a powerful arm in management strategy. He analyzes the following four stages. He recognizes Stages 1~3 as the aspects of TQM. He insists that if enterprise is to cope with quality elevation from now, they should aim of Stage 3 at least, and that the final object of enterprise is to get to Stage 4.

Stage 1 : Conformance Quality Stage 2 : Customer Satisfaction Stage 3 : Market - Perceived Quality and Value Relative to Competitors Stage 4 : Quality as a key to Customer Value Management. (Figure 2)

He states that this activity should be promoted with tie - ups of all stake holders under leadership in order to elevate the quality of products, service, and enterprise activities from the stand point of the customer and market.

It is said that the criteria of MBNQA, which is the standard of management quality, contributed to the basic idea of TQM. That is to say, the criteria of MBNQA is the criteria systematized from TQM diagnosis and evaluation of the results.

TQM, to which the importance of "Market - Perceived Quality" is attached highly, took a new concept into management strategy, and was promoted as a powerful method of management renovation to gain remarkable results. (Figure 3)

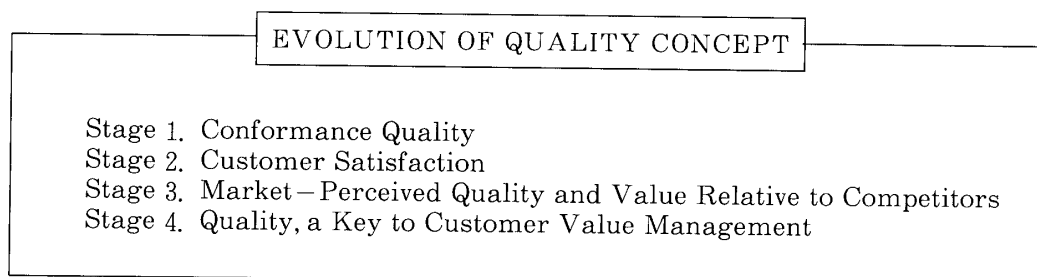


Figure 2 Evolution of Quality Concept 「Managing Customer Value」 By B. T. Gail
quote from Morinobu Mikata 「TQM」 Nikkei Business Nikkei BP 1997

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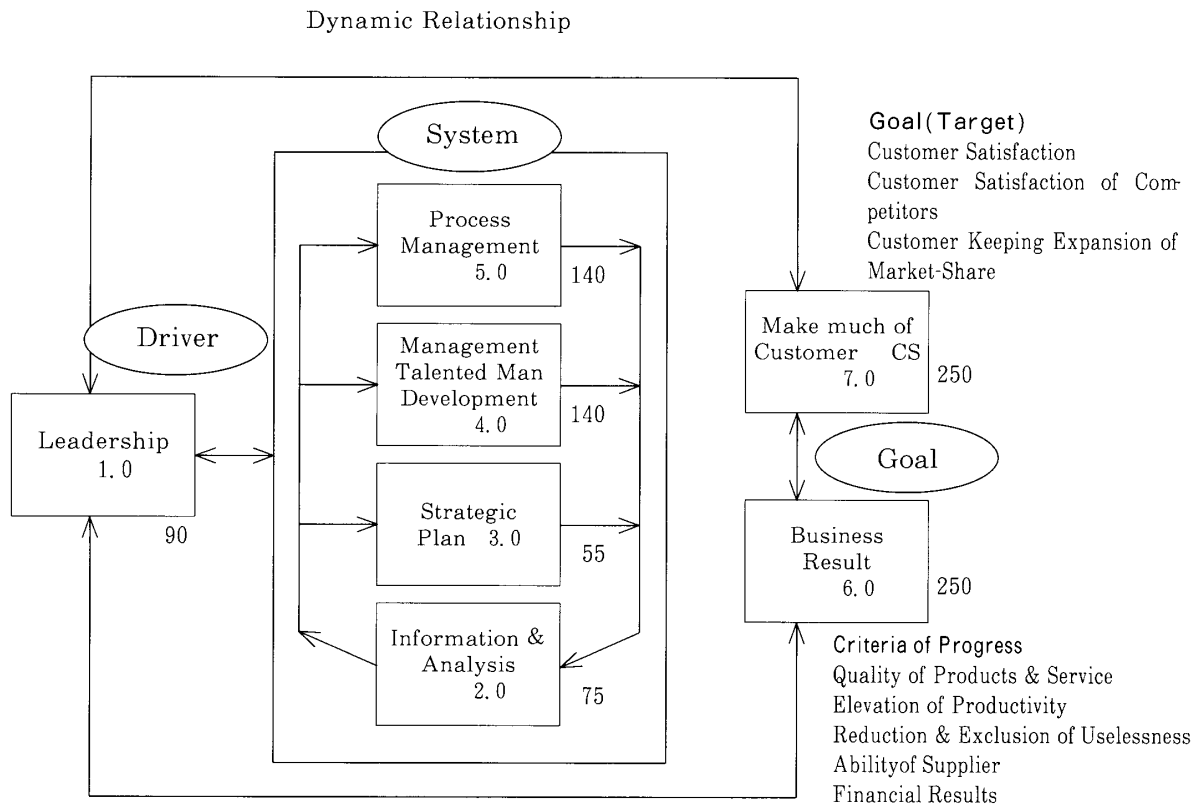


Figure 3 Framework of Criteria of MB National Quality Award
quote from Tomohiro Takanashi 「Revolution for QM」 Toyo Keizai Sinpo 1996

7. Impetus of JQC concept shift

7. 1 Change of the quality estimation scheme and shift of the QC paradigm

CS activity couldn't obtain the expected effects nor good business results in Japan. The reason was that in spite of the motto of "customer first", CS activity continued working formally with the mentality of product-out QC. Japanese CS must get rid of such fixed and superficial actions and Japanese enterprises must develop management activities that bear customer's real requests in mind.

The features of the activities are ;

- ①All members of the enterprise conduct all business bearing CS in mind fully.
- ②Through the life cycle of goods, CS is maintained to raise "Life Time Value"
- ③Endeavor on the view point that all activities in the enterprise are related to CS.
- ④Promote CS activity on a priority basis which contributes to business results.

That is to say, bases of QC are put on the completion of CS which acts in the spirit of Market-In. And QM of real customers first should be done.

7. 2 ISO Quality system certification

Among many recent themes about QC, from the view point of global standardization, the concepts of JQC are forced to shift thoroughly. Japan is influenced by this international quality certification system. ISO 9000s are demanded by the customer from the supplier. Accordingly, as these requirements

are used for certification system and adopted as a condition for commercial transaction, they have increased as in importance.

Many enterprises have acquired certification of this international quality system. The direct reasons are favorable dealings of foreign trade, but the other reasons are reconstruction and consolidation of existing QC systems.

This certification system is utilized to deal with international tendencies of QA and as a means to rationalize the trade of products of high quality. Existing TQC is self-controlled QC/QA on the supplier side-position, and on the contrary, this quality system is certified by purchasers' assessments on public quality systems. Accordingly, this quality system can be said to be contracting QC on the purchaser-side position. That is to say, JQC is characterized by supplier-oriented

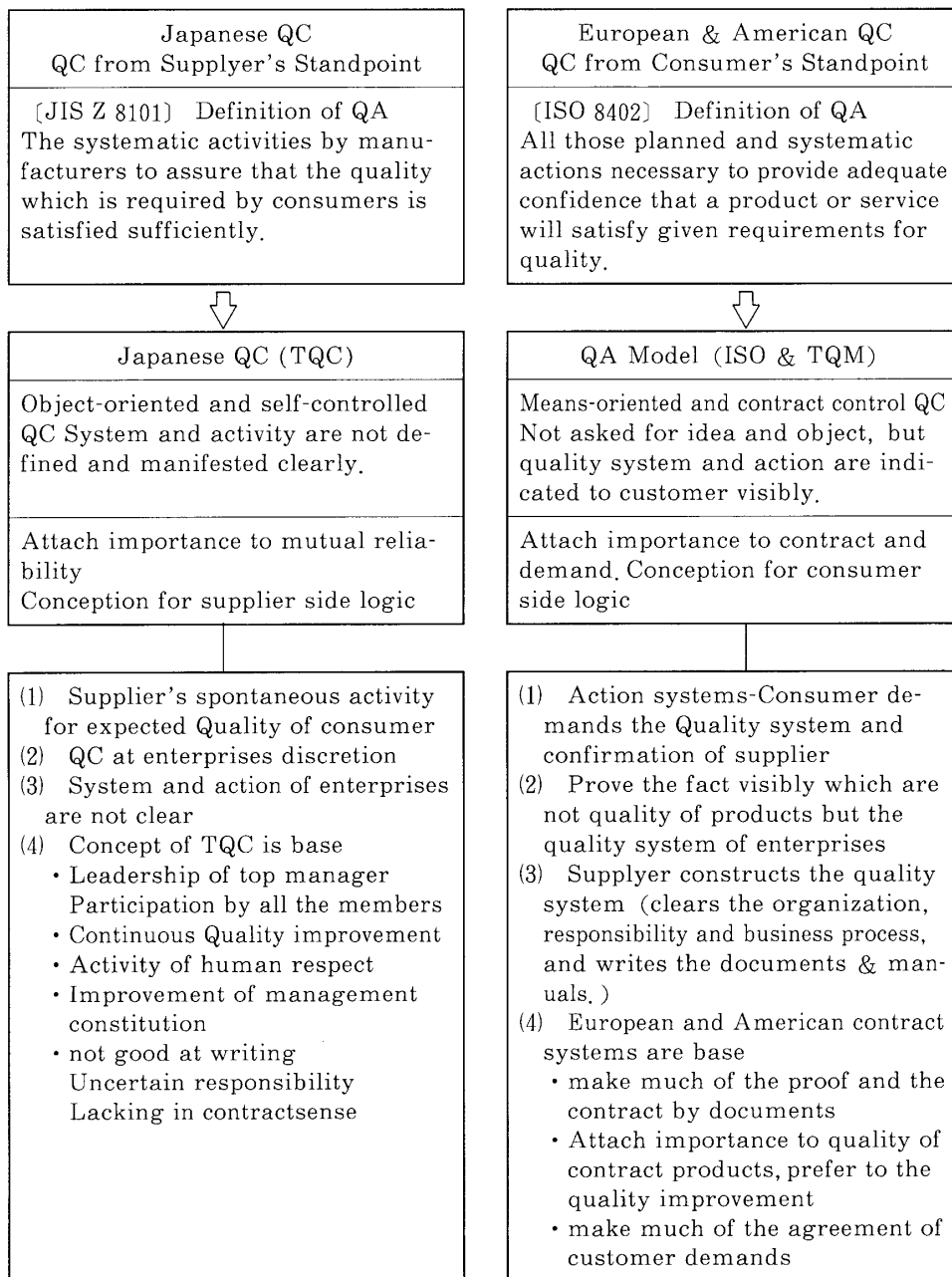


Figure 4 Differences between JQC and European & American QC

type, but ISO 9000s are featured by consumer-oriented types.

In the age of global standardization, Japan is asked to deal with this international quality system actively, and to change the concept of Japanese QC which is represented by TQC.

In this opportunity, it is also important to inspect and improve QC/QA systems completely with linkage of the certification system of ISO 9000s. (Figure 4)

7. 3 Enforcement of PL law

In Japan, PL law was enforced in July 1995.

In order to prevent PL problems of product defect, QA including security should be done thoroughly. It is said that the way of thinking and system of usual QA are not enough. In order to supply safe products to customers, enterprises should review their guarantees and obligations to enlarge scope, and the improvement of the QC system. Especially, renovational change and the review of QA concept leads to "activity-demonstrated QA" from usual "TQC-oriented QA".

It is important to grapple with PL problems as a part of TQM which advanced from TQC. For PL prevention, it is needful to establish a management policy for safe products and at the same time, to reconstruct QA system and QA program rearrangement. And still more, it is necessary to make efforts to establish a safe product design, and to practice a synthetic PL control, namely, documents and information control for QA, establishment of safe product design engineering, and rearrangement of safety programs.

7. 4 Reengineering (BPR) activity and new QC concept

BPR aims at thorough review and renovation for business, and the fundamental idea which constructs this basis is management renovation from the viewpoint of customer-orientation. We can find that BPR starts from customer-oriented QA.

Among Q, C, D which are three elements for customers, in Japanese management renovation, manufacturing efficiency is preferred according to enterprises' logic, and C (cost) and D (delivery) are dealt with preferentially, while renovation by Q (quality) is put aside. It is not too much to say that BPR begins from the renovation of enterprises' climate and organization, in other words, BPR is not simply a tool for rationalization, but a means of development for enter-

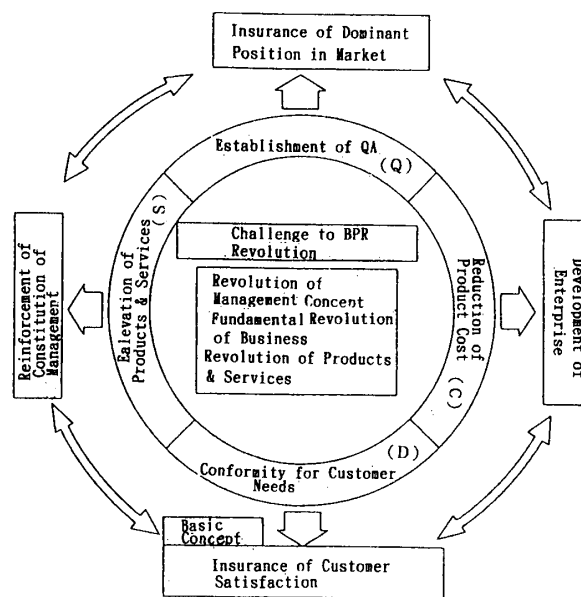


Figure 5 Final Object of Reengineering Renovation

prises' quality management with CS.

Here, it is said that the conventional thinking to quality from enterprise-side logic should innovate from customer-side logic on the base of CS. (Figure 5)

8. Conclusion

The concepts and activities based on past JQC, are needed to change and to reform points of view and activities. QM and thinking about quality should be based on the basic ideology of TQM and the activity which is concerned deeply in management. The enterprise should have the fundamental thinking of customer - first for CS. It is important to grapple with the new concepts of the quality based on new enterprise ethics, social consciousness and a world - wise view. The following conditions are needful for a "Respectable enterprise".(Figure 6)

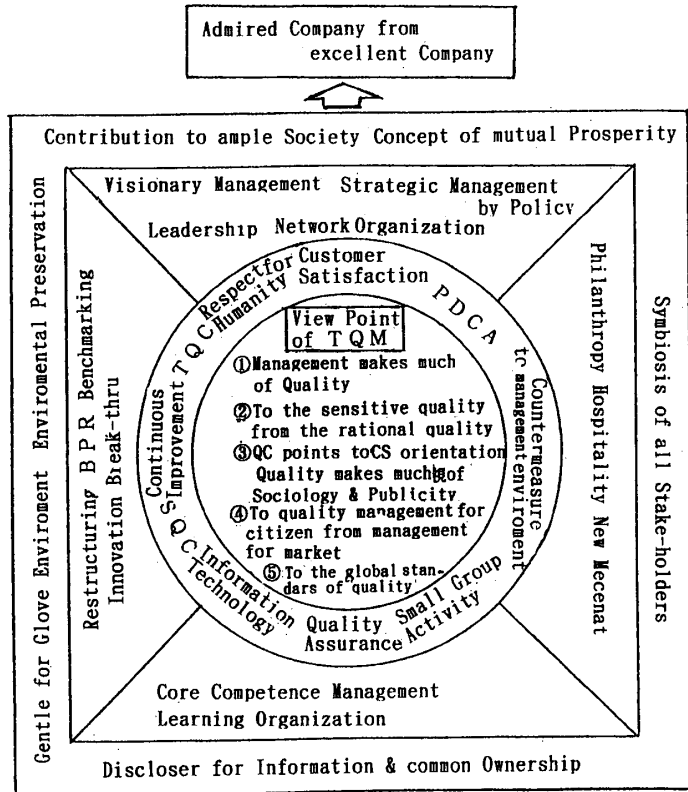


Figure 6 Framework of New Quality Management

- ①Enterprise activities attached importance to "quality" and tender for the stake- holder, society and the earth,
- ②To the sensitive quality from the rational quality
- ③To the activity of customer- side logic from that of supplier side Logic
- ④To quality management for citizen from management attached importance to market
- ⑤To the global standards of quality from the Japanese standards of quality

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