COMPARATIVE STUDY OF THE NATIONAL PROMOTION
ACTIVITIES OF TOTAL QUALITY MANAGEMENT IN
THE U.S.A., JAPAN AND MEXICO.

by

ANTONIO RAFAEL FLORES LUNA

I.Q., Universidad Nacional Autónoma de México
1974
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1990

Submitted to the Alfred P. Sloan School of Management
and the School of Engineering
in Partial Fulfillment of the Requirements for the Degree of

MASTER OF SCIENCE IN
THE MANAGEMENT OF TECHNOLOGY

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 1990

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Director, Management of Technology Program.

JUL 16 1990
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ABSTRACT

This comparative study was carried out to understand the
essential elements of a successful national promotion program
of the TQM management paradigm. Emphasis was on all external
activities off limits of individual firms such as those
conducted by non- and pro-profit quality promoting
organizations.

Research methodology was based on a bibliographic survey,
collection of profiles, statistics, and interviews.

The comparative analysis of the promotion activities uses
the Shiba’s model, consisting of four essential elements of
the industry-wide diffusion of TQM: Knowledge Dissemination,
Societal Learning, Standardization and Certification, and
National Promotion.

Conclusions drawn from the comparative analysis show that
all three countries have started a strong TQM national
promotion project only after the perception of an economic
crisis reached their leader sectors.

Japan's current superior performance in this field can be
explained by its very early application to such a project with
the eventual consolidation of two non-profit, company
membership associations, which complementary and
cooperatively, horizontally and vertically, have led the
activities of all segments of industry, involving both firms
and government.

Both the U.S. and Mexico, with different timing, intensity
and speed, show a trend to develop such associations,
abandoning the old organizational model with individual
membership and professional orientation.

Each country shows a different level of progress in the
development of activities in each element of Shiba's model.
Japan is by large the most advanced country.

Until recently, knowledge dissemination had been the only
element strongly addressed by the U.S. and Mexico.

Thesis Supervisor: Dr. Thomas H. Lee,

Philip Sporn Professor of Energy Processing.

Thesis Reader: Stephen C. Graves,

Leaders for Manufacturing Professor
ACKNOWLEDGEMENTS

The author is particularly indebted to the following people and Institutions:

In the U.S.:
To my thesis supervisor Prof. Thomas H. Lee; my thesis reader; Prof. Stephen C. Graves, my thesis reader; Mr. Dr. Peter Gil, and Mrs. Jennifer Mapes, Former Director and Coordinator of the MANAGEMENT OF TECHNOLOGY PROGRAM, at MIT, for their permanent kindness and helpful disposition.
To THE AMERICAN SOCIETY FOR QUALITY CONTROL, (ASQC); THE MALCOLM BALDRIDGE NATIONAL QUALITY AWARD CONSORTIUM, INC.; THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, (NIST); Mr. Bruce L.R. Smith of THE BROOKINGS INSTITUTION; THE JURAN INSTITUTE, INC.; and THE AMERICAN PRODUCTIVITY AND QUALITY CENTER (APQC) for their generous information.
My special gratitude to Mr. and Mrs. Masahiko Nemoto for their friendship and help.

In Japan:
To Dr. Shoji Shiba of TSUKUBA UNIVERSITY; the members of the QC CIRCLE ASSOCIATION, IBARAGI PREFECTURE; Dr. Jun'ji Noguchi of the JAPANESE UNION OF SCIENTISTS AND ENGINEERS, (JUSE); Mr. Masanobu Kawamura of the JAPANESE STANDARDS ASSOCIATION, (JSA); Mr. Raymond Wan Sui Lun of the ASIAN PRODUCTIVITY ORGANIZATION, (APO), and to Mr. and Mrs. Yasuo Kunimatsu for their generous help and hospitality.

In México:
To my company VITRO SOCIEDAD ANONIMA, MEXICO, generous sponsor of my study at MIT, through the "Roberto G. Sada Scholarship"; to Mr. Ernesto Martens, President and CEO, Mr. Federico Sada, Vice-Chairman; and Mr. Carlos Segovia, and Ramón Ramos, Directors, for their kind support.
To Mr. Carlos De Mucha and his staff at VIDRIERA QUERETARO S.A.; Mr. Ricardo Pro, Mr. David Rodríguez and Mr. José Manuel Morín, my scholarship coordinators at VITRO RELACIONES HUMANAS Y PLANEACION; Mr. Santiago Colunga and Mr. Manuel Suárez of VITRO ENVASES; Miss. Beatriz Martínez Saucedo of VITROTEC, all kindly supportive. To my brother Mr. José Luis Flores Luna, for his advise and invaluable help in the preparation of my interviews. To Mr. Antonio Maza and all his staff at INFOTEC; Mr. Duncan Thurnell-Read consultant of RESOURCE, UK.; ; Mr. Joaquín Peón and Mr. Teodoro González of FUNDAMECA, A.C.; Mrs. Keiko Toda de Miyamoto of CELANESE MEXICANA S.A.; MR. Luis H. Carmona of CORPSYN S.A.; Mr. Francisco González P., Mrs. Vilma García de González and Mr. Agapito González H. of IMECCA, A.C.; Mr. Augusto Pozo Pino of the QUALITY CENTER of the ITESM, A.C.. CAMPUS MONTERREY, Mrs. Raúl Cárdenas, Jesús Madinaveitia and David Hernández of THE QUALITY CENTER at ITESM. CAMPUS QUERETARO; Mrs. Rosa García and Mrs. Josefina López of CANACINTRA, DELEGACION QUERETARO; ; Mr. Rodrigo Plancarte of ALFA CORPORATIVO S.A. de C.V.; Mr. Guillermo Flores Luna at Querétaro City for their generous help.
TO MY COMPANY: VITRO S.A.
MY GENEROUS SPONSOR.

TO MY WIFE KEIKO.
MY TOP QUALITY COMPANION.
FOR HER RELIABLE AND CONSISTENT SUPPORT.

TO KAORI AND AKEMI, OUR CHILDREN.
WHO SHARED WITH US THIS EXTRAORDINARY EXPERIENCE.

TO MY PARENTS JULIO AND GUADALUPE.

TO MY PARENTS IN LAW MR. AND MRS. MIYAMOTO.
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1. INTRODUCTION

1.1. SCOPE.

This thesis is a cross-country comparative study of the organized efforts of the U.S., Japan and Mexico for the promotion of Total Quality Management (TQM) in their industries.

To understand the essential elements of a successful National Quality Promotion Project, this work intends to study the actors, their organization, their relations and the scenarios in which they have evolved in these three countries.

1.2. METHODOLOGY.

Research was conducted through a survey of primary and secondary sources of information, such as papers, articles, laws, profiles, interviews, and books published in each country.

1.3. STRUCTURE.

The main body is formed by an Introduction, a Comparative Analysis, and Conclusions (Chapters I, II, and III), written in a way such that the busy reader may benefit from the findings and suggestions offered by the author without reading the Appendices.

Appendices I, II, and III offer a detailed description of the leading national institutions in the promotion of TQM in the three countries studied.
Appendix IV offers the most relevant interviews conducted by the author in Japan and Mexico, and are intended to present the viewpoints of important personalities in the field of quality promotion.

Appendix V is a chronological table of the evolution of Quality Control and Standardization in each country, and its relation with relevant economic events.

1.4. JUSTIFICATION.

Globalization means not only increasing international competition, but also the possibility of learning across borders from other countries' organizations and their successful management approaches.

The evolution of international competition is giving Quality a new strategic dimension. Quality is nowadays not only an essential ingredient of corporate's competitive advantage, but a very important component of national policy to solve an urgent need to improve economic performance.

Examples are the national level campaigns for the promotion of quality that several countries have just recently set forth. Such are the establishment of the Malcolm Baldrige National Quality Award and the Quality Month in the U.S., the IIASA-Shiba Prize in Hungary, and the National Quality Prize in Mexico, to mention only a few.
1.5. DEFINITION OF TOTAL QUALITY MANAGEMENT.

Author's Definition of TQM:

A management system that integrates quality improvement to the nature, activities and goals of all elements of an organization, deploys it across all its value chain and structure, and directs it to the satisfaction of the organization's mission in society.

Objectives:

In order to assess the relative value of each organization's performance, the mission of a TQM national promotion organization may be described as aimed to the following objectives:

Culture.

Development of an inter- and intra-organizational culture for quality improvement.

Management.

Promotion of policy dissemination and cross-functional management. Emphasis on the clarification of top management policy for all functions and levels. Promotion of management quality audits to render management and control systems workable.

Knowledge Dissemination.

Dissemination of knowledge throughout all companies' structure. Education and training in quality control to all

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Imai, Kanechire. 1989: 42.
levels, from top management to line workers. Promotion of learning by social activities and the exchange of valuable experiences. Best practice and successful case dissemination.

Quality Assurance.
Promotion of quality assurance activities throughout all their member companies function structure, [from research, to planning, marketing, product development, engineering design, procurement, production, inspection, sales, and servicing].

Technology.
Development and promotion of the active use of technology for quality improvement, [knowledge, tools, and methods]. Development of technical and organizational capabilities to solve important problems. Utilization of statistical principles and tools in all measurable problems. Establishment of a dynamic process of standardization to support quality improvement within its member organizations.

Mobilization.
Promotion of the mobilization of all hierarchical levels within an organization toward quality improvement. Promotion of group activities for this purpose.

Improvement.
Promotion of a never ending thrust toward improvement of quality in all its aspects. Promotion of the constant application of improvement cycle methodology (such as the
Plan-Do-Check-Act cycle) as a necessary tool to approach problem solving in a systematic way.

Expansion.

Country- and industry-wide promotion activities of Total Quality Management. Promotion of the TQM concept as a group-wide activity beyond the physical bounds of individual companies. Expansion of total quality improvement activities from the manufacturing industry to other industries and business in the three sectors of the economy.

Evolution.

Promotion of a positive attitude towards change to respond to new external challenges. Always heading beyond present needs to satisfy the future requirements of the sectors of society to which organizations are committed. Consider public welfare as a priority.

Note:

Total Quality Management (TQM) will be referred also as Total Quality Control (TQC) \(^1\) to respect Japanese usage.

\(^1\) This term was first proposed by Dr. Armand Feigenbaum in his book with the same name (Feigenbaum, Armand. 1961) Later, the term was adopted by the Japanese and used indistinctly with their concept of "Company-Wide Quality Control" to refer to their characteristic Quality Management System. In the U.S., control has a bad connotation, therefore it is referred as "Total Quality Management".

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11.6. MODEL FOR THE COMPARATIVE ANALYSIS.

For the comparative analysis, the author will use the model of diffusion developed by Dr. Shoji Shiba:

![Diagram of the model of the diffusion of industry-wide total quality management.]

FIGURE 1.1. MODEL OF THE DIFFUSION OF INDUSTRY-WIDE TOTAL QUALITY MANAGEMENT

Shiba's model\(^1\) proposes four essential components of any successful Industry-Wide Quality Promotion:

1. **Knowledge Dissemination** related with quality improvement.

2. **Societal Learning Process** enhanced both by frequent social contact, information exchange and joint work among the elements involved in quality promotion, through which the new managerial paradigm is assimilated into the organization's culture.

3. **Promotion of Quality at a National Level.** Encompassing both corporate and governmental activities directed to stimulate national awareness of the importance of quality.

4. **Standardization and Certification of Quality.** Both at an industrial and company levels.

2. ANALYSIS

2.1. HISTORIC EVOLUTION OF QUALITY MANAGEMENT.


TABLE 2.1.

<table>
<thead>
<tr>
<th>U.S. EVOLUTION OF QUALITY MANAGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1600- 1800</td>
</tr>
<tr>
<td>Craftsman ship.</td>
</tr>
<tr>
<td>Reliance on skill and reputation of craftsmen.</td>
</tr>
<tr>
<td>Work Ethos: &quot;Be skillful&quot;</td>
</tr>
<tr>
<td>Division of labor.</td>
</tr>
<tr>
<td>Control of Quality through self-inspection and master's inspection.</td>
</tr>
<tr>
<td>Small scale production.</td>
</tr>
<tr>
<td>Fit for use and beauty concepts of quality.</td>
</tr>
<tr>
<td>Strict enforcement of quality within the guild.</td>
</tr>
<tr>
<td>Mandated specifications for materials supplied.</td>
</tr>
<tr>
<td>Audits of guild members performance.</td>
</tr>
<tr>
<td>1800- 1850</td>
</tr>
<tr>
<td>Dominance of the English System.</td>
</tr>
<tr>
<td>Work Ethos: &quot;Perfection&quot;.</td>
</tr>
<tr>
<td>Dominance of Machines over hand crafting.</td>
</tr>
<tr>
<td>Emphasis on accuracy. Tolerance Concept emerges Written specifications.</td>
</tr>
<tr>
<td>Measuring devices and instruments: e.g. Micrometer.</td>
</tr>
<tr>
<td>De-skilling of work. Break-up of guilds.</td>
</tr>
<tr>
<td>Standardization of products.</td>
</tr>
<tr>
<td>Focus on product functionality.</td>
</tr>
<tr>
<td>Emergence of the engineering profession.</td>
</tr>
<tr>
<td>Mechanical Ethos.</td>
</tr>
<tr>
<td>1850-1900</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Work Ethos: &quot;Satisfy requirements&quot;</td>
</tr>
<tr>
<td>Emphasis on manufacturing. Economies of scale.</td>
</tr>
<tr>
<td>Staff/Line separation.</td>
</tr>
<tr>
<td>Single purpose machines.</td>
</tr>
<tr>
<td>Further de-skilling and division of labor.</td>
</tr>
<tr>
<td>Tight supervision of work.</td>
</tr>
<tr>
<td>Product and work must have repeatability and conformance.</td>
</tr>
<tr>
<td>Parts Interchangeability.</td>
</tr>
<tr>
<td>Control instrument: Go/No-go gauges. Stop watch.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1900-1930</th>
<th>Taylor System.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work emphasis: &quot;Reproduce design&quot;</td>
<td></td>
</tr>
<tr>
<td>Separation of planning from execution.</td>
<td></td>
</tr>
<tr>
<td>Functional specialization.</td>
<td></td>
</tr>
<tr>
<td>Emphasis on productivity and process conformance.</td>
<td></td>
</tr>
<tr>
<td>Process focus: Repeatability.</td>
<td></td>
</tr>
<tr>
<td>Mass Production. e.g. Ford Model &quot;T&quot;</td>
<td></td>
</tr>
<tr>
<td>Analysis of work: Time and motion procedures.</td>
<td></td>
</tr>
<tr>
<td>Determination of efficient/&quot;average&quot; procedures</td>
<td></td>
</tr>
<tr>
<td>Central inspection departments are created.</td>
<td></td>
</tr>
<tr>
<td>Inspectors get all responsibility for quality</td>
<td></td>
</tr>
<tr>
<td>Control instrument: Go/No-go gauges.</td>
<td></td>
</tr>
<tr>
<td>Imposition of Standards for operation and output. Crippling blow to craftsmanship.</td>
<td></td>
</tr>
<tr>
<td>Loose supervision of work. Tight supervision of contingencies.</td>
<td></td>
</tr>
<tr>
<td>Priority given to quality declines significantly.</td>
<td></td>
</tr>
<tr>
<td>Responsibility concentrated on the Quality Department.</td>
<td></td>
</tr>
<tr>
<td>Quality Assurance departments, Quality Engineering, Reliability Engineering.</td>
<td></td>
</tr>
<tr>
<td>National standardization: American Engineering Standards Committee (AESC).</td>
<td></td>
</tr>
<tr>
<td>Industrial Engineering emerges.</td>
<td></td>
</tr>
<tr>
<td>1930-1985</td>
<td>Statistical Quality Control (SPC).</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Work Ethos: &quot;Monitor quality&quot;</td>
<td></td>
</tr>
<tr>
<td>Quality progress based on military improvement</td>
<td></td>
</tr>
<tr>
<td>Emphasis on process standards and stability.</td>
<td></td>
</tr>
<tr>
<td>Process Capability is first priority.</td>
<td></td>
</tr>
<tr>
<td>Training on SPC and statistical techniques to quality specialists.</td>
<td></td>
</tr>
<tr>
<td>Emphasis on diagnostic skills to solve errors.</td>
<td></td>
</tr>
<tr>
<td>Emergence of the Quality Professionalism.</td>
<td></td>
</tr>
<tr>
<td>ASQC is founded.</td>
<td></td>
</tr>
<tr>
<td>Instruments of Control: Process Charts and Inspection Tables (e.g:MIL-STD and AQL concept)</td>
<td></td>
</tr>
<tr>
<td>Emergence of problem solving teams.</td>
<td></td>
</tr>
<tr>
<td>Zero defects advocacy.</td>
<td></td>
</tr>
<tr>
<td>Loose supervision of contingencies.</td>
<td></td>
</tr>
<tr>
<td>Dr. Joseph Juran's pioneering advocacy for management leadership in quality.</td>
<td></td>
</tr>
<tr>
<td>Dr. Armand Feigenbaum sets forth TQC concept.</td>
<td></td>
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</tbody>
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<table>
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<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Work Ethos: &quot;Improve quality&quot;</td>
<td></td>
</tr>
<tr>
<td>NBC TV broadcast: &quot;If Japan Can, Why Can't We?&quot; triggers &quot;The Quality Revolution&quot;.</td>
<td></td>
</tr>
<tr>
<td>Strong influence of Japanese CWQC</td>
<td></td>
</tr>
<tr>
<td>Renaissance of quality as a major priority.</td>
<td></td>
</tr>
<tr>
<td>Management begins to take leadership.</td>
<td></td>
</tr>
<tr>
<td>Advocacy for education of work force.</td>
<td></td>
</tr>
<tr>
<td>Training in management for quality for non-quality specialists. Small group activities.</td>
<td></td>
</tr>
<tr>
<td>The Quality concept extends from product and process to working life, life standards, organization, service, environment, energy, education, information and society.</td>
<td></td>
</tr>
<tr>
<td>Self-inspection and control practices.</td>
<td></td>
</tr>
<tr>
<td>Cross-functional management is stressed.</td>
<td></td>
</tr>
<tr>
<td>Vendor-vendee cooperation is approached.</td>
<td></td>
</tr>
<tr>
<td>Quality from design gains priority.</td>
<td></td>
</tr>
<tr>
<td>Inter-company cooperation is re-discovered.</td>
<td></td>
</tr>
<tr>
<td>A national promotion campaign for quality improvement starts: MB National Quality Award.</td>
<td></td>
</tr>
<tr>
<td>Best in class competitive benchmarking.</td>
<td></td>
</tr>
</tbody>
</table>

Sources: Cusumano, Michael. 1990.  
Smith, Bruce L. 1990: 1-44.
2.1.2. Japan's Evolution.

Japanese evolution of TQM is characterized by a very fast assimilation of Western technology, through an extensive dissemination of a systematically organized set of tools.

<table>
<thead>
<tr>
<th>TIME PERIOD</th>
<th>KEY EVENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920-1945</td>
<td>First Standardization Efforts.</td>
</tr>
<tr>
<td>1946-1955</td>
<td>Statistical Quality Control. Quality Control Education for Engineers.</td>
</tr>
<tr>
<td>1960-1964</td>
<td><strong>Quality Control Education for Foremen.</strong></td>
</tr>
<tr>
<td>-----------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Participation of foremen and workers of the production departments in quality control activities.</td>
</tr>
<tr>
<td></td>
<td>Dr. Kaoru Ishikawa helps to establish the 1st. QC Circle activities for foremen and production workers.</td>
</tr>
<tr>
<td></td>
<td>JUSE magazine &quot;Gemba to QC&quot; : Channel for knowledge and experience dissemination of problem solving activities in QC Circles.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1965-1969</th>
<th><strong>Emergence of Company-Wide Quality Control (CWQC) or &quot;Japanese TQC&quot;.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Extraordinary growth of QC Circle activities. The QC Circle Association is established. Shift from departmentalism to a company-wide approach.</td>
</tr>
<tr>
<td></td>
<td>National promotion: FQC Prize for best case of QC Circle problem solving activities.</td>
</tr>
<tr>
<td></td>
<td>Societal learning: Conferences, seminars and observation trips for all levels. Quality and Standardization grow together. Self-steering (JK) and zero defects team activities start.</td>
</tr>
<tr>
<td></td>
<td>Reliability courses. Market-In concept applied to quality. Quality costing.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1970-1974</th>
<th><strong>CWQC spreads to Subcontractors and Small and Medium Industries.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Age of the quality of product. The Quality Function Deployment system is developed.</td>
</tr>
<tr>
<td></td>
<td>QC Circle activities become systematized. Spread of social activities for the promotion of quality: national and regional conferences.</td>
</tr>
<tr>
<td></td>
<td>Quality principle: Satisfaction of apparent requirements. Quality Assessment. Just in Time system is developed.</td>
</tr>
<tr>
<td>Year</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1975-1979</td>
<td>CWQC Spreads to Non-Manufacturing Industries.</td>
</tr>
<tr>
<td></td>
<td>Introduction of CWQC Activities to the construction industry and the banking</td>
</tr>
<tr>
<td></td>
<td>Introduction of Quality Engineering.</td>
</tr>
<tr>
<td></td>
<td>Development of the New 7 Tools for Management.</td>
</tr>
<tr>
<td></td>
<td>Quality Engineering: Taguchi Method.</td>
</tr>
<tr>
<td></td>
<td>Marketing-Design-Production Quality Plan: QFD.</td>
</tr>
<tr>
<td></td>
<td>Quality in the research and design stages.</td>
</tr>
<tr>
<td></td>
<td>FMEA and FTA analysis.</td>
</tr>
<tr>
<td></td>
<td>Emphasis on the satisfaction of customer's latent requirements.</td>
</tr>
<tr>
<td></td>
<td>Product liability: Parts per million defective policy.</td>
</tr>
<tr>
<td></td>
<td>Quality principle: &quot;Next process is customer&quot;</td>
</tr>
<tr>
<td></td>
<td>CWQC Spreads to Service Industries.</td>
</tr>
<tr>
<td></td>
<td>NBC TV program triggers TQC boom.</td>
</tr>
<tr>
<td></td>
<td>CWQC is introduced to utility industries.</td>
</tr>
<tr>
<td></td>
<td>Quality control for software industry.</td>
</tr>
<tr>
<td></td>
<td>Internationalization of TQC.</td>
</tr>
<tr>
<td></td>
<td>CWQC goes to Japanese multinational companies' overseas plants.</td>
</tr>
<tr>
<td></td>
<td>The Asian Productivity Organization promotes TQC in the Asian countries.</td>
</tr>
<tr>
<td></td>
<td>JUSE and JSA start training foreign managers and technicians, mostly Asiatic.</td>
</tr>
<tr>
<td></td>
<td>JIS Mark System to Japanese overseas plants.</td>
</tr>
<tr>
<td></td>
<td>Sensory Inspection is developed.</td>
</tr>
<tr>
<td></td>
<td>Policy deployment and cross-functional management.</td>
</tr>
<tr>
<td></td>
<td>Quality in innovation and basic research.</td>
</tr>
<tr>
<td></td>
<td>Shift from top-bottom to bottom-up decision making.</td>
</tr>
<tr>
<td></td>
<td>Emergence of United Quality Control: Customer in the process. Software and Service industry. TQC in automation, robotics, and information. NHK TV broadcasts on TQC.</td>
</tr>
</tbody>
</table>
2.1.3. Mexico's Evolution.

Mexico's evolution of quality management was long characterized by a passive assimilation of U.S. technology for quality all over the stable economic growth age that spanned from the 1930's to the mid 1970's. During this period, the main sources of knowledge and technology were American subsidiaries in Mexico and U.S. university graduate Mexican students. This situation lasted until the economic crisis (inaugurated by the first peso devaluation in 1976, through the international debt crisis in 1982, and government's decision to enter GATT in 1986). Only then, Mexican industry and government perceived the need to change their approach to quality. Before the crisis, domestic market was big, protected, and permissive enough to discourage any serious effort for quality improvement. The need to overcome the increasingly negative current account and balance of payments, and the threat of losing domestic market share to the newly coming imported goods, forced country's leaders to change direction. Accordingly, during the late 1980's, an increasingly vigorous activity for quality promotion was observed. Yet very young, TQM movement lacks form and national character. Also, an increasing interest for the Japanese model has grown, influenced by the U.S.
<table>
<thead>
<tr>
<th>Year</th>
<th>Quality Management Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900-1940</td>
<td>Quality Control based on Inspection. Influence of U.S. and European systems through scholars and foreign companies' headquarters.</td>
</tr>
<tr>
<td>1950-1980</td>
<td>The Mexican National Association of Statistics and Quality Control (ANMECC) is established and becomes ASQC (U.S.) Mexican chapter.</td>
</tr>
<tr>
<td>1973-1980</td>
<td>IMECCA the Mexican Institute of QC is founded. Quality congresses each year. Training for quality specialists starts. The first attempts to establish QC Circle activities fail due to the lack of top-management interest and systematic approach. The National Council for Science and Technology (CONACYT) is founded. First Mexican trainees on quality in Japan.</td>
</tr>
<tr>
<td>1987-1990</td>
<td>Rapid increment of TQM activities. National Quality Prize. Several quality promotion associations are formed. FUNDAMECA, CAINTRA-CPM, CANACINTRA. Many companies start their TQM campaigns.</td>
</tr>
</tbody>
</table>
2.1.4. Remarks:

The U.S.:

Although the U.S. have been for a long time the source of many innovations and breakthroughs in the field of industrial quality technology, the isolation of this function in the quality profession and in the firms' Quality Control departments, prevented until the 1980's, a proper dissemination of the TQM paradigm born in the U.S. and developed extensively in Japan.

The lack of interest in quality improvement was caused by the exclusion of quality from top management's priorities. This myopic approach was nurtured by a business environment focused on fast and substantive profits, short term investment policies, and a stable and fast economic growth.

Until the 1980's, the only activities for quality conducted at a national level were congresses, conferences, seminars and courses for quality professionals. Most quality improvements were originated in the defense industry.

Non-defense industry laid behind.

Standardization in the U.S. is a very fragmented activity. At least 65 organizations are active in this field. Consequently there is no clear leadership.

1 JSA. 1989b: 102-175.
Japan:

Japan shows a very fast assimilation of Western technological developments in the quality field as in many other. As Dr. Noguchi of JUSE observes, this country shows a 5 years cycle of leaps in the evolution of quality management. Not only keeping abreast of all international improvements, but assimilating them through a revolutionary process of dissemination. However, Japan has also made contributions to Quality Management since the 1960's, both in the social and in the technical fields.

Social contributions are:

The **Company Wide Quality Control** system. The horizontal and vertical expansion of the quality across companies walls, hierarchical structure, functional divisions, and industrial sectors. **QC Circle activities.** A mechanism for workers involvement, knowledge dissemination and cultural assimilation; the extensive network of courses, seminars, symposiums, conferences, study trips, company visits, research committees, etc as a means for societal learning; the Deming Prize, a powerful tool for stimulating company's top-management involvement; the **Quality Month**, a mechanism for multi-organization cooperation and national promotion for quality awareness; the "Q" **flag**, a unifying symbol of national commitment to quality; the **FQC Magazine**, an excellent channel of diffusion of knowledge and skill for foremen and workers; the **Seven QC Tools** and the **New Seven**

23
Tools for Management, a standardized set of tools for problem solving, quality improvement, and communication for societal learning; the non-profit, multi-company membership national associations, such as JUSE, JSA and the QC Circles Association, vehicles for the unification of industry-wide efforts and national promotion, within a structure where services user's can manage and cooperate.

In the technical field, not less important are the Japanese contributions:

Just-in Time and its relation with quality, the Taguchi Methods, Quality Function Deployment, the contribution to the international standardization movement are the most significant.

Mexico:

This country shows a very modest performance. Not until the onset of its economic crisis, and the announcement of its incorporation to the General Agreement on Trade and Tariffs (GATT), with the consequent opening of its domestic market to foreign competition, neither industry nor government had showed any serious involvement in Quality as a very important national priority. After this events, a fast growing interest and the first signs of the emergence of Mexican TQM are the optimist perspective. In the future Mexico could contribute to the evolution of TQM with the development of an interesting modality for less developed countries.
### 2.2. COMPARATIVE ANALYSIS.

#### 2.2.1. National level.

**TABLE 2.4.**

<table>
<thead>
<tr>
<th>MAJOR TQM PROMOTION ORGANIZATIONS</th>
<th>IN QUALITY MANAGEMENT:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U.S</td>
</tr>
<tr>
<td></td>
<td>JUSE</td>
</tr>
<tr>
<td></td>
<td>MEXICO</td>
</tr>
<tr>
<td>ASQC, APQC,</td>
<td>JSQC (Intl.)</td>
</tr>
<tr>
<td>AMA, AQP, ASI</td>
<td>CJSQC (Region.)</td>
</tr>
<tr>
<td>APMA, BI, AMIE</td>
<td></td>
</tr>
<tr>
<td>MANY OTHER ASSNS.</td>
<td></td>
</tr>
<tr>
<td>AND MANY CONSULTANTS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ITESM</td>
</tr>
<tr>
<td></td>
<td>IMECCA</td>
</tr>
<tr>
<td></td>
<td>FUNDAMECA</td>
</tr>
<tr>
<td></td>
<td>ANMECC</td>
</tr>
<tr>
<td></td>
<td>OTHER ASSNS.</td>
</tr>
<tr>
<td></td>
<td>AND CONSULTANTS</td>
</tr>
</tbody>
</table>

**LEADERSHIP:**

**FOR INDIVIDUAL PARTICIPATION:**

For quality experts: CONCENTRATED

For non-specialists: VERY FRAGMENTED

**FOR CORPORATE PARTICIPATION:**

VERY FRAGMENTED CONCENTRATED FRAGMENTED

**COOPERATION AMONG ASSOCIATIONS:**

LIMITED EXTENSIVE ALMOST ABSENT

**GOVERNMENT SUPPORT:**

MARGINAL, BUT INCREASING EXTENSIVE ALMOST NONE, BUT INCREASING

**MANAGEMENT COMMITMENT AND LEADERSHIP FOR QUALITY:**

MARGINAL BUT INCREASING DEEP AND STILL VERY WEAK

**POSITION ON THE LEARNING CURVE OF NATIONAL PROMOTION:**

IN THE FIRST STAGE 10 YEARS

VERY ADVANCED 45 YEARS

JUST STARTING 3-4 YEARS
In the U.S. and Mexico, the promotion of Quality Management has been very fragmented. Unity and search for a common language have been absent. Presumably, there is much effort duplicity, and there still conflict among several philosophical and practice currents, therefore, cultural assimilation has still a long way to go. For a long time, and in both countries, corporate business had not been interested in associating and working for a common promotion effort of quality improvement. Quality was an internal issue and quality education and training activities were the role of consultant firms. In both countries, ASQC and ANMECC (its Mexican Chapter), acting as leaders in the quality field, were only busy on quality expert training and accreditation, market demand did not ask for more. For the U.S., it was not until 1979 (when the Juran Institute was incorporated) and for Mexico in 1983 (when the Ford-ITESM program was signed up) that quality education for managers and other levels became a formal activity.

The most striking difference between JUSE on one side, and ASQC and ITESM on the other, is its corporate membership nature and the way it uses a pool of lecturer and instructor resources from academia, industry and government without having a fixed staff of instructors. Not only education and training are approached in this way, but consulting for member companies too, although this is a marginal activity. [See Appendix IV.1].
### Table 2.5.

<table>
<thead>
<tr>
<th>LEADER ORGANIZATIONS IN QUALITY MANAGEMENT:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>U.S.</strong></td>
</tr>
<tr>
<td>ASQC</td>
</tr>
</tbody>
</table>

**Character:**

<table>
<thead>
<tr>
<th>QUALITY PROFESSIONAL ASSOCIATION</th>
<th>SCIENCE-TECHNOLOGY PROMOTION ASSOCIATION FOR INDUSTRIAL DEVELOPMENT</th>
<th>TECHNICAL INSTITUTE EDUCATION, RESEARCH &amp; CONSULTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>NON-PROFIT</td>
<td>NON-PROFIT</td>
<td>NON-PROFIT</td>
</tr>
</tbody>
</table>

**Management:**

<table>
<thead>
<tr>
<th>ELECTED BOARD OF MEMBERS, QUALITY PROFESSIONALS</th>
<th>ELECTED BOARD OF UNION AND CORPORATE REPRESENTATIVES &amp; UNIVERSITY PROFS.</th>
<th>COLLEGE DIRECTORS &amp; TRUSTEES BOARD</th>
</tr>
</thead>
</table>

**Type of Membership and Number:**

<table>
<thead>
<tr>
<th>INDIVIDUAL &gt; 70,000 MEMBERS 650 CORPORATE MEMBERS</th>
<th>CORPORATE MEMBERSHIP 1,850 COMPANIES</th>
<th>CORPORATE TRUSTEES ASSN. FOR EACH CENTER N/A</th>
</tr>
</thead>
</table>

**Technical Staff:**

<table>
<thead>
<tr>
<th>PROFESSIONAL EXPERTS N/A</th>
<th>PROFESSIONAL VOLUNTEERS 2,000 approx.</th>
<th>FACULTY: 200 persons approx.</th>
</tr>
</thead>
</table>

**Industrial Standardization.**

Japan is the only one of the three countries where standardization has been fully incorporated to TQM activities. Not only conventional industrial standardization has been addressed, but through JSA the country's standards association, the country engaged in very early development of
in-company standardization, conceptualized as a process to support technology progress and quality improvements within industrial firms.

In the U.S., industrial standardization is highly developed technology, but its activities are scattered in about 63 institutions\(^1\), and there has been no unified national promotion effort. Just recently, the National Institute for Standards and Technology was restructured and its mission reoriented to address this problem.

In Mexico, DGN has been a very passive actor. Engaging only in traditional standardization. Many of its standards are not updated, and has no relationship with any quality movement.

**TABLE 2.6.**

<table>
<thead>
<tr>
<th>PROMOTION ORGANIZATIONS OF INDUSTRIAL STANDARDIZATION:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U.S</td>
<td>JAPAN</td>
</tr>
<tr>
<td>ANSI, NIST, ASTM, A total of 63 institutions</td>
<td></td>
<td>JSA</td>
</tr>
<tr>
<td>LEADERSHIP:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VERY FRAGMENTED AND EXTERNAL</td>
<td></td>
<td>CONCENTRATED AND STRONG</td>
</tr>
<tr>
<td>FIELD:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PREPARATION INDUSTRIAL STANDARDS ONLY</td>
<td></td>
<td>PREPARATION &amp; DISSEMINATION, OF INDUSTRIAL STDS. PROMOTION OF IN-COMPANY STANDARDIZATION</td>
</tr>
</tbody>
</table>

\(^{1}\) JSA. 1989b: 102-174.
2.2.2. THE FOUR ELEMENTS OF SHIBA'S MODEL.

A. KNOWLEDGE DISSEMINATION.

**TABLE 2.7.**

<table>
<thead>
<tr>
<th>KNOWLEDGE DISSEMINATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EDUCATION AND TRAINING:</strong></td>
</tr>
<tr>
<td>U.S.</td>
</tr>
<tr>
<td><strong>REACH AND COVERAGE:</strong></td>
</tr>
<tr>
<td>MOSTLY MANAGERS AND SPECIALISTS</td>
</tr>
<tr>
<td><strong>CHANNEL:</strong></td>
</tr>
<tr>
<td>MOSTLY CONSULTANTS</td>
</tr>
<tr>
<td><strong>NUMBER OF COURSES AND SEMINARS PER YEAR:</strong></td>
</tr>
<tr>
<td>ASQC: 100 approx. Juran: 77 events APQC: 7</td>
</tr>
<tr>
<td><strong>PARTICIPANTS PER YEAR AND CUMULATIVE NUMBER:</strong></td>
</tr>
<tr>
<td>ASQC: N/A APQC: 800/Yr Cum.:</td>
</tr>
<tr>
<td>ASQC: &gt; 27,000</td>
</tr>
<tr>
<td><strong>RANGE OF LENGTH OF COURSES:</strong></td>
</tr>
<tr>
<td>N/A GENERALLY SHORT</td>
</tr>
<tr>
<td><strong>INSTRUCTORS:</strong></td>
</tr>
<tr>
<td>PROFESSIONAL EXPERTS AND SPECIALISTS</td>
</tr>
<tr>
<td><strong>APPROACH:</strong></td>
</tr>
<tr>
<td>MOSTLY THEORY **</td>
</tr>
</tbody>
</table>
* Notes: This is the total cumulative number (since 1946).
** : With the exception of the Juran Institute which emphasizes practical examples, most educational and training courses lack the balanced approach of theory and practice that Japanese training has.

Recently, APQC and others have started to publish best practice and successful cases to satisfy this need.

By looking at the number of participants per year, it is very apparent that knowledge dissemination has been much more emphasized in Japan than in the U.S. and Mexico.

** TABLE 2.8. **

<table>
<thead>
<tr>
<th>KNOWLEDGE DISSEMINATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BOOKS:</strong></td>
</tr>
<tr>
<td>U.S.</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td><strong>TARGET SEGMENT:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BOOKS ON QUALITY EDITED PER YEAR AND TOTAL AVAILABLE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASQC: 22/Yr (1990) JUSE: 33/Yr JSA: 13,000 JIS copies</td>
</tr>
<tr>
<td>TOTAL: 100 approx. JUSE, JSA: 660 books on QC (1960-1985)</td>
</tr>
<tr>
<td>APQC: 21 JSA: 500 books</td>
</tr>
</tbody>
</table>

30
### Knowledge Dissemination

#### Number of Journals on Quality:

<table>
<thead>
<tr>
<th></th>
<th>U.S.</th>
<th>Japan</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASQC:</td>
<td>3 quarterly</td>
<td>JUSE: 2 monthly</td>
<td>None</td>
</tr>
<tr>
<td>&quot;Quality Progress&quot;</td>
<td>180,000 copies/mo</td>
<td>JSA: 2 monthly</td>
<td></td>
</tr>
<tr>
<td>APQC:</td>
<td>2 bimonthly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AQP:</td>
<td>1 quarterly</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Magazines:

<table>
<thead>
<tr>
<th>U.S. Department of Commerce: 1, not specific.</th>
<th>JUSE: 1 monthly</th>
<th>ITESM: 2, monthly but not specific.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fortune: 1 special ed./Yr</td>
<td>&quot;Shokuba to QC&quot; 170,000 copies per month</td>
<td>IMECCA: 1, quarterly</td>
</tr>
<tr>
<td>Business Week: eventually special editions</td>
<td>Magazine for foremen and workers.</td>
<td>FUNDAMECA: 3 annually</td>
</tr>
</tbody>
</table>

#### Other Channels:

#### Booklets, Newsletters:

<table>
<thead>
<tr>
<th>ASQC: &quot;HOW-TO&quot; SERIES. DIVISIONS &amp; COMMITTEES NEWSLETTERS. GALLUP SURVEY.</th>
<th>JUSE: &quot;REPORTS OF STAT. APPL. RESEARCH&quot; quarterly.</th>
<th>FUNDAMECA: MONOGRAPHS, CASES, &amp; SURVEYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AQP: NEWSLETTER</td>
<td>JSA: Surveys.</td>
<td></td>
</tr>
</tbody>
</table>

#### Videos:

<table>
<thead>
<tr>
<th>JURAN, AQP, OTHER CONSULTANTS</th>
<th>JSA: 51</th>
<th>JUSE: N/A</th>
<th>N/A</th>
</tr>
</thead>
</table>
The U.S. have in ASQC's *Quality Progress* the most powerful instrument of diffusion of printed information about quality. It is read by about 70,000 professionals, out of a total of 180,000 readers.

Japan, has in JUSE's *Skokuba to QC, QC Sâkuru* (the successor of *Gemba to QC*, and later *FOC*) a similarly powerful instrument, with 170,000 copies per month. Mexico has no such instrument.

It is worth noting that while ASQC's magazine is targeted on educated people, JUSE's is on production foremen and workers. This fact reveals the different orientation this two associations have.

Another difference between these two periodicals is that while *Quality Progress* is aimed to the diffusion of technical applications and new developments, *Shokuba to QC* is published for the dissemination of practical and successful cases of the PDCA problem solving method of real cases by real QC Circles.
### B. SOCIETAL LEARNING.

**TABLE 2.10.**

<table>
<thead>
<tr>
<th>SOCIETAL LEARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONFERENCES:</strong></td>
</tr>
<tr>
<td>ASQC:</td>
</tr>
<tr>
<td>Annual Congress,</td>
</tr>
<tr>
<td>The Ntl, Quality</td>
</tr>
<tr>
<td>APQC:</td>
</tr>
<tr>
<td>Several confs.</td>
</tr>
<tr>
<td>JURAN:</td>
</tr>
<tr>
<td>IMPRO Conference</td>
</tr>
<tr>
<td><strong>OTHER CHANNELS:</strong></td>
</tr>
<tr>
<td><strong>APQC:</strong></td>
</tr>
<tr>
<td>*<em>MBNQA <em>:</em></em></td>
</tr>
<tr>
<td>WINNERS STORY</td>
</tr>
<tr>
<td>SEMINARS</td>
</tr>
<tr>
<td>AND WORKSHOPS</td>
</tr>
</tbody>
</table>

33
<table>
<thead>
<tr>
<th>QUALITY CIRCLES OR OTHER TYPE OF GROUP ACTIVITIES:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSOCIATION:</td>
</tr>
<tr>
<td>U.S.</td>
</tr>
<tr>
<td>AQP:</td>
</tr>
<tr>
<td>NUMBER OF REGIONAL CHAPTERS:</td>
</tr>
<tr>
<td>90</td>
</tr>
<tr>
<td>NUMBER OF CIRCLES:</td>
</tr>
<tr>
<td>300 approx.</td>
</tr>
<tr>
<td>MEMBERS:</td>
</tr>
<tr>
<td>5,500</td>
</tr>
<tr>
<td>(3000 INDIV.</td>
</tr>
<tr>
<td>NUMBER OF CIRCLE PARTICIPANTS:</td>
</tr>
<tr>
<td>N/A estimated 22,000</td>
</tr>
<tr>
<td>PARTICIPANTS</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>NATURE OF PARTICIPATION:</td>
</tr>
<tr>
<td>VOLUNTARY</td>
</tr>
<tr>
<td>REPORTS PRESENTED:</td>
</tr>
<tr>
<td>N/A</td>
</tr>
</tbody>
</table>
### C. NATIONAL PROMOTION

#### TABLE 2.12.

<table>
<thead>
<tr>
<th>NATIONAL PROMOTION.</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>JAPAN</td>
<td>MEXICO</td>
</tr>
</tbody>
</table>

#### PRIZES AND MEDALS:

<table>
<thead>
<tr>
<th>NATIONAL QUALITY PRIZE:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MALCOLM BALDRIGE NATIONAL QUALITY AWARD</td>
<td>DEMING PRIZE</td>
<td>NATIONAL QUALITY PRIZE</td>
</tr>
</tbody>
</table>

#### FIRST AWARDING YEAR:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>1951</td>
<td>1989</td>
</tr>
</tbody>
</table>

#### CUMULATIVE NUMBER OF RECIPIENT COMPANIES:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>141</td>
<td>2</td>
</tr>
</tbody>
</table>

#### FREQUENCY:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ANNUALLY</td>
<td>ANNUALLY</td>
<td>ANNUALLY</td>
</tr>
</tbody>
</table>

#### OBJECTIVE:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TO PROMOTE QUALITY FOR INTERNATIONAL COMPETITIVENESS</td>
<td>TO STIMULATE COMPANIES TO ACHIEVE AN EXCELLENT LEVEL OF QUALITY</td>
<td>TO STIMULATE THE SATISFACTION OF CONSUMER NEEDS AND INTERNATIONAL COMPETITIVENESS</td>
</tr>
</tbody>
</table>

#### FUNDING:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CORPORATE DONATION TO A CONSORTIUM</td>
<td>CORPORATE MEMBER DONATIONS</td>
<td>FEDERAL BUDGET</td>
</tr>
</tbody>
</table>

#### AWARDEE:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>THE MINISTRY OF TRADE AND INDUSTRY</td>
<td>JUSE-OTHER ASSNS.' AWARDING COMMITTEE</td>
<td>MEXICAN GOVERNMENT</td>
</tr>
<tr>
<td>TABLE 2.12. NATIONAL QUALITY PRIZE: (cont.)</td>
<td></td>
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<tr>
<td>-------------------------------------------</td>
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<tr>
<td>ADMINISTRATOR:</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NIST</td>
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<tr>
<td>JUSE</td>
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<td>SECOFI</td>
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<tr>
<td>CATEGORIES:</td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>FIRMS:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) MANUFACTURING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) SERVICE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) SMALL BUSINESS</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>FIRMS &amp; INDIVIDUALS:</td>
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</tr>
<tr>
<td>(1) INDIVIDUAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) LARGE ENTERPRISE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) SMALL &amp; MEDIUM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) DIVISION</td>
<td></td>
<td></td>
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<tr>
<td>(5) FACTORY</td>
<td></td>
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<tr>
<td>FIRMS:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) LARGE MFR. CO.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) SMALL &amp; MEDIUM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) LARGE TRADE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) SMALL &amp; MEDIUM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5) LARGE SERVICE</td>
<td></td>
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<tr>
<td>(6) SMALL &amp; MEDIUM</td>
<td></td>
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<tr>
<td>LIMIT NUMBER OF PRIZES:</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 PER CATEGORY</td>
<td></td>
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<tr>
<td>NO LIMIT</td>
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<tr>
<td>1 PER CATEGORY</td>
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<tr>
<td>CRITERIA:</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>(1) LEADERSHIP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) INFORMATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) PLANNING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) HUMAN RESOUR.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5) QUALITY ASS.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(6) QUALITY LEVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(7) CUSTOMER SAT.</td>
<td></td>
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</tr>
<tr>
<td>(1) POLICY AND OBJ.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) MGMT. AND ORG.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) EDUCATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) INFORMATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5) PROBLEM SOLVING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(6) STDN. SYSTEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(7) CONTROL SYSTEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(8) QUALITY ASSUR.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(9) EFFECTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(10) FUTURE PLANS</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>(1) TQM STRATEGY</td>
<td></td>
<td></td>
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<tr>
<td>(2) IMPLEMENTATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) CUSTOMER SATIS.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) QUALITY LEVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5) WORKERS LIFE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(6) MARKET SHARE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(7) RECOGNITIONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(8) COMPETITIVENESS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(9) ECON. RESULTS</td>
<td></td>
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<tr>
<td>(10) EFFECTS ON SOC.</td>
<td></td>
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<tr>
<td>PROCESS:</td>
<td></td>
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<tr>
<td>APPLICATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCREENING &amp; ON-SITE AUDIT</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ON-SITE INSPECTIONS</td>
<td></td>
<td></td>
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<tr>
<td>INTERVIEW WITH CEO</td>
<td></td>
<td></td>
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<tr>
<td>REVISION OF DOCUMENTED EVIDENCE</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>AWARDING COMMITTEE CONSTITUTION:</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASQC-APQC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JUSE-OTHER ASSN. COMMITTEES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GOVERNMENT OFFICERS</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BENEFITS FOR WINNERS:</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GOVERNMENT PUBLICITY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SELF PUBLICITY</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRESTIGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USE OF PRIZE LOGO FOR 1 YEAR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SELF PUBLICITY</td>
<td></td>
<td></td>
</tr>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

36
### Table 2.13. Other Prizes and Medals

<table>
<thead>
<tr>
<th>U.S.</th>
<th>Japan</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASQC: Edwards Medal</td>
<td>Japan QC Medal</td>
<td>None</td>
</tr>
<tr>
<td>Shewhart Medal</td>
<td>Ishikawa Medal</td>
<td></td>
</tr>
<tr>
<td>Lancaster Medal</td>
<td>Nikkei QC Prize</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FQC Award</td>
<td></td>
</tr>
<tr>
<td></td>
<td>QC Circle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grand Prize</td>
<td></td>
</tr>
<tr>
<td></td>
<td>QC Circle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chapter Award</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2.14. National Promotion

#### Quality Month:

**First Year:**

<table>
<thead>
<tr>
<th>1984</th>
<th>1960</th>
<th>None</th>
</tr>
</thead>
</table>

**Organizer:**

<table>
<thead>
<tr>
<th>ASQC</th>
<th>JUSE-JSA-JAPAN CHAMBER OF COM.</th>
<th>None</th>
</tr>
</thead>
</table>

**Activities:**

<table>
<thead>
<tr>
<th>National Quality Forum</th>
<th>Top MGRS. Conference</th>
<th>Middle MGRS. Conf.</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASQC/Fortune Advertising Section</td>
<td>Staff Conference</td>
<td>Foremen Conference</td>
<td></td>
</tr>
<tr>
<td>ASQC/Gallup Survey Community Conferences, Workshops, and Symposia</td>
<td>Consumers Conference</td>
<td>Software Conference</td>
<td></td>
</tr>
<tr>
<td></td>
<td>QC Circles Conf.</td>
<td>&quot;Q&quot; Flag Use</td>
<td></td>
</tr>
</tbody>
</table>
### D. STANDARDIZATION AND CERTIFICATION:

**TABLE 2.15.**

<table>
<thead>
<tr>
<th>LEADER ORGANIZATIONS IN INDUSTRIAL STANDARDIZATION:</th>
<th>U.S.</th>
<th>JAPAN</th>
<th>MEXICO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INSTITUTION:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANSI</td>
<td>NIST</td>
<td>JSA</td>
<td>DGN</td>
</tr>
<tr>
<td><strong>CHARACTER:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VOLUNTARY STANDARDS CERTIFICATION INSTITUTE</td>
<td>NATIONAL LABORATORY STANDARDS &amp; TECH.</td>
<td>GOVERNMENTAL ASSOCIATION FOR INDUSTRIAL STDN.</td>
<td>GOVERNMENT AGENCY FOR STDN.</td>
</tr>
<tr>
<td><strong>MEMBERSHIP:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>NONE</td>
<td>8,700 CORPORATE ASSOCIATES</td>
<td>NONE</td>
</tr>
<tr>
<td></td>
<td>1,500 CLIENTS FIRMS</td>
<td>4,700 JIS SUBSCRIBING COMPANIES</td>
<td></td>
</tr>
<tr>
<td><strong>STAFF:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>3,000 employees approx.</td>
<td>160 persons approx.</td>
<td>200 persons approx.</td>
</tr>
<tr>
<td><strong>NUMBER OF STANDARDS:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10,000 approx.</td>
<td>100 STDs</td>
<td>10,000 approx.</td>
<td>5,200 STDs. AND 3,000 REGULATED PRODUCTS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 million foreign stds. available</td>
<td></td>
</tr>
<tr>
<td><strong>OTHER ACTIVITIES:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESEARCH TECHNICAL SUPPORT FOR SMALL &amp; MEDIUM SIZE FIRMS</td>
<td>NONE</td>
<td>IN-COMPANY STANDARDIZATION &amp; QUALITY NATIONAL PROMOTION</td>
<td>NONE</td>
</tr>
</tbody>
</table>

38
<table>
<thead>
<tr>
<th>PROMOTION OF STANDARDIZATION.</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
</tr>
<tr>
<td>AWARDS:</td>
</tr>
<tr>
<td>NONE</td>
</tr>
<tr>
<td>JOURNALS:</td>
</tr>
<tr>
<td>EACH INSTITUTION</td>
</tr>
<tr>
<td>CONFERENCES:</td>
</tr>
<tr>
<td>EACH INSTITUTION</td>
</tr>
<tr>
<td>STANDARDIZATION MONTH:</td>
</tr>
<tr>
<td>NONE</td>
</tr>
<tr>
<td>CERTIFICATION:</td>
</tr>
<tr>
<td>EACH INSTITUTION</td>
</tr>
<tr>
<td>METROLOGY:</td>
</tr>
<tr>
<td>NIST</td>
</tr>
<tr>
<td>STATE OF ADVANCEMENT:</td>
</tr>
<tr>
<td>VERY HIGH</td>
</tr>
</tbody>
</table>
III. CONCLUSIONS

(1) All three countries have endeavoured seriously in quality improvement national promotion only after an economic crisis has been perceived by their leading sectors.

(2) Only in Japan, all four elements of Shiba's model have been strongly addressed and involve all sectors, functions and levels, and size of companies of industry.

(3) Multi-company integrated, non-profit associations seem to be an emerging model for the organization of promotion efforts of TQM beyond individual company limits.

(4) Non-profit organizations seem to be the most effective and with the highest credibility to conduct national promotion activities. Particularly in societal learning and national dissemination. Most consultant firms, seem to limit their delivered service to what has been contracted, thus limiting potential improvements during the interaction with participants.

(5) TQM national promotion in the U.S. and in Mexico is very fragmented, a big number of organizations both non-profit and pro-profit are active, and there is much duplicity. There is a need for some organizations to become and be accepted as national leaders in the seek
for synergy and efficiency.

(6) Societal Learning must receive a much stronger attention both in the U.S. and Mexico. A much more intensive and extensive range of activities directed toward verbal and visual exchange of knowledge and experience is an urgent need to achieve TQM goals.

(7) The promotion of standardization in the U.S. is divorced from company quality improvement activities. Standardization in Mexico is obsolete and metrology is almost absent. Dynamic Standardization is an essential element of quality improvement which must be promoted by corporate associations and government. Only Japan has a Standardization Month for national promotion.

(8) In the early 1980's, U.S. Top Management leadership for quality improvement, an essential condition, emerged at a very fast pace.

In Japan emerged very strongly since the 1950's.

In Mexico is still scarce.

(9) In Mexico, quality knowledge dissemination and awareness must be nationally promoted very strongly, due to its population's average age and educational level. Mexico has neither Quality Month activities, nor Quality Flag yet.

(10) U.S.'s Malcolm Baldrige National Quality Award (MBNQA) objectives lay more emphasis on international competitiveness than the Deming Prize. Future
developments will show if this approach is beneficial.

(11) The National Quality Prize in Mexico is awarded through a screening process lacking of on-site inspection. The selection committee is formed almost entirely by government officers. This could put in risk the credibility of the prize.

(12) Both U.S. and Mexico quality prizes limit the number of winners, establishing thus a different mindset as compared with Deming Prize's. The latter, theoretically implies that as many companies could satisfy the requirements, all would receive the prize in the same year. For the former two, companies must compete to get the prize. Loser could attain enough high quality and still not win the award.

Following, the author proposes a model for the evolution of TQM with emphasis on the U.S. contribution of statistical techniques, and Japan's systemic approach development. (TABLE 3.1.)

Next, the author presents Lawler's model of employee involvement in the U.S., which explains the current trend towards small group activities in the U.S. (FIGURES 3.1. and 3.2.)

Finally, the author adapted Juran's and Mattana's models of quality evolution to incorporate several concepts presented in this work. (FIGURES 3.3., 3.4., and 3.5.)
**TABLE 3.1. TOTAL QUALITY MANAGEMENT: MODEL OF EVOLUTION**


<table>
<thead>
<tr>
<th>SOCIAL DIMENSIONS</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Scientific Techniques &amp; methods</td>
<td>1925-1945</td>
</tr>
<tr>
<td>- Industrial tools &amp; methods</td>
<td>JURAN: Quality Mgmt.</td>
</tr>
<tr>
<td>- Company organization</td>
<td>1945-1980</td>
</tr>
<tr>
<td>- Vertical organization</td>
<td></td>
</tr>
<tr>
<td>- Industrial organization</td>
<td></td>
</tr>
<tr>
<td>- National organization</td>
<td></td>
</tr>
</tbody>
</table>

**UNITED KINGDOM:**
- Statistics
- Sampling Inspection

**UNITED STATES:**
- Statistical Process Control
- Acceptable Quality Level

**JAPAN**

**PHILOSOPHICAL FRAMEWORK:**
- "KAIZEN": Continuous Improvement
- "TENKAI": Expansion
  - (Totalization)
  - Horizontally
  - Vertically
  - Across Boundaries

**INDUSTRIAL TOOLS:**
- 7 Basic, 7 New Tools, QFD, JIT,

**ORGANIZATIONAL SYSTEMS:**
- Company Wide Quality Control
- Quality Control Circles
- Non-Profit, Corporate Membership, Umbrella Associations

**INDUSTRY-WIDE & NATIONAL PROMOTION SYSTEMS:**
- Quality Prizes, Quality Month, Quality Flag,

**DYNAMIC STANDARDIZATION SYSTEMS FOR QUALITY:**
- Industrial and in-company standardization systems.

**SOCIETAL LEARNING SYSTEM:**
- e.g. QC Circles for workers,
  - Congresses, Seminars, Study trips for all levels,
  - Mass media dissemination: Books, magazines, radio & TV

**1980's: OTHER COUNTRIES**
- Companies: Partial adoption
- Countries: Crisis perception
- Social mobilization
Figure 3.1.

CURRENT TRENDS IN EMPLOYEE INVOLVEMENT IN THE U.S.

<table>
<thead>
<tr>
<th>INFORMATION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>High performers are more likely to disseminate information on:</td>
</tr>
<tr>
<td>- Unit operating results.</td>
</tr>
<tr>
<td>- Fellow employee's pay.</td>
</tr>
<tr>
<td>- New technology.</td>
</tr>
<tr>
<td>- Competitor's relative performance.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>KNOWLEDGE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>High performers are more likely to train their people in:</td>
</tr>
<tr>
<td>- Decision making and problem-solving analysis.</td>
</tr>
<tr>
<td>- Team building.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EMPLOYEE INVOLVEMENT PRACTICES OF HIGH PERFORMANCE COMPANIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>High performers are more likely to use:</td>
</tr>
<tr>
<td>- All salaried work force</td>
</tr>
<tr>
<td>- Knowledge, skill-based pay.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POWER:</th>
</tr>
</thead>
<tbody>
<tr>
<td>High performers are more likely to implement:</td>
</tr>
<tr>
<td>- Job enrichment, redesign.</td>
</tr>
<tr>
<td>- Quality Circles.</td>
</tr>
<tr>
<td>- Participation groups.</td>
</tr>
<tr>
<td>- Self-managed work teams.</td>
</tr>
</tbody>
</table>

Source: Lawler, Edward E.III. 1989: Figure 14-1.
FIGURE 3.2. EVOLUTION OF EMPLOYEE INVOLVEMENT PRACTICE IN U.S. CORPORATIONS. PERIOD OF TIME OF USE OF EACH SPECIFIC PRACTICE AGAINST PERCENTAGE OF RESPONDENTS. n= 323 companies.

Source: Lawler, Edward E. III. 1989: Figure 6-1..

Note: Graph by thesis author.
FIGURE 3.3. COUNTRIES COMPARATIVE PROGRESS ON QUALITY.

Adapted from Juran Joseph M. 1989: 32. by thesis author.
FIGURE 3.4. CHRONOLOGICAL EVOLUTION OF QUALITY

FROM THE 1920’s TO THE 1980’s.


Adapted by thesis author.
FIGURE: 3.5. DIMENSIONAL EVOLUTION OF QUALITY.

Adapted from the original of Mattana, Giovanni K. 1989: 317.
by thesis author.
IV. SUGGESTIONS:

KNOWLEDGE DISSEMINATION:

(1) To achieve a satisfactory progress in the national promotion of TQM, it is strictly necessary to establish an efficient network for education and training. Non-profit, corporate membership associations seem to be the best fitted for this purpose due to their credibility, coverage, autonomy of management, ability to pool resources from their member companies, and their political weight to solicit resources from academia and government. This presupposes total top management support.

It is absolutely necessary, not to duplicate efforts in a project of this magnitude.

(2) Education and training for all hierarchical levels is also mandatory.

When approaching foremen and workers education, courses, materials and readings must be customized. Visual aids and attractive design are very effective for this purpose.

For all hierarchical levels, even for top managers, a good balance between theory and practice seems to be the most effective.

(3) Books and magazines designed and written for every educational level and type of generic job are a must.
Here again, and particularly true for people with low educational level, pictures, cartoons, and graphs are useful aids in conveying meaning and goals.

(4) Mass media means of communication can also be a useful complementary resource.

(5) Companies must take an active role in all activities to fully benefit from their associations constitution. Instead of relying on the limited instructor and lecturer resources a TQM promotion association can have as permanent staff, a pool of company instructors must be available for the implementation of an extensive and fast-paced effort.

SOCIETAL LEARNING.

(1) Classroom instruction, on-site, and on-the-job training are not enough for the cultural and organizational change implied in TQM objectives. Social interaction among individuals and groups is an essential factor to help in the required transformation. "Learning by Doing" and "Learning by Perceiving" are complements of intellectual understanding.

(2) Accordingly, TQM promotion associations must engage in a very intensive and extensive project to enhance both frequency, quality, and network expansion of knowledge and experience exchange.

(3) Associations must promote small group activities, no matter how they could be named. These units seem to be
a very effective channel for verbal and non-verbal exchange of information, and for the development of individual motivation and skills.

(4) Associations must ensure a certain number of opportunities for conducting common and cooperative projects to promote interaction, and unity of approach.

NATIONAL PROMOTION.

(1) Two elements are essential for a successful national promotion:
A Quality Award, with recognized national prestige, to stimulate organizations in striving for quality improvement and adopting TQM.
A Quality Month project to arouse general awareness for the relevance of a quality improvement attitude.

(2) To achieve credibility, the Quality Award must be managed by a consortium or committee of different associations representatives with high visibility, and recognized impartiality. It must gather elements from all leading sectors of the country to insure representation.
Corporate industry must be heavily represented.
The screening process must be conducted by the most recognized TQM experts of the country.

(3) The prize awarding criteria must give high priority to quality improvement and TQM internal promotion.
Emphasis on competitive advantage characteristics
attainable by means other than quality improvement, are alien to this purpose, and could distort the objective of the prize, inviting companies to attain competitiveness through strategies conflicting with quality improvement.

(4) The prize must be awarded to all companies attaining a certain level of excellence, and not to a limited number of winners. This limitation could discourage some companies perceiving themselves as too far behind other to start working for quality.

STANDARDIZATION.

(1) Standardization is an important element in the process of quality improvement and must be incorporated to TQM promotion efforts in all industrial sectors. It must be addressed with the same organizational efforts and stimuli than quality.

(2) Countries might benefit from inaugurating their Standardization Month, implementing a comprehensive Industrial Standardization System, a Quality Standard Certification System and In-company Standardization National Training Program.

(3) Dynamic Industrial Standardization can be achieved by coupling this activity with an improvement cycle such as the PDCA cycle.
I.1. THE AMERICAN SOCIETY FOR QUALITY CONTROL (ASQC).

PROFILE

A. Offices.

The Society's headquarters is located in Milwaukee, WI.

B. Foundation and Objectives.

The Society was founded in 1946 as a non-profit organization and its main objective has been to focus on enhancing the quality profession and on the role of quality in today's marketplace.

Through the years, ASQC has developed programs that fulfill those needs.

In a more general sense, the Society has dedicated its efforts to the advancement of quality and is devoted to provide leadership in the development, promotion and dissemination of quality-related technologies to serve the needs of its members.

Society's Symbol:

An inverted "Q", the Society's name inside the "Q", and inside it a circle with a control chart.

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1 ASQC. 1989a: 2.

2 Ibid: 3.

3 Burek, Deborah M. 1990: 721.

C. Main Activities.

The Society concentrates its activities heavily on the segment of quality professionals:

In the field of Knowledge Dissemination, ASQC offers to its members, through its Professional and Technical Development Department, a set of advanced courses in quality engineering, reliability engineering, quality management, management of quality costs, quality audit-development and administration, management of the inspection function, probability and statistics for engineers and scientists, and product liability and prevention. Through ASQC's Quality Press, the Society edits books, the proceedings of its annual Quality Congress, several journals, magazines, newsletters, bulletins, and provides to its members additional information support, such as standards and other technical literature.

In the promotion of Societal Learning, ASQC sponsors through its 14 Divisions and 10 Technical Committees, a range of meetings, special events, programs and exhibits throughout the country. ASQC's Annual Quality Congress is one of its most important contributions to this field. The Society's Sections [Local Chapters] organize also Regional Quality Conferences. The Business Improvement Symposiums are also important events in the promotion of the service sector.

In the field of Certification and Standardization, the

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1 Burek, Deborah M. 1990: 721.
Society serves as a certifying institution for the professional qualification of individuals, by offering six quality professional specialties. ASQC is also a leading organization in the standardization of quality. ASQC has developed 18 quality standards accredited by the American National Standards Institute (ANSI) and participates in the International Organization for Standardization (ISO) as administrator of several Technical Advisory Groups and Committees (ISO/TCs).

In the field of the National Promotion activities, ASQC is again one of the leading organizations in the U.S., organizing the National Quality Month, and co-sponsoring its premier event, the National Quality Forum and the ASQC/Gallup Survey On Quality during this month. The Society sponsors the recognition of the accomplishments of quality professionals by awarding several medals. In addition, ASQC functions as the administrator of the NASA Excellence Award for Quality and Productivity, the highest quality honor to companies in the aerospace industry for their technological advancements, innovative thinking and overall awareness of quality. The annual Customer Satisfaction Measurement Conference and the American Quality Foundation, aimed to strengthen the future of quality, are additional examples of this leadership. Finally, co-administering the U.S. Department of Commerce's Malcolm Baldrige National Quality Award, the highest level of national recognition a U.S.
company can receive, ASQC has entered fully to the age of nation-wide quality promotion. Additionally, ASQC offers Personnel Listing Services (PLS) to help its members to find job opportunities.

D. Financing.

With an annual budget of $10,000,000 ¹, ASQC finances its activities through the contributions of its corporate members, the fees of its individual members ($350 per year ²), and the revenues from publications, congresses, conferences, seminars, courses attendance fees, etc.

E. Membership.

The current number of individual members exceeds 70,000 ³ and corporate members are more than 650 ⁴. Individual membership is reserved to individuals at least 21 years old, holding a grade of a college or a university, or having six years or more of relevant experience in the quality field. Associate members must be at least 18 years old and interested in the field of quality. Students are accepted as such, must be at least 18 y.o. and currently enrolled in full time educational programs ⁵.

A Corporate Sustaining Member can be any private

¹ Burek, Deborah M. 1990: 721.
² Ibid. 1990b: 8.
³ Ibid. 1990h: 1.
⁴ Ibid. 1990b: 4.
⁵ ASQC. 1989a: 15.
corporation, division within a corporation, governmental agency or organization willing to share ASQC's mission.  

Membership benefits are:

- Annual subscription to ASQC publications.
- Affiliation publication.
- Discounts on:
  - Books.
  - Professional and Technical Development Courses.
  - Conferences.
  - The Annual Quality Congress.
  - Advertising on Quality Progress, its most known magazine.
  - Additional publication subscriptions.
  - ASQC's Annual Quality Congress Transactions.
  - Personnel Listing Service of job opportunities.
  - Quality Month Bulletin.
  - Corporate sustaining membership plaque.

F. Organization.

With a staff of 90 people, ASQC organizes its activities through 14 Divisions, 10 Technical Committees, 277 Local Chapters or Sections (within the U.S.), one Foreign Countries International Chapter (that coordinates relations and activities with 64 countries), and the ASQC Quality Press, its publishing organ.

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1 Ibid. 1990b: 8.
2 Ibid. 1990c: 7.
3 Ibid. 1989a: 16.
1. Divisions:
   a. Automotive Division
   b. Aviation Space and Defense Division.
   c. Biomedical Division.
   c. Chemical and Process Industries Division.
   d. Electronics Division.
   e. Energy Division.
   g. Human Resources Division.
   h. Inspection Division.
   i. Quality Management Division *
   j. Reliability Division.
   k. Software Division.
   l. Statistics Division.
   m. Textile and Needle Trades Division.

2. Technical Committees:
   o. Construction Technical Committee.
   q. Environmental Technical Committee.
   r. Home Appliances Technical Committee.
   s. Home Furnishings Technical Committee.
   t. Metrology Technical Committee.
   u. Quality Auditing Technical Committee.
   w. Standards Committee.

* The Quality Management Division has several specialized subcommittees:
   - Quality Costs Subcommittee.
   - Banking Subcommittee.
   - Insurance Subcommittee.
   - Telecommunications Subcommittee.
   - Government Subcommittee.
   - Health Care Subcommittee.
   - Quality Management Subcommittee.
   - Manufacturing Support Subcommittee.
   - Research Subcommittee.
   - Utilities Subcommittee.
   - Retail Subcommittee.
   - Information Systems Subcommittee.
   - Laboratory Services Subcommittee.
   - Logistics Subcommittee.

* NOTE: The organization chart was not provided to the author. This chart was prepared exclusively for the purpose of giving a broad picture of the Society's organization.
G. Description of Main Activities.

1. Knowledge Dissemination.

a. Education and Training.

Through its Professional Development Department, ASQC is active in education and training by sponsoring 24 courses during the Fall, and 28 during the Winter-Spring season on the following subjects ¹:

(1) Design of Industrial Experiments.
(2) Introduction to Quality Costs
(3) Managing for Quality.
(4) Procurement Quality.
(5) Quality Audit.
(6) Quality Engineering.
(7) Reliability Engineering.
(8) Software Quality Assurance.
(9) Statistical Process Quality Control.

And co-sponsoring the following:

(10) Hôshin Planning ².
(11) Introduction to Quality Engineering-Taguchi.
(12) Quality Function Deployment.
(14) Other special courses.

Note: Course fees range from $350 to $935.

In-plant training and home-study classes designed to keep professionals up-to-date on quality technology are also available. Tutorials are offered as part of the activities within the Annual Quality Congress ³.

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¹ ASQC. 1989e and f.
² A Japanese word meaning company policy.
³ ASQC. 1990h: 12.
Local Sections offer refresher or preparation courses and home study materials for individuals who want to take any of six certification program examinations. ASQC's customized Section Management Program (SMP) helps each section's activities in training for management leadership skills.

Many activities of the Society are administered by each division and committee, according to the needs of its industrial sector. Thus, almost each division and committee is involved in specific educational and training activities:

(i) The Automotive Division sponsors seminars and workshops presenting state-of-the-art quality concepts and technologies to division members and others, and offers education courses. It also disseminates important quality-related publications in the auto industry through Quality Press.

(ii) The Biomedical Division provides training on:

- Good Manufacturing Practice (GMP).
- Statistical Control in GMP.
- Quality Auditing.
- Quality and Hospital Management.
- Quality Assurance in Biomedical Conference.

This division maintains also several joint scholarship programs with industry.

\[1\text{ ASQC. 1989c: 1-20.}\]
(iii) The Chemical and Process Industries Division sponsors short courses related to statistical applications and quality control procedures for the practitioner.

(iv) The Electronics Division distributes the IEEE Transactions on Reliability and co-sponsors tutorial and workshops on the subject. Tutorials are offered during the "Fall Quality in Electronics Conference". This division also provides free copies of various conference proceedings for its members.

(v) The Food, Drug, and Cosmetic Division sponsors or co-sponsors short courses for small groups requiring comprehensive training, and holds seminars on current industrial quality technology developments.

(vi) The Human Resources Division sponsors tutorials at the Annual Quality Congress.

(vii) The Inspection Division sponsors or co-sponsors tutorials at all national and most regional ASQC conferences.

(viii) The Quality Management Division assists the Professional and Technical Development Department in developing and conducting the following courses:

- Managing Quality Costs and
- Quality in the Service Industries.

It also offers special seminars, such as:

- Bank Quality Control Shop.
- Quality Costs Workshop and
- Service Industry Workshop (Administrative Functions and Statistical Process Control).
(ix) The Reliability Division cooperates with the Professional and Technical Department in developing and conducting the Reliability Engineering Course.

(x) The Software Division cooperates with academia to promote educational resources for the software quality profession.

(xi) The Statistics Division and the Textile and Needle Trades Divisions present courses and tutorials on SQC. The latter also organizes programs to enhance the professional level of the quality control function.

(xii) The Construction Technical Committee identifies educational needs related to quality control and quality assurance within this sector.

(xiii) The Environmental Technical Committee sponsors one-day seminars on quality assurance of the Toxic Substances Act and of the Resource Conservation and Recovery Act during Fall.

(xiv) The Product Safety and Liability-Prevention Technical Committee develops the training material for the course with the same name.
b. Publications.

(1) Periodicals.

(a) Magazines.

(i) Quality Review. Quarterly. Co-published with the American Quality Foundation. This magazine addresses broad-based concerns of top management about productivity and profitability, the application of quality systems, profiles, strategies and recommendations for business industry.

(ii) Quality Progress. Monthly. Analyses new products, services and developments in all areas of the quality profession. Its contents range from Taguchi Methods, assuring quality service, to interviews with leading CEOs and executives. In 1990 the magazine had 70,000 professional reading members out of a total of 180,000 readers.

(b) Journals.

(i) The Journal of Quality Technology. Quarterly. Covers the technical aspects of quality control, reliability and related disciplines in all the range of quality technology.

(ii) Technometrics. Quarterly. Published jointly by the American Statistical Association. Addresses new statistical techniques and innovative applications on

Ibid. 1990g: 51.
traditional statistical methods for the physical, chemical, and engineering sciences. It combines articles on applied statistical concepts, and methods with expert's commentaries on selected papers.

(iii) Quality Engineering. Quarterly. Co-sponsored by Marcel Dekker Inc., provides in-depth examination of practical applications of quality engineering and quality technology for the engineer dedicated to the manufacturing process.

(iv) On Quality, a newsletter for members.

(2) Books:

(a) In 1990, ASQC is offering 36 new books, of which 22 were edited by the Society.

(b) The Human Resource Division is responsible for the preparation of the "How-To" booklet series emphasizing techniques for improving human resource skills. Additionally, this division develops publications on such topics as quality circles, quality of work life, motivation, decision making and other human resource issues.

(c) Most divisions and committees edit and distribute their own membership newsletters, and provide input to the Society's periodicals. Some also edit their division directory.

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1 ASQC. 1990g: 1-65.
(d) The Chemical and Process Industries Division is responsible for writing:

- "Applications for Experimental Design."
- "Inter-laboratory Testing Techniques."
- "Use of Statistical Designs of Experiments in Industry."

(e) The Energy Division is in the same way responsible for:

- "Domestic Matrix Quality Assurance Program Requirements."
- "International Matrix of Nuclear Quality Assurance Program Requirements."
- "Nuclear Quality Systems Auditor Training Handbook."

(f) The Inspection Division develops and publishes inspection, test, and auditing methods and techniques.

(g) The Quality Management Division publishes:

- "Quality Costs—What and How."
- "Guide To Reducing Quality Costs."
- "Guide for Managing Vendor Quality Costs."
- "Guide for Quality Costs in Administrative and Service Functions."
- "Quality Assurance in Banking."

(h) The Reliability Division does its part by publishing:

- "Reliability Reporting Guide."
- "Guaranteed Quality by Sampling."
- "Reliability Review" the division's journal.

(i) The Statistics Division publishes the following "How-To" Series booklets:

- "How to Analyze Data with Simple Plots."
- "How to perform Continuous Sampling."
- "How to Test Normality and Other Distributional Assumptions."
- "How to Apply Response Surface Methodology."
- "How to Use Regression in Quality Control."
- "How to Run Mixture Experiments for Product Quality."
- "How to Analyze Reliability Data."
- "How and When to perform Bayesian Acceptance Sampling."
"How to Perform Skip-Lot and Chain Sampling."
"How to Plan and Accelerate Life Test- Some Practical Guidelines."
"How to Perform Statistical Tolerance Analysis."
"How to Choose the Proper Sample Size."
"How to Use Sequential Statistical Methods."

(j) The Customer-Supplier Technical Committee prepares and publishes:

"How to Conduct a Supplier Survey."
"Procurement Quality Control."
"ANSI/ASQC C-1 Specifications of General Requirements for a Quality Control Program."
"How to Evaluate a Supplier's Product."
"How to Establish Effective Quality Control for Small Suppliers."
"How to Motivate Suppliers."
"How to Deal with Distributors."
"How to Implement and Use a Vendor Rating."
"Quality Control for the Small Medical Device Supplier."

(k) The Home Appliances Technical Committee prepared:

"Quality Systems and General Defect Classification Guidelines."

(l) The Home Furnishing Technical Committee is responsible for:

"Furniture Quality Planning Guide."

(m) The Metrology Technical Committee prepares:

"Metrology Training Aids List."
"Metrology Speakers List."
"Metrology Bibliography."
"Metrology Newsletter."
TABLE I.1.1.

<table>
<thead>
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<th>SUBJECT</th>
<th>TOTAL NUMBER OF BOOKS OFFERED</th>
<th>NUMBER OF EDITED BY ASQC</th>
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<td></td>
<td>100 %</td>
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Source of data: ASQC. 1990g: 2-58.
(3) Standards.
ASQC publishes ANSI/ASQC Standards. From the same source, the author found 20 standards prepared by the Society and available to its members.

d. Consulting and Aid Services.
Some ASQC's divisions and committees are active in consulting:

(i) The Human Resource Division assists and supports quality professionals in building quality into their organizations by improving the utilization of their human resources.

(ii) The Inspection Division advises members and other parties in industry on the application of inspection, test, and auditing methods and techniques.

(iii) The Quality Management Division does the same in its field and provides speakers for conferences. In the same way, the Statistics, the Textile Divisions, the Computer Information Systems, the Environmental Technical, the Quality Auditing, and the Product Safety Technical Committees manage their services.

2. National Promotion.
a. The National Quality Month.
This is an annual public awareness campaign aimed to stimulate, support and strengthen U.S.'s commitment to quality. It was launched in 1984 with a joint resolution by the U.S. Congress and a proclamation by President Reagan.
The designated month for these nation-wide activities is every year's October. During this period, business across the country join ASQC groups and other organizations in sponsoring special promotional events to call public attention toward quality improvement as a very important element in business strategy for increasing the nation's competitiveness in foreign markets.

In 1989, the program of the National Quality Month featured:

- The National Quality Forum, co-sponsored with Fortune Magazine. It is a conference on the latest research, surveys, and case studies on quality. In 1988 the forum was broadcast live via satellite to over 150 locations with a viewership exceeding 100,000 people.

- The fifth annual ASQC/Fortune advertising section on quality highlights the strategic advantage quality is giving to some companies.

- The release of the fifth annual ASQC/Gallup Survey on the state of quality in the U.S.

- Community conferences, workshops, and symposiums.

- Promotional materials created to enhance daily quality efforts of business.

- The publication of the National Quality Month Bulletin.

The Quality Month's symbol:

A blue oval with three red stripes (the U.S. spangled banner), coming out the oval, from its lower right and pointing to the SE to make up the shape of a "Q".

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1 ASQC. 1990g: 21.
2 Ibid.
b. Medals, Awards and Prizes.

As was mentioned before, ASQC awards several medals to recognize published works, leadership in the quality field and outstanding quality programs. The recipients are the best in their areas and are featured in articles, books and at seminars:

- **Edwards Medal** for outstanding works on quality.
- **Shewhart Medal** for leadership in quality.
- **Lancaster Medal** for highest levels of achievement in quality.

In 1990, the National Quality Month videotape was produced by Federal Express, that year's sponsor. Additionally, ASQC is the administrator of NASA's Excellence Awards for Quality and Productivity in the aerospace industry and co-administers the Malcolm Baldrige National Quality Award.

Several ASQC's divisions such as the Food, Drug and Cosmetic Division, the Inspection Division, and the Textile and Needle Trades Division, grant awards and scholarships for outstanding quality accomplishments to individuals and companies in their respective industrial sectors.

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¹ ASQC. 1989a: 11.

a. The Annual Quality Congress.

This event is one of world's most important forums for the transference of information, introduction of new ideas, and the gathering place of leaders and personalities of the field. The 1990 event was scheduled to host 4,000 delegates representing more than 40 countries and to join the Eight Triennial Conference of the International Academy of Quality.

Divided in sections assigned to several divisions, committees and departments, the 1990 congress has scheduled 154 presentations, 21 standby speakers, 10 tutorials and panels, 96 committee meetings [including the ASQC medals awarding], 3 special sessions [dedicated to the Quality Month, the Malcolm Baldrige National Quality Award and the NASA Award], 75 company exhibits, 4 pre-conference tutorials, 4 plant tours, and other services ¹.

b. Divisional and Regional Conferences' Seminars, Workshops and Research.

Each division and committee sponsor and co-sponsor conferences, seminars, workshops for their membership, with other related organizations. They disseminate relevant literature, promote leadership, and continuous improvement activities among their members. Likewise, they maintain research cooperation and interaction with federal and state

¹ ASQC. 1990h: 1-29.
institutions. They also act as a liaison and interphase with other organizations in each industrial sector.

Some closely related institutions are:

- The Society of Automotive Engineers (SAE).
- The Department of Defense (DoD).
- The National Administration of Space and Aeronautics (NASA).
- FAA.
- The U.S. Food and Drug Administration (FDA).
- The American Statistical Association (ASA).
- The American Marketing Association (AMA).
- The American National Standards Institute (ANSI).
- The Institute of Electrical and Electronic Engineers (IEEE).
- The Association of Computing Machinery (ACM).
- The Air Pollution Control Association (APCA).
- The American Productivity and Quality Center (APQC).
- The Japanese Union of Scientists and Engineers (JUSE).
- The International Academy for Quality (IAQ).
- Other quality associations in the U.S. and all over the world.

4. Certification and Standardization.

ASQC acts a certifying organization for the quality profession by offering the following programs ¹:

- Certified Quality Engineer (CQE).
- Certified Reliability Engineer (CRE).
- Certified Quality Technician (CQT).
- Certified Mechanical Inspector (CMI).
- Engineering-in-Training Certification Program (QEIT).
- Certified Quality Auditor (CQA).

More than 27,000 professionals have been certified ².

ASQC formed its Committee on Standardization as early as

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¹ ASQC. 1990g: 43 and ASQC. 1989 i-m.
1947, since then, it has worked in the development of
generic quality standards in close contact with the American
National Standards Institute (ANSI), the International
Standards Organization (ISO) and the International Academy
for Quality (IAQ). For this purpose, ASQC has a Standards
Council as the managing body, and the Standards Committee as
the standards preparing and monitoring organ ¹. ASQC's work
on standards is accredited by ANSI, the coordinator of
U.S.'s voluntary standards. ASQC has developed 20 standards
accredited by ANSI (See next table), and has 13 standards
projects under preparation.²
In the international field, ASQC participates sponsoring the
ISO Technical Committees within two Technical Advisory
Groups (TAGs) ³:

- **US TAG to ISO/TC69**: This committee works on
  statistical methods, the standardization of statistical
terminology and symbols, the formal presentation and
interpretation of test and inspection results, and the
diagnosis of their repeatability and reproducibility.

- **US TAG to ISO/TC176**: Working for Quality Assurance,
  this group is involved in the standardization and
harmonization of generic quality systems and quality
assurance and their related technologies.

¹ Ibid. 1989d: 2.
² ASQC. 1987.
³ Ibid.: 4.
<table>
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<td>QUALITY STANDARDS BY ASQC AND IEEE AND ACCREDITED BY ANSI</td>
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<td>ANSI/ASQC A1-1987</td>
<td>DEFINITIONS, SYMBOLS, FORMULAS AND TABLES FOR CONTROL CHARTS.</td>
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<td>ANSI/ASQC A2-1987</td>
<td>TERMS, SYMBOLS, AND DEFINITIONS FOR ACCEPTANCE SAMPLING.</td>
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<td>ANSI/ASQC A3-1987</td>
<td>QUALITY SYSTEMS TERMINOLOGY.</td>
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<td>ANSI/ASQC B1-1985 (ANSI Z1.1-1958)</td>
<td>GUIDE FOR QUALITY CONTROL CHARTS</td>
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<td>ANSI/ASQC B2-1985 (ANSI Z1.2-1958)</td>
<td>CONTROL CHART METHOD OF ANALYZING DATA</td>
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<tr>
<td>ANSI/ASQC B3-1985 (Z1.3-1969, Reaffirmed 1975)</td>
<td>CONTROL CHART METHOD OF CONTROLLING QUALITY DURING PRODUCTION.</td>
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<td>ANSI/ASQC C1-1985</td>
<td>SPECIFICATIONS FOR GENERAL REQUIREMENTS FOR A QUALITY PROGRAM.</td>
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<tr>
<td>ANSI/ASQC E2-1984</td>
<td>GUIDE TO INSPECTION PLANNING.</td>
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<tr>
<td>ANSI/ASQC M1-1987</td>
<td>AMERICAN NATIONAL STANDARD FOR CALIBRATION SYSTEMS.</td>
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<tr>
<td>ANSI/ASQC S1-1987</td>
<td>AN ATTRIBUTE SKIP-LOT SAMPLING PROGRAM.</td>
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<td>GENERIC GUIDELINES FOR AUDITING OF QUALITY SYSTEMS.</td>
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<td>QUALITY MANAGEMENT AND QUALITY ASSURANCE STANDARDS.</td>
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<td><strong>ANSI/ASQC Q92-1987:</strong></td>
</tr>
<tr>
<td>QUALITY SYSTEMS. Model for Quality Assurance in Production</td>
</tr>
<tr>
<td>and Installation.</td>
</tr>
<tr>
<td><strong>ANSI/ASQC Q93-1987:</strong></td>
</tr>
<tr>
<td>QUALITY SYSTEMS. Model for Quality Assurance in Final</td>
</tr>
<tr>
<td>Inspection and Test.</td>
</tr>
<tr>
<td><strong>ANSI/ASQC Q94-1987:</strong></td>
</tr>
<tr>
<td>QUALITY MANAGEMENT AND QUALITY SYSTEM ELEMENTS:Guidelines.</td>
</tr>
<tr>
<td><strong>ANSI/ASQC Z1.4-1980:</strong></td>
</tr>
<tr>
<td>SAMPLING PROCEDURES AND TABLES FOR INSPECTION BY</td>
</tr>
<tr>
<td>ATTRIBUTES.</td>
</tr>
<tr>
<td><strong>ANSI/ASQC Z1.9-1980:</strong></td>
</tr>
<tr>
<td>SAMPLING PROCEDURES AND TABLES FOR INSPECTION BY</td>
</tr>
<tr>
<td>VARIABLES FOR PERCENT NONCONFORMING.</td>
</tr>
<tr>
<td><strong>ANSI/ASQC Z1.15-1979:</strong></td>
</tr>
<tr>
<td>GENERIC GUIDELINES FOR QUALITY SYSTEMS.</td>
</tr>
</tbody>
</table>

| **ANSI/IEEE 730-1981:**  |
| SOFTWARE QUALITY ASSURANCE.  |
| **ANSI/IEEE 830-1984:**  |
| GUIDE TO SOFTWARE REQUIREMENT SPECIFICATIONS.  |

ASQC. 1990g: 56-57.
FIGURE I.1.2. ASQC. INDIVIDUAL MEMBERSHIP. HISTORICAL GROWTH.


Notes: Available data are from 1946, 1970, 1979, 1982, 1988, and 1990. All other points were interpolated to show the growth trend. Graph by thesis author.

Remark: In 1982 and again in 1990, an increasing growth ratio can be observed.
FIGURE I.1.3. ASQC. NUMBER OF REGIONAL CHAPTERS. HISTORICAL GROWTH.

ASQC. 1990a: 16.

Note: Graph by thesis author.
FIGURE I.1.4. ASQC. ANNUAL QUALITY CONGRESS.
NUMBER OF REPORTS SUBMITTED.
HISTORICAL GROWTH.


Note: Available data are for years 1960, 1965, 1970, 1977-1988.). The rest were interpolated to give a clearer picture.
<table>
<thead>
<tr>
<th>YEAR</th>
<th>THEME</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td>Quality: Through Test of Management.</td>
<td></td>
</tr>
<tr>
<td>1979</td>
<td>Quality: Fundamental, Universal and Now.</td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>Quality in the New Decade.</td>
<td></td>
</tr>
<tr>
<td>1981</td>
<td>Quality: A Prerequisite to Survival.</td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td>Quality: Key to Productivity.</td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>Quality: Results of Teamwork.</td>
<td></td>
</tr>
<tr>
<td>1988</td>
<td>Quality: Positive Response to the Challenge.</td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>Total Quality: An International Imperative.</td>
<td></td>
</tr>
</tbody>
</table>

FIGURE I.1.5. NUMBER OF PRACTICAL EXAMPLES REPORTED IN THE ASQC ANNUAL TRANSACTIONS AND CLASSIFIED ACCORDING TO ASQC's LCS CODE.


Remarks: Although the number of practical applications reported has been scarce, some increase is observed.
FIGURE I.1.6. ASQC. ANNUAL QUALITY CONGRESS. INDIVIDUAL ATTENDANCE. HISTORICAL GROWTH.


Remarks: Slow growth.
FIGURE I.1.7. ASQC TRANSACTIONS. PERCENT DISTRIBUTION BY SUBJECT.

- Quality
- Management
- Engineering
- Production
- Service
- Other

Source: Ibid. 304.

Remarks: Quality Control and Quality Management are the most numerous.

Note: Graph by thesis author.
FIGURE I.1.8. ASQC TRANSACTIONS. APPROACH DISTRIBUTION.

- Inspection
- Process
- New Product Development.

Source: Ibid.

Remarks: Interest for Inspection is decreasing and increasing for Process and Product Development.

Note: Graph by thesis author.
FIGURE I.1.9. ASQC TRANSACTIONS.
PERCENT DISTRIBUTION OF EACH SUBJECT.

Source: Ibid.

Note: Graph by thesis author.
FIGURE I.1.10. ASQC TRANSACTIONS. APPROACH TO VENDOR-VENDEE (SUPPLIER-CUSTOMER) RELATIONS HISTORIC EVOLUTION.


Remarks: The approaches for Vendee leadership and Education of Vendor are losing popularity. The approach for Cooperation is gaining favor. (See note in second next page)

Note: Graph by thesis author.

86
FIGURE I.1.11. ASQC TRANSACTIONS.
PERCENT DISTRIBUTION OF APPROACHES TO VENDOR-VENDEE RELATIONS.

Source: Ibid.

Note: Graph by thesis author.
NOTE ON THE LABELS OF FIGURES 1.1.10. AND 1.1.11.

"VENDEE AS LEADER" (or "VENDEE MUST DECIDE") is an approach in which Vendee decides the minimum quality requirements of its purchase inputs, places strong emphasis on inspection of supplies at their reception, bases its criteria on AQL method, classifies its suppliers according to these results, and defines Vendor quality on the basis of defective percent. This approach is the oldest and in the 1980's is still present but in a rapid decreasing proportion.

"EDUCATE VENDOR" (or "VENDEE EDUCATES") is an approach in which big companies look for a preeminent position over their suppliers, and search for vertical integration. Mother companies educate their subsidiaries, control their quality policies and force them to supply with a minimum quality level. This trend is observed since the 1960's and is still popular.

"COOPERATE" (or "BOTH COOPERATE") represents the most recent policy in which both Vendor and Vendee work on an equality basis. As members of a team, they cooperate in the improvement of the quality of their products and in the development of a comprehensive quality design, and the control and improvement system, i.e.: Vendor is not anymore a subject of customer's regulations or tutoring, but is equally responsible and committed to develop a Group-Wide Quality System. ¹

¹ Ibid.: 306.
FIGURE I.1.12. ASQC TRANSACTIONS SURVEY.
RELATIVE PERCENT DISTRIBUTION OF QUALITY RELATED SUBJECTS IN THE ASQC TRANSACTIONS. HISTORIC EVOLUTION.


Note: Graph by thesis author

Remarks: Note the increased relative relevance of Quality Assurance reports in the ASQC Transactions. Management applications show a steady increase. Sampling issues show a decreasing importance.
FIGURE I.1.13. ASQC TRANSACTIONS SURVEY.
DISTRIBUTION OF REPORTS IN ASQC TRANSACTIONS ON QUALITY ASSURANCE ACCORDING TO THEIR APPROACH.


Note: Graph by thesis author.

Remarks: Emphasis on control technologies and economic issues.
Interest in Promotion from 1980.
Marginal interest in Education & Training and The Organization of Promotion.
FIGURE I.1.14. ASQC TRANSACTIONS SURVEY.
DISTRIBUTION OF REPORTS IN ASQC TRANSACTIONS
ACCORDING TO THEIR INDUSTRIAL PRODUCTION
SECTOR.

Source: Ibid.

Note: Graph by thesis author.

Remarks: Shift toward assembling and electric and
electronic sectors.
FIGURE I.1.15. ASQC TRANSACTIONS SURVEY.
RELATIVE PERCENT DISTRIBUTION OF REPORTS
ACCORDING TO THEIR SECTOR.

Source: Ibid.

Note: Graph by thesis author.

Remarks: Clear predominance of Manufacturing and
Governmental applications.
FIGURE I.1.16. ASQC TRANSACTIONS SURVEY.
DISTRIBUTION OF REPORTS BY THEIR AUTHORS' TYPE OF ORGANIZATION.


Remarks: Third party organizations stand second in place after Production Industry and Government.

Graph by thesis author.
FIGURE I.1.17. ASQC TRANSACTIONS SURVEY.
DISTRIBUTION OF REPORTS BY THEIR QUALITY ASSURANCE APPLICATION OBJECTIVE.


Graph by thesis author.
FIGURE I.1.18. ASQC TRANSACTIONS SURVEY.
DISTRIBUTION OF REPORTS BY THEIR QUALITY ASSURANCE APPLICATION.

Source: Ibid.

Remarks: Shift from QA for products to Services and Soft Technologies.
FIGURE I.1.19. 1985 ASQC/GALLUP SURVEY. CONSUMER RATING OF AMERICAN MADE PRODUCTS.

Ratings:
0: Don't know.
1: Exceptionally poor.
2-9: Increasing satisfaction level.
10: Exceptionally Good.

APPENDIX I

I.2. THE AMERICAN PRODUCTIVITY & QUALITY CENTER (APQC).

PROFILE

A. Offices.

Its main offices are in Houston TX.

B. Foundation and Objectives 1.

The Center was founded in 1977 by its current chairman, Jackson Grayson Jr., (former Dean of the Business School of the Southern Methodist University in Dallas), and about 100 organizations, as a response to the risk the U.S. are facing with their increasing loss of international competitiveness. The mission of the Center is to work with people in organizations to improve productivity, quality, and quality of work life by:

- Providing educational, advisory, and information services of exceptional value and
- Researching new methods for improvement on both the domestic and the international fronts, and broadly disseminating its findings.

The Center functions in a neutral, non-partisan way thanks to its non-profit status and its affiliations with business, government, organized labor, and academia. The Center works mainly on the human side of productivity and quality improvement. Its philosophy rests on the belief that it is critical to educate the largest possible number of employees

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1 APQC. 1990a: 1.
in any organization ¹.

The Center changed in 1988 its former name of American Productivity Center to the current one, indicating with this fact a re-directio of its mission.

**The Center's Symbol:**

An "A" compounded by a black, inverted "V", and a horizontal set of three red stripes.

**C. Main Activities.**

APQC seeks to improve productivity, quality, and the quality of work life in the U.S. through a set of joint activities with business, unions, academia, and government agencies. Accordingly, APQC conducts research, disseminates information, conducts courses and seminars, sponsors conferences and maintains a library and a bibliographic information service in every field ².

**D. Financing.**

APQC supports its activities mainly from the contribution of business, industrial organizations, and from individuals. Secondarily, it also receives support from federal, state and local governments. On a third level, the fees from membership, services, and publications, contribute to its funding. The number of sponsoring organizations are approximately 300 ³.

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¹ APQC. 1990b: 3.

² Burek, Deborah M. 1990: 249.

³ Ibid. 1990: 249.
Membership fees range from $10,000 to $600 for the highest and lowest levels of membership.

E. Membership.

APQC membership is hierarchically classified into the following levels:
- Center Roundtable.
- Corporate II.
- Corporate I.
- Nonprofit.
- Small Business (≤ 500 employees).
- International.
- Individual.

The category determines the level at which membership benefits are provided.

F. Organization.

A Board of Directors of about 50 personalities representing the public and private sectors, organized labor, and academia meets annually to provide long-range planning advice.

An Advisory Council, a group of about 20 productivity and quality practitioners from member organizations, meets twice a year to review the Center's activities and to offer ideas for specific projects or areas of emphasis.

G. Description of Main Activities.

In the category of knowledge dissemination, the Center offers:

1. Courses.

APQC offers 7 different courses:

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1 APQC. 1990b: 4.
TABLE 1.2.1.

<table>
<thead>
<tr>
<th>COURSES OFFERED</th>
<th>SCHEDULE</th>
<th>FREQUENCY TIMES/Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMERICAN PRODUCTIVITY AND QUALITY CENTER.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SUBJECT</strong></td>
<td><strong>SCHEDULE</strong></td>
<td><strong>FREQUENCY TIMES/Yr</strong></td>
</tr>
<tr>
<td>Total Quality Management</td>
<td>2 days</td>
<td>6</td>
</tr>
<tr>
<td>Designing and Managing Work Teams</td>
<td>2 days</td>
<td>3</td>
</tr>
<tr>
<td>Employee Participation Skills to Build Teamwork</td>
<td>2 days</td>
<td>6</td>
</tr>
<tr>
<td>Measuring Productivity in Your Organization</td>
<td>2 days</td>
<td>3</td>
</tr>
<tr>
<td>Activity Based Cost Management</td>
<td>2 days</td>
<td>4</td>
</tr>
<tr>
<td>Managing and Measuring White Collar Performance</td>
<td>2 days</td>
<td>3</td>
</tr>
<tr>
<td>Gain Sharing: Rewards for the Employee and the Organization</td>
<td>2 days</td>
<td>8</td>
</tr>
</tbody>
</table>


2. Seminars

The Center had over 800 participants in 1989 seminars.

3. Library.

APQC offers to its members a library with 3000 volumes and 10,000 articles on issues such as Productivity, Quality and Quality of Work Life. This library is intended to become the national clearinghouse for information on these subjects.

4. Information Services.

APQC's staff responds about 4,000 requests on literature to its members each year.
5. Consulting 1.

The Center consultants have expertise in:

- Total Quality Management.
- Productivity Management.
- Productivity Measurement.
- White Collar Productivity and Quality Improvement.
- Organizational Assessment.
- Labor-Management Cooperation.
- Gain Sharing and other rewards.
- Employee Involvement.

6. Research.

The Center conducts research through structured projects, joint projects, multi-client projects, and the development of analytical models 2. Corporate members are invited to participate in research projects on a variety of issues.

7. National Promotion activities.

The center co-administers the Malcolm Baldrige National Quality Award with the ASQC. The prize is managed by the National Institute of Standards and Technology (NIST).

In the category of societal learning, the Center publishes several materials with the following approach:


- To disseminate the best current thinking on productivity and quality improvement issues and trends.

- To present the practical details of specific improvement techniques, such as profit sharing, productivity measurement, employee involvement and other.

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1 APQC. 1990b: 9.
2 Ibid: 9-10.
Real-life examples of various organizations' improvement strategies.

The Center publications include:

- A monthly Letter on organizations' programs, current statistics, emerging trends, experts' opinions, and upcoming events.

- Briefs, bi-monthly, on issues in productivity and quality improvement.

- Notebooks, bi-monthly, on specific techniques.

- Case Studies, six times per year, of organizations' successful improvement efforts.

- Perspectives, an annual chartbook updating U.S. and international productivity statistics.

- Digest, an annual annotated bibliography of the year's best books on productivity and quality.

- Consensus, 4 times a year, reporting the findings of regular polls of members' opinions on business-related issues.

- Special reports on the Center's research, conference, and other events.

- Pathways. 21 sets of approximately 10 articles describing the current best thinking on productivity or quality, details on the practical use of a technique, and concrete examples of how companies and organizations have solved their problems.

9. Conferences.

The Center works with the Department of Labor on the design of several national and international conferences.

Additionally, the Center conducts public conferences once to twice a year. Sometimes a conference is the result of a research project, other times the conference is organized

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1 APQC. 1990: 2.
jointly with another organization, like the one entitled "Quest for Excellence", where the recipients of the MBNQ Award reviewed how their winning quality efforts met the Award criteria and how their initiatives gained results.
APPENDIX I

I.3. THE MALCOLM BALDRIGE NATIONAL QUALITY AWARD (MBNQA) PROFILE.

A. Offices.

Its managing offices are located in the National Institute of Standards and Technology's (NIST) offices in Gaithersburg, MD, and its Administrative staff works in the MBNQA Consortium, Inc. offices in Milwaukee, WI.

B. Foundation and Objectives.

The Malcolm Baldrige National Quality Improvement Act was established by the Public Law 100-107 in 1987, and signed by President Reagan on August 20, 1987. The kick-off meeting was held at the White House on March 31, 1988.

The Award's objectives are:

"To promote national quality awareness, to recognize quality achievements of U.S. companies and to publicize successful quality strategies".

The Findings and Purposes Section of this Public Law makes the following statements:

1 MBNQA. 1990a: 1.

2 Mc Donell, Sanford. 1988: 7.

The Award is named for Malcolm Baldrige, who served as Secretary of Commerce from 1981 until his tragic death in a rodeo accident in 1987. He is remembered for his managerial excellence that contributed to long term improvement in efficiency and effectiveness of U.S. government.


"1. the leadership of the United States in product and process quality has been challenged (and sometimes successfully) by foreign competition, and our Nation's productivity growth has improved less than our competitors over the last two decades.

2. American business and industry are beginning to understand that poor quality costs companies as much as 20 percent of sales revenues nationally, and that improved quality of goods and services goes hand in hand with improved productivity, lower costs, and increased profitability.

3. strategic planning for quality and quality improvement programs, through a commitment to excellence in manufacturing and services, are becoming more and more essential to the well-being of our Nation's economy and our ability to compete effectively in the global marketplace.

4. improved management understanding of the factory floor, worker involvement in quality, and greater emphasis on statistical process control can lead to dramatic improvements in the cost and quality of manufactured products.

5. the concept of quality improvement is directly applicable to small companies as well as large, to service industries as well as manufacturing, and to the public sector as well as private enterprise.

6. in order to be successful, quality improvement programs must be management-led and customer-oriented and this may require fundamental changes in the way companies and agencies do business.

7. several major industrial nations have successfully coupled rigorous private sector quality audits with national awards giving special recognition to those enterprises the audits identify as the very best, and

8. a national quality award program of this kind in the United States would help to improve quality and productivity by:

A. helping to stimulate American companies to improve quality and productivity for the pride of recognition while obtaining a competitive edge through increased profits;
B. recognizing the achievements of those companies which improve the quality of their goods and services and providing and example to others; 

C. establishing guidelines and criteria that can be used by business, industrial, governmental, and other organizations in evaluating their own quality improvement efforts, and

D. providing specific guidance for other American organizations that wish to learn how to manage for high quality by making available detailed information on how winning organizations were able to change their cultures and achieve eminence."

The 1990 Application Guidelines state:

"The Award promotes:

- awareness of quality as an increasingly important element in competitiveness,
- understanding of the requirements of quality excellence, and
- sharing information on successful quality strategies and on the benefits derived from the implementation of these strategies."

Note: With this approach, the Award is addressing three of the areas of Prof. Shiba's model of the diffusion of TQM:

- **National Promotion**: Stimulating public awareness of the importance of quality improvement in U.S., industry and in the public in general.

- **National Certification**: By certifying outstanding performance and achievements of companies in industry in the quality field, and

- **Societal Learning**: By disseminating best practices and managerial approaches to TQM, and the characteristics of an excellent quality system.
The Prize’s Symbol:

A vertically positioned two spangled blue banner, folding over itself and a white star in its center.

C. Organization.

The Award is managed by the U.S. Secretary of Commerce and the National Institute of Standards and Technology (NIST), responsible to develop the Awards with cooperation and financial support from the private sector.

The examination process is administered by the Malcolm Baldrige National Quality Award Consortium Inc., formed by the American Society of Quality Control (ASQC) and the American Productivity and Quality Center (APQC). The Board of Examiners is integrated by quality experts selected from industry, professional and trade organizations, and universities. ¹

D. Financing.

Funds come from the Foundation for the Malcolm National Quality Award. Leading U.S. firms executives of the following companies serve as directors and/or trustees of the Foundation ²:

- Adolph Coors
- American Express
- Boeing
- Eastman Kodak
- Federal Express
- Florida Power & Light
- Ford Motor Co.

¹ Ibid.
² Mc Donell, Sanford. 1988: 7.
General Dynamics
Goodyear
Hewlett Packard
Honeywell
IBM
Lockheed
Mc Donell Douglas
Metropolitan Life
Milliken Textiles
Northrop
Robert Mills
Rockwell International
Ryder Systems
Sears
Texas Instruments
Westinghouse
Xerox.

A total of $9.9 M was required to cover start-up costs, plus an endowment to cover operating costs in perpetuity. In 1988, pledges had totaled $3.855 M. 1

Fees: In 1989, a fee of $2,000 was charged for review of the basic written examination for the manufacturing and service categories. A reduced fee of $1,200 was charged for the small business category 2. Later in 1990, the fee for small business has been decreased to $1000. 3

In 1987, the Secretary of Commerce appointed a Board of Overseers to review the award processes and to suggest improvements 4.

1 Ibid.
2 Ibid. 1990a: 2.
3 Ibid. 1990b: 3.
E. Eligibility.

Any for-profit business incorporated and located in the U.S. may apply for the Awards, under the restriction that more than 50 % of each of the number of total employees, of physical assets, and of the TQM operations of the applicant company must be inside the U.S. territory.

F. Confidentiality:

Individual applications, commentaries, and scoring information developed during the review of applications are regarded as proprietary and are kept confidential. Such information is available only to those individuals directly involved in the evaluation and application distribution processes ¹.

G. Categories.

Up to two awards may be given each year in each of the following categories:

- manufacturing companies or subsidiaries
- service companies or subsidiaries
- small businesses (no more than 500 employees)

Fewer than two awards may be given in a category if the standards of the Award Program are not met.

There is no monetary reward ². Award recipients receive a medal bearing the inscriptions of the Award and may publicize and advertise their Awards, provided they agree to

¹ MBNQA. 1990b: 3.

share with other U.S. organizations information about their successful quality strategies\textsuperscript{1}.

H. Process.

FIGURE I.3.1.

1. Application Distribution.

The application guidelines are regarded by the Program Director useful for self-assessment guide and for training and education in business, government, schools, hospitals and other institutions.

\textsuperscript{1} Business America. March 28, 1988: 36.
In 1989, 65,000 copies were distributed.¹

2. Site Visits:
Companies must permit rigorous evaluation of their applications, including site visits for high scoring finalists. Only those applicants achieving high scores in their written application's review may follow the process.

3. Criteria:
Seven areas are examined:²

(1) Leadership.
(2) Information and Analysis.
(3) Planning.
(4) Human Resource Utilization.
(5) Quality Assurance of Products and services.
(6) Quality Results.
(7) Customer satisfaction.

4. Publication
Successful quality strategies are publicized in collaboration with ongoing private sector efforts to disseminate best quality practices. NIST's established Affiliates Program helps to disseminate them.

¹ Reimann, Curt. 1990b.
² MBNQA. 1990b: 17.
I. Winners.

1. First time, 1988:

In 1988, 10,000 applications were requested, and only 76 were submitted (54 large and mid companies, and 12 small businesses \(^1\)). Out of these 76, NIST selected 13 respondents to send out teams of experts for thorough audits. 3 deserving Award recipients were selected \(^2\):

a. **Motorola.** Distinguished by its "Six Sigma Quality" (aimed to achieve no more than 3.4 defects per million products), "Total Cycle Time" and "Benchmarking" programs.  
   In 1981, Motorola started its "Total Customer Satisfaction" approach to achieve a tenfold reduction of product defective level. The company has received nearly 50 quality awards and certified supplier citations.

b. **Commercial Nuclear Fuel Division, Westinghouse Electric Corporation.** Set out its "Total Quality" strategy aimed to gain a bigger share of world markets.

c. **Globe Metallurgical Inc.** In 1985, the company set out to become the lowest-cost, highest-quality ferro-alloys producer of the U.S. through its company-wide quality improvement system called "Quality, Efficiency, and Cost" (QEC).

\(^1\) Bacon, Donald. 1989: 32.

MBNQA. 1989: 33.
2. 1989:

a. **Milliken & Company** a 124-year-old privately owned company with 14,300 "associates" employed in 47 manufacturing facilities produces 48,000 different textile and chemical products. In 1981, Milliken started its "Pursuit of Excellence" (POE) commitment to customer satisfaction. Since the early 1980's, productivity increased 42%. In 1988, 1,600 "Corrective Action Teams" were formed and nearly 500 teams responded with improvements.

b. **Xerox Business Products and Systems.** The company launched its quality improvement program in 1983. Its new product development program is organized in 375 information management systems, of which 175 are specific for planning, managing, and evaluating quality improvement. "World Leader Benchmarking" is another very strong activity in key areas such as product, service and business performance. Xerox BPS employs 50,200 people at 83 locations in the country and produces 250 types of document-processing equipment.

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1 MBNQA. 1990b: 37.
APPENDIX I

I.4. THE ASSOCIATION FOR QUALITY AND PARTICIPATION, (AQP).

Formerly:
The International Association of Quality Circles (IAQC).

PROFILE.

A. Offices.

AQP's headquarters is located in Cincinnati, OH.
Its staff is about 14 employees.

B. Foundation and Objectives.

The Association was founded by Dcnald Dewar and Jeff
Beardsley in 1978, former QC Circle Coordinator and QC
Circle Training Coordinator of the Missile Systems Division
of the Lockheed Missiles & Space Company. ¹

AQP's mission is stated to be:
"The improvement of quality, productivity, and motivation of
corporate human resources through the coordination of
Quality Circles and employee involvement activities
throughout the world."

C. Main Activities.

AQP acts as a clearinghouse for Quality Circle and employee
involvement professionals. Bestows awards, compiles
statistics, maintains specialized education and placement
services, such as the one-week Certification Course for QC
Facilitators, operates a speaker's bureau, holds an annual

¹ Cole, Robert. 1989: 188.
conference and sponsors seminars ¹.

D. Financing.

AQP funds its activities mainly from the fees of its conferences and Facilitator Training courses ².

E. Membership.

In 1990, members are 6000 persons, most of them quality managers, manufacturing executives, consultants such as personnel relations and employee involvement professionals, and organization's presidents.

F. Organization.

The Association is organized in several committees:

- Awards Committee,
- Certification Task Force Committee,
- Education Committee,
- Materials Review Committee and
- Research Committee.

G. Description of Main Activities.

AQP is involved in activities concerning knowledge dissemination, and societal learning. For the first purpose, besides the courses and seminars, it publishes the following periodicals:

- **AQP Report.** Bimonthly. A newsletter about employee involvement, quality circles, and self-managing teams in improving quality, productivity, and motivation. Its circulation is about 6000 copies.

¹ Burek. Deborah M. 1990: 718.

Transactions of the AQP Annual Conference.

AQP produces also several materials:

- Training materials, surveys, and newsletters.
- Videotapes.

AQP's contribution to societal learning is also present in the biannual conferences, where experiences on team involvement are presented.

AQP has struggled to survive in times when interest for employee involvement through teams activities has been poor in the U.S.

Dr. Robert Cole cites the following obstacles for AQP growth during the 1980's:

- Lack of corporate interest in joining an association for the promotion of quality circles.

- Professional consulting members' effort to direct the Association's activities away from any competition with their personal business services (mainly the training, the preparation of educational material and consulting). Consultant members having relatively high leverage within this Association.

- Lack of top management's membership and interest in joining AQP.

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1 Ibid.: 180-250.
- Unions' opposition against AQP's promotion activities for Quality Circles, allegedly an attempt of some company managers to gain control over Union's affiliates.

- Weak members' support due to their individual job position and poor hierarchical influence.

- Lack of members' experience and skill in managing an organization.

- Poor administration of the association.


Remarks:  Membership shows almost no growth in the last 6 years.
FIGURE I.4.2. ATTENDANCE TO THE AQP ANNUAL CONFERENCE FROM 1979 TO 1989.

Source: Ibid.

Remarks: The 1989's figure come from a different bibliographic source. Membership could not be decreasing.
FIGURE I.4.3. CONFERENCE ATTENDANCE FEE. 1979-1989.

Source: Ibid.

Remarks: For the last 6 years there is almost no increase.


Remarks: After 1884 both types of membership has not grown.
(Data from 1978 to 1984 were not available, but it does not mean there were no QC activities).

Source: Ibid.
FIGURE I.4.6. AQP. REGIONAL AND LOCAL CHAPTERS. HISTORICAL GROWTH.

Burek, Deborah M. 1990: 718.

Remarks: Again, 1989's figure comes from the second source.
APPENDIX I

I.5. THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).

PROFILE

Founded in 1918, currently with a staff of 107 employees, a budget of $8.8 M, and a membership of 1250 industrial firms, trade organizations, and government agencies, ANSI serves as a clearinghouse for nationally coordinated voluntary standards in fields ranging from information technology to building construction. ANSI gives status as American National Standards to those standards developed by agreement (canvassing) of all groups concerned in areas such as:

Definitions, terminology, symbols and abbreviations; materials; performance characteristics; procedures and methods for rating quality; methods for testing and analyzing quality; size, weight, volume, and rating of other product physical characteristics; practice, safety, health, and building.

ANSI provides information on foreign standards, and represents the U.S. interests in international standardization projects.

It is organized in:

A Certification Committee, and several councils:

Board of Standards Review, Company Member, Consumer Interest, Executive Standards and Organizational Member.
ANSI publishes:


- **The Catalog of American National Standards.** Listing 8,000 current ANSI approved standards by subject and designation.

- **Progress Report.** Periodic. About the Association's activities.

- **Standards Action.** Biweekly. Listing newly published international standards. Provides opportunities to comment on standards and regulations of GATT signatory countries.
APPENDIX I

I.6. THE NATIONAL INSTITUTE OF
STANDARDS AND TECHNOLOGY (NIST).
U.S. DEPARTMENT OF COMMERCE.

PROFILE

A. Offices.

Its offices are located in Gaithersburg, Md. where 27
buildings house the administration and research facilities.
Other 14 buildings are located in Boulder, Co.
Its staff is approximately 3,000 people.

B. Foundation and Objectives.

Founded in 1901 as the National Bureau of Standards (NBS),
on August 1988 got its current name.
Its original mission had been to be the U.S. central
laboratory for the development and dissemination of
measurement and scientific information standards for
science, engineering, manufacturing, commerce, industry and
public security. This objective had been pursued through:

1. The development and harmonization of measurement
   standards and methods,

2. The development of testing methods for private
   industry and government agencies products,

3. The establishment of standards in cooperation with
   the private sector and other governmental agencies

\footnote{JSA. 1989: 159.}
Technology Competitiveness Act of August 23, 1988, the new NIST received the assignment "to further assist industry in developing technology and procedures for improving quality, and to facilitate the commercialization, specially by small- and mid-sized U.S. firms, of products derived from new scientific discoveries".

C. Main Activities.

1. Industrial Research and Development.

Accordingly, besides standardization, NIST has expanded its activities to support industry in the development of technology and methods in a wide range of scientific fields for improving quality, up-dating manufacturing processes, securing product reliability, performance and cost efficiency, and encouraging product commercialization. NIST renders its research and testing facilities available to other researchers for collaborative or independent work. NIST also encourages U.S. researchers to conduct proprietary work in selected Institute facilities on a cost recovery basis when equal or superior facilities are not otherwise readily available.

2. The Malcolm Baldrige National Quality Award Administration.

In 1987, still as the NBS, NIST was selected to be the managing organism of the Malcolm Baldrige National Quality Award Program, based upon its long history and experience of

---

1 NIST. 1990: 1.
2 Ibid.
helping industry to improve the quality of its products and processes, and thanks to its reputation for serving as a catalyst and as a neutral third party to facilitate the exchange of ideas and technical information.

Note: As can be observed, NIST has played an important role in the Certification and Standardization and Knowledge Dissemination elements of Dr. Shiba's model. And very recently has been incorporated to the efforts of Quality National Promotion.

D. Financing.

NIST's annual budget of about $260 M, is fully supported by the U.S. Department of Commerce. Revenues for calibration services for 1,500 clients amount $6 M approximately.

E. Organization.

NIST is organized in 4 main areas:

- The National Measurement Laboratory (NML)
- The National Engineering Laboratory (NEL)
- The National Computer and Telecommunications Laboratory (NCTL)
- The Institute for Materials Science and Engineering (IMSE)

For each research opportunity and facility offered by NIST, potential users have an appointed researcher available for the establishment of a first contact.

---

1 Reimann, Curt W. 1988: 5.

2 NIST. 1990.
FIGURE I.6.1.

NIST. ORGANIZATION CHART.

- NIST
  - IMSE
    - Non Destructive Evaluation
    - Ceramics
    - Fractures & Deform.
    - Polymers
    - Metallurgy
    - Reactors
  - NML
    - Measurement
    - Radiation Research
    - Physical-Chemistry
    - Analytical Chemistry
    - Information Systems
    - Standard Materials
    - Physical Measurement
  - NCTL
    - Systems Engineering
    - Software
    - Computers Systems
    - Systems Architect.
    - Advanced Systems
  - NEL
    - Applied Mathematics
    - Electronics & Electrical Engineering
    - Mfg. Engineering
    - Building Technology
    - Fire Research
    - Chemical Engineering
NML is in charge of metrology related activities:

- Keeps and gives maintenance to national standards
- Develops new reference standards
- Acts as a reference laboratory for over 250 M measurements
- Develops measurement methods for physical and chemical applications
- Design dosimeters for radiation measurement
- Provides information for government agencies, industry and academy.
APPENDIX I

I.7. THE DEMING STUDY GROUP OF GREATER DETROIT.
This is a group of statisticians and practitioners who meet periodically, under the guidance of Dr. W. Edwards Deming, to discuss topics that deepen knowledge about statistical tools and the philosophy of continual improvement.¹

I.8. OTHER ASSOCIATIONS AND INSTITUTIONS.
Worth to mention are other associations and institutions involved indirectly in the promotion of quality:

- The National Conference of Standards Laboratories (NCSL)
- The American Quality Institute (AQI).
- The American Quality Foundation.
- The American Supplier Institute (ASI).
- The American Management Association (AMA).
- The American Productivity Management Association.
- The Association of Productivity Specialists.
- The Brookings Institution.
- The Center for Quality and Applied Statistics at the University of Rochester.
- The George Washington University.
- The Quality and Productivity Improvement Center (QPIC) at the University of Wisconsin.
- The Britannica Training & Development Centre.
- The New England Center for Quality Management.

¹ ASQC.1990h: 13.
APPENDIX I

U.S. CONSULTING FIRMS *

* Note: Although the quality consulting business in the U.S. is vastly widespread and fragmented, with at least hundreds of firms currently active. Due to their importance, the fame of their founder, or influence in industry, some of these firms deserve a special attention:

I.9. JURAN INSTITUTE.

PROFILE.

A. Offices.

Its headquarters office is located in the Wilton Executive Campus in Wilton, CT.

The Juran Institute is a Quality Management consultant firm with a staff of approx. 40 people. All instructors are experienced people in business and industrial quality management ¹.

B. Foundation and Objectives.

Founded by Dr. Joseph M. Juran, the Institute is a profit seeking organization incorporated in 1979.

Its mission is "to provide its clients with the concepts, methods, and guidance for attaining leadership in quality."

As an organization, it aims to be recognized worldwide as the leading source of education, training and consulting in managing for quality ². As reported, Dr. Juran has future plans to transform the Institute into a non-profit organization, through the Juran Foundation.

¹ JI. 1990b: III-XI.

² JI. 1990: 19.
C. **Main Activities.**

The Juran Institute is active only in the fields of knowledge dissemination and societal learning, as far as it is not involved in any national promotion activity and conducts no standardization work.

The Institute's philosophy of service is responsiveness to client needs for practical methods, and an objective approach to each case, by developing, jointly with its clients, plans and strategies compatible with their needs and structure.\(^1\)

The Institute conducts research and development, does consulting services, offers seminars and workshops, organizes an annual conference, and prepares training and support materials for its seminars and workshops, and for sale.

**D. Financing.**

The Institute funds its activities from the fees of its services. Annual sales in 1988 were $7 M.\(^2\)

**E. Description of Main Activities.**

In the field of knowledge dissemination the Institute is active in:

1. **Research and Development.**

   The Institute conducts research for "identifying proven roads that lead to enviable results, and creating products

---

\(^1\) JI. 1990a: 7.

and services that reflect the experience of successful quality efforts\textsuperscript{1}.

2. Consulting Services.

The Institute has 750 clients accounts (including giant firms and small ones)\textsuperscript{2} and holds licenses for consulting in 14 countries\textsuperscript{3}.

The Juran Institute consulting areas \textsuperscript{4} are:

- **Quality Assessment.** Conducting evaluations against such criteria as ISO 9000 and the Malcolm Baldrige Quality Award.

- **Upper Management Counseling.** Assisting top management in the creation of a quality policy, specific corporate-level quality goals, and drafting an action plan.

- **Developing a Strategic Plan for Quality.** Structuring a plan to manage quality throughout the organization by:
  - estimating current quality costs.
  - incorporating quality goals into the strategic business plan.
  - assessing the internal culture and identifying changes to assure acceptance of total quality efforts.

\textsuperscript{1} JI. 1990a: 7.

\textsuperscript{2} Dun's Marketing Services Inc. 1988.

\textsuperscript{3} Takahashi, Takenori. 1989: 303.

\textsuperscript{4} JI. 1990a: 9.
creating a quality council of top-level managers to oversee quality activities.

- training for all functions at all levels.

■ Ongoing Support. Counseling, conducting progress reviews and advanced training.

JI's staff performs consulting work abroad by more than one third of its total service time.

3. Seminars, Courses and Workshops.

The Institute's seminars are conducted all over the U.S. and abroad. In 1988 the 66th seminar was scheduled. The Continuing Education Unit is responsible for their preparation and its certification allows participants to get unit credits from some universities and schools.

The Institute advertises its seminars and workshops as providing a complete curriculum of management, project team, work force, and technical training for organization-wide quality, and addressing to the specific needs of both service and manufacturing industries. Recent additions to the curriculum are seminars for government service managers, courses in managing business process quality and workshops for team leaders, facilitators and team members. The goal is stated to be the securing a change in managerial behavior and providing means for applying training to actual job situations.

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1 Ibid.

2 JI. 1990a: 11.
All services are based on the "Juran Trilogy" of quality process: quality planning, quality control, and quality improvement.  

TABLE I.9.1.

<table>
<thead>
<tr>
<th>JURAN INSTITUTE COURSES (1990)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COURSES:</td>
</tr>
<tr>
<td>Making Quality Happen</td>
</tr>
<tr>
<td>Management of Quality</td>
</tr>
<tr>
<td>Planning for Quality</td>
</tr>
<tr>
<td>Management of Quality Manufacturing</td>
</tr>
<tr>
<td>Quality Improvement for Manufacturing</td>
</tr>
<tr>
<td>Management of Quality Services</td>
</tr>
<tr>
<td>Quality Improvement for Services</td>
</tr>
<tr>
<td>Teaching Quality Improvement Tools</td>
</tr>
<tr>
<td>Using Quality Improvement Tools</td>
</tr>
<tr>
<td>Managing Business Process Quality</td>
</tr>
<tr>
<td>SQC Troubleshooter 1.3</td>
</tr>
</tbody>
</table>

FACILITATING COURSES:

| Juran on Quality Planning     | 5 days    | 5     |
| Juran on Quality Improvement  | 5 days    | 10    |

VIDEO PREVIEW SEMINARS:

| Juran on Quality Improvement | 1 day    | 10    |
| Juran on Quality Planning    | 1 day    | 8     |

Sources: JI. 1990e, f, g, and h.

1 JI. 1990c.

The Institute prepares and sells its own materials, which have been translated to French, German, Italian, Spanish, Portuguese, Danish, Finish, and Swedish: "Juran on Quality Improvement", "Juran on Quality Planning", and "Juran on Quality Leadership" are all trade marks for packages. The two first are made up of about 15 videocassettes, 1 Leader's Manual or Guide, 10 Workbooks, Action Guides or Synopsis Booklets, and 1 book. The third is smaller.

JI has collaborated with AT&T in the preparation of quality control software to provide its clients a tool for studying, monitoring and troubleshooting their operations. JI declares that its tapes have been field-proven by 60,000 managers in over 480 companies worldwide.

In the field of societal learning, the Institute main contribution is its three-day "IMPRO" Conference. An effort to promote learning from practical examples of quality improvement. Additionally, JI organizes Client Workshops in the U.K., India, and Singapore.

Finally, JI schedules special interest forums to focus on topics such as "Quality in Software Development", "The CEO's Role in Quality", and "Managing Quality in Health Care Organizations".
FIGURE I.9.1. THE JURAN INSTITUTE. "IMPRO" CONFERENCE
HISTORICAL GROWTH OF ATTENDANCE.

FIGURE I.9.2. THE JURAN INSTITUTE. "IMPRO" CONFERENCE.

PRACTICAL EXAMPLES PRESENTED.

Source: Ibid.
APPENDIX I

OTHER CONSULTANTS.

I.10. Dr. W. Edwards Deming ¹.

Born with the century, Dr. Deming is one of the great American leaders for quality of the postwar era. Though he remained quiet unnoticed in the U.S. from the 1930's through the 70's, in spite of his relevant role in the Japanese launching stage of industry-wide efforts for quality improvement, and that the highest Japanese Prize for Quality holds his name. Almost overnight, after the NBC TV program in June 1980, "If Japan can, Why can't we?" addressing the Japanese challenge to U.S. industrial leadership, Dr. Deming got in demand as a consultant for top U.S. firms. His book Out of the Crisis ² synthesizes his experience and teachings.

APPENDIX I

I.11. CROSBY ASSOCIATES INTERNATIONAL INC.

This is another consulting firm founded by a prestigious quality author: Philip Crosby, an advocate of the "zero defects movement" who worked at Martin Marietta, the first company to practice this philosophy, in the 1960's. Crosby claims that perfect quality is both technically possible and economically desirable ¹. One of the most popular and controversial books is Quality is Free, and more recently The Art of Getting Your Own Sweet Way and Quality Without Tears ².

The firm's sales are $3 M per year, it has 39 staff people and is based in Winter Park, FL.

Crosby Associates Intl. Inc. operates internationally as management consultant specializing in quality improvement.

¹ Crosby, Philip. 1979.
APPENDIX II

JAPANESE INSTITUTIONS

II.1. THE JAPANESE UNION OF SCIENTISTS AND ENGINEERS (JUSE) ¹

PROFILE

A. Offices.

JUSE has its headquarters in Tokyo and a branch office in Osaka. The Institute of JUSE Inc. (computation center) and JUSE Press Co. (its publishing arm) are also in Tokyo.

Staff:
- JUSE Headquarters: 83
- Institute of JUSE Inc: 147
- JUSE Press Co.: 30
- Collaborators: 260 *

* (Japanese scientists and engineers)

B. Foundation and Objectives.

The Union of Japanese Scientists and Engineers (JUSE) was established in May 1946, and in 1962 was consolidated under the jurisdiction of the Agency of Industrial Science and Technology (AIST) of the Ministry of International Trade and Industry (MITI). JUSE's main objective is the promotion of the systematic studies in science and technology to contribute for the development of culture and industry in Japan.

JUSE is a private, nonprofit, interdisciplinary, umbrella type institution supported and managed by its members.²

¹ JUSE. 1989b: 1-12.
C. Main Activities.

The Union's efforts are concentrated in the field of Soft Technology where mathematical and statistical methods can be applied to corporate management. Quality Control has been the primary subject, and great efforts have been dedicated since its origin to the development and dissemination of this technology. As a result, JUSE is widely known as the center of quality control in Japan. In particular, the Union has proved to be a driving force in areas of research and development, education and diffusion of soft technologies.

Fields of activities:

- Quality Control
- Reliability
- Design of Experiments
- Operations Research
- Marketing
- Industrial Engineering
- Sensory Analysis
- Product Liability
- Application of numerical analysis
- Other related

Approach:

1. Education and training in each of the fields above mentioned.
2. Research and Development.
3. Technical meetings.
4. National Promotion and extension services.
5. Technical Consulting.
6. Publication for knowledge dissemination.

JUSE's activities are implemented with the support and cooperation of about 2,000 persons from several academic fields, industry and governmental institutions. These people collaborate in about 200 different committees specialized in
many tasks and subjects.

D. Financing.

Most JUSE's income is derived from undertakings from member companies. No financial support is received from the Japanese government.

E. Membership.

Membership is allowed only on corporate basis, i.e. JUSE does not have individual members. As November 1989, total membership was 1,848 companies.

F. Organization:

JUSE is organized functionally in a pool and umbrella concept for several technical organizations ¹, i.e. most JUSE collaborators work in a part time basis. They are members either of industry, academy or government. Their service is available only upon JUSE's special request. The core of the Union's activities is supported by the following elements:

Board of Directors:

President, Managing Director and 7 Executive Directors.

Auditors:

Two auditors are in charge of accounting and management supervision of funds.

Advisors:

Entrusted by JUSE's President, they are selected among the people who have made outstanding contributions to the

Union's activities, or to the advancement of science and technology. Their role is to advise on important matters concerning JUSE's administration and management.

**Collaborators:**

They act as committee members and lecturers, and are appointed by the Committee of Directors and Advisors among people working in related fields of academic, industrial and governmental institutes. They integrate the technical research committees and/or the administrative committees, and serve as training course lecturers, in editing committees, as articles contributors for JUSE publications, etc.

**Councilors:**

Entrusted by the President and elected among the member companies, they serve in committees working on the selection of JUSE journals' articles, and in the Directors and Auditors Electing Committee.

**Counselors:**

Again, selected by JUSE's President among learned and experienced people, they serve as advisors on practical issues related to the Union's administration.

**Member Companies:**

Corporate firms which pay their membership fees on the consent to the objectives of JUSE.

**Affiliated Companies:**

As was mentioned before, the Union has two affiliated
companies: The Institute of JUSE Inc. in charge of computation services, and JUSE Press Co. in charge of the publication and distribution of all JUSE's printed material.

Committees:
The Union is organized in more than 200 permanent and special committees dedicated to specific fields of study, research, promotion and special projects.

Quality Circles Headquarters.
The Union also manages the QC Circle Association headquarters and its Branch Offices under the same policy of shared management and responsibility with member companies.

(See FIGURE II.1.1.)

G. Description of Main Activities.

1. Knowledge Dissemination.

a. Education and Training.

JUSE is heavily involved in Quality Management education. In 1987, the Union ran 270 courses for 33,560 participants. Table II.1.1. explains its performance:

---

1 Shiba, Shoji. 1989b: 30.
FIGURE II.1.1.

JUSE. ORGANIZATION CHART.

Election Body:
- Board of Councilors
- Member Companies

Advisory Group:
- Advisors
- Counselors
- Collaborators

SECRETARIAT

200 COMMITTEES.
- LECTURERS, RESEARCHERS, CONSULTANTS

AFFILIATED COMPANIES
- Institute of JUSE Inc. (Computation Center)
- JUSE Press Co. Ltd (Publishing)

UNION SERVICES

INDUSTRY, SOCIETY, GOVERNMENT

### TABLE II.1.1.

REGULAR TRAINING COURSES HELD DURING 1989.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Year Established</th>
<th>Length (days)</th>
<th>Frequency (times/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quality Control:</strong></td>
<td></td>
<td>L</td>
<td>F</td>
</tr>
<tr>
<td>QC Basic Course</td>
<td>1949</td>
<td>30</td>
<td>7</td>
</tr>
<tr>
<td>QC Middle Managers Course</td>
<td>1955</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>QC Top Management Course</td>
<td>1957</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>QC Introductory Course</td>
<td>1957</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>QC Executive Course</td>
<td>1962</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>QC Basic Course for Foremen</td>
<td>1967</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>QC Course for Sales Dept.</td>
<td>1968</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>QC Course for Purchasing Dept.</td>
<td>1971</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>QC Correspondence Course</td>
<td>1971 (6 months)</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>QC Circle Instructor Course</td>
<td>1972</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>QC Circle Top Management C.</td>
<td>1973</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>QC Basic Course for Group Leaders</td>
<td>1974</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>QC Introductory Course for Sales Dept. (Osaka)</td>
<td>1974</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>TQC Instructor Course</td>
<td>1976</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>QC Course for GMP* (Pharmaceutical)</td>
<td>1977</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>QC Introductory Course for GMP (Pharmaceutical)</td>
<td>1977</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>QC Circle Leader Course</td>
<td>1977</td>
<td>3</td>
<td>38</td>
</tr>
<tr>
<td>QC Circle Course for Clerical Work</td>
<td>1979</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>QC Circle Middle Managers Course</td>
<td>1980</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>QC Introductory Course for Executives and Managers</td>
<td>1981</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>QC Introductory Course for Purchasing Department</td>
<td>1983</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>QC Introductory Course for Sales Department (Tokyo)</td>
<td>1983</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>TQC Introductory Course for Service Industry</td>
<td>1984</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

*Notes: GMP: Good Manufacturing Practice.
FMBA: Failure Mode and Effect Analysis
FTA: Fault Tree Analysis.*
<table>
<thead>
<tr>
<th>Subject</th>
<th>Year Established</th>
<th>Length (days)</th>
<th>Frequency (times/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quality Control (Cont.):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introductory Course for the Seven Management Tools</td>
<td>1984</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Policy Management Seminar for TQC</td>
<td>1989</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Introductory Course on Seven Management Tools for QC in Sales Dept.</td>
<td>1989</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Introductory Course for Quality Function Deployment (QFD)</td>
<td>1989</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td><strong>Reliability:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE Basic Course</td>
<td>1960</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>RE Introductory Course</td>
<td>1965</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>RE Management Course</td>
<td>1966</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>RE Course on FMEA-FTA *</td>
<td>1976</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>RE Course on Design Review</td>
<td>1977</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>RE 6 day Course (Osaka)</td>
<td>1980</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>RE Course on Test</td>
<td>1983</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>RE Course on Failure Analysis</td>
<td>1985</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>RE Course on Checklists</td>
<td>1989</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Design of Experiments:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DE Basic Course</td>
<td>1955</td>
<td>30</td>
<td>1</td>
</tr>
<tr>
<td>DE Osaka Course</td>
<td>1962</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>DE Introductory Course</td>
<td>1963</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td><strong>Multivariate Analysis:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA Advanced Course</td>
<td>1970</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>MA Seminar (Osaka)</td>
<td>1971</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>MA Basic Course</td>
<td>1984</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td><strong>Operations Research:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corporate Strategy Managers Course</td>
<td>1962</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Corporate Strategy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Executive Course</td>
<td>1980</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>OR Introductory Course</td>
<td>1987</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Seminar for Corporate Planning Staff</td>
<td>1988</td>
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Notes:

1) Most of the courses are held in Tokyo and Osaka, but some are also held in other cities.

2) For more information on this subject refer to the Appendix Section.
b. Publications.

(1) Periodicals.

The Union publishes the following periodicals:

(a) **Engineers Journal**. Monthly, since 1948.

Features up-to-date engineering information related with quality control.

In January 1990, the 495th volume was issued.

(b) **Hinshitsu Kanri. Total Quality Control** Journal.

Monthly, since 1950. Specialized journal for managers and staff people.

In January 1990, the 41th volume was issued.

(c) **Shokuba to QC. QC Sâkuru** magazine, [The Work Place and Quality Control. QC Circle]. Monthly since 1962.

Originally with the name **Gemba to QC** [The Factory and Quality Control], and later with the name **FOC**, has been a publication specialized on quality control for foremen and workers of the work floor participating in the widely known QC Circles. This magazine is a very sui generis publication designed to be attractive and understandable by Japanese common workers, and featuring the following contents ¹:

(i) A special theme section of 3 to 4 articles written by company executives, staff and several QC Circle leaders.

¹ JUSE. 1990b: 1-88.
(ii) A section of suggestions for improving QC Circle activities.

(iii) A news section called "Tea Time" distributed in several segments within the magazine.

(iv) A section called "Sharing Experiences" with four problem solution cases written by QC Circle team members from real experiences in a very descriptive and graphical way to fit a six-page format for each case. Graphs, drawings, tables and cartoons are generously displayed. All cases follow this general pattern:
1. Introduction and case frame of reference.
2. Theme and selection rationale.
3. Objectives and criteria.
5. Improvement activities schedule.
6. Analysis of Results. Retrial and re-checking.
7. Final actions taken to prevent problem recurrence. Standardization of operations.
9. Conclusions and future improvement plans.

(v) A section called "Digressions" ["Michikusa-Michikusa"] on general informative issues.

(vi) A tutorial section explaining general purpose technical terms.

(vii) A Quality Control Basic Course Section.
(viii) A section for improving QC Circle management skills called "Try a solution and try another." ["Konna kufû, mô hito kufû"].

In January 1990, the 333th issue was published and its current circulation is about 170,000 units per month ¹. Note: Through this description, the author wants to convey his perception of social importance of this magazine: "QC Circle" has proved to be a very effective means for the dissemination of quality technical knowledge, the promotion of quality improvement and the development of problem solution skills in Japanese workers.

Due to an attractive design that facilitates learning and high quality content, its style has been copied extensively by many other Japanese technical and scientific divulging publications.

(d) Reports of Statistical Application Research. Union of Japanese Scientists and Engineers. Quarterly in English since 1951. This magazine introduces foreign parties to the current trends of applied statistics in Japanese academic and industrial fields.

(2) Books.

Between 1960 and 1985, JUSE and JSA published 660 books on quality control. In 1988, the Union published 33 books, two thirds of which were on concrete technical application examples. JUSE publishes also special best-case editions of the "QC Circle" magazine.

c. Library.

Book stock: 6,500 Japanese Books and 2,000 foreign books.
Periodicals: 180 Japanese and 160 foreign.
Texts of educational and training courses sponsored by JUSE, and of symposia proceedings, are available to the member companies and their staff.
JUSE has a bibliographic exchange program with foreign parties.

d. Technical Consulting.

The Union offers the following consulting services:

(1) On-The-Spot Instruction.

Upon request from companies, JUSE sends instructors to the work place, mainly factories and branch offices, etc.

(2) Quality Control Diagnosis.

Under the same terms, JUSE sends experts to evaluate the companies' performance on Quality Control and to recommend action guidelines.

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1 Shiba, Shoji. 1989: 30.
(3) In-company Education and Training.

Special lectures for company employees.

Note:
It is worth noting, that according with the author's interview with Director Junji Noguchi, JUSE gives only secondary importance to consulting, and that the way it is conducted is never allocating the responsibility of project's success on the consultant, but on the serviced company. Furthermore, JUSE consultants are not professionally dedicated to this activity, but are members of industry or academia 1.

2. National Promotion Activities.

A very important role of JUSE has been the promotion of public awareness on the importance of Quality Management and improvement. For this purpose, JUSE has established and sponsored the following awards:

a. Deming Prize.

Established and first awarded by JUSE's initiative in 1951, in commemoration of Dr. Edwards Deming's contributions and friendship 2. Funded by Dr. Deming's partial donation of the sales proceeds from his lectures text in Japan. Its awarding ceremony is held in November each year within the Quality Month events schedule 3.

The Prize was originally intended only for individuals and corporate enterprises with respectively outstanding contributions and performance in the Statistical Quality Control (SQC) field. Later, the former came to be called the "Deming Prize for Individuals" [or Original Prize] and the latter, the "Deming Application Prize for Corporations". To further stimulate other segments of Japanese industrial structure, the "Deming Prize for Small and Medium Enterprises" (1957), the "Deming Prize for Corporate Divisions" (1965), and the "Deming Prize for Factories" (1972) were added. Finally, the "Deming Prize for Foreign Corporations" (1984) was established in concordance with Japan's internationalization policy and JUSE's increasing international prestige.

TABLE II.1.2.

<table>
<thead>
<tr>
<th>SINCE</th>
<th>DEMING PRIZE CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951.......</td>
<td>Deming Prize for Individuals (original).</td>
</tr>
<tr>
<td>1951.......</td>
<td>Deming Application Prize for Companies.</td>
</tr>
<tr>
<td>1957.......</td>
<td>Deming Prize for Small and Medium Enterprises.</td>
</tr>
<tr>
<td>1965.......</td>
<td>Deming Prize for Corporate Divisions.</td>
</tr>
<tr>
<td>1972.......</td>
<td>Deming Prize for Factories.</td>
</tr>
<tr>
<td>1984.......</td>
<td>Deming Prize for Foreign Corporations.</td>
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</tbody>
</table>

**OTHER PRIZES**

<table>
<thead>
<tr>
<th>SINCE</th>
<th>PRIZE NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970.......</td>
<td>Japan Quality Control Medal</td>
</tr>
<tr>
<td>1970.......</td>
<td>Ishikawa Prize</td>
</tr>
<tr>
<td>1954.......</td>
<td>Nikkei Quality Control Prize *</td>
</tr>
</tbody>
</table>

Sources: Kumami, Tokisuke. 1982: 38.

* Note: Established, administered and awarded by the Japan Economics Journal [Nippon Keizai Shinbun].

Originally, the criterion for the Prize awardee selection was carried on with emphasis on the screening of papers rather than on-site inspection. However, since 1956, the latter became the primary criterion under the current double on-site inspection schedule system. Later, since 1960, the examination emphasis was expanded to include activities in a broader sense, according to the Awarding Committee's new definition of quality control (1961): "to develop, design, produce, sell, and serve the most economic and most useful products, thus providing customer satisfaction". Again in 1971, the objective of quality control was expanded:

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1 Ibid. : 4.
"to achieve corporate aim through rational repetition of Planning, Acting, Evaluating, and Taking Measures". The following TABLE II.1.3. presents the Deming Prize Awarding Committee main examination points for the contesting companies:

**TABLE II.1.3.**

<table>
<thead>
<tr>
<th>DEMING PRIZE COMMITTEE. EXAMINATION POINTS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. POLICY AND OBJECTIVES</td>
</tr>
<tr>
<td>2. MANAGEMENT. ORGANIZATION AND OPERATION</td>
</tr>
<tr>
<td>3. EDUCATION AND ITS EXTENSIONS</td>
</tr>
<tr>
<td>4. ORGANIZATION, DISSEMINATION AND USE OF INFORMATION</td>
</tr>
<tr>
<td>5. ANALYSIS AND PROBLEM SOLVING METHODOLOGIES</td>
</tr>
<tr>
<td>6. STANDARDIZATION SYSTEM</td>
</tr>
<tr>
<td>7. CONTROL SYSTEM</td>
</tr>
<tr>
<td>8. QUALITY ASSURANCE SYSTEM</td>
</tr>
<tr>
<td>9. EFFECTS</td>
</tr>
<tr>
<td>10. FUTURE PLANS.</td>
</tr>
</tbody>
</table>


The Industry-wide high esteem that the Deming Prize has held for many years is itself a very important achievement in JUSE's promotional efforts, as long as getting the prize has been a high priority goal for many Japanese companies, and certainly not a few have gotten involved in the internal promotion of QC, and later in TQC, exclusively for this
purpose. Thus, the Deming Prize stands today also as a kind of certification for Corporate Quality Excellence in the Japanese Industry.

As can be appreciated in TABLES II.1.4. and II.1.5., the Deming Prize awarding emphasis has been gradually shifted toward the service sector, i.e. it has expanded to include smaller companies, softer technologies and has moved toward internationalization.
### Historical Influence of the Deming Prize on Industry

#### Deming Prize Recipients Classified by Sector

<table>
<thead>
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<th>Recipient Industrial Sectors</th>
<th>Year</th>
<th>Date of Creation</th>
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<td>1985</td>
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160
SYMBOLS:

- Deming Prize for Large Enterprises
- Deming Prize for Small and Medium Enterprises
- Deming Prize for Corporate Divisions
- Deming Prize for Factories
- Japan QC Medal

CH: CHEMICAL INDUSTRY
PH: PHARMACEUTICAL
CE: CERAMIC
PA: PAPER
FI: FILM
GU: GUM
TE: TEXTILE
ST: STEEL
OS: OTHER METALS
EM: ELECTRICAL MACHINERY
EL: ELECTRICAL LINES
EC: ELECTRONIC AND COMMUNICATIONS
MS: MACHINE PARTS
PM: PRECISION MACHINERY
MP: MACHINES FOR PRODUCTION
AU: AUTOMOBILE
SH: SHIPBUILDING
AC: AIRCRAFT
MT: MACHINE TOOLS
OM: OTHER MANUFACTURING INDUSTRIES
CB: CONSTRUCTION
SE: SERVICE

Source: Adapted from Kogure, Masao. 1989: 27.
### TABLE II.1.4.

#### NUMBER OF DEMING PRIZE AWARDS PER CATEGORY

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<tr>
<th>YEAR</th>
<th>LARGE ENTERPRISE</th>
<th>SMALL ENTERPRISE</th>
<th>LARGE DIVISION</th>
<th>SMALL DIVISION</th>
<th>LARGE FACTORY</th>
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</tbody>
</table>

**TOTAL** | **83** | **33** | **5** | **12** | **8** | **141** |
b. The Japan Quality Control Medal.

This award was established in 1970 with the purpose of upgrading the quality improvement efforts and keeping the motivation of recipients of the Deming Application Prize. It can be awarded to recipients only 5 years or later after they were awarded the Prize.

c. The Ishikawa Prize.

The Ishikawa Prize [in commemoration of the late Ishikawa Ichirō, first Chairman of the Union] aimed to stimulate the development and successful application of new management systems and methods, completes the set of awards managed by JUSE.

d. The Quality Month.

In cooperation with the Japanese Standards Association, and other governmental agencies and associations, JUSE organizes the Quality Month every November, and the Committee formed for this purpose decides on the various events and programs, such as the schedules for the annual QC Conferences, the Public Lecture Meeting, the general theme and the conferences themes, the campaign mottos, the publicity materials, etc. During this month, the "Q" flag is seen in many factories and working places throughout the country.

a. Symposia and Conferences:

JUSE organizes many gathering events to promote knowledge, experience exchange, industry cooperation and international relations. In 1988, during the QC Conference, participants were introduced to 92 examples from industry, visited 15 plants and held on-site debates ¹. This is an example of the role of JUSE conferences in support of societal learning.

TABLE II.1.5.

<table>
<thead>
<tr>
<th>DATE OF ESTABLISHMENT</th>
<th>SYMPOSIUM NAME</th>
<th>TIMES PER YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965..................</td>
<td>Quality Control Symposium ................................</td>
<td>2</td>
</tr>
<tr>
<td>1971..................</td>
<td>Symposium on Reliability and Maintainability..........</td>
<td>1</td>
</tr>
<tr>
<td>1971..................</td>
<td>Symposium on Sensory Analysis..........................</td>
<td>1</td>
</tr>
<tr>
<td>1977..................</td>
<td>Symposium on Multivariate Analysis....................</td>
<td>1</td>
</tr>
<tr>
<td>1978..................</td>
<td>Symposium on the Seven Tools for QC..................</td>
<td>1</td>
</tr>
<tr>
<td>1980..................</td>
<td>Symposium on Product Safety...........................</td>
<td>1</td>
</tr>
<tr>
<td>1980..................</td>
<td>Symposium on Numerical Analysis in Fluid Mechanics...</td>
<td>1</td>
</tr>
<tr>
<td>1981..................</td>
<td>Symposium on Quality Control on Software Production</td>
<td>1</td>
</tr>
<tr>
<td>1983..................</td>
<td>Symposium on Quality Control of Service Industry.....</td>
<td>1</td>
</tr>
</tbody>
</table>


TABLE II.1.6.

<table>
<thead>
<tr>
<th>DATE OF ESTABLISHMENT</th>
<th>CONFERENCE NAME</th>
<th>TIMES PER YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1957</td>
<td>Quality Control Spring Conference</td>
<td>1</td>
</tr>
<tr>
<td>1963</td>
<td>Quality Control Conference for Top Management (during November, the Quality Month)</td>
<td>1</td>
</tr>
<tr>
<td>1951</td>
<td>Quality Control Conference for Managers and Staff (idem.)</td>
<td>1</td>
</tr>
<tr>
<td>1962</td>
<td>Quality Control Conference for Foremen (idem.)</td>
<td>1</td>
</tr>
<tr>
<td>1962</td>
<td>Quality Control Conference for Consumers</td>
<td>1</td>
</tr>
<tr>
<td>1971</td>
<td>All Japan QC Circle Conference</td>
<td>1</td>
</tr>
<tr>
<td>1985</td>
<td>Quality Control Conference for Service Industry</td>
<td>1</td>
</tr>
</tbody>
</table>


b. Lecture Meetings.

These meetings are held on topics related to advanced science, technology and applied management.

c. Research and Development Activities.

These activities are classified in three major types:

(1) **Research on new scientific technology with application to corporate management.**

For this purpose, special committees are organized into major subjects, and activities are carried out by JUSE's research and development budget.
(2) Commissioned research and development by government agencies or companies under a signed contract.

(3) Joint research with companies and universities on specific themes.

Study committees are formed for this purpose. Expenses and tasks are shared. Assistance of experts is solicited.

**TABLE II.1.7.**

<table>
<thead>
<tr>
<th>ESTABLISHMENT DATE</th>
<th>NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1952 ........</td>
<td>Sampling of Bulk Materials</td>
</tr>
<tr>
<td>1954 ........</td>
<td>Operations Research for Mining</td>
</tr>
<tr>
<td>1957 ........</td>
<td>Sensory Analysis</td>
</tr>
<tr>
<td>1969 ........</td>
<td>Quality Management for Top Executives and Managers</td>
</tr>
<tr>
<td>1971 ........</td>
<td>Multivariate Analysis</td>
</tr>
<tr>
<td>1974 ........</td>
<td>Reliability Data</td>
</tr>
<tr>
<td>1974 ........</td>
<td>Product Liability</td>
</tr>
<tr>
<td>1978 ........</td>
<td>Seven Management Tools for Quality Control</td>
</tr>
<tr>
<td>1979 ........</td>
<td>Flow Analysis</td>
</tr>
<tr>
<td>1985 ........</td>
<td>Numerical Methods in Geotechnical Engineering</td>
</tr>
<tr>
<td>1985 ........</td>
<td>Quality Control in Software Production.</td>
</tr>
</tbody>
</table>

Source: JUSE. Ibid.: 8.
d. Other.

JUSE is the permanent secretariat of the following societies:

- The Japanese Society for Quality Control (JSQC) (since 1971).
- The Japan Society for Simulation Technology (since 1973).
- The Japanese Association of Reliability Engineers (since 1978).
- The Japanese Chapter of the American Society of Quality Control (since 1952).
- The Quality Control Circles Association Headquarters.

e. Quality Circle Activities ¹.

(1) Objectives.

Led by the JUSE's QC Circles Headquarters, the QC Circle Association is a quasi-autonomous organization that has been a key element for the national promotion, knowledge dissemination and societal learning activities toward quality improvement in Japan.


To illustrate the pattern of the activities of a Regional Chapter of the QC Circle Association, the author used data from the Ibaragi Chapter. Also, in this chapter the author includes his observations on its 1990 Activities Planning Meeting.

The author wants to express his gratefulness to Prof. Shoji Shiba, for his kind invitation and guidance, and to the members of that chapter for their kind reception.
(2) Membership.

The QC Circle Association members, like all other active associations under JUSE's umbrella, are companies represented by their designated staff members and their Circle members. QC Circle activities are the realm of supervisors, foremen and workers, but company staffs are responsible for their promotion, and support.

(3) Organization.

The Association is organized in nine branches that correspond to the main geographic and industrial regions in Japan, every regional branch sub-divides into many regional chapters that roughly correspond to each prefecture.

(FIGURE II.1.3.)

(a) QC Circle Headquarters.¹

The Secretariat's Office is located in JUSE's headquarters office.

The President of the QC Circle Association is JUSE's President or Managing Director.

The Executive Directors are the Editor-in-Chief and the Assistant Director of the "QC Circle" (or FQC) Magazine.

Advisors are the Editorial Board members of the same magazine.

(b) Regional Branches.

¹ JUSE. 1985: 243.
Regional Branch staffing is done in a ladder-like successive upward and (later downward) displacement of executives and coordinators through increasing responsibility positions to insure smooth annual leadership transference, incremental learning, and increasing social exposure.

Regional President: A representative of the member company selected to be current year's Secretary Company.

Regional Vice President: Representative of the company selected to be next year's Secretary Company.

Honorary Advisor: Last year's President.

Executive Secretary: QC Circle Promoter or Coordinator of current year's Secretary Company.

Assistant Executive Secretary: QC Circle Promoter of next year's Secretary Company.

Secretaries: QC Circle Promoter and Leader of current year's Secretary Company.

Advisor and Assistant: Selected from the Editors Board of the Association's magazine. One advisor per region.

The same structure is replicated for each Regional Chapter for those Regional Branches with enough size.

The following TABLES II.1.3. and II.1.4. will help to give a general picture of the Association's function deployment.
FIGURE II.1.3.

NATIONAL ORGANIZATION OF THE QC CIRCLE ACTIVITIES IN JAPAN.

QC CIRCLE HEADQUARTERS

BRANCHES:

HOKKAIDO BRANCH

OKINAWA BRANCH

KANTO BRANCH

TOKAI BRANCH

KYUSHU BRANCH

HOKURIKU BRANCH

CHUGOKU-SHIKOKU BRANCH

KINKI BRANCH

REGIONAL CHAPTERS:

AOMORI

IWATE

AKITA

MIYAGI

YAMAGATA

FUKUSHIMA

TOKYO

KANAGAWA

CHIBA

IBARAGI

GUNMA

YAMANASHI

NAGANO

SAITAMA

TOCHIGI

NIIGATA

TOYAMA

FUKUI

ISHIKAWA

OKAYAMA

HIROSHIMA

YAMAGUCHI

SHIMANE

TOTTORI

SHIKOKU

OSAKA

KYOTO

SHIGA

WAKAYAMA

HYOGO

NARA
FIGURE. II.1.4.

QUALITY CIRCLE ASSOCIATION. ORGANIZATION CHART.

<table>
<thead>
<tr>
<th>Q Circle Headquarters</th>
<th>President...JUSE's Director</th>
</tr>
</thead>
<tbody>
<tr>
<td>JUSE</td>
<td>Executive Directors:</td>
</tr>
<tr>
<td></td>
<td>......&quot;X&quot; Company executive</td>
</tr>
<tr>
<td></td>
<td>......&quot;Y&quot; University professor</td>
</tr>
</tbody>
</table>

(Total number of branches: 9)

Take for example:

Eight Other Branch Offices

↓

Kantō Branch

Branch executives
Secretariat......"S" Company
President......."S" Company
Advisor.......University prof.
Secretary...."S" Company rep.

(Total number of regional chapters: ≈ 36)

take for example:

9 other regional chapters in the Kantō Branch

↓

Ibaragi Chapter

Office executives
Secretariat...."A" Company
President....,"A" Co. rep.
Advisor....University prof.
Secretary......"A" Co. rep.
Office...TQC Department

General Meeting
Secretary and Member Companies
(300 companies based in
the Ibaragi Prefecture)

↓

Advisors Committee

Secretariat ( 41 Secretary Companies)
FIGURE II.1.4. QC CIRCLE ASSOCIATION. ORGANIZATION CHART. (cont.)

Event: Official Commendations Training Meeting........"C" Company's factory staff

Organizer:

Operative Secretaries Committee (91 secretaries)

Conference Coordinators:

Spring Conference...... "D" Company's factory staff
Summer Conference...... "E" Company's factory staff
Block Conference...... "F" Company's factory staff
Fall Conference......., "G" Company's factory staff

Training Committee:

Promoters-Administrative
Staff Training Committee..."H" Co.'s factory staff
New Methods Training
 Committee................ "I" Co.'s factory staff
QC Circle Leaders
Training Meeting (I)......."J" Co.'s factory staff
QC Circle Leaders
Training Meeting (II)......"K" Co.'s factory staff
Middle Managers
Training Committee........."L" Co.'s factory staff

Other:

Representatives Interchange Committee.................."A" Company's staff
Company Visits
Interchange Committee.........."M" Company's staff
(4) Activities.

The Association endeavors in a range of activities directed to the development of a well educated and strongly motivated work-force.

(a) Main education and training courses sponsored by JUSE:

(i) QC Basic Course for Group Leaders.
(ii) QC Basic Course for Foremen.
(iii) QC Practice course for Foremen.
(iv) IE Basic Course for Foremen.
(v) QC Circle Course for Promoters.
(vi) QC Circle Top Management Course.
(vii) QC Correspondence course for Foremen.
QC Circle Seminar.

QC Circle Cruising Seminar (or "University Over the Ocean" Seminar).

A chapter's most relevant activities are:
The annual QC Circle Conference, the QC Circle Symposium (of the best Branch Offices circles), the QC Circle magazine [described above], many educational and training courses, and the preparation of educational books and booklets.

All Association's activities are oriented toward the development of skills and attitudes for work within a QC Circle as a way to achieve a high quality and motivating work performance.

TABLE II.1.8. will give a fair idea of the way coordination responsibility is distributed within a QC Circle Association's Regional Chapter. As it can be observed, in most of all tasks, responsibility is assigned to a Coordinator Company and an Assistant Company. Usually the last year's Coordinator Company is also assigned to the current year's team to guarantee smooth responsibility transference, to give advise, and to accelerate the learning process of coordination. In addition, most coordinating activities are also staffed with several Auxiliary Companies (in the range of 2 to 7 in number). TABLE II.1.9. presents the deployment of the coordination responsibility for one year. The very even distribution of responsibility among the 41 secretary companies is quite apparent.
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>COORDINATOR COMPANY</th>
<th>ASSISTANT COMPANY</th>
<th>AUXILIARY COMPANIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Representatives Interchange Meeting</td>
<td>1/1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Office Secretaries Training Course</td>
<td>1/1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Spring Conference</td>
<td>1/1</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>New Tools Training Course</td>
<td>1/1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Circle Leaders Training Course</td>
<td>1/1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Middle Managers and Department Heads Training Course</td>
<td>1/1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Summer Conference</td>
<td>1/1</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Rush Conference</td>
<td>1/1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Fall Conference</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Female QC Circle Leaders Course</td>
<td>1/1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Company Visits Interchange Meeting</td>
<td>1/1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Circle Champions Conference</td>
<td>1/1</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Official Announcements Meeting</td>
<td>1/1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>New Seven Tools Research Meeting</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texts Meeting</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secretaries Meeting</td>
<td>1/1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
TABLE II.1.9. ANALYSIS OF TABLE 11.1.8.

| TOTAL NUMBER OF PARTICIPANT COMPANIES |
| IN THE ASSOCIATION'S ACTIVITIES .......... 41 |

| TOTAL NUMBER OF PERSONS INVOLVED: |
| GENERAL ACTIVITIES ..................... 102 |
| SECTIONAL MEETINGS ..................... 9 |
| OTHER .................................. 2 |
| TOTAL ................................ 123 |

| ORGANIZATION ACTIVITIES DISTRIBUTION PER SECRETARY COMPANY: |
| COMPANIES INVOLVED IN 5 ACTIVITIES: 3 |
| 4 ACTIVITIES: 3 |
| 20 |
| 3 ACTIVITIES: 16 |
| 2 ACTIVITIES: 19 |
| 10 |
| 1 ACTIVITY : 0 |
| 1 2 3 4 5 TOTAL: 41 |

Note: 1/1 means the last year's Coordinator company was assigned to back up team activities of current year.

(a) The Year's Activities Planning Meeting of a Regional Chapter.

Following, the author will refer his observations of the second part of the 2-days meeting held in the Tsukuba-ne Public Resort facilities by the Ibaragi Chapter of the QC Circles Association to decide on its 1990 activities. The Planning Committee was integrated by the chapter's secretaries, general coordinators, managers, the advisor, and the Kantō Branch Representative. All people stayed in the same hotel for two days. Expenses were afforded by each participant's company.

All planning activities were held simultaneously in a big
conference room.

In big letters, the year's slogan and the meeting's general guidelines were displayed for all teams.

The meeting's planning activities were divided into about 10 teams. Each one with about 5 members. All work teams worked in the same room, and each one around a table where its members were discussing and preparing their plan presentation.

During the plan presentation stage, every team presented date, place, required fee, maximum number of participants, slogan, main theme, schedule, educational content, last year's problems, proposed solutions, additions, improvements, new appeals, etc. of their assigned event. General discussion of each activity. Suggestions, critics and questions were listened and considered.

**Highlights:**

(i) Top Management Course: 400 participants. 1 day schedule: 10:00-18:30 hrs. Fee: 7000 ¥.

(ii) Coordinators Seminar: 60 participants, 2 days schedule. 9 companies organized. Presentation of two case studies on How to Promote QC Circles within a company.

(iii) Spring Conference: 1,000 participants. 20 presentations. 3500 ¥. 8 companies organized.

(iv) Seven Management Tools Seminar: 60-72 participants.
(v) Leaders training Meeting. 80 participants. One session for male and one for females. 18,000 ¥. Q & A session.

(vi) Middle managers and Department Heads Seminar: 60-80 participants. Two days schedule. 20,000 ¥.

(vii) Summer Conference: 1,000 participants. 3,500 ¥.

(viii) Conference for Clerical, Sales and Service Industry. Male's and female's sessions.

(ix) Beginners Seminar: 600 participants. 3,500 ¥. Emphasis on effort to increase membership.

(x) Fall Conference: 300-400 participants. Emphasis on increasing conference educational effects. Survey results.

(xi) Plant Visits. 25th season. 70 organizer companies. 7,000 ¥.

(xii) QC Circle Champions Conference: 900 participants. 13 presentations. 3,500 ¥. Addition of attractions such as traditional chinese style singing poetry, "Questions and Advise Corner", etc.

(xiii) Advisor's comments and suggestions.

Analysis of last year's conferences. Emphasis on:

(a) Sharing experience & learning. Seeking new experiences and ways of learning. For training lecturers, to seek gaining knowledge through teaching.

(b) Increasing the learning effects. Getting to the point of practical application of knowledge.
Practice of the Japanese "sandwich type" teaching method (Homework and practice between lessons).

(c) Societal learning. Learn from and for society.

(b) Short Interviews:
Three coordinators were questioned about their perception of the importance of their activities, answered were: "I work for the Association because this is a way to give back to the community something back of what we have received", "Our suppliers and other small sub-contracting industries do not have the experience and resources our company has, therefore, we can help them to improve for their benefit and ours". "The experience of sharing knowledge with other companies member's is very enriching and stimulating".

(5). National Events that concern QC Circles:

(a). The Quality Month.
(b). The QC Annual Conference for Foremen.
(c). The QC Circle Conference.
(d). The All Japan QC Circle Conference.
(e). The National Commendation System.

(i) The QC Circle Magazine Award. For best excellent case reports.

(ii) The Nikkei Quality Control Literature Award. Workshop Section. For the best case.

(iii) The QC Circle Grand Prize. For excellent performance during three years or more. Awarded in
the All Japan QC Circle Conference.

(iv) The QC Circle Chapter Award.
FIGURE II.1.5. JUSE. NUMBER OF COURSES OFFERED EACH YEAR SINCE ITS ESTABLISHMENT.

- Quality Control.  - Multivariate Analysis.
- Design of Experiments.


Note: Data processing and graph by thesis author.
FIGURE II.1.6. JUSE. NUMBER OF COURSES OFFERED EACH YEAR SINCE ITS ESTABLISHMENT.

- Quality Control*  - Sensory Analysis.
- Industrial Engineering  - Product Liability.
- Marketing  - Other Management Techniques.

Source: Ibid.

* Note: Quality Control is included again to give a perspective of relative importance.

Data processing and graph by thesis author.
FIGURE II.1.7. JUSE. HISTORICAL GROWTH OF ALL COURSES OFFERED

Source: Ibid.

Data processing and graph by thesis author.
FIGURE II.1.8. JUSE. DISTRIBUTION OF ALL DIFFERENT COURSES OFFERED ACCORDING TO THEIR TECHNICAL FIELD. (1989).

Source: Ibid.

Symbols:
QC: Quality Control. SA: Sensory Analysis.
DE: Design of Experiments.
MA: Multivariate Analysis.
IE: Industrial Engineering.
MR: Marketing.

Data processing and graph by thesis author.
FIGURE II.1.9. JUSE. HISTORIC GROWTH OF ANNUAL DAYS OF TRAINING.

Source: Ibid.

Data processing and graph by thesis author.
FIGURE II.1.10. JUSE. CUMULATIVE GROWTH OF TRAINING DAYS.

Source: Ibid.

Data processing and graph by thesis author.
FIGURE II.1.11. JUSE. DISTRIBUTION OF TRAINING DAYS PER TECHNICAL FIELD (1989).

Symbols:
QC: Quality Control
REL: Reliability
DE: Design of Experiments
OR: Operations Research
IE: Industrial Engineering
MA: Multivariate Analysis
MR: Marketing
SA: Sensory Analysis
PL: Product Liability
O: Other Management Techniques.

Source: Ibid.
Data processing and graph by thesis author.
FIGURE II.1.12. JUSE. HISTORIC GROWTH ANNUAL DAYS OF TRAINING IN MAIN TECHNICAL DISCIPLINES.

Source: Ibid.

Data processing and graph by thesis author.


Data processing and graph by thesis author.
### TABLE II.1.10

**EVERY FIVE YEARS COMPARISON OF THE TOP PARTICIPANT INDUSTRIES IN THE QC TOP MANAGEMENT COURSE**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>RANKING BY ATTENDANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>CHEM STEEL TRANSP MACHINE ELECTR</td>
</tr>
<tr>
<td>1965</td>
<td>TRANS RUBBER CHEM STEEL ELECTR</td>
</tr>
<tr>
<td>1970</td>
<td>TRANS MACHINE RUBBER CERAM ELECTR</td>
</tr>
<tr>
<td>1975</td>
<td>TRANS MISCEL MACHINE CHEM STEEL</td>
</tr>
<tr>
<td>1980</td>
<td>CONSTR TRANS CHEM ELECTR MISCEL</td>
</tr>
<tr>
<td>1985</td>
<td>ELECTR TRANS CONSTR MACHINE SERVICE</td>
</tr>
<tr>
<td>(1987)</td>
<td>CHEM TRANS CONSTR ELECTR TRADE</td>
</tr>
</tbody>
</table>

*CHEM: CHEMICAL INDUSTRY*  
*TRANS: TRANSPORTATION EQUIP.*  
*CERAM: CERAMIC INDUSTRY*  
*MACHIN: MACHINERY*  
*ELECTR: ELECTRIC & ELECTRONIC*  
*CONSTR: CONSTRUCTION*  
*MISCEL: MISCELLANEOUS*


Giving weight to each year's figures the author obtained the following overall participation ranking:

### TABLE II.1.11.

**OVERALL PARTICIPATION RANKING (1960-1987) TOP 11 ATTENDANT INDUSTRIES**

| 1. | TRANSPORT |
| 2. | CHEMISTRY |
| 3. | CONSTRUCTION |
| 4. | ELECTRIC AND ELECTRONIC |
| 5. | MACHINERY |
| 6. | MISCELLANEOUS |
| 7. | RUBBER |
| 8. | STEEL |
| 9. | CERAMIC |
| 10. | TRADE |
| 11. | SERVICE |
FIGURE II.1.14. JUSE. QC MIDDLE MANAGERS ANNUAL ATTENDANCE.


Remarks: Note the effect of the Nixon Shock (Yen appreciation in 1965) and the first Oil Shock (1974) on managers attendance, and the later boom reaction.
FIGURE II.1.15. JUSE. QC BASIC COURSE ANNUAL ATTENDANCE.

FIGURE II.1.16. JUSE. CUMULATIVE ATTENDANCE TO MAIN QUALITY CONTROL COURSES.


Data processing and graph by thesis author.
QUALITY CIRCLE PROMOTION ACTIVITIES.

FIGURE II.1.17. QUALITY CIRCLE CONFERENCE. HISTORICAL GROWTH.

Sources: JUSE. 1988b: 8.
Kumami, Tokisuke. 1882: 48.

Data processing and graph by thesis author.
FIGURE 71.1.18. QC CIRCLE CONFERENCE ATTENDANCE. HISTORICAL GROWTH.


Data processing and graph by thesis author.
FIGURE II.1.19. QC CIRCLES NUMBER. HISTORICAL GROWTH.


Data processing and graph by thesis author.
FIGURE II.1.20. QC CIRCLE MEMBERSHIP. HISTORICAL GROWTH.

Sources: JUSE. 1988b: 8.
Kumami, Tokisuke. 1882: 48.

Data processing and graph by thesis author.
FIGURE II.1.21. QC CIRCLE AVERAGE SIZE (NUMBER OF MEMBERS PER CIRCLE). HISTORICAL EVOLUTION.

Source: Cusumano, Michael. 1989: 337.

Graph by thesis author.
FIGURE II.1.22. QC CIRCLE CONFERENCE.
NUMBER OF REPORTS PRESENTED.
HISTORICAL GROWTH.


Data processing and graph by thesis author.
FIGURE II.1.23. QC CIRCLE CONFERENCES AND REPORTS PRESENTED. CUMULATIVE NUMBERS. HISTORICAL GROWTH.

Source: Ibid.

Data processing and graph by thesis author.


Note: Sample size n = 578.
FIGURE II.1.25. QC CIRCLES. DISTRIBUTION BY INDUSTRY (1988).

Source: Ibid.

Note: n= 313.

Source: Ibid.

Note: n= 313.
FIGURE II.1.27. DISTRIBUTION OF SMALL GROUP ACTIVITIES BY TYPE IN JAPANESE INDUSTRY (1988).

Source: Ibid.

Notes: n = 313.
JK Groups: Self steering groups (Jishū Kanri).
ZD Teams: Zero Defects Groups.
FIGURE II.1.28.

TYPES OF SMALL GROUP ACTIVITIES IN JAPAN

RELATIONSHIP WITH DAILY WORK

PROJECT TEAMS
WORK COUNCILS

BIG

ZD GROUPS
QC CIRCLES
JK TEAMS
SEMI-AUTONOMOUS
WORK GROUPS

ACROSS WORK

I

II

WITHIN WORK

III

IV

HOBBY ASSOCIATIONS
CULTURE CIRCLES
TEAM-LEADER ASSOCIATIONS

SISTER SYSTEM
GUARDIAN SYSTEM
STUDY GROUPS

SMALL

FIGURE II.1.29. QC CIRCLES IN ITS TQC CONTEXT. (1988).


Source: Ibid.
FIGURE II.1.31. QC CIRCLE MEMBERSHIP DISTRIBUTION BY REGIONAL BRANCHES. (1982).

Source: Kumami, Tokisuke. 1982: 46.
FIGURE II.1.32. DEGREE OF QC CIRCLE RECOGNITION WITHIN JAPANESE INDUSTRY. (1988).

FIGURE II.1.33. DEGREE OF IMPLEMENTATION OF QC CIRCLES BY SECTOR IN JAPANESE INDUSTRY. (1988).

Economic Sectors:

(1) Finance & Insurance.  (5) Sale & Retail.
(3) Transport & Telecommunications.  (7) Service.
(4) Manufacturing.

Source: Ibid.
FIGURE II.1.34. DISTRIBUTION OF QC CIRCLES BY SECTOR IN JAPANESE INDUSTRY. (1988).

Economic Sectors:

(1) Manufacturing  (5) Service.
(2) Wholesale & Retail.  (6) Construction.
(3) Transport & Telecommunications.  (7) Mining & Heat Supply.
(4) Finance & Insurance.

Source: Ibid.
FIGURE II.1.35. QC CIRCLES POSITION WITHIN QUALITY IMPROVEMENT POLICY IN JAPANESE INDUSTRY. DISTRIBUTION BY SECTOR. (1988).

Source: Ibid.
FIGURE II.1.36. ACTIVE SEGMENT IN QC CIRCLE PROMOTION IN JAPANESE INDUSTRY (1988).


APPENDIX II

II.2. THE JAPANESE STANDARDS ASSOCIATION. (JSA).¹

PROFILE

A. Offices.

Its main office is located in Tokyo and 7 branch offices are located in other important cities.

Staff: Approximately 160 persons

B. Foundation and Objectives.

JSA was founded under government authorization in 1945 as a non-profit organization with the main objective to propagate Industrial Standardization and Quality Control to the Industry in general.

Standardization Philosophy ²:

Standardization is an activity that developed naturally since man became sedentary, and has advanced gradually along with technological progress. Its first radical improvement occurred during the Industrial Revolution.

The main objectives of standardization activities are:

Standardization Objectives:

Communication: Language, Symbols and Drawings.
Security, Health, Environment: People and Wealth Security
Commonness and Substitutability: Systems Harmonization.
Fitness for Intended Use: Quality and Performance of Products.
Product Simplification: Quality Delimitation.


The process of standardization must begin taking current scientific knowledge, technology and economic situation as a basis on which to achieve the objective stated in any category of the previous list. Then the subject and the condition to be standardized must be selected:

**Standardization Subjects and Conditions:**

<table>
<thead>
<tr>
<th>Subject:</th>
<th>Condition:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matter:</td>
<td>Size, Dimensions</td>
</tr>
<tr>
<td></td>
<td>Structure</td>
</tr>
<tr>
<td></td>
<td>Fitness</td>
</tr>
<tr>
<td></td>
<td>Lot size</td>
</tr>
<tr>
<td></td>
<td>Composition</td>
</tr>
<tr>
<td></td>
<td>Physical Properties</td>
</tr>
<tr>
<td></td>
<td>Chemical Properties</td>
</tr>
<tr>
<td></td>
<td>Appearance</td>
</tr>
<tr>
<td></td>
<td>Function</td>
</tr>
<tr>
<td></td>
<td>Performance</td>
</tr>
<tr>
<td></td>
<td>Resistance</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
</tr>
<tr>
<td></td>
<td>Durability</td>
</tr>
<tr>
<td></td>
<td>Safety</td>
</tr>
<tr>
<td>Fact:</td>
<td>Technology</td>
</tr>
<tr>
<td></td>
<td>Manufacturing Regulations</td>
</tr>
<tr>
<td>Related Item:</td>
<td>Weight Unit</td>
</tr>
<tr>
<td></td>
<td>Vocabulary</td>
</tr>
<tr>
<td></td>
<td>Language</td>
</tr>
<tr>
<td></td>
<td>Signs</td>
</tr>
<tr>
<td></td>
<td>Harmony</td>
</tr>
<tr>
<td></td>
<td>System</td>
</tr>
<tr>
<td></td>
<td>Series</td>
</tr>
<tr>
<td></td>
<td>Value</td>
</tr>
<tr>
<td></td>
<td>Condition</td>
</tr>
<tr>
<td></td>
<td>Class</td>
</tr>
</tbody>
</table>
Must also consider the desired reach of the standard:

International
Regional
National
Sectorial
or
In-company

In designing a standard, people and processes (Production, Distribution and Users), as well as information derived from practice must be considered. Beyond the purpose of stabilizing current performance, the standardization process must go further, improving the standard by using the information derived from its early application as feedback for adjusting the standard to satisfy the objective. Thus, standardization has both a stabilizing function and an improvement function. Standardization has a close relation with the processes of Simplification and Specialization. The former is the process of reduction of materials, parts and products by the elimination of unnecessary variety in shape, size, or type. The latter is the process of adoption of limits for product variety in order to improve the productivity of the production process and the logistic operations.

As Standardization progresses, by applying Simplification principles to the design stage and Specialization principles to several operations, a suitable rationalization of production, distribution and consumption processes can be achieved, quality can be improved, cost can be reduced, delivery time can be shortened, and customer service can be
improved.

C. **Main Activities.**

1. Publication and distribution of the Japanese Industrial Standards (JIS), English edition of JIS, and related monthly magazines, books, standardization practice materials and tools, and other.


3. Education and consultation on Standardization and Quality Control.

4. Study and research of Standardization and various engineering techniques.

5. Cooperation in International Standardization Activities.

6. Other.

D. **Funding.**

Total: 1.1 billion yen.

E. **Financing:**

JSA derives its income from the sales of JIS and related publications, and from other sources such as lecture fees, conferences, technical materials, instruments, and software. Government subsidies, are also present, although they are not a significant amount in a percentage basis\(^1\). Subsidies usually are awarded to JSA by MITI with each new project assigned. (See Table II.2.1.)

---

\(^1\) Flores, Antonio R.. 1990b: 3.
TABLE II.2.1.

<table>
<thead>
<tr>
<th>FISCAL YEAR</th>
<th>ANNUAL INCOME *</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>4.3</td>
</tr>
<tr>
<td>1989</td>
<td>4.7</td>
</tr>
</tbody>
</table>

* billion yen

E. Membership.

Membership is on company basis and there is no individual membership. The number of supporting members was 8,615 companies in 1987 FY.\(^2\)

Members are entitled to the following services:

- **Monthly magazines**, free of charge.
- Discount on fee of lectures.
- Admittance to the "National Meeting of Standardization" and the "National Meeting of Quality Control and Standardization", free of charge.
- Discount on the price of foreign standards.
- Discount on the price of newly established or revised JIS standards issued monthly under JIS subscription system.

In 1987 FY, the total number of standards from foreign countries available in the JSA libraries was 873,259 and classified in 215 kinds. The total number of readers at JSA

---


\(^2\) JSA. 1988.
libraries amounted 10,076. 

Subscribing members: 

By advance payment of subscriptions, members automatically receive copies of newly established or revised JIS issued every month. The total number of JIS subscribing companies in 1987 FY was 4,704. 

F. Organization. 

The Japanese Standards Association is organized functionally in its Head Office and also has Branch Offices in 7 main cities as was described above. Libraries are available in the Head Office and in other 2 major offices:

FIGURE II.2.1.

JSA ORGANIZATION CHART: Headquarters.

President

Auditors  Councilors  Advisors

Board of Directors

Director-General Executive Directors

---

1 Ibid.

2 Ibid.
FIGURE II.2.1. JSA ORGANIZATION CHART: Headquarters (cont.)

Head Office

General Affairs Department

- General Affairs Division
  - Accounting Division

- Standards Eng. & Inspection Dept.
  - Standardization Division
  - Accredited Factory Inspection Div.

Publication Department

- JIS Publication Division
  - Publication Div.

Business Department

- Sales Division

- Overseas Standards Center

- Library

- Management Engineering Center *

- International Standardization Cooperation Center

- Information Technology Research and Standardization Center

(* QC Circle activities)

Branch Offices
FIGURE II.2.2. ORGANIZATION CHART. Branch Offices.

Source: JSA. 1989a: 3.
G. Main Activities Description.

Knowledge Dissemination.

1. Publication and Distribution Activities:


All JIS prepared by the Agency of Industrial Science and Technology (AIST) of the Ministry of Trade and Industry (MITI) are sent to JSA to be printed. Thus, printing and distribution of JIS are carried out by JSA. Subscription is the main distribution channel.

The total number of JIS standards (March 1987) were 8,223.¹ During 1987 FY, 597 new standards were issued.

The cumulative number of JIS copies printed amounted 1.2 million².

b. Sectional Sets of JIS.

(1) JSA has prepared 18 JIS Sectional Subsets on the following subjects:

Civil Engineering and Architecture.........(A)
Mechanical Engineering.................(B)
Electronic and Electrical Engineering.....(C)
Automotive engineering...................(D)
Railway Engineering......................(E)
Shipbuilding..............................(F)
Ferrous materials and Metallurgy........(G)
Non-Ferrous Metals and Metallurgy.......(H)
Chemical Engineering.....................(K)
Textile Engineering.......................(L)
Mining...................................(M)
Pulp and Paper................................(P)
Ceramics...................................(R)
Domestic Wares............................(S)
Medical Equipment and Safety Appliances..(T)

¹ Ibid.
² Ibid.
(2) JIS special compilations:

- Environmental pollution
- Architecture
- Concrete products
- Safety control
- Clothing
- Radioactivity
- Energy saving
- Noise, vibration
- Packaging
- Industrial robots, etc.

c. English Translation of JIS.

Carried out by JSA to facilitate JIS overseas services, particularly in international trade.

Topics are:

- Civil Engineering and Architecture
- Mechanical Engineering
- Electronic and Electrical Engineering
- Ferrous Materials
- Non-Ferrous Materials
- Chemical Engineering

In 1987, 740 JIS were translated into English. 5,700 standards (69.3% of total JIS have been translated)\(^1\).

d. Magazines and Journals.

(1) **Standardization and Quality Control**, monthly magazine.

Contains explanatory articles and essays on Standardization and Quality Control.

(2) **Standardization**, monthly journal.

Up-dated information on the activities of national and

\(^1\) Ibid.
international standardization committees, on the
development, establishment, revision and abolition of JIS,
on lists of new and draft JIS, and on new foreign standards
from the International Standardization Office (ISO).

**e. Lists of Standards.**

(1) Catalogue of JIS

13,000 copies per year are currently issued.

(2) JIS Yearbook (an English edition containing an annual
report on standardization activities in Japan, and the up-
dated JIS list).

1,700 JIS Yearbook copies are issued annually.

**f. Books.**

(1) JIS Handbooks (Japanese edition):

On 49 different subjects, including one volume on
Quality Control and one on Standardization.

(2) JIS Handbooks (English edition):

On 16 different issues, including Quality Control.

(3) Glossary of JIS Technical Terms:

Comprises 60,000 JIS industrial technical terms.

(4) How to Use JIS Series (in Japanese):

21 volumes on different subjects.

Includes "Key points for..." different techniques,
"Choice and use of..." different materials and tools,

---

1 Ibid.

2 Ibid.

(5) Books on Standardization (in Japanese):

- The Industrial Standardization Law.
- Guideline to Become a JIS Marked Factory.
- In-company Standardization.
- 12 Key Points on In-company Standardization.
- Benefits of Standards.
- Standardization of Directions.
- Handbook of In-company Standardization.
- Science and technology introductory books.

(6) Books on Quality Control and related subjects

(in Japanese):

- Quality Control Handbook.

Contents:

Terminology symbols:

(Quality Control/ Reliability/ Instrumentation/
Operations Research/ Production management/
Mathematical symbols.)

Sampling Inspection:

(General rules/ Single sampling inspection plans/
Sequential sampling inspection plans/ Sampling
inspection procedures and tables by attributes with
severity adjustment.)

Control Chart:

(Control Chart method/ Median Control Chart/ x Control
Chart.

**Statistical methods:**

(Presentation and reduction of data/ Significance tests/ Interval estimation of population mean/ Interval estimation of population variance/ et.)

**Miscellaneous:**

(Rules for rounding off numerical values/ General rules for permissible tolerance/ Preferred numbers/ Random sampling methods/ General rules for sensory test/ Tables/ Index).

- **Introduction to TQC** (several volumes)
  
  (a) Guide to TQC.
  
  (b) Guidebooks for top managers, staff, QC leaders.
  
  (c) Practices of TQC, etc...

- **Textbooks for Quality Control lectures.**
  
  (a) Control chart methods.
  
  (b) Sampling inspection.
  
  (c) Statistical methods.

- Statistical tables and formulas with computer applications.

- Other.

**English editions:**

- **Guide to Quality Control and In-company Standardization.**

- **Dr. Taguchi Genichi's books:**
  
  (a) **On-line Quality Control During Production.**
  
  (b) **Introduction to Off-line Quality Control.**
Managerial Engineering.


20 volumes on several subjects:


g. Standard Reference Materials (in Japanese and some in English):

(1) The Book of JIS Color Standards.

(2) Book of names of JIS Standard Colors.

(3) Color Fastness Tests of Textiles, 11 volumes.

(4) Slide Scales, 2 kinds.

(5) QC Temple.


(7) Icosahedron Dices.

From the JSA Books Sale List \(^1\) the author classified them by technical field and application * to give a perspective of the wide coverage of JSA activities for knowledge dissemination. (See TABLE II.2.2.)

\(^1\) JSA. 1989d: 1-63.
<table>
<thead>
<tr>
<th>NUMBER</th>
<th>ITEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>53</td>
<td>JIS Handbooks</td>
</tr>
<tr>
<td>41</td>
<td>Talk about Science and Technology Series books</td>
</tr>
<tr>
<td>37</td>
<td>JIS Special Edition 1989 Series books</td>
</tr>
<tr>
<td>35</td>
<td>JIS How to Use Series books</td>
</tr>
<tr>
<td>34</td>
<td>Educational materials and instruments:</td>
</tr>
<tr>
<td></td>
<td>- JIS Slide Scales (2),</td>
</tr>
<tr>
<td></td>
<td>- IS Conversion Scale (1),</td>
</tr>
<tr>
<td></td>
<td>- Font software floppy disks (2),</td>
</tr>
<tr>
<td></td>
<td>- Statistics Simulator Kit (1),</td>
</tr>
<tr>
<td></td>
<td>- Statistics and Quality Control Experiments Kit (1),</td>
</tr>
<tr>
<td></td>
<td>- QC templet (1),</td>
</tr>
<tr>
<td></td>
<td>- 3 Icosahedron Dice Kit (1),</td>
</tr>
<tr>
<td></td>
<td>- Standard Color Table (1),</td>
</tr>
<tr>
<td></td>
<td>- Book of JIS Color Names (1),</td>
</tr>
<tr>
<td></td>
<td>- JIS Color Fastness Tests for textiles (5),</td>
</tr>
<tr>
<td></td>
<td>- JIS Mark Authorization Labeling Plates (3),</td>
</tr>
<tr>
<td></td>
<td>- Industrial Standardization Best Plant Award Labeling Plates (1)</td>
</tr>
<tr>
<td></td>
<td>- Formatted paper: for use in QC related activities (6), for Control Charts data collection and processing (6), for Design of Experiments (2)</td>
</tr>
<tr>
<td>32</td>
<td>Books on Foreign Standards</td>
</tr>
<tr>
<td>27</td>
<td>Educational Videos:</td>
</tr>
<tr>
<td></td>
<td>- Middle Managers QC Practice Course (12 vol.)</td>
</tr>
<tr>
<td></td>
<td>- QC Seminar Basic Courses (11 vol.)</td>
</tr>
<tr>
<td></td>
<td>- QC Circle &quot;Activation Series&quot; (4 vol.)</td>
</tr>
<tr>
<td>27</td>
<td>Books on Quality Engineering (7) and Quality Engineering Series (20)</td>
</tr>
<tr>
<td>18</td>
<td>JIS Standards Sets (196 files, 8,489 standards)</td>
</tr>
<tr>
<td>18</td>
<td>JIS Standards Sets (English edition: 114 files, 4,005 standards)</td>
</tr>
<tr>
<td>17</td>
<td>Books on Information Technology and Software Development</td>
</tr>
<tr>
<td>16</td>
<td>JIS Handbook English editions</td>
</tr>
<tr>
<td>16</td>
<td>&quot;Introduction to QC&quot; books</td>
</tr>
<tr>
<td>15</td>
<td>Books on International and In-company Standardization</td>
</tr>
<tr>
<td>14</td>
<td>Books on Open Systems Interconnection (OSI)</td>
</tr>
<tr>
<td>12</td>
<td>Books on the Introduction and Promotion of TQC</td>
</tr>
<tr>
<td>10</td>
<td>QC Introductory Course books</td>
</tr>
<tr>
<td>9</td>
<td>&quot;How to Become a JIS Marked Factory&quot; books</td>
</tr>
</tbody>
</table>
9 On statistical methods
9 On Industrial Engineering (IE), Value Engineering (VE), Operations Research (OR), PERT, Managerial Engineering
8 Dictionaries of technical terms
8 Books on Measurement Series
7 Books on SI [International System of Units]
6 Books on new product development
6 JIS Standards Special Edition for Technical High Schools (5) and for Commerce High Schools (1)
5 General handbooks
5 Data books
4 Books on the practice of TQC
4 On Information Processing
4 On Reliability
4 On Problem Solving Methods
3 On Design of Experiments (DE)
3 On Pollution Measurement
2 On Inspection and Sampling
2 On Statistical Tables
2 On measurement Control
2 On Economic Analysis
1 JIS Yearbook
1 QC Textbook (in English)
1 Book on Sensory Analysis
1 Book on Equipment Maintenance
1 ANOVA software prepared by Drs. Taguchi and Yokoyama

| Total:556 | Different books, videos and educational Materials on issues related with QC and standardization. |

* Note: * (Although many books are not edited by JSA, its contribution to knowledge dissemination is apparent.)

2. Education and Consultation Activities.

a. Long Term Seminars on Quality Control and Standardization:

Since 1953, JSA has offered them for the purpose of training quality control staff. They are conducted 13 times each year, with a total length of 150 hours in 8 cities.
b. Short- and Medium-Term lectures on Quality and In-company standardization.

To train staff from various fields in industry, research, government and education. The following courses have been offered for several consecutive years:

- Basic Quality Control Course .......(12 hours)
- Managers Quality Control Course.....(45 hours)
- TQC Top Management Course.........(36 hours)
- Foremen's Quality Control Course....(36 hours)
- In-company Standardization Course...(18 hours)
- Introduction to Reliability Course..(24 hours)
- Design of Experiments Course........(138 hours)

For a more detailed description. (See TABLE II.2.3).
## TABLE II.2.3.

<table>
<thead>
<tr>
<th>Type of courses</th>
<th>Type</th>
<th>Total No. of Sessions.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>For workers and new employees:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2-days QC Intr. Course</td>
<td>8</td>
</tr>
<tr>
<td>1</td>
<td>6-days QC Seminar</td>
<td>6</td>
</tr>
<tr>
<td>1</td>
<td>6-days QC Intr. Course</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>1-2-days QC Circle Course</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total:</strong> 4</td>
<td><strong>Total:</strong> 23</td>
<td></td>
</tr>
<tr>
<td><strong>For Foremen and Group Leaders:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>QC Course</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Problem Solving Courses</td>
<td>7</td>
</tr>
<tr>
<td>1</td>
<td>6-day QC Intro. Course</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>TQC Course</td>
<td>6</td>
</tr>
<tr>
<td>1</td>
<td>TQC Problem Solving Sem.</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Sampling Inspection Course</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>In-company Standardization C.</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>Motivation Training Course</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total:</strong> 10</td>
<td><strong>Total:</strong> 28</td>
<td></td>
</tr>
<tr>
<td><strong>For QC Promoters and Trainers:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>QC and Standardization Seminar</td>
<td>8</td>
</tr>
<tr>
<td>1</td>
<td>Design of Experiments Course</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>Reliability Introductory Course</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>Leaders and Staff TQC Promotion C.</td>
<td>1</td>
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<tr>
<td>1</td>
<td>QC Circle Leaders Course</td>
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<tr>
<td>1</td>
<td>QC Practice Course</td>
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</tr>
<tr>
<td>1</td>
<td>TQC Practice Course</td>
<td>6</td>
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<tr>
<td>1</td>
<td>In-company Standardization Course</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total:</strong> 10</td>
<td><strong>Total:</strong> 29</td>
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</tr>
<tr>
<td><strong>For Staff:</strong></td>
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<td>1</td>
<td>QC Introductory Course</td>
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<td>1</td>
<td>QC Advanced Course</td>
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<tr>
<td>1</td>
<td>Reliability Introductory Course</td>
<td>3</td>
</tr>
<tr>
<td>Course/Program</td>
<td>Quantity</td>
<td></td>
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<tr>
<td>-------------------------------------------------------------------------------</td>
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<tr>
<td>Problem Solving Course</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Quality Engineering Seminar</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Policy Management Course</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Quality Improvement Course</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Function Deployment Course</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>New Statistical Methods Course</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>New Products Development Course</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>In-company Standards Design Course</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Concrete and Raw Concrete QC C.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>New Seven Tools Application Course</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Equipment Maintenance Course</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Basic QC C. for Tech. and Staff</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Sensory Analysis Introductory C.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Measurement Control for QC</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PC application Statistical Analysis for QC Course</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Inference and DE Improvement C.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Data Analysis and DE Course</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>QC Introductory Course for Adm.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>QC Course for Administrators</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>QC Course for Sales Dept.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>QC Course for Service</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>TQC Intr. Seminar for Service Ind.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>TQC Problem Solving Seminar</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>TQC Intr. Course for Non-Mfg.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Total: 29</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total: 48</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**For JIS Mark holding companies in-company promoters:**

<table>
<thead>
<tr>
<th>Course/Program</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>QC and Standardization Courses (Specialization, Short-term and Regular)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total: 3</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total: 24</strong></td>
<td></td>
</tr>
</tbody>
</table>

**For Middle Managers:**

<table>
<thead>
<tr>
<th>Course/Program</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courses and seminars with names similar to those for supervisors</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total: 13</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total: 17</strong></td>
<td></td>
</tr>
</tbody>
</table>

**For Top Managers:**

<table>
<thead>
<tr>
<th>Course/Program</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>TQC for Management Sections Sem.</td>
<td>1</td>
</tr>
<tr>
<td>TQC for Top Management Seminar</td>
<td>2</td>
</tr>
<tr>
<td>Function Deployment Course</td>
<td>1</td>
</tr>
<tr>
<td>Policy Management Course</td>
<td>1</td>
</tr>
<tr>
<td>QC C. for Mgrs. and Controllers</td>
<td>1</td>
</tr>
<tr>
<td>TQC for Managers Course</td>
<td>2</td>
</tr>
<tr>
<td>Special JIS Course for Admin.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total: 1</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total: 7</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total: 9</strong></td>
<td></td>
</tr>
</tbody>
</table>
Total number of Educational QC Courses : 76
Total number of Sessions : 178

Source of data: JSA. 1989d.
Note: Otherwise specified, all course are under a one day schedule.

From the JSA's 1990 Courses Program the author found:

**TABLE II.2.4.**

<table>
<thead>
<tr>
<th>Objective Segment</th>
<th>Educational Objectives</th>
<th>Available Courses</th>
<th>Courses per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>New employees and general staff</td>
<td>TQC and QC concepts and tools, QC Circle essentials.</td>
<td>4</td>
<td>23</td>
</tr>
<tr>
<td>Supervisors and foremen</td>
<td>QC and TQC concepts and tools. Problem solving. Motivation.</td>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>QC coordinators and QC Education Promoters</td>
<td>QC and In-company standardization. Reliability. TQC promotion. Problem solving. QC Circle leadership.</td>
<td>10</td>
<td>29</td>
</tr>
<tr>
<td>Staff</td>
<td>QC Introduction. QC and Standardization. Design of Experiments. Problem Solving.</td>
<td>29</td>
<td>48</td>
</tr>
<tr>
<td>Administrative</td>
<td>QC introduction.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>QC for administrative staff.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>QC for Service.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TQC problem solving.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JIS Marked factories QC Promoters</td>
<td>Promotion of industrial standardization and QC.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle Managers</td>
<td>QC for managers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quality Assurance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Policy Deployment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quality Improvement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quality Engineering.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>New Product Development.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TQC for managers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TQC Promotion for managers, staff, and leaders.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>QC for administrative staff.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>QC for Service.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Function Deployment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top Managers</td>
<td>TQC for top managers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Policy Management.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Function Deployment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>QC for top managers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>JIS system.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>7</td>
<td>9</td>
</tr>
</tbody>
</table>

Total: 76 178

Notes: Emphasis on the intermediate hierarchical levels of company organization is apparent. i.e. JSA training efforts are concentrated on those organizational strata where technical work is done.

Distribution of All Training Courses by Region

<table>
<thead>
<tr>
<th>Office</th>
<th>Number of Sessions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headquarters</td>
<td>90 (32)</td>
<td></td>
</tr>
<tr>
<td>Sapporo</td>
<td>21 ( 7)</td>
<td></td>
</tr>
<tr>
<td>Tôkoku</td>
<td>39 (14)</td>
<td></td>
</tr>
<tr>
<td>Nagoya</td>
<td>31 (11)</td>
<td></td>
</tr>
<tr>
<td>Kansai</td>
<td>40 (14)</td>
<td></td>
</tr>
<tr>
<td>Hiroshima</td>
<td>24 ( 8)</td>
<td></td>
</tr>
<tr>
<td>Shikoku</td>
<td>16 ( 6)</td>
<td></td>
</tr>
<tr>
<td>Fukuoka</td>
<td>24 ( 8)</td>
<td></td>
</tr>
</tbody>
</table>

Total: 285


A fair distribution of the training activities over the Branch offices can be appreciated.

The total number of trainees during 1987 FY concerning Management Engineering was 15,082, and concerning the Seminar on Standardization was 4,400 ¹. In 1987, JSA 250 courses were catered to some 15,000 participants ².

c. Technical Consultation:

JSA offers technical consultation services to executives and staff members of companies that wish to obtain governmental license for the use of the JIS Mark for designated products. JSA offers management and control techniques consulting services to the Japanese industry in the fields of consultation for:

- TQC introduction and promotion
- Problem solution on new product and new technology

¹ JSA. 1988.
development.

- Defective product reduction and improvement activities.
- Small group activities and mannerism.
- In-company seminars and conferences.
- Design, organization and practice of In-company training programs.
- Technology robustness and quality assurance.
- Other.

Top rank lecturers, most of them either researchers or university professors, are on charge of this activities:

- Drs. Taguchi (JSA), Kondō (Kyoto Univ), Sugimoto (Director, Daiwa Seiko), Karatsu (Tōkai Univ.), Asaka (Tokyo Univ.), Makabe (Tokyo Institute of Tech.), Isobe (Management Research Center Inc.), etc.


d. Consulting for JIS Mark overseas factories applicants:

For overseas companies that want to hold JIS Mark, JSA offers consulting services.

e. Explanatory meetings on JIS Mark System:

JSA holds explanatory meetings to guide application for the license of the JIS Mark.

f. Lecture on JIS Standards:

Since 1945, JSA has held short-term lectures on JIS Mark System in Tokyo and other main cities. The lectures deal with the contents and application of new and revised JIS standards widely used in industry.
g. Training Course for the staff in charge of In-company Industrial Standardization and Quality Control Promotion Activities.

To appoint a staff member responsible for the promotion of industrial standardization and quality control activities is a compulsory requirement for JIS Mark holding industries. This course was approved by the Ministry of International Trade and Industry (MITI).

3. National Promotion Activities.

a. Promotion of JIS Mark use:

JSA carries out, in cooperation with MITI's AIST, promotion campaigns to make a wider appreciation of the JIS Mark among people. These campaigns are mainly through printing and distributing posters and pamphlets to central and main local government offices, JSA 7 Branch Offices, and consumer associations. Also, a list of JIS marked products is issue monthly in the Standardization Journal.

b. Promotion of the Standardization Journal:

JSA promotes its journal as an information channel about the current state of newly established or revised JIS publications, and of current news about JIS marking System such as public notice and newly designated commodities for JIS marking.

c. The National Conference on Standardization:

Every year since 1958, the National Conference on Standardization has been held with its 3 days schedule:

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Awarding the JSA Prize for Literature on Standardization, a special lecture, debate meetings, presentation of studies, and/or experiences on standardization are conducted as part of the conference. In the last years, the participants number amounts to approximately 1,500. At the same time, Local Meetings are held by the Branch Offices in each region.

d. The **Quality Month** activities:

In 1960 JSA designated the month of November as "Quality Month, since then and every year, JSA conducts a nationwide campaign in collaboration with the Japanese Union of Scientists and Engineers (JUSE) and the Japan Chamber of Commerce (JCC). Its purpose is to bring the problems of quality to public attention. This is done by means of posters, catch phrases, "Q" flags (Q in red letters on white cloth to match the national banner colors), pamphlets, etc., as well as through lecture meetings in all principal districts throughout the country. The Quality Month has proved to be a very effective vehicle to promote nationally awareness of quality improvement importance and benefits.

e. Participation in the Movement for "Industrial Standardization Promotion Month" :

JSA participates in preparing and distributing printed slogans, pamphlets and posters about this event. It was instituted under the auspices of several governmental organizations and every October several activities are
carried out all over Japan to promote the development and propagation of industrial standardization.

f. National Meeting of Quality Control and Standardization (Q-S Conference):

Since 1967, this meeting has been held every year for 3 consecutive days in spring for the promotion of industrial rationalization. During the first two days, case presentation and discussions sessions are held based on 4 main sub-themes. On the final day, during the Plenary meeting all lectures and discussions are related to the main theme. The current number of participants amounts 2,000 approximately. The World Standards Day celebration events (October 14) are also held during this organization. See FIGURE II.2.3.

The series of conferences and symposia organized by JSA, as well as those organized by JUSE, have contributed greatly to boost the process of societal learning in Japanese Industry.
FIGURE II.2.3. JSA. ATTENDANCE TO THE Q-S AND THE STANDARDIZATION CONFERENCES. HISTORICAL EVOLUTION.

Source: Kumami, Tokisuke. 1982: 44.
4. Study and Research Activities:

a. Control Systems Committee (COSCO):

Formed in 1950. Its purpose is to study techniques and applications of quality control and related fields. This activities result in the following contributions:

- JIS drafts related to Quality Control
- Guidebooks on QC applications
- Manuals on Design of Experiments and product specifications
- Papers on various topics, mathematic tables and Control Chart theories.

The committee presents its studies on a monthly meeting.

b. Quality Control Research Group (QCRG):

Since its formation in 1963, QCRG has carried out comprehensive studies on Quality Control. The results of its activities are compiled in the form of handbooks:

- Quality Evaluation Systems
- Off-line and On-line Quality Control
- Applications of Design of Experiments
- Application of the Taguchi SN ratio to measurement technology.

The results of this committee's activities are also presented once every month.

c. Research and Study for Standardization:

Research activities are focused on:

- Experimental research on standardization of the New Tolerance Methods.
- The modern significance of standardization technology.
- Promotion of the harmonization between the JIS and the international standards.

JSA works in cooperation with several agencies of the Ministry of International Trade and Industry (MITI), such as
the National Research Laboratory for Metrology (NRLM), located in Tsukuba City, near Tokyo, which is responsible for the development and standardization of all physical measurement technologies, except for those of electrical and magnetic character under the responsibility of the Electrical Technology Laboratory (ETL).

d. The Secretariat and the National Committee:

As part of its international activities, JSA undertakes the ISO/TC 164 (International Standards Organization's 164 Technical Committee) Secretariat, the ISO/IEC (International Electro-technical Commission) JTC1/SC 23 (23th Sub-committee), and organizes the National Committees for ISO/TC3, /TC3, /TC10, /TC12, /TC37, /TC69, /TC125, TC/145 and /TC176. Also organizes the ISO/WG (Working Group). Recently, JSA's work is has particularly required an enlargement in order to harmonize the JIS System with the international standards in compliance with GATT's Standards Code.

e. Preparation of Draft JIS:

JSA participates actively in the preparation of draft JIS, in the fields of control techniques, Quality Control, Production Control, etc.

f. Information Technology:

To standardize information technology, JSA set up the "Information Technology Research and Standardization Center" in 1985, and is carrying out research on:

- Computer Network Protocols
- Computer systems interfaces

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5. International Activities:

JSA participates actively in the Cooperation Found for International Standardization Promotion (Established in 1973). In the pacific Standards Congress (PASC, established in 1972 to reflect the opinions of the pacific area countries on the International Standards Organization [ISO] and the International Electro-technical Commission [IEC]). JSA has an office in Geneva inside the JETRO Geneva Office to maintain close contacts with ISO, IEC and other European organizations.

In cooperation with the Japan International Cooperation Agency (JICA), JSA offers three Group Training Courses for participants of the developing countries:

- Standardization and Quality Control Course
- Certification System Course
- Industrial Standardization and Quality Control (Senior Seminar).

In 1987 FY, the JICA Training Course was attended by 35 participants, and the cumulative number was 421.

---

1 Ibid.
APPENDIX III
MEXICAN INSTITUTIONS

III.1. THE MEXICAN INSTITUTE OF QUALITY CONTROL
(IMECCA)

[INSTITUTO MEXICANO DE CONTROL DE CALIDAD, A.C.]

PROFILE

A. Offices.

Its Headquarter is located in Mexico City and two branch offices in Monterrey and Guadalajara, the second and third industrial cities of the country. Administrative staff is 30 persons.

B. Foundation and Objectives.

IMECCA is one of the oldest Mexican organizations still active in the promotion of quality. It was founded in 1973 by Francisco Gonzalez Prado and Agapito Gonzalez, respective current General Director and President, as a non-profit civil association. Prior to founding the Institute, both had been active in the quality professional field. The first conducted a research study at Stanford, U.S. on quality systems, and had established an industrial consulting firm called "Gonzalez Prado y Asociados, S.C.", (currently annexed to all IMECCA's offices in the country), and the second, formerly a member of ANMECC ¹, had worked for a GE

¹ AF. 1990c:1.
subsidiary firm in Mexico under the indirect authority of Dr. Armand Feigenbaum.

The Institute was created to satisfy the need for a training and promoting organization in the field of quality. Its mission is to promote quality improvement in Mexican industry.\(^1\)

The author visited IMECCA's headquarters in Mexico City in January 1990, and could observe the level of frugality at which administrative operations are conducted. The author also perceived a high level of involvement in Mexican industry actual state of needs in the quality field, including medium and small size firms, and the interest the Institute's staff showed in allowing enough time and information to this research's interview.

IMECCA's staff activities are oriented with emphasis to knowledge dissemination and societal learning in the middle level of its members' organizations. Flexibility, simplicity, and emphasis on practical applications are the Institute's priorities.

C. **Financing.**

IMECCA funds its activities from membership, courses, seminars, and conference fees. Course fees range between $50 to $200 per participant. Congress fees are $360.

Revenues share is: Courses fees: 80 %
Membership fees 20 %

\(^1\) Ibid.
Note: Conference fees set only to cover operation expenses.

D. Organization.

Figure III.1.1.

*NOTE: The Organization Chart was not provided to the author, this chart is offered only for the purpose of illustration.
E. Membership.

Two kinds are currently active: corporate (about 500 companies, among them, 100 are large corporations \(^1\)) and individual membership (200 persons) \(^2\).

Main membership benefits are:

- Newsletters.
- Institute's magazine subscription.
- Bi-monthly workshops.
- Courses and congresses discounted fees.

F. Main Activities.

IMECCA has assimilated both experience and technical knowledge from very varied sources and from all the main philosophical currents of quality in the world \(^3\). Always trying to adapt ideas, methodologies and techniques to the Mexican environment. For example, IMECCA has adapted Japanese style Quality Circles to the Mexican character. The Institute has worked for the implementation of Quality Circle concept and activities both at top management level (calling this effort "Managerial Quality Circles") and at middle management and workshop level (calling them "Operative Quality Circles") for which the Institute educates the course participants in a preparatory behavioral and leadership platform integrated by two courses: "Personal Relations at Home" and "Personal Relations in the Work

\(^1\) IMECCA. 1989a.

\(^2\) Interview.

\(^3\) Interview.
Place". Only after, IMECCA conducts training in the use of 10 basic problem-solving tools (included are the 7 Japanese basic tools plus "Data Collection Methods", "The Modern Concept of Control" and "Results Presentation"). IMECCA believes that the current evolutionary stage of Quality Circles in Mexico does not allow for a self-management style of Quality Circles as is happening in Japan. They believe that a strong and very active manager's and supervisor's guidance is necessary. Therefore Quality Circle training and practice
The Institute stresses the importance of learning beyond knowledge and conducts training aimed to achieve both skill and attitude change.

Knowledge Dissemination.

1. Courses.

Basic courses are conducted by the Institute's staff, and for advanced courses an external consultant or expert is invited is invited, frequently from abroad. Courses offered in 1990 are listed in TABLE III.1.1.

Other courses not listed in 1990 Courses Schedule and traditionally offered are listed in TABLE III.1.2. IMECCA's proprietary quality systems called "Dynamic Management" and "Integral Quality Circles" are the basis for its educational activities.
2. Periodicals.

The Institute publishes:

a. Sistemas de Calidad magazine bi-monthly, featuring issues in the national and international quality field and translating articles from world-wide quality experts with the main purpose to update readers and to promote the Institute's activities at a national level.

b. Informative Newsletter, updating members about the institute's national and international activities.

c. The Institute's Congress Transactions.

3. In-company training and consulting.

The Institute offers services for management assistance (over 70 % of these services are to top managers). However, due to the demand for the Institute's educational and training services,IMECCA does not concentrate in this segment of activities.

Upon company's request,IMECCA conducts follow-up-in-company sessions after the company's personnel and instructors' training period has been completed, to assess the progress of implementation and to offer advice to the company's staff. Many companies are so mature, as was stated, that they do not need nor ask for the monitoring sessions. Therefore, frequency, intensity and length of this activities varies with each case.IMECCA also promotes the exchange of experiences among its members.
<table>
<thead>
<tr>
<th>COURSE</th>
<th>SCHEDULE</th>
<th>TIMES/Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPC FOR INSPECTORS</td>
<td>30 Hr</td>
<td>10/Yr</td>
</tr>
<tr>
<td>SPC IN PRODUCTION (LEVEL I)</td>
<td>45 Hr</td>
<td>9</td>
</tr>
<tr>
<td>SPC IN PRODUCTION (LEVEL II)</td>
<td>45 Hr</td>
<td>5</td>
</tr>
<tr>
<td>COMPUTERIZED SPC</td>
<td>16 Hr</td>
<td>3</td>
</tr>
<tr>
<td>SPC AND TECHNOLOGY FOR RUBBER AND ELASTOMERS</td>
<td>45 Hr</td>
<td>2</td>
</tr>
<tr>
<td>SAMPLING INSPECTION TECHNIQUES</td>
<td>30 Hr</td>
<td>2</td>
</tr>
<tr>
<td>QC FOR PRODUCTION SUPERVISORS AND FOREMEN</td>
<td>35 Hr</td>
<td>3</td>
</tr>
<tr>
<td>QC IN ADMINISTRATIVE OFFICES</td>
<td>30 Hr</td>
<td>2</td>
</tr>
<tr>
<td>QC IN FOOD INDUSTRY</td>
<td>45 Hr</td>
<td>4</td>
</tr>
<tr>
<td>QUALITY OF EDIBLES</td>
<td>15 Hr</td>
<td>4</td>
</tr>
<tr>
<td>QUALITY IN HEAT TREATMENTS</td>
<td>24 Hr</td>
<td>4</td>
</tr>
<tr>
<td>QUALITY ENGINEERING</td>
<td>24 Hr</td>
<td>3</td>
</tr>
<tr>
<td>QUALITY AUDITS</td>
<td>20 Hr</td>
<td>2</td>
</tr>
<tr>
<td>QUALITY AUDITS. INTERNATIONAL COURSE.</td>
<td>16 Hr</td>
<td>1</td>
</tr>
<tr>
<td>QUALITY ASSURANCE</td>
<td>16 Hr</td>
<td>2</td>
</tr>
<tr>
<td>TAGUCHI METHOD</td>
<td>40 Hr</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL QUALITY MANAGEMENT FOR TOP MANAGERS</td>
<td>8 Hr</td>
<td>4</td>
</tr>
<tr>
<td>QC FUNCTION MANAGEMENT</td>
<td>24 Hr</td>
<td>3</td>
</tr>
<tr>
<td>QUALITY COSTS MANAGEMENT</td>
<td>16 Hr</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL QUALITY MANAGEMENT</td>
<td>24 Hr</td>
<td>4</td>
</tr>
<tr>
<td>QC CIRCLES INSTRUCTORS COURSE</td>
<td>40 Hr</td>
<td>8</td>
</tr>
</tbody>
</table>
### TABLE III.1.1. IMECCA. COURSES (cont.)

<table>
<thead>
<tr>
<th>COURSE</th>
<th>SCHEDULE</th>
<th>TIMES/Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>LATIN AMERICAN COURSE FOR QC SUPERVISORS</td>
<td>200 Hr</td>
<td>1</td>
</tr>
<tr>
<td>INTERNATIONAL COURSE FOR QC SPECIALISTS</td>
<td>440 Hr</td>
<td>1</td>
</tr>
<tr>
<td>TECHNOLOGY AND QUALITY FOR RUBBER AND ELASTOMERS</td>
<td>15 Hr</td>
<td>2</td>
</tr>
<tr>
<td>SENSORY ANALYSIS</td>
<td>24 Hr</td>
<td>3</td>
</tr>
<tr>
<td>DESIGN OF EXPERIMENTS</td>
<td>40 Hr</td>
<td>3</td>
</tr>
<tr>
<td>INTRODUCTION TO RELIABILITY</td>
<td>20 Hr</td>
<td>3</td>
</tr>
<tr>
<td>RELIABILITY PROGRESS AND ACCELERATED SERVICE LIFE EVALUATION</td>
<td>40 Hr</td>
<td>2</td>
</tr>
<tr>
<td>MAINTAINABILITY AND AVAILABILITY ENGINEERING APPLICATIONS</td>
<td>16 Hr</td>
<td>2</td>
</tr>
<tr>
<td>METROLOGY (LEVEL I)</td>
<td>30 Hr</td>
<td>5</td>
</tr>
<tr>
<td>METROLOGY (LEVEL II)</td>
<td>30 Hr</td>
<td>3</td>
</tr>
<tr>
<td>NDE BY VISUAL TESTS</td>
<td>10 Hr</td>
<td>3</td>
</tr>
<tr>
<td>NDE BY PENETRATING LIQUIDS (LEVELS I,II)</td>
<td>12 Hr</td>
<td>3</td>
</tr>
<tr>
<td>NDE BY MAGNETIC PARTICLES</td>
<td>20 Hr</td>
<td>2</td>
</tr>
<tr>
<td>NDE BY ULTRASONIC DEVICES</td>
<td>40 Hr</td>
<td>2</td>
</tr>
<tr>
<td>NDE BY EDDY CURRENTS</td>
<td>80 Hr</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total number of courses offered:** 36  
**Total number of training hours offered:** 3957 Hrs.  
**Cities involved:** 6

**SOURCE:** IMECCA. 1990a: 1-8.

**NOTES:**  
QC: QUALITY CONTROL  
NDE: NON-DESTRUCTIVE EVALUATION

252
<table>
<thead>
<tr>
<th>IMECCA. OTHER COURSES OFFERED</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION TO INSTRUMENTAL ANALYSIS</td>
</tr>
<tr>
<td>QC IN TEXTILE INDUSTRY</td>
</tr>
<tr>
<td>QC IN GRAPHICS INDUSTRY</td>
</tr>
<tr>
<td>QC FOR VENDORS AND VENDEES</td>
</tr>
<tr>
<td>STATISTICAL APPLICATIONS TO INDUSTRY</td>
</tr>
<tr>
<td>TESTS ENGINEERING AND RELIABILITY</td>
</tr>
<tr>
<td>DESIGN AND ANALYSIS OF QUALITY SYSTEMS</td>
</tr>
<tr>
<td>GMP PROGRAM ORGANIZATION</td>
</tr>
<tr>
<td>GMP</td>
</tr>
<tr>
<td>MAINTAINABILITY ENGINEERING</td>
</tr>
<tr>
<td>QC CIRCLES FOR TOP MANAGERS</td>
</tr>
<tr>
<td>QC FOR EXPORTS</td>
</tr>
<tr>
<td>QC CIRCLES ORGANIZATION AND OPERATION</td>
</tr>
<tr>
<td>DEFECTS IN STEEL</td>
</tr>
</tbody>
</table>

**Total Other Courses: 14**

**NOTE:** GMP - GOOD MANUFACTURING PRACTICES

Societal Learning

2. Congresses.

a. Quality Control Annual Congress.

Since 1973 IMECCA has sponsored this event. Works presented are both from nationals and foreigners.
The 17th Annual Congress \(^1\) was organized as described in TABLES III.1.3. and III.1.4.
As was declared during the research interview, during these congresses, IMECCA has advocated the formation of local quality promotion organizations, and has cooperated in training several of them (e.g. the Aguascalientes Industrial Association).

b. Since 1982, and in parallel with the Annual Congress, IMECCA holds the National Convention of Quality Circles. In 1989, \(15\) corporate members presented practical experiences.
See TABLE III.1.5.
For this year, IMECCA's staff expect to double participation. 95 % of all presentations are supervisor-workers circles cases. The rest is about managerial circles. Two were about circle activities in the field of education. The purpose of holding each congress and convention in a different city within the country has been to carry and to spread the seed of the importance of quality all over the country. Social exchange is also promoted within the congress to stimulate experience exchange and integration.

\(^1\) IMECCA. 1989b: 1-4.
The deterioration of Mexico's Economy since the late 1970's and its crisis in the early 1980's was a negative factor in all quality promotion activities (as quality was not perceived as a critical strategic element in business). IMECCA was not an exception, participation to its courses and congresses suffered a severe reduction. However, the recent decision to open the country to international trade has triggered a new interest in corporate's personnel training, re-evaluating it as a profitable investment rather than an expenditure, as was the old concept.

c. The Latin American Quality Congress. Bi-annual. Jointly sponsored and organized with several Latin American quality associations since 1972. IMECCA has hosted this event three times.
<table>
<thead>
<tr>
<th>FIELD</th>
<th>WORKS PRESENTED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nationality: N: Mexico F: Foreign →</strong></td>
<td></td>
</tr>
<tr>
<td>QUALITY AND PRODUCTIVITY IMPROVEMENT</td>
<td>N 4 5</td>
</tr>
<tr>
<td>TOTAL QUALITY AND PRODUCTIVITY</td>
<td>3 4 7</td>
</tr>
<tr>
<td>INTERNATIONAL QUALITY AND PRODUCTIVITY COMPETITIVENESS IMPROVEMENT</td>
<td>- 3 3</td>
</tr>
<tr>
<td>JUST IN TIME</td>
<td>- 1 1</td>
</tr>
<tr>
<td>QUALITY AND FLEXIBLE MANUFACTURING SYSTEMS</td>
<td>1 - 1</td>
</tr>
<tr>
<td>QUALITY AND &quot;TIME COMPRESSION&quot;</td>
<td>1 - 1</td>
</tr>
<tr>
<td>QUALITY AND TOTAL PRODUCTIVE MAINTENANCE</td>
<td>1 - 1</td>
</tr>
<tr>
<td>TOTAL QUALITY MANAGEMENT</td>
<td>5 4 9</td>
</tr>
<tr>
<td>MANAGERIAL TOOLS FOR QUALITY</td>
<td>2 4 6</td>
</tr>
<tr>
<td>QFD. THE JAPANESE APPROACH</td>
<td>1 - 1</td>
</tr>
<tr>
<td>QUALITY ENGINEERING</td>
<td>1 - 1</td>
</tr>
<tr>
<td>QUALITY IN SERVICE INDUSTRY</td>
<td>2 - 2</td>
</tr>
<tr>
<td>QUALITY IN PUBLIC SECTOR</td>
<td>- 1 1</td>
</tr>
<tr>
<td>TOTAL QUALITY AND HIGH TECH EQUIPMENT MANAGEMENT</td>
<td>2 1 3</td>
</tr>
<tr>
<td>UNIONS ROLE IN QUALITY AND PRODUCTIVITY IMPROVEMENT</td>
<td>1 3 4</td>
</tr>
<tr>
<td>NON-DESTRUCTIVE TESTS</td>
<td>- 1 1</td>
</tr>
<tr>
<td>SENSORY ANALYSIS</td>
<td>1 - 1</td>
</tr>
<tr>
<td>PROPOSAL FOR THE FORMATION OF THE MEXICAN ACADEMY FOR QUALITY</td>
<td>1 - 1</td>
</tr>
</tbody>
</table>

Note: QFD.– Quality Function Deployment.
<table>
<thead>
<tr>
<th>MEXICAN WORKS PRESENTED</th>
<th>23</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOREIGN WORKS PRESENTED</td>
<td>26</td>
</tr>
<tr>
<td>TOTAL OF WORKS PRESENTED</td>
<td>49</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FOREIGN CONTRIBUTION BY COUNTRIES:</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.A.</td>
</tr>
<tr>
<td>ARGENTINA</td>
</tr>
<tr>
<td>INDIA</td>
</tr>
<tr>
<td>CANADA</td>
</tr>
<tr>
<td>BRAZIL</td>
</tr>
<tr>
<td>FRANCE</td>
</tr>
<tr>
<td>INDONESIA</td>
</tr>
<tr>
<td>JAPAN</td>
</tr>
<tr>
<td>MALAYSIA</td>
</tr>
<tr>
<td>PHILIPPINES</td>
</tr>
<tr>
<td>U.S.S.R.</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>IMECCA. NATIONAL QUALITY CIRCLES ANNUAL CONFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUALITY CIRCLES PRESENTATIONS</td>
</tr>
</tbody>
</table>

Note: 6 cases were presented by AHMSA
Foreign Relations.

d. IMECCA has been a positive factor in the promotion of quality in Latin America, and particularly in the region's efforts to implement quality circle activities. As an example, the author was referred Colombia's First Quality Circles Contest, 4 years ago, where the three winning circles had been trained by IMECCA ¹. Other countries where IMECCA has served are Panama, Venezuela (training personnel both there and in Mexico), Argentina (with the "Instituto Argentino de Control de Calidad" (IACC)), Chile (for a short period), Costa Rica (very extensively), Nicaragua (not very successfully), Honduras, El Salvador and Guatemala. The Institute is member of the Latin American Organization for Quality (OLAC).

IMECCA keeps relations with quality associations of the America. Europe, and Asia. With countries such as U.S., Spain ,France, Norway, U.S.S.R., India, Japan, etc., attending and sometimes presenting works in their respective quality congresses. IMECCA's President is Vice-president of International Relations of the Asia-Pacific Quality Control Organization (APQCO), and eventually participates in JUSE's conferences. The Institute's General Director is a member of the World Confederation of Productivity Science.

These activities have been an important means for experience exchange and for expanding the range of societal learning

¹ Interview.
beyond national borders.

3. Certification.

IMECCA offers certification of several degrees of education in quality to individuals completing a determined curriculum of courses at the Institute within a specified time.
APPENDIX III

III.2. THE QUALITY CENTERS OF

THE MONTERREY INSTITUTE OF TECHNOLOGY

(CC-ITESM)

[INSTITUTO TECNOLOGICO DE ESTUDIOS SUPERIORES DE MONTERREY]

PROFILE

A. Offices.

The Quality Centers are located in the Institute headquarters, (located in Monterrey, a northern city located 200 miles to the south of the Laredo Texan border with the U.S.) and in other selected 9 campuses of the system covering most of the nation's geography.

B. Foundation and Objectives.

ITESM is a private non-profit educational organization established by a business conglomerate in 1943. Its is composed of 26 university campuses located in 25 cities throughout the country, with 1,100 full-time professors, 2,000 part-time professors, 40,000 students, and 23 graduate programs. 28,000 professionals have received education from this institute ¹.

The origins of the Quality Centers can be traced back to 1979 when the decision to make the Extension Department of the Division of Administration and Social Sciences a Center specialized in the study of quality was taken. Later, a study conducted in 1983 in the Monterrey Campus on modern

quality philosophies defined the future path to be followed. The first two of the Quality Centers were founded in 1984 in the Monterrey campus and in the Queretaro campus \(^1\). Currently, there are 10 Centers \(^2\).

The mission of the Quality Centers is:

"Research, design, experimentation and dissemination of Company Wide Quality Control (CWQC), especially adapted to the realities of Mexico, focused on the growth of the competitive capability of Mexican companies, through the involvement and development of professors and graduate students, as well as corporate managers."\(^3\)

**C. Main Activities.**

The Quality Centers' main activities are in the following fields:

1. Research
2. Academic and Industrial Education and Training
3. Consulting

\(^1\) ITESM. 1990: 1.

\(^2\) ITESM. 1990: 1.

\(^3\) ITESM. 1989a.
D. Financing.

ITESM is sponsored by an association of trustees named "Higher Education and Research" [Enseñanza e Investigación Superior A.C.]. Other 9 similar associations give their support to other campuses of the system.¹

The Quality Center funds its activities from the fees of courses, seminars, conferences, and related services to industry.

E. Membership.

There is no membership. Some companies make special short or long term contracts with the Quality Center for educational and/or consulting services. Other are eventually requiring their services.

F. Organization.

The Quality Centers are organized under the supervision of the Division of Graduate Studies and Research of each one of 10 campuses.

Each Quality Center has assigned a pool of 10 professors, 18 research assistants and 4 administrative employees in the case of its biggest unit, the Monterrey Center ², and in the case of other Centers the number is smaller. Additionally, the Centers are supported by a pool of 65 professors, 72 research assistants and 42 administrative staff assigned to the different technology centers.

¹ ITESM. 1989b: 25.
² ITESM. 1989a.
FIGURE III.2.1.

ITESM. QUALITY CENTERS. ORGANIZATION CHART

ITESM

BOARD OF TRUSTEES
BOARD OF GOVERNORS

PRESIDENT
ITESM SYSTEM

4 VICE-PRESIDENTS:
- ACADEMIC AFFAIRS
- STUDENT AFFAIRS
- ADMINISTRATIVE & FIN.
- PR AND DEVELOPMENT

PRESIDENT MONTERREY CAMPUS
PRESIDENT E.GARZA S. CAMPUS
PRESIDENT NORTH CAMPUS
PRESIDENT CENTRAL ZONE
PRESIDENT SOUTHERN ZONE

26 UNIVERSITY CAMPUSES

FOR EACH OF 10 CAMPUSES:

PRESIDENT OF CAMPUS

SERVICE SUPPORT DEPTS.

6 ACADEMIC DIVISIONS

DIVISION OF GRADUATE RESEARCH

5 GRADUATE PROGRAMS
6 RESEARCH CENTERS

THE QUALITY CENTER
### F. Description of Main Activities.

#### TABLE III.2.1.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>MAJOR EVENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>QUALITY CENTER SEED IDEAS</td>
</tr>
<tr>
<td>1980</td>
<td>DR. ICHIRO MIYAUCHI (JUSE) VISIT AND LECTURE ON JAPANESE QUALITY WIDE QUALITY CONTROL (CWQC). QUALITY CENTER OPERATIVE MODEL.</td>
</tr>
<tr>
<td>1982</td>
<td>MEXICO'S ECONOMIC CRISIS TEMPORARILY PARALYZES EXTENSION EDUCATION PROGRAMS.</td>
</tr>
<tr>
<td>1983</td>
<td>FORD–ITESM PROGRAM SIGNED TO TRAIN DOMESTIC FORD SUPPLIERS IN STATISTICAL PROCESS CONTROL TEXT PREPARATION AND STAFF'S TRAINING. EXPERIMENTATION WITH TEACHING LEARNING–SYSTEMS</td>
</tr>
<tr>
<td>1984</td>
<td>THE MONTERREY AND QUERETARO QUALITY CENTERS ARE ESTABLISHED. QUALITY CONTROL PHILOSOPHIES AND APPLIED STATISTICS ARE INCLUDED IN NORMAL UNDERGRADUATE AND GRADUATE CURRICULA. QUALITY CRITERIA FOR ACADEMIC PERFORMANCE ARE REINFORCED. ITESM PRESIDENT'S FORMULATION OF A TOTAL QUALITY CONTROL MODEL.</td>
</tr>
<tr>
<td>Year</td>
<td>Event</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>1985</td>
<td>THIRD ENCOUNTER JAPAN-MEXICO ON QC CIRCLES.</td>
</tr>
<tr>
<td></td>
<td>BRAZILIAN QUALITY EXPERT VISITS ITESM. EXPERIENCE EXCHANGE AND SEARCH</td>
</tr>
<tr>
<td></td>
<td>FOR A LATIN AMERICAN MODEL OF QUALITY CONTROL: IMPLEMENTATION OF SPC</td>
</tr>
<tr>
<td></td>
<td>AND IMPROVEMENT PROJECTS IN THE CONTEXT OF DR. JURAN'S PHILOSOPHY.</td>
</tr>
<tr>
<td>1986</td>
<td>DEMAND FOR SERVICES SURGES. ITESM EXPANDS ITS SERVICES TO INDUSTRIAL</td>
</tr>
<tr>
<td></td>
<td>SECTORS AND CLIENTS BEYOND THE FORD-ITESM PROGRAM SCOPE.</td>
</tr>
<tr>
<td>1987</td>
<td>DESIGN OF EXPERIMENTS EDUCATIONAL AND CONSULTING PROGRAM IS STARTED.</td>
</tr>
<tr>
<td></td>
<td>RELIABILITY AND QUALITY ASSURANCE ARE INCORPORATED. QUALITY</td>
</tr>
<tr>
<td></td>
<td>FUNCTION DEPLOYMENT PROGRAM BEGINS.</td>
</tr>
<tr>
<td></td>
<td>THE ASSUMPTION THAT TOP MANAGEMENT WAS COMMITTED WITH QUALITY AND</td>
</tr>
<tr>
<td></td>
<td>LACK OF PRACTICAL EXPERIENCE CAUSED SOME FAILURES</td>
</tr>
<tr>
<td></td>
<td>GRADUATE STUDENTS START SERVICE AT THE QUALITY CENTERS.</td>
</tr>
<tr>
<td>1988</td>
<td>TOP MANAGEMENT PROGRAMS ARE STRENGTHENED. DR. MYRON TRIBUS VISIT.</td>
</tr>
<tr>
<td></td>
<td>THE QUALITY CENTER ACADEMIC PROGRAMS AUDIT BY DR. GEORGE BOX.</td>
</tr>
<tr>
<td></td>
<td>THE CERTIFICATE PROGRAM IN APPLIED STATISTICS IS LAUNCHED.</td>
</tr>
<tr>
<td></td>
<td>DR. TAGUCHI'S VISIT. EXPERIMENTAL COMPARATIVE STUDY ON DESIGN OF</td>
</tr>
<tr>
<td></td>
<td>EXPERIMENTS METHODOLOGIES (DE).</td>
</tr>
<tr>
<td>1989</td>
<td>DISSEMINATION OF ADVANCED MANUFACTURING TECHNOLOGIES: FMS, CIM, CAD/</td>
</tr>
<tr>
<td></td>
<td>CAM, QUALITY-RELIABILITY MODELS.</td>
</tr>
<tr>
<td></td>
<td>INTEGRATED SERVICES FOR COMPANIES: THE QUALITY CENTERS, THE</td>
</tr>
<tr>
<td></td>
<td>MANUFACTURING SYSTEMS CENTER, AND THE INTEGRATED MANUFACTURING</td>
</tr>
<tr>
<td></td>
<td>LABORATORY.</td>
</tr>
<tr>
<td></td>
<td>DEVELOPMENT OF RELATIONSHIPS WITH STATE-OWNED INDUSTRIES AND SERVICE</td>
</tr>
<tr>
<td></td>
<td>ORGANIZATIONS.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>1989</th>
<th>(cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DEVELOPMENT OF SOCIAL MODELS. SUPPORT FOR NATIONAL QUALITY PROMOTION ORGANIZATIONS, PROFESSIONAL AND STUDENT ASSOCIATIONS.</td>
</tr>
<tr>
<td></td>
<td>ESTABLISHMENT OF REGIONAL PROGRAMS FOR SMALL BUSINESSES.</td>
</tr>
<tr>
<td></td>
<td>FIRST MASS MEDIA PROMOTION OF QUALITY IN MEXICO: A PAGE IN A LOCAL NEWSPAPER.</td>
</tr>
<tr>
<td></td>
<td>NEW SERVICE AGREEMENT FORD-QUALITY CENTER, ITESM TO DEVELOP AND TRAIN FORD SUPPLIERS IN PROJECT MANAGEMENT AND MARKETING CUSTOMER CONCEPTS.</td>
</tr>
</tbody>
</table>


Knowledge Dissemination:

1. Research.

- Conducted mainly through academic thesis, 10 HBS type cases on quality control and 5 cases on change of management style from autocratic to participatory style have been developed.

- Studies of successful creative solution of problems by using Japanese 7 basic tools, etc.

- Studies on western management principles that support quality control circle practices in an effort to match both managerial currents.

- Social studies on the service culture in Mexico.

- Studies on systems approach to quality control.

- Marketing applications of Quality Function Deployment in food industry.

- Theoretical and experimental validation studies on Taguchi Methods.
2. Education and Training.

a. FORD-ITESM Program of training in Statistical Process Control.

**TABLE III.2.2.**

<table>
<thead>
<tr>
<th>OFFICIAL FORD LEVELS</th>
<th>TEACHING MODULES</th>
<th>Hrs.</th>
<th>ITESM CERTIFICATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I USER</td>
<td>1 Quality Philosophies</td>
<td>20</td>
<td>Process Control Operator</td>
</tr>
<tr>
<td></td>
<td>2 Basic Mathematics</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 Basic Tools I</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>II PROMOTER</td>
<td>4 Basic Tools II</td>
<td>30</td>
<td>Statistical Process Control Technician</td>
</tr>
<tr>
<td></td>
<td>5 Process Capability:</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 measurement and evaluation</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>III ANALYST</td>
<td>7 Statistical Inference</td>
<td>30</td>
<td>Statistical Process Control Analyst</td>
</tr>
<tr>
<td></td>
<td>8 Acceptance sampling</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 Design of Experiments</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 Topics in Statistics</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>IV CONSULTANT</td>
<td>Statistical Consultant Certificate</td>
<td>320</td>
<td>Consultant in Statistics</td>
</tr>
<tr>
<td>V EXPERT</td>
<td></td>
<td></td>
<td>Expert in Statistics</td>
</tr>
</tbody>
</table>

Note: The four first levels are scheduled 18 times/Yr.


b. Other courses.

- Statistical Consultant Certificate Course...... 320 Hrs
- Quality Function Deployment and Quality Engineering Course.........................120 Hrs
- Concept to Customer and Project Management.............
- Certificate Seminars in Quality-Productivity......60 Hrs
Other courses have been:

- A 3 course QC Circle Program.
- One course on the New 7 tools for Management.
- Two courses on QFD.
- Several seminars on JIT.
- One course on Metrology.

Since 1985, a total of 30,000 hrs of instruction on quality have been conducted.


a. Educational.

- 10 Texts have been developed for the FORD-ITESM Program (not publicly sold and available only to participants)
- 14 texts have been prepared for other courses on quality.
- 6 Videos for education on quality issues.
- Two books on Quality Management have been written by ITESM staff.

b. Periodicals.

In this field, the Institute activities are still almost limited to their campuses geography. In two campus magazines, Tetla-Ni and Transferencia frequently issue articles on quality to inform the academic community.

A full page on quality issues has been published in "El Norte" regional and most read newspaper of Monterrey City.

c. Library and the Quality Information System.

1 Poso, Jaime P. 1990.
Gutierrez, Mario. 1989.

The Quality centers have served about 160 companies in consulting.

The main services have been:

a. CWQC organizational design
b. Quality Control System
c. Process optimization
d. Statistical Techniques.

Societal Learning:

ITESM has promoted several events for experience exchange of the academic and industrial community:

- Lectures to student associations.
- Lectures to professional groups.
- Member of the Metropolitan Council.
- Member of FUNDAMECA.
- Member of the Quality Control Promotion Council of Saltillo City.
- 2-3 quality symposiums per year.

The associate companies to ITESM have established about 40 Quality Circles.

The questionnaire filled by ITESM Campus Queretaro shows the following figures:

TABLE III.2.3.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td>-</td>
<td>35</td>
<td>100</td>
<td>-</td>
<td>30</td>
<td>-</td>
<td>165</td>
</tr>
</tbody>
</table>
The average number of persons per circle is 5. A total of 100 Quality Circles in the cities of Mexico, Guadalajara and Monterrey is reported 1. Associate companies have won 4 "Q-1" quality prizes from FORD MOTOR Co., 2 FDA prizes to quality in the U.S., and 1 "Prize for Excellence" from SECOFI in Mexico.

5. International Relations.

ITESM holds relations with other quality promotion organizations of the world: JUSE of Japan, and ASQC in the U.S., and several consultants and consulting firms Drs. Deming and Tribus, Crosby Associates, Newcomb Associates

Certification and Standardization.

The only ITESM contribution to this field are the Certificate Courses for Statistical Specialization.

National Promotion.

Although ITESM has considered launching the ITESM Quality Prize, and the Quality Month, both projects are still not a reality.

1 Poso, Jaime P. 1990: 46.
FIGURE III.2.2. FORD-ITEM PROGRAM.

NUMBER OF INDIVIDUAL PARTICIPANTS.
HISTORIC GROWTH.


Note: This Program was signed by Ford Motor Co. and ITESM in 1984 to conduct the required training in SPC techniques of all Ford suppliers in Mexico.
FIGURE III.2.3. FORD-ITESM PROGRAM.

CUMULATIVE NUMBER OF INDIVIDUAL PARTICIPANTS.
HISTORIC GROWTH.

Source: Ibid.
FIGURE III.2.4. FORD-ITESM PROGRAM.
INDUSTRY DISTRIBUTION OF PARTICIPANTS.
TWO YEAR COMPARISON.

Order according to their participation:
(1) Automotive   (5) Petrochemical   (9) Construction
(2) Metallurgy   (6) Services
(3) Electronic   (7) Food Processing
(4) Plastics     (8) Education

Source: Ibid. Graph by thesis author.
Note: Electronic, Petrochemical industries and Education show the largest increments from 1985 to 1988. Plastics and Food Processing show a decreasing participation.
FIGURE III.2.5. FORD-ITESM PROGRAM.

1985's SHARE DISTRIBUTION OF PARTICIPATION BY INDUSTRY.

Source: Ibid.

Remarks: The participation was distributed very closely to the nature of Ford suppliers activity sector.

Graph by thesis author.
FIGURE III.2.6. FORD-ITESM PROGRAM.

1988'S SHARE DISTRIBUTION OF PARTICIPATION BY INDUSTRY.

Source: Ibid.

Remarks: Share distribution by industry shows a change seemingly revealing an increasing participation of Ford non-suppliers.

Graph by thesis author.
FIGURE III.2.7. FORD-ITESM PROGRAM.

FUNCTION DISTRIBUTION OF PARTICIPANTS

DISTRIBUTION OF PARTICIPATION BY ORGANIZATIONAL FUNCTION.
TWO YEAR COMPARISON.

Ordered by their number of participants:
(1) Production
(2) Quality Control
(3) Industrial Engineering
(4) Maintenance
(5) Industrial Relations
(6) Administrative
(7) Sales
(8) Materials
(9) Purchasing

Source: Ibid.  Graph by thesis author.
Remarks: Production participants number is bigger than quality control staff. Sales and Administrative participation declining.
FIGURE III.2.8. FORD-ITESM PROGRAM.

DISTRIBUTION OF PARTICIPATION BY ORGANIZATIONAL HIERARCHY.
FOUR YEAR COMPARISON.
Ordered by their number of participants:
(1) Middle Management  (4) Consultants
(2) Supervisors        (5) Operators
(3) Top Management

Source: Ibid.      Graph by thesis author.
FIGURE III.2.9. FORD-ITESM PROGRAM.

OTHER PROGRAMS.
NUMBER OF INDIVIDUAL PARTICIPANTS.
HISTORIC GROWTH.

Source: Ibid. Graph by thesis author.

In 1987, ITESM starts its Quality Engineering Program.
In 1989 the reaction of industry to Mexico's decision to enter GATT is apparent.
FIGURE III.2.10. ITESM. ALL PROGRAMS' NUMBER OF PARTICIPANTS. HISTORIC GROWTH.

Source: Ibid.

Graph by thesis author.

Remarks: Participation rate is increasing very rapidly.
APPENDIX III

III.3.A. THE MEXICAN FOUNDATION FOR TOTAL QUALITY
(FUNDAMECA)
[FUNDACION MEXICANA PARA LA CALIDAD TOTAL]

PROFILE

A. Offices.

FUNDAMECA offices are located in Mexico City.

Administrative staff: 11 persons.

Operative staff: 3 persons ¹.

B. Foundation and Objectives.

FUNDAMECA was founded in 1988 ² by a group of corporate directors as a response of the perceived need to disseminate industry- and society-wide awareness for an urgent need of an improvement in the quality of Mexican products and services and in the level of quality of life of the Mexican population ³.

The stated mission of the Foundation is to promote proselytism for a nation-wide urgent effort for survival by improving quality and competitiveness of Mexican products and services ⁴. A need which under the new international circumstances, Mexican industry is facing since government's

¹ Interview with Mr. Teodoro Gonzalez, Director. January, 24, 1990.

² FUNDAMECA. 1989a: 2.


⁴ Ibid.
decision to open domestic market to foreign imports. Its approach is to work on the environment rather on any particular segment of companies within industry. The Foundation aims toward a cultural change within Mexican industry and society, recognizing that these task is a long term project. Its stated approach to this task is by learning and applying the experience of other national organizations (in Mexico, the former Industrial Center for Productivity (INAPRO), the National Center for Productivity (CENAPRO), etc.), and international organizations (the American Productivity and Quality Center (APQC), the National Productivity Network, the European Foundation for Quality Management, the Japanese Union of Scientists and Engineers (JUSE), and consulting firms such as the Juran Institute)\(^1\) in the national promotion of quality. FUNDAMECA defines quality as satisfaction of customer's expectatives and needs, and considers quality as a process involving all organizational functions within a firm, including customers and suppliers. The Foundation states that quality in production must be closely related with quality of life, thereby, its interest for the concept for Total Quality\(^2\).

\(^1\) Ibid: 3.

\(^2\) FUNDAMECA. 1989b: 1-5.
FUNDAMECA's values are stated to be ¹:

- To remain a private, autonomous and non-profit organization.
- To serve all sectors of Mexican industry.
- To remain committed to national interests.
- To keep the following approach:
  - To focus on strategic issues.
  - To have a scientific approach.
  - To be a multi-disciplinary organization.
  - To be eclectic. (Remaining open to all quality philosophies, trying to learn what is good from every practical case available ²)
  - To keep a socio-technic point of view.
- To promote innovation.
- To work for the protection of ecosystems.
- To respect regional cultures and organizations.
- To keep a simple and slim structure.

C. Membership.

Classified in founder associate companies and affiliate companies. The first group is a very selected one, and is integrated only by the founder corporations. The latter is made up any corporation willing to work according to the Foundation's principles and currently conducting a serious and consistent program for quality improvement within its


² Interview with Mr. Teodoro Gonzalez, Director. January 24, 1990.
organization, with the whole support and commitment of its top management, and to be willing to share with other members their experiences on quality improvement. The Foundation does not accept as members those companies that could be considered as harmful to eco-systems \(^1\). Affiliates have the same right than founder associates, except that they do not have the right to attend and vote in the General Assembly and sit in the Board of Directors. \(^2\)

36 company executives constitute the Directive Board, 8 persons integrate the Administrative Board and 29 corporations make up the Associate Founders Group.

D. Financing.

Being a private organization, any difference between the Foundation's revenues from fees of courses and services and its operational expenses is covered by a donation equally distributed among all member companies.

E. Main Activities.

Knowledge Dissemination.

1. Research.

On successful practices and theories related with quality management and improvement.

FUNDAMECA conducted and published in 1988 the First statistical study on the status of Total Quality Management

\(^1\) Interview.

in Mexico \(^1\) [see at the end of this profile some of its findings], and in 1989, three research projects on:
- The Values of Mexican Managers and Workers with respect to quality.
- On quality educational systems in Mexico and abroad.
- On experiences in quality cultural change processes.

2. **Consulting** on processes and Total Quality in Advanced education. Due to FUNDAMECA's orientation to act as a promotion element upon the Mexican social and industrial environment, the Foundation does not have either the human resources nor the intention to give extensive consulting assistance to its members but to act as a connecting element to suggest, upon the request of the interested company, a series of alternative private consultants on quality.

3. **Education.**

Courses and seminars for members. FUNDAMECA leased and adapted the seminar "The Advantage of Quality" from ODI, a consulting firm in Boston, and has the exclusive rights in Mexico.

4. **Diffusion.**

FUNDAMECA publishes three different periodicals as its main channels for the dissemination of knowledge and societal learning with its target segment being middle and top management:

a. **Calidad Total/Perspectivas**, Annually. ["Total Quality/Perspectives"]). A series of macroeconomic and social studies related with quality.

b. **Calidad Total/Monografías**, ["Total Quality/Monographs"]). Another series of studies on each specific issue related either with quality philosophies or with movements in the social field toward the improvement of the quality of life. The first monograph was about performance evaluation of service industry. The second was on socio-technic systems to stress the importance of the human factor in industry competitiveness. Next works will deal with quality of working life (QWL) and the relation between technology and quality.

c. **Calidad Total/Casos**, ["Total Quality/Cases"]). A series of studies on specific examples of successful quality improvement efforts of Mexican corporations.

The Foundation has collaborated with the Mexican Ministry of Trade and Industry [Secretaría de Industria y Comercio (SECOFI)] for the design of the recently established National Prize for Quality.

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1 Although FUNDAMECA is in its first year of life, its participation in the design project for the recently established National Quality Prize [Premio Nacional de Calidad], can be understood by the economical and political weight the Foundation's corporate associates have on the large corporations' segment of Mexican Industry, and consequently, on the federal government.
The Foundation was also asked to help the Mexican Institute of Social Welfare [Instituto Mexicano del Seguro Social (IMSS)] in launching a program for the improvement of this Institute's services.¹

5. Future Projects.

The establishment of an electronic bulletin board system with a database available for all members on issues such as international literature on quality and educational resources (courses and conferences), and to facilitate the free inter-communication and information and resource sharing among all corporate members.

The use of a communication expert to promote the Foundation's activities.

6. Foreign Relations.

FUNDAMECA has a close relationship with the American Productivity and Quality Center (APQC), and has received donations from them, such as the whole collection of APQC published works for the Foundation's library.

Just recently, Bill Minoro from the Quality and Productivity Management Association (QPMA) visited the Foundation's offices. Hopefully they will establish a permanent relation.² FUNDAMECA is planning also to establish a relation with the recently formed European Foundation for Quality Management, which publishes Quality Inc. FUNDAMECA is a

¹ Interview.

² Interview.
member of the National Productivity Network, which accepted one Canadian and one Mexican non-profit organizations as foreign members. The Foundation has also a good affinity with the Juran Institute, as it perceives this firm as very serious and involved in the field of FUNDAMECA's interest: the Management of Quality.
FIGURE III.3.1. SAMPLED FIRMS' HEADQUARTER'S LOCATION.
n=122.
Source: FUNDAMECA. 1988a: 3.
FIGURE III.3.2. FUNDAMECA. MEXICO. HIERARCHY OF RESPONDENTS WITHIN THEIR ORGANIZATION.
Source: Ibid.: 7. (Graph by thesis author)

TABLE III.3.1. RESPONSE PERCENTAGE DISTRIBUTION.

<table>
<thead>
<tr>
<th>RESPONSE TO THE QUESTIONNAIRE.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DID RESPOND</td>
<td>122</td>
</tr>
<tr>
<td>DID NOT</td>
<td>60</td>
</tr>
<tr>
<td>DISQUALIFIED</td>
<td>2</td>
</tr>
</tbody>
</table>

SAMPLE SIZE: 184

Sources: Ibid.: 2. (Table by thesis author)
FIGURE III.3.3. FUNDAMECA, MEXICO. QUALITY PHILOSOPHIES AND MODELS REPORTED AS MOST INFLUENTIAL IN THE IMPLEMENTATION OF IN-COMPANY QUALITY PROMOTION PROGRAMS.

Categories:

(1) No model  
(2) Deming philosophy  
(3) Juran philosophy  
(4) Ishikawa philosophy  
(5) Own model  
(6) Crosby philosophy  
(7) Taguchi methods  
(8) Other

Sample size: n=122

FIGURE III.3.4. FUNDAMECA. MEXICO. PERCENTAGE DISTRIBUTION OF ORGANIZATION FUNCTIONS REPORTED AS INVOLVED IN-COMPANY QUALITY PROMOTION PROGRAMS.

Categories:
(1) Production          (5) Information systems
(2) Quality Assurance    (6) Marketing
(3) Personnel relations  (7) R & D
(4) Sales

FIGURE III.3.5. FUNDAMECA. MEXICO. REPORTED WORK FORCE ATTITUDE TOWARDS IN-COMPANY QUALITY PROGRAMS.

Sample size: n=122

Source: Ibid. 11.
FIGURE III.3.6. FUNDAMECA. MEXICO. DISTRIBUTION OF THE NUMBER OF QUALITY EDUCATIONAL AND TRAINING COURSES ATTENDED BY EACH ORGANIZATIONAL FUNCTION WITHIN THE SAMPLED COMPANIES.

Sample sizes for each level: n = 122, 63, 122, 47, 40.


Note: Graph by thesis author
FIGURE III.3.7. FUNDAMECA, MEXICO. MAIN SUBJECT OF THE COURSES ATTENDED BY EACH FUNCTIONAL LEVEL.

Source: Ibid.

Note: Graph by thesis author.
FIGURE III.3.8. FUNDAMECA. MEXICO. PERCENTAGE DISTRIBUTION OF THE REPORTED QUALITY OF COMPANY-LABOR UNION RELATIONS IN THE SAMPLED COMPANIES.

Sample size: n= 122

Source: Ibid.: 11
FIGURE III.3.9. FUNDAMECA. MEXICO. PERCENTAGE DISTRIBUTION OF IN-COMPANY QUALITY PROMOTION ACTIVITIES IN THE SAMPLED COMPANIES.


Note: Graph by thesis author.
FIGURE III.3.10. FUNDAMECA. MEXICO. DISTRIBUTION OF THE NUMBER OF COURSES AND SEMINARS ON QUALITY ATTENDED BY THE TOP MANAGEMENT OF THE SAMPLED COMPANIES.

Sample size: n=122

FIGURE III.3.11. FUNDAMECA, MEXICO. DISTRIBUTION OF CURRICULA OF COURSES RELATED WITH QUALITY ATTENDED BY THE TOP MANAGEMENT OF THE SAMPLED COMPANIES.

Sample size: n=63


Note: Graph by thesis author.
FIGURE III.3.12. FUNDAMECA. MEXICO. PERCENTAGE DISTRIBUTION OF THE SOURCE OF TRAINING ON QUALITY FOR TOP MANAGERS IN THE SAMPLED COMPANIES.

Sample size; n=63

Source: Ibid.

299
FIGURE III.3.13. FUNDAMECA. MEXICO. LENGTH OF THE COURSES ON QUALITY ATTENDED BY THE TOP MANAGEMENT OF THE SAMPLED COMPANIES.

Categories: Sample size: n=63

- Less than 15 hrs
- 21-40 hrs
- 41-60 hrs
- 61-100 hrs
- Did not answer.

Source: Ibid. (Graph by thesis author)
FIGURE III.3.14. FUNDAMECA. MEXICO. PERCENTAGE DISTRIBUTION OF PARTICIPATION IN QUALITY CIRCLES BY FUNCTIONAL LEVEL IN THE SAMPLED ORGANIZATIONS.

FIGURE III.3.15. FUNDAMECA. MEXICO. PERCENTAGE DISTRIBUTION OF SAMPLED COMPANIES CURRENTLY RUNNING QUALITY COMMUNICATION PROGRAMS.

FIGURE III.3.16. FUNDAMECA. MEXICO. MESSAGE CONTENT OF THE IN-COMPANY QUALITY COMMUNICATION PROGRAMS OF THE SAMPLED COMPANIES.

Categories:
(1) "Let's improve quality"        (8) "Zero defects"
(2) "Let's satisfy our customer"       (9) Other.
(3) "We all make up quality"
(4) "Let's strive for excellence"
(5) Emphasis on the relation among individual work, organization, and quality.
(6) "Let's do it right the first time"

Source: Ibid.: 27.
Note: Graph by thesis author.
FIGURE III.3.17. FUNDAMECA, MEXICO, IN-COMPANY QUALITY PROMOTION COMMUNICATION MEDIA OF THE SAMPLED COMPANIES.

Categories:

(1) Group Sessions.
(2) News boards.
(3) Posters.
(4) Memos and letters.
(5) Videos.
(6) Verbal.
(7) Did not answer.
(8) Other.

Source: Ibid.
FIGURE III.3.18. FUNDAMECA. MEXICO. PERCENTAGE DISTRIBUTION OF REPORTED PROGRESS IN PLANNED IN-COMPANY QUALITY COMMUNICATION PROGRAMS OF THE SAMPLED COMPANIES.

Categories:
- 20 % or less
- 21-30 %
- 31-40
- 41-50
- 51-60 %
- 61-70 %
- 71-80 %
- 81-90 %
- 91-100%

Sample size: 122
Figure III.3.19. FUNDAMECA, MEXICO. DISTRIBUTION OF THE DEGREE OF SATISFACTION WITH THE RESULTS OF THE IN-COMPANY QUALITY PROMOTION PROGRAMS.

Sample size: 122

Source: Ibid.
APPENDIX III

III.4. THE QUALITY INSTITUTE

OF THE NATIONAL CHAMBER OF TRANSFORMATION INDUSTRIES
(CANACINTRA)

III.4.A. THE QUERETARO CHAPTER.

[CAMARA NACIONAL DE LA INDUSTRIA DE LA TRANSFORMACION
DELEGACION QUERETARO]

PROFILE

A. Offices.

CANACINTRA is a national organization that groups large and
middle size companies of Mexican industry.

CANACINTRA, Querétaro is one of its local chapters and it is
located in a city of the central Mexico area, Querétaro
City, a growing industrial region located 150 miles to the
north of Mexico City.

B. Foundation and Objectives.

Although very young and small, the Quality Institute has the
merit of being one of the pioneers of a new model of
regional promotion for quality improvement in Mexico:
The gathering of several sectors of society to work jointly
for a common objective related with quality.

The Institute was founded in 1987 by six member, large size
companies of the local chapter ¹ [Astral, Kostal, Singer,

¹ Note: All are companies which have clearly felt the
pressure of the new economic circumstances and early
perceived the threat of the country's recent
entrance to GATT and its opening to international
trade.

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Spicer, Tremec and Vidrieras Querétaro], the State Government [Gobierno del Estado de Querétaro], the Section for Industrial Support of the National Financial Institution [Nacional Financiera (NAFINSA)], the Local Small & Medium Size Industrial Firms Association [Asociación de Pequeños y Medianos Industriales de Querétaro, (APEMIQ)], the Monterrey Institute, Campus Querétaro (ITESM), and the Querétaro Institute of Technology (ITQ)\(^1\).

The Quality Institute was created to implement mechanisms to disseminate and promote quality improvement in the local industry, focused in improving the quality of production inputs of its large size members. Accordingly, the Quality Institute objectives are:

1. Exchange of knowledge and experience to promote a local suppliers competitive platform.
2. Increase the number of local supplier for large and medium firms of the region.
3. Improve the quality of local suppliers.
4. Train quality experts abroad to expand the Institute's activities and to strengthen local firms.

C. Membership.

Any member of the local chapter can be member of the Institute, providing it is willing to support its activities and to participate actively. Current membership is only six companies.

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\(^1\) CANACINTRA, Querétaro. 1989: 6-8.
D. Organization.

FIGURE III.4.1.

CANACINTRA, QUERETARO. QUALITY INSTITUTE. ORGANIZATION CHART

CANACINTRA NATIONAL HEADQUARTER MEXICO CITY

71 REGIONAL CHAPTERS

CANACINTRA QUERETARO CHAPTER

CHAPTER'S PRESIDENT

THE QUALITY INSTITUTE FOUNDER INSTITUTIONS

COMPANY MEMBERS

OPERATIVE MANAGER

THE QUALITY INSTITUTE DIRECTOR

STAFF OTHER COMMITTEES

COLLABORATORS (STAFF FROM THE 6 FOUNDER COMPANIES)

LOCAL SUPPLIERS. MEDIUM SIZE AND SMALL COMPANIES

* Note: This organizational chart was not supplied, and was prepared by the author for the exclusive purpose of giving a picture of the organizational relationships
E. Main Activities 1.

1. Program.

The Institute activities program is:

- Periodic monitoring & evaluation meetings on the progress of the Institute by the founder members.
- On-going identification of current problems and evaluation of progress of quality level of target segment.
- Training program of quality promoters.
- In-company training.
- Quality Assurance Systems implementation in member companies.
- Special promotion events.

2. Summary of Activities.

The first stage of the program was to concentrate in education and training:

a. The Institute has trained 4 groups of local suppliers on the first educational module; "Philosophies and Techniques for Quality Improvement" with a total participation of 84 persons. This course was conducted by the Institute's Director.

b. Follow-up in-plant monitoring program of the progress of the quality improvement efforts of local supplier manufacturing companies. This stage was conducted by ITQ faculty and volunteer students.

c. Training Course in Statistical Process Control and Introduction to Reliability and Design of Experiments to the

1 CANACINTRA, Querétaro. 1989: 1-10.
team of 6 technicians prior to their trip to Japan. This course was conducted by the ITESM, Campus Querétaro's Quality Center.

d. "Training Course on Total Quality Management" for 6 founder companies staff technicians in the Nagoya International training Institute (NITC), Nagoya, Japan by the Central Japan Industrial Association (Chu-San-Ren). The purpose of this program was to expand the Institute's experts platform to help the Director in the tasks of training, consulting assistance and process monitoring.

e. "Theory and Practice of Modern Philosophies of Quality" with a total participation of 16 persons from local supplier manufacturing companies.(Course prepared and conducted by 3 of the Institute trainees in Japan).

3. Perspectives.

As was mentioned earlier, the main merit of the Quality Institute is its pioneering work with a model of quality promotion that includes not only knowledge dissemination but societal learning for quality improvement through the cooperation of several sectors of the society directly or indirectly involved in local industry and its emphasis in the development of a quality system beyond the walls of each individual company member.

However, the task has not been an easy one, the weak perception among CANACINTRA, Querétaro Chapter company members, (as has been for a long time the common pattern of
throughout almost all Mexican firms) of the importance of
developing such an inter-company quality system explains the
scarce participation in the Institute's membership and
activities. In the same way, many local supplier small and
medium size industries are still not aware of the strategic
importance of improving their quality performance of the
products and services. Consequently their courses attendance
and further improvement efforts has been very variable.
Lack of commitment response of half of the founder company
members, which after the training trip to Japan did not send
their staff to the Institute's work sessions to prepare
training materials for the industrial community.

III.4. B. OTHER CANACINTRA CHAPTERS

In his interview to the Queretaro Chapter' Operative
Manager, the author was informed about other Chapter's
activities in the quality field. He was referred about the
Aguascalientes City Chapter has formed a similar
Organization to work for Quality. 20 questionnaires were
mailed to the regional chapters in the country where
industrial activity is at a significant level, none of them
was returned. In addition, a document received from the
Queretaro Chapter is a report submitted to the CANACINTRA
headquarters offering help for any other chapter for
designing a quality dissemination program.
Thus, the author assumes other chapter's quality activities
are marginal
APPENDIX III

III.5. THE 1988 FEDERAL LAW ON METROLOGY AND STANDARDIZATION
[LEY FEDERAL DE METROLOGIA Y NORMALIZACION]

THE MEXICAN MINISTRY OF TRADE AND INDUSTRY PROMOTION

THE MEXICAN GOVERNMENT

In 1988, the Mexican Government joined other sectors of Mexican society in their nascent interest to promote the improvement of the quality of Mexican products and issued the Federal Law on Metrology and Standardization ¹.

This law is compounded of six titles and several chapters and establishes the following major issues:

- Establishes the general aspects of the law.
- Defines the scope of the law.
- Establishes the General Unit System.
- Defines the basic concepts of metrology.
- Defines the general procedures for dealing with basic standards.
- Institutes the National Calibration System.
- Promotes standards enforcement.
- Establishes the National Standardization Commission.
- Establishes the National System of Testing Laboratories.
- Establishes the National Metrology Center.
- Redefines the role of the Federal Norms.
- Redefines the Official Quality Certification System.

Establishes the **National Quality Prize**.

Establishes the sanctions for the infringement of the new law.
APPENDIX III

III.6. THE NATIONAL QUALITY PRIZE.

[PREMIO NACIONAL DE CALIDAD]

THE MEXICAN MINISTRY OF TRADE AND INDUSTRY PROMOTION [SECOFI]

THE MEXICAN GOVERNMENT

A. Foundation and Objectives.

To promote general awareness of the mexican population on the importance of quality and as a stimulus for the efforts of quality improvement within the industrial sector, in the above mentioned 1988 Federal Law on Metrology and Standardization, Mexican Government established the first National Quality Prize in the country's history.

In 1989, the Mexican Ministry of Trade and Industry Promotion [SECOFI] issued an official resolution to regulate the recipient companies selection and the awarding procedures for this Prize ¹.

1. The major selection criterium to award the Prize is defined as:

"The adequate satisfaction of consumers and users needs" ²

2. The main objective is stated in the following way:

"To become an instrument for the promotion, development, and dissemination of the quality

¹ SECOFI. 1989: 5-8.

² Ibid.: 5.
of industrial processes, products, and services, to support the modernization and competitiveness of corporations established in the country" ¹

3. Categories: ²

I. Large Corporations.
II. Small and Medium Size Companies.
III. Large Trading Companies.
IV. Small and Medium Size Trading Companies.
V. Large Service Companies.
VI. Small and Medium Service Companies.

4. Procedure:

a. Each applicant company must send the required information containing company's data, competing category, short description of systems and processes aimed to achieve Total Quality.

b. A pre-screening committee formed by SECOFI officers and FUNDAMECA (see APPENDIX III. Section III.3) representatives evaluates each application and selects a set of final contestants.

c. The final contestants must submit a detailed written description of their Total Quality systems, processes and achievements, and the available documents and statistics

¹ Ibid.
[sic] on the following aspects ¹:

2. Scope and Extent of its implementation.
3. Acknowledgements and notes form their suppliers and user customers.
4. Economic effects and results.
5. Attained quality levels.
7. International and national market share growth.
8. National and international recognitions achieved.
9. Comparative evidence of the superiority of their achievements versus other companies, national and international, in the same market segment.
10. Effects on the community.

d. The final evaluation and selection of the prize recipients is made by a committee integrated as follows:

1. The Minister of SECOFI.
2. The Vice-Minister of Industry and Foreign Investment.

Officers from:

3. The General Standards and Norms Direction [DGN].
4. The Technological Development General Direction [DGDT].
5. The General Direction of Industrial Promotion [DGPI].
6. The National Consumer Institute, [Instituto Nacional del Consumidor].

¹ Ibid.: 7.
7. The National Laboratories of Industrial Promotion [LANFI].

A representative from:

8. The Mexican Confederation of Industrial Chambers [CONCAMIN].

9. The National Chamber of Transformation Industries [CANACINTRA], (see APPENDIX III. Section III.4.).

10. The National Confederation of Trade Chambers [CONCANACO]

The Committee President may invite a representative from:

11. FUNDAMECA.

5. Privileges and benefits.¹

(1) Every November, The President of Mexico will award the Prize in a special ceremony.

(2) The use of the National Quality Prize logo can be used during the following year.

(3) The winners can advertise their awards at their discretion by any mass media during the following year.

(4) In case a company's plant or product had received the prize, publicity must mention only them.

6. Awarding History.

In 1989, for the first time, President Salinas awarded the Prize to a set of Mexican companies.

¹ Ibid.: 7.
APPENDIX III

III.7. THE MEXICAN OFFICE OF STANDARDS.
(DGN)
[DIRECCION GENERAL DE NORMAS]
PROFILE

A. Foundation and Objectives.

Founded in 1943, and currently under the Ministry of Trade and Industry Promotion (SECOFI), DGN is the federal institution responsible for the preparation, dissemination and supervision of the Mexican Official Standards (NOM). A set of standards organized alphabetically (A-Z) and chronologically according to technical field and the year they were issued. This set is aimed mostly to regulate consumer products for domestic and international market.

B. Activities.

DGN issues pamphlets with new standards and a general catalog organized by industrial sector. As 1984, a total of 5,200 standards had been issued. Additionally, DGN awards to the qualified applicant companies the "Warranty Official Seal" (SOG-DGN)

DGN is a member of the International Organization for Standardization (ISO), the Pan American Technical Standards Commission (COPANT), and the Pacific Area Standards Congress (PASC).

1 JSA. 1989: 183.
Norex. ?: 1-47.
Interview with Mr. Salvador Diaz, Jan., 1990.
DGN has focused its activities on the political, administrative and inspection field of standardization. As a consequence, DGN has failed to be play an important role in the promotion of standardization (both in generic and in-company industrial standardization), metrology and quality improvement promotion.

Since the establishment of the National Council for Science and Technology (CONACYT) in the early 1970's, Mexico has headed, though quite slowly and with big ups and downs, toward strengthening its industrial and scientific infrastructure. However, many efforts have been short-lived due to a lack of consistency present after each President Administration Staff's change.

An example is the idea born in CONACYT to create the National Center for Metrology, which eventually was established jointly by CONACYT, the National Polytechnic Institute (IPN), and DGN. IPN supplied staff and facilities and DGN funded the Center with about $10 million (U.S. dollars). President Lopez Portillo headed the kick-off ceremony.

Eventually, after one of the above mentioned administration changes, DGN decided to kill the program and granted the use of both facilities and equipment to IPN's Center for Advanced Research (IPN-CINVESTAV), which currently serves DGN as a national laboratory for metrology. However, both equipment and facilities seem to be not state-of-the-art in
metrology, and staff although well trained is young and lacks enough experience. Therefore CINVESTAV has been unable to support a serious effort in the promotion of applications of metrology to industry and science.

Mexico's process to enter GATT dates back to the early 1970's, when Mexico entered this organization as an observer, Government made several timid attempts to become a formal member, but found a strong opposition from private and state-owned industry. allegedly still not prepared to face international competition. In 1984, the process was re-started and, with the arrival of President Salinas to the political scene, the Government signed the "letter of intent" to enter GATT.

Since then, all Mexican industrial sectors have reacted to cope with the new challenge.

DGN has expanded its activities to certify the quality level of domestic products and to co-validate third party-certification of imported products.

A National Laboratory for Measurements and a network of Secondary Laboratories support the new efforts to serve industry in the calibration field.

Another relatively recent effort towards quality improvement of domestic products has been conducted by the National Consumer Institute, which has set out a strong campaign for processing consumer's claims on defective products or abusive vendors. The Institute runs also several evaluation
tests on consumer products and publishes its results in a magazine widely distributed all over the nation. However, its facilities and technological support seem to be limited and unable to function as a sound platform for a broader scope of quality developments.

C. Organisation.

The Department of Industrial Control has a staff of approximately 33 persons and controls about 300 products. The Department of National Standards has a staff of approximately 40 persons, and the Dept. of international Standards has a staff of 25 persons.
TABLE III.7.1

DGN. ORGANIZATION CHART

General Direction

Technical and Legal Councils

Standards Sub-Direction
- Department of National Standards
- Department of International Standards

Sub-Direction for Quality
- Department of Industrial Control
- Department of Metrology
- Department of "NOM" Warranty Official Seal
- Registry and Approval of Electro-mechanic Devices

Sugar Sub-Direction
APPENDIX III

III.8. THE MEXICAN ASSOCIATION
OF STATISTICS AND QUALITY CONTROL
(ANMECC)

(Asociación Mexicana de Estadística y Control de Calidad)

Founded in 1955 as ASQC's Mexican Chapter. Its headquarter is located in Mexico City. The author visited ANMECC's headquarters in January 1990. Found only a secretary in a large room with a poorly organized and furnished office. There were no partitions. The training room was also there in the same big room, a blackboard and some chairs were the only equipment available. The author was told there was no written information available about the Association's activities. ANMECC's Director was absent, working in a personal business. Finally, he did not show at his appointed date for this research's interview.

These facts seem to explain, at least in part, why in spite of being ASQC's Mexican Chapter, and being the only Mexican organization for quality listed in the World Directory of Quality Control Associations ¹, ANMECC has failed to hold the leadership for the quality promotion in Mexican Industry.

¹ IAQ. 1989: 179.
III.8. OTHER ORGANIZATIONS FOR QUALITY

During the interviews the author conducted in Mexico and from the literature he collected from this country, came out several corporate associations, either formal or informal, long lasting or short-lived, and most of them regional. Following, they will be listed to complete the Mexican framework:

1. Associations.

The Monterrey Productivity Center [Centro de Productividad de Monterrey, A.C.] and the Association of Industrial Relations Executives [Ejecutivos de Relaciones Industriales, A.C.], two associations active in the state of Nuevo León. Besides a Certification Seminar on Quality and Productivity, jointly organized with ASQC (U.S.A.), JETRO (Japan), Monterrey University, ITESM, FUNDAMECA and CAINTRA, these two associations organized in 1989 the "First International Congress of Total Quality" in Mexico¹, and the 5th International Exchange "Man and Quality" in 1990.

The American Chamber of Commerce Quality Center is another active organization that groups several U.S. subsidiaries and joint ventures.² Several other organizations are also active in Mexico City and Guadalajara.

The Mexican Academy for Quality constitution proposal was addressed in 1989 and will be formed in a near future.

² Interview with Mr. Luis Carmona. Jan, 1990.
2. Consulting Firms.

INFOTEC (the largest technology information service firm in the country) is planning to enter the quality consulting firm in a near future, and many other consultants are active in Mexico: The Juran Institute, Crosby International Associates Inc., Newcomb and Associates, Myron Tribus, and many national firms.


Many American subsidiaries in Mexico have trained their personnel in the U.S. making use either of the resources of their headquarters in the U.S., or their contacts with a quality consultant.
APPENDIX IV

INTERVIEWS IN JAPAN AND MEXICO

IV.1. INTERVIEWS IN JAPAN.

IV.1.1.

Interview with Dr. Junji Noguchi.
Executive Director.
Japanese Union of Scientists and Engineers (JUSE). *

by Antonio R. Flores.

* (This report is a transcription of selected issues from the recorded interview held by the author with Dr. Junji Noguchi at JUSE Headquarter's Office, Tokyo, Japan, January 12, 1990. Original recording in Japanese language).

Translation: Keiko and Antonio R. Flores.

Note: I: Interviewer JN: Mr. Junji Noguchi's answer

INTERVIEW

I: I am particularly interested in the managerial aspects of JUSE's Quality Promotion activities. In particular, I would like to hear your opinion about studying TQC from the management of a technology.

JN: This approach is inappropriate to TQC. As I understand it, TQC is not intrinsically related to any technology nor it is managed as a technology. TQC is essentially a culture.

I: However, from another point of view, TQC must be a subject of the same managerial principles, as any other business activity is, e.g. JUSE might see its associates as customers and therefore might have a marketing policy to address issues as distribution, pricing, customization of its services, etc. From another point of view, although it is a non-profit organization, JUSE needs financial resources to survive. Therefore I guess JUSE must have policies such as financing policy, service policy, etc...

JN: JUSE is not selling TQC. It only responds to the requirements and needs of its members. JUSE is only trying to satisfy its associates needs. This is the first concept that you must understand well:
JUSE is a nonprofit organization and JUSE does not impose guide-lines of action to any of its associates. Contrary to what U.S. consultants do with their clients, JUSE has no intention to sell TQC as a service or product.

Understanding this point is a pre-requisite to understand Japanese TQC. We also must understand its historical evolution:

**TQC BASIC CONCEPTS.**

* TQC is a culture.

* TQC is a management way that can achieve high quality of products with low cost.

* TQC must be practiced and accomplished by all the members in the whole company.

* Leadership of top management is vital.

* Education and training of TQC to all the members of the company is a necessary condition.

* TQC is not a technology, i.e. emphasis only on the correct use of a set of tools does not guarantee its success. All firms striving to carry out TQC must realize that it is not a method but a culture. It starts with an attitude that makes all people in a firm to work for its development. This is why we can consider TQC a culture.

* The TQC tools [the seven statistical tools, the seven managerial tools, etc.] are technological means to support TQC's goal of producing goods with high quality and low cost. Notwithstanding, these tools are a pre-requisite knowledge for all the people involved in the work for TQC.

* In any instance, the existence of any tool neither explains nor justifies the existence of TQC. Among all TQC tools, the statistical tools are specially useful for producing goods with high quality and low costs. They have been particularly useful in the partial solution of complex problems. Among the infinite variety of solutions for a problem only a few type of solutions are more basic than the rest, and among these, the statistical solutions are there.

* Knowledge is not enough to achieve TQC. However, knowledge is one of the minimum pre-requisites to be able to work for TQC.
* To understand Japan's TQC we have to understand its historical evolution:

HISTORICAL EVOLUTION.

Each 5 years TQC has showed a new evolutionary stage of progress:

(1950)
In 1950 we invited Dr. Deming to teach statistical methods. The first to attend these courses were some Japanese engineers. These people were able to prove the effectiveness of the statistical methods after they had diligently applied the solution of some of their companies' problems. The first applications were only in the field of manufacturing and production. Thanks to the outstanding good results achieved. Managers tried to adapt the new methods to other functional units of their organizations to achieve improvements in those areas too. A consensus among Japanese managers developed about the need to adapt this methodology to other areas of their companies. At this stage, they did not have a clear idea of what to do but there certainly was a general awareness and a strong will to work for the improvement of Quality Control. This awareness was caused from the need to change the international position Japanese products had as low cost but poor quality products. They understood that if Japanese industry would keep on producing poor quality goods, their demand would not grow. There was a very clear perception of the need to restructure the economy. In the Japanese postwar's devastated economy it was a natural and mandatory perception of the need to work for the improvement of the Japanese Quality Control.
At that time, the English words QUALITY and QUALITY CONTROL proved to be very popular among all Japanese people:

"If we do not improve the quality of our products we will not be able to export. And if we do not export we will not be able to improve our country's economy".

The Japanese Association for Science and Engineering existed before the WW-II, since then, it had worked in the task of finding practical applications to scientific and engineering knowledge.

(1954)
After the war, this association re-organized under the name of the Japanese Union of Scientists and Engineers (JUSE). Immediately after its re-establishment JUSE started to work for the industrial development of Japan. To determine the direction of their activities, JUSE established a Research
Study Committee to analyze those developments in science and engineering in the U.S. and Europe for which Japan did not have a good background yet. The first that came out from the study were the so called "soft" methodologies, such as the statistical and mathematical tools. In 1926, in the U.S., Dr. Shewhart had developed a statistical methodology that had been used in the U.S. War Standards for the production of military equipment. The knowledge supporting the development of these standards was not under practical use in Japan. It soon became clear that Japanese scientists and engineers should learn these new methodologies to be able to develop a strong quality control system. As a first step, JUSE organized a Japanese statisticians conference to study the new methods. Renown Japanese statisticians like professors Kitaqawa, Yamanouchi and Matsuyama attended the course. However, because they studied the new methods from a theoretical point of view, when it was their turn to teach them, their explanations were not understandable to Japanese managers and technicians. This people resisted the idea of having to study such complex subjects. To remedy this problem, JUSE asked the GHQ (General Headquarters of the Allied Forces) to bring to Japan some of its experts on Statistical Quality Control [SPC].

Dr. Deming was the expert who came to Japan to teach SQC.

I: I guess besides expertise, the need of credibility asked for the participation of foreign experts in the dissemination of this new knowledge.

JN: Yes, at that time, credibility was a crucial factor to determine the strong influence of U.S. experts in the Japanese industry. The U.S. had won the war and defeated Japan. This fact gave a very strong psychological appeal to anything of American origin among all Japanese. This appeal has lasted for a very long time. It was not until the 1980's that Japanese society became aware of its superior achievements in the world context and reduced its will to imitate the U.S.. Not until 1985, the general awareness of Japan's leadership in world industry, except for aeronautics, had not developed.

(1962)

TQC evolved in an escalating way. In the 1960's, Japanese foremen and workers began to get involved in the so called QC Circle activities to promote Quality Control. These activities are an essential characteristic of Japanese TQC. Workers' involvement in QC Circle activities was a process with a simplicity not possible in Western societies.

I: Did TQC find any strong opposition among managers and workers? I mean, for example, In many western industrial societies it is unthinkable to gather workers affiliated to
different unions because of the risk of contamination of their ideas. Also, some unions oppose strongly QC Circle activities by labeling them as a managers' attempt to increase their control over their affiliated workers.

JN: No, not a strong opposition. Although at the beginning it found a weak resistance, QC Circles activities, as a part of Quality Control, were very soon accepted in the Japanese industry. Only a few Japanese labor unions, mostly communist, distributed propaganda against QC Circle activities.

Except for these isolated attempts, most labor unions backed up QC Circle activities. What is more important, workers did not participate only because it was their manager's command. They found in QC Circle activities an opportunity to express themselves and participate in the effort to improve the quality of the goods they were producing. This is a fact strongly linked to Japanese culture, although not unique of it. They responded in a very positive way to their managers' call to join efforts to improve quality. Thanks to the good results they could see, they soon developed confidence on these activities.

I think that if Japanese workers would have been told:

"Don't care about thinking what you do. You just do what we say".

Or treated like many Western managers treat their workers as

"People who should not lose their time thinking about how to change their way of working".

Without doubt, they would have resisted.

On the contrary, they were told:

"We want you all to use your minds and act openly and do what you think is right".

This is a Japanese cultural characteristic. In Japanese society, workers can develop their own potential.

I: But was not this attitude a product of the pressure that Japanese society exerts on individuals, rather than of increasing individual freedom?

JN: No. This happened in a historical stage of social development. In the 1960's, the government of Prime Minister Ikeda issued several laws promoting social growth. This was an environment that promoted participation. This period showed an unprecedented growth. Whatever we produced we could sell it. This condition lasted until the first Oil Shock (1973).
During this period, workers were able to get as much income as they were willing to work. They made the age of "hardworking workers". Overtime, bonuses and wage raises were offered on a basis of annual evaluations of their performance.

I: Japan decided not import any foreign labor force to cover its increasing demand for labor during its very fast industrial growth. On the contrary, the U.S. did it at its time, was this a factor that forced companies to increase wages and to educate their workers?

JN: Yes. But because labor force wages could not be increased as fast as its demand growth rate, Japan had to manage its industrial growth with a limited labor force supply. Because it was decided not to import cheap foreign labor resources, Japanese industry had to operate with more educated people and consequently its technology progressed relatively faster.

(1965)

A new stage in the development of QC occurred when Japanese managers listened to Dr. Juran's ideas and decided to introduce QC Circle activities to other functional sectors of their companies. Engineers and even workers, the lowest hierarchical level of the organization, were already active in the production sector. Therefore people in other areas of the companies felt they needed to participate. Accounting, Materials, Industrial Relations, etc., all administrative staff started to promote their own activities for the quality control of their activities, and especially they began to get involved in QC Circle activities.

This evolutionary process, finally brought Japanese companies to TQC. For the first time, the concept of Company Wide Quality Control (CWQC) emerged in Japanese industry.

I: Do Japanese companies introducing TQC for the first time currently start also from their production department and gradually extend the process to the rest of the functional areas of the organization?

JN: No, now they start TQC in all sectors at the same time. Especially, service industry firms, which naturally do not have a production department, start their TQC activities simultaneously in all their functions. This is also the case of Department Stores.

It is a surprising phenomenon that it took only three years, from the kick off of QC Circle Activities in 1962, to the emergence of TQC as a Company Wide Quality Control concept (CWQC) in 1965. Again, this is a marvelous fact.
It is QC Circles' merit to have spurred quality improvement during the Japan's rapid industrial growth, counteracting at the same time the common trend toward a phenomenon of quality downgrading when production volume is increased.

This fact was recognized and gained an increasing general esteem for QC Circles in Japan, and stimulated a large variety of industries to start their own QC Circle activities. Additionally, the companies that were already active and those which had succeeded in their introduction to the production sector wanted to spread the activities to other areas.

It is important to note that many Japanese companies only run QC Circles activities. Banks are an example. Although it is good, under JUSE's criteria, those companies do not have TQC. We do not let them to say that they have TQC. This is an important distinction between running only QC Circles and having a TQC system.

It is also a fact that in Japanese QC Circles we can find the origin of the Company Wide Quality Control system (CWQC).

I: Some Japanese companies have a sort of Quality Control System based on a consultant's know-how. Is that also TQC?

JN: No. This is the western style. JUSE does not sell any know-how. I believe there is no know-how in TQC, but certainly there is knowledge. Action is also an essential element of TQC. Action is something which the people trying to learn, and not who is teaching, must set forth. This is why we dare to say that TQC is closer to the nature of a culture rather than to the nature of any know-how or technology.

I: However, since a culture is something that is in the minds of people, cultural change needs to be managed. Therefore, I believe there must be a managerial content in the evolution of TQC promotional activities.

JN: I have traveled about four times to Mexico and South America. Based on what I have seen, I think the reason for the poor results in the promotion of quality in those countries lays in the lack of understanding of the basic concept of the cultural nature of TQC. Latin American managers think that bringing somebody with a special knowledge, e.g. a consultant or a specialist, and putting him to work on quality control is enough to achieve TQC.
About the same pattern of thinking can be observed in some U.S. companies which try to set up a training relationship with JUSE. First, they want to send their consultant company to learn from us. Then they want the consultant to start working in their companies transformation. They themselves seldom want to come to see and learn.

I: They understand TQC introduction as a process that can be delegated to a consultant. Don't they?

JN: Yes. But we do not want to help any organization under that kind of relationship. Company representatives must come, see and learn by themselves if they want our help to promote TQC.

Consulting system in Japan, especially Quality Control consulting is completely different to the U.S. and European ways. Now in Japan, we have specialized consultants working for TQC, but during the historical development stage of TQC, all consultants were university professors. They helped the companies to develop TQC as special consultants. Even now, their consulting role is typically to attend the company only once a month. There, they only give their comments about what the company reports to them as work done, activities performed, and results obtained during the last month and offer suggestions for future courses of action. Sometimes these consultants have to admonish or even "give orders" to the company's president to do something important on the issue. Japanese consultants can do this because they are highly esteemed persons and they are acting on the basis of a voluntary cooperation to help the company. They are not sub-contractors of any service subject to the company's president authority. The company is always responsible for the progress of its TQC efforts, not the consultant or counselor [as they are called in Japan]. This is Japanese TQC.

In other countries, consultants have to follow the orders of the company president. For example, in the U.S., the company and a consultant sign a service contract for several years, then the consultant becomes responsible for the progress of the project. Company's managers delegate their responsibility to the consultant. When the contract ends, and the consultant leaves, the company the quality level of the company might even go down to an even lower level than before.

We tell the companies which want to learn from us that a good way to do it is to send some of their people to learn TQC from JUSE's instructors. Then they can go back and start they program in their company. But the whole company must be set out to learn from them.
We recommend to every country trying to organize their TQC activities to do it through non-profit organizations rather than by hiring consultants in each company. This is a very important step.

This year, for the first time, an American company won the Deming Prize: Florida Power and Light Company. This proves that American companies can have TQC. This company did it the Japanese way.

We have learned from many experiences that companies must educate their people from their very top management. This is why now many people are taking the Top Management Course in Japan. Also, many foreign managers are attending Top Management courses in Japan. However, this is happening only in the case of companies from the developed countries.

Managers, and some CEOs and Presidents, from very wealthy companies of non-developed countries such as Colombia and India are also coming to Japan to attend a one week top management course.

I: I guess managers from other countries coming to Japan to learn TQC find this country at a very high stage of development of TQC, and the fact that Japan has been promoting it for 25 years and is up in the learning curve, offers them the opportunity to learn from a country where TQC is well understood. They even can find a theoretical and practical framework to guide them not available before even for Japanese companies. However, the evolutionary lag between Japan's TQC and their countries' QC system is a handicap for them to understand how to start TQC in their countries. What solution do you suggest to fill this understanding gap?

JN: You are right. Even more than hard trying to understand and then adapt Japanese TQC, it is impossible. Japanese TQC is based in its culture. If they do not understand Japan, they can not understand its network of social relations and activities.

I: Even more, in the process to adapt what they perceived as Japanese TQC to their organizations, they find that they can not implement many of its characteristic as they saw them in Japan, because of their cultural content, so they begin to strip down TQC of many of its essential elements, in other words, they start an impoverishment process rather than an assimilation process. What do you think about those companies ?. Considering that even when a system with very high cultural content is intentionally copied, inevitably a transformation occurs because of the different cultural background of the recipients. Don't you think managers should rather try to copy what they saw in Japan and only
after, learning by doing, begin the cultural adjustments?

JN: The fact that Japan's TQC is based in its national culture does not mean that TQC can not be achieved in other countries. We Japanese learnt the Quality Control System from the U.S. and transformed it to fit our culture. This is the same process to be followed by other countries: Study Japan and Japanese TQC and then decide on how to adapt it to their country's cultural characteristics.

A very important cultural difference between Japanese philosophy of work and other countries' is that in Japan work is a noble activity. It is a sacred gift. However, other countries' religious thinking turns work into a curse that human beings have to bear. This a very big handicap for the development of those countries. Catholics have this problem.

On the other hand, we find that although for communist countries work is something that has to be done to survive, they have not being very successful in their struggle for progress.

In Japan the cultural perception of work has a very positive effect, the more we work the more we benefit. TQC activities depend a lot on this cultural value. Countries that have taken Japan as an example are also progressing rapidly. Taiwan and Korea, that are following the steps of Japan, are progressing at a very fast pace. Their success is having a very strong influence on other developing countries. One of their common traits among Japan, Taiwan and Korea is their keen interest for education. Their example is also leading other countries to put a strong emphasis on education.

In Japan, we have a saying: "TQC begins with education and ends in education". This is a very essential principle for the promotion of TQC. We keep our work consistent with this principle. Year by year, JUSE's courses are improving. Every year we set a new record. Participants' number in education and training courses is always increasing.

I: It seems to me that in Japan, JUSE, JSA (the Japanese Standards Association) and other organizations are providing the necessary education and training services to the industry. How do they agree on the distribution of their activities?

JN: Industrial Associations and companies decide on that issue. We do nothing about it. JUSE and JSA, all act cooperatively. In quality control matters, JUSE is the best option. Therefore, many firms come to JUSE. JSA recognizes JUSE's superiority in the Quality Control field. Our courses attendance is always saturated. JSA's are not. JUSE has more
participants from large firms. Something to remember is that JUSE has the Deming Prize which has a very strong attractive for those big companies, they strive to be the recipients of such a cherished and socially visible achievement.

On the other hand, JSA is the strongest in the standardization field. It is their main field and they are the best.

JUSE is recognized in all Japan as the center for quality control and JSA is the same for standardization.

I: It is my understanding that mentioned as Action, somehow process standardization is one of the steps in PDCA's Cycle of Improvement. How does JUSE help in this field?

JN: Standardization is a pre-requisite for TQC. If there is no previous standardization, improvement [in Japanese: "kaizen"] is not possible. Again, after improvement standardization becomes a necessary step. Putting some brake or latch [in Japanese: "hadome" or literally, putting a latch to gear to prevent back rolling] to prevent the process from decaying or going back to a previous and less desirable condition is very important. Then, after each stage of improvement, there must be a corresponding action for the standardization of that improvement. In this way, step by step progress is made possible and progress as a spiral process is achieved. Consequently in Japan, TQC can not be conceived without standardization.

I: To what extend have QC Circle activities spread to other countries?

JN: One interesting example of the international diffusion of QC Circle activities is the contract signed by the World Bank and JUSE to conduct training for some Third World countries currently World Bank debtors. This attempt is purposely made to improve their ability to pay back their loans, now in a very critical situation.

Other examples are the second visit of French QC Circle experts. Many developing countries are also starting TQC. I can mention Cyprus, small African countries, Colombia, India, the Philippines...

I: Do you know about some Mexican firms seriously involved in QC Circles.

JN: Many firms are implementing them. Good examples are Hylsa, Cydsa and Picasa. However, they are not going further to implement TQC yet. They are still in the stage of education of their top management. However in the case of Mexico, top
management courses are too short. Only a day or half a day. In contrast our top management courses are at least five days long. Other countries like U.S.A., Colombia, India, and others are asking us for one week courses.

In the past, also for these countries, courses for their top managers lasting one week were unthinkable. They could not conceive taking their top managers away from their duties for a whole week! Fortunately, they have realized that their former approach was wrong.

In Mexico this has not happened yet. We recommend to Mexican top managers to form teams and to come to Japan, to visit Japanese companies, and to take courses here. Mexican top managers must observe by themselves the essence of Japanese TQC. JUSE will always be willing to arrange for their visit.

For the U.S., this year's February, we are scheduling courses for Boeing and other companies. Top Management of large American firms, including their CEO and Executive Presidents are coming to Japan to attend our top management courses. For security reasons they are flying divided in several groups. One company sent 160 managers divided in four groups! In this way they are showing very clearly their strong interest. It is wonderful that they have achieved the climate to do it.

In all Central and South America, Colombia has been the first to do this. I was surprised. They organized a one week course for their top managers in Cali!

I: QC Circles are not enough to say that a company has TQC. What else is necessary?

JN: QC Circle activities involve only the company's workers. In the pyramid model of a company's structure, QC Circle activities occur only at the base of it. TQC asks also for middle and top management activities. In the same sense that in Japan Deming's SQC implies only the activities of the bottom half of the pyramid and Juran's ideas imply the upper half.

A big cultural problem that Central and South American countries find in their efforts for implementing TQC is their top managers' income. It is extremely high compared to their workers'. They wages are in a ratio usually going from about 30 to 50:1. It is even larger than in the U.S., where they have almost the same big difference. This is one reason for their workers' lack of self-driven cooperation.
In Japan this ratio is about 8:1. A small ratio helps to arouse workers' will to work harder.

I: Has this ratio always been as low as it is now in Japan?

JN: No. Only after the WW-II.

I: In relation to this issue, I believe that Japan has changed its social wealth and standard of living in the same way as it has changed the quality of its products: It has been reducing its dispersion (standard deviation) and has been increasing its average. Am I right?

JN: Yes. You are.

I: Which parameter has improved first?

JN: They have been improving together in a natural way. Education improvement was the main cause for its dispersion reduction. Nowadays 98% of all Japanese workers are high school graduates. 35% of that 98% are also university or college graduates. It is very easy to train a well educated worker. High educational level is a factor that prevents any growth of social differences. Then if social dispersion shrinks, it is possible to increase the average salary and reduce economic dispersion. Japan has been a country very interested in education since long time ago. This interest is a very strong underlying cause for its progress.

I: Going back to the issue of the presumed existence of an elite group managing the direction of Japanese economy's crucial issues. Are TQC and education orientation also included. What is the truth?

JN: In Today's Japan there is no such leading elite. This is why Japanese large companies are doing everything at their will. It is not MITI who tells Industry what to do. It is Industry that tells MITI what it should do to help them. Of course in a very deferential way. E.g.: In the past, the Japanese industry put pressure on MITI to establish a legislation to boost its growth and protect it from outside competition.

MITI plays in Japan the role of its industry protector.

I: Now in the U.S. there is a strong advocacy for a national policy to promote U.S. competitiveness, and in a certain degree, it is also an attempt to emulate what is perceived Japan did, and still is doing, to protect its domestic economic. What do you think about this issue?
JN: Seen from outside, Japan looks as "Japan Inc.", but it is actually not that way. A short time ago, in a TV program, several top leaders of the Japanese economy gathered to discuss the nation's future direction. They included in their agenda the decreasing effectiveness of the government and of the ruling party. Both are now criticized with increasing bitterness. Japan's future is decided through the mechanism of its firms competing in the world market. Government has been unable to keep up with industry's pace and has been laid behind. Industry is driving Japanese economic growth. Japanese government has protectionism as the only important role.

I: For a long time, the importance of quality has been undervalued in many countries, therefore all early attempts to start Quality Promotion Programs have failed. Please, give me some insights on this issue.

JN: For example, I remember an interview with a very prominent officer of the government of a socialist country. When we turned to talk about TQC as a management alternative to produce high quality goods at low cost, he said that unfortunately his country was not at the Quality Control stage. He said they, as leaders of his country, were interested only in achieving high production volume. I told him that they had the wrong approach. TQC could help them to reduce waste and scrap and therefore help them to achieve their production targets. Besides that, from a customer's point of view, the wish to buy at least a fairly good product is natural and legitimate.

To improve the quality of products it is necessary to preserve market competitiveness, and to prevent the development of monopolies that eventually sacrifice quality at the expense of their interest. Japan adopted from the very beginning of its post-war effort to stand up, a policy to guarantee the existence of at least five competing firms in the same market. Then naturally, progress was a natural product from competition.

(1973). The Oil Shock
About TQC's evolution in Japan, at the beginning, only the big companies were active. But after the first oil shock, TQC entered a boom and began to be implemented by medium and small companies and by the service sector. They all had to introduce TQC to survive. Japan's industrial sector is very sensitive to all economic changes. In Japan, we have a saying:

"Look for the way to change disaster into fortune".
Accordingly, thanks to the oil shock, TQC was established definitively in all Japan's Industry. Therefore, we can say now that TQC offers the possibility to turn a bad situation into a good one.(!).

In Latin America, although Brazil started TQC about 10 years ago it has not progressed much. Also Argentina, through its Ministry of Industry and in cooperation with AOTS (the Japanese Association for Overseas Training and Scholarships), started a training relationship with JUSE. We trained about 80 people during three weeks. However, after they went back to Argentina, they did not start any TQC activities at all.

Mexico also started sending a seven months TQC training mission to Japan (4 months Japanese language study and 3 months TQC training) as early as 1976. First came 14 trainees. In the fourth year's and last mission, the number had decreased but at least 10 trainees came. Again, after two years of their being back to Mexico, many have tried to enter the quality consultant business. One of the reasons for my travel to Mexico was to ask them:

Why don't you establish an Association and work for your country?

I: Is Asian Productivity Organization [APO] playing a role in Japan's TQC promotion?

JN: Not inside Japan but Internationally. They translate JUSE's books into English and send Japanese TQC instructors to the asian countries.

I: Are there other Japanese associations playing an important role in TQC's promotion?

JN: There is another: The Quality Control Association of Central Japan [In Japanese: Chubu Hinshitsu Kanri Kyokai]. They are active in that region.

I: What would you suggest for a better promotion of TQC activities in Mexico?

JN: I have been invited by Japanese JETRO and other organizations in Mexico to give lectures about TQC. In cities like Mexico City, Queretaro, Guadalajara and Monterrey. All have of them have scheduled very short conferences, about one hour or half hour long. Most of the people attend only to learn conceptual TQC. They only want to know TQC very superficially but actually they are not practicing it. TQC is not TQC if it is not practiced. I am against one hour conferences. I am requesting them at least a day and a half.
In Japan, we train our engineers in six month courses, with an actual training time of 30 days. Our courses are structured in a way that trainees go back to their work after every weekly session and try to apply what they have learned. We purposely schedule our courses to be as long as half a year, to promote a learning and trial process to guarantee true learning. A one day study session and a whole week practice schedule where trainees learn new concepts, receive orientation, get new assignments and homework, and decide on the experiments that they are going to perform during the next week in their work places, while doing their job, is a very effective training schedule.

I: For a country that has not developed enough expertise in the practical application of TQC methodology what could be a good way to start?

JN: A good way would be attending courses with people from other companies. Also if you find people with enough command of Japanese language. They could even attend JUSE's courses for Japanese companies. You could even develop some friendly relations with other trainees and organize visits to each trainee's company and start an exchange of information and experience.

I: In glass container industry, in which I am particularly interested, do you know of a Japanese company currently applying TQC?

JN: Yes. Asahi Glass. They are recipients of the Deming Prize and they have just re-started their TQC activities. Also, Japan Flat Glass [Nippon Ita Garasu] has TQC activities. In the U.S., Corning Glass is also active.

I wonder why companies other countries do not start practicing a TQC in due form. I mean, in a more basic way and with real practical activities.

I: What is your middle and top management courses schedule?

JN: They attend 3 days sessions every month during four consecutive months. Top managers come to a full time course of one week. Our courses are un such demand that we have to limit the number of participants.

I: In many countries currently implementing TQC we find the problem of managers being so busy that they do not want to attend a course so long.
JN: Yes it is a common problem in Latin American countries. In the Japanese case it is managers' interest what drives them to attend. We only have to respond to their needs. In every activity, interest must come from the actual users. First of all, interest must start from top managers.

I: Has JUSE recently offered training courses for Mexican companies?

JN: We have offered special three month courses for Mexicans with Spanish translators to overcome some of the trainees lack of full command of English. Mexico's first step toward TQC is to awake top managers's interest. Japanese top managers are so interested that they even ask our help as a special favor. For example: The President of Toyota's subsidiary in Los Angeles, being an executive from the biggest Japanese auto-maker, came to ask our help to train his American employees. This is and example of the interest top managers must have in TQC. Toyota is frequently scheduling cycles of TQC courses. They have also included 160 of their supplier companies.

I: A socially accepted Japanese norm of behavior is to acknowledge other people's merits but not to mention own achievements. I guess this custom has caused some omission of details in the way Japanese TQC's historic evolution has been described to foreigners visiting Japan. This fact has caused in Western TQC literature a bias, such as almost only the names of Dr. Deming and Dr. Juran are present in the description. We can find versions in which TQC is described as almost a product exclusively and 'like a miracle thanks to these two personalities contributions. Knowing a little about Japan, this is a story hard to believe and too romantic and simple to be true. What is the truth?

JN: We are in debt with both Dr. Deming and Dr. Juran. However, there is a difference: we have learnt more from Dr. Juran. In everyone of his visits to Japan, he has come to tell us something new, adding one more of his contributions to Japan's TQC. In the case of Dr. Deming, we learnt from him what we needed during his famous lectures in the 1950's. His role in Japan's TQC has been over-emphasized in Western literature. It is not his fault but some of his followers'. For example, we Japanese developed QC Circles. However, some people abroad say they are Dr. Deming's creation.

On the other hand, both Dr. Deming and Dr. Juran recognize that although they have been disseminating the same concepts in their lectures all over the world, only Japan has applied them. They say there must be something special in Japanese attitude. It is our merit.
I: You said that Mexico's first objective must be to arouse top managers interest. To become a reality, I believe that many managers of my country have to get rid of our colonial past psychological anchors and get interested in improving the education and wealth of their company's workers. Perhaps also in Japan there was a time when social structure was such that education and progress was not for all people. Wasn't it?

JN: No. In Japan the existence of "Terakoya" [the school annex to the temple where peasants could get education] testifies the interest for education since the ancient times. Also, the effective appropriation of cultural elements from China and Korea are a proof of this. Since then, cultural transfer was a one-way process because Japan was at the end of the eastern cultural transfer chain. Since then, Japanese have been very avid to learn from other cultures.

Now information spreads all over the world very rapidly. Japan TQC's ideas too. It is the time for Japan to start the process of teaching.

However, sometimes Japanese ideas have been deformed during transference from some people to other.

For example, once I was inquired by an Eastern European government executive about what percentage of salary was taken away from Japanese workers per each defective percentage found in their product, according to Japanese TQC's policy to assign product's quality responsibility to workers. They had heard this news from JUSE's Chinese trainees!. It was a very unfortunate misunderstanding. Such a policy has never been imposed in Japan.

I: I have seen in Japan's bookstores many Japanese books on TQC that are full of illustrations. Is that a common characteristic?

JN: Yes. That is specially true for QC Circle books. They are designed to be attractive to Japanese workers.

I: Do you have a last comment?

JN: Yes. You have to convince Mexico's top managers to put all effort to allow your country to produce goods of high quality to be competitive in the world's markets. The point is to do it at low cost.
APPENDIX IV

IV.1. INTERVIEWS IN JAPAN.

IV.1.2.

Interview with Dr. Masanobu Kawamura
Director.
Japanese Standards Association.*

by Antonio R. Flores.
February, 1990.

* (This report is a transcription of selected issues from the recorded interview held by the author with Dr. Masanobu Kawamura and Mr. Yawara Tomiyama at JSA's Headquarters' Office. Tokyo, Japan. January 16, 1990. Original recording in Japanese language).

Translation: Keiko and Antonio R. Flores.

Note: I: Interviewer, MK: Mr. Masanobu Kawamura's answers.

INTERVIEW

I: In your opinion, what are the most important organizations involved in the national promotion of TQM in Japan?

MK: The Japanese Union of Scientists and Engineers (JUSE), the Japanese Standards Association (JSA), and the Central Japan Society for Quality Control (CJSQC) [Chūbū Hinshitsu Kanri Kyōkai].

I: Is there any relation between JSA's quality promotional activities with those of JUSE? Is it competitive or complementary?

MK: We cooperate friendly. For example, JSA is a member of JUSE's Deming Prize Awarding Committee.

In many situations, both organizations get involved in the same activities and consultation processes. And many JUSE members are also JSA members. Both associations share the same source of demand for services, i.e. the same firms that come to JSA asking services also go to JUSE asking for other services in the same field of quality.

Japan's QC activities are mostly centered in JUSE and JSA. Both organizations cooperate harmoniously for the development of Quality throughout the nation.
Cooperation rather than competition is a very important characteristic of the national promotion activities for quality in Japan. And cooperation is encouraged by both organizations.

However, with respect to the orientation of their activities, there is one important difference: JSA is an organization of governmental nature. It is administered under the guidance and partial financial support of the Ministry of International Trade and Industry (MITI).

I: What are JSA's objectives?

MK: JSA was established with the main objective of developing the Japanese National Standardization System. It was created to incorporate the standardization principles learned in Japan from the U.S. War Standards in the postwar period. This happened at the same time, when Drs. Mizuno, Ishikawa and other pioneers were forming JUSE's QC Research Committee.

I: What are JSA activities?

MK: JSA activities are divided into two big classes: Industrial Standardization and TQC activities.

JSA's Industrial Standardization activities are related mainly to the Japanese government's Industrial Standardization and Quality Certification System, i.e. the JIS Marking System.
This system has two licensing procedures:
The "JIS Mark for a Product" that uses the JIS logo, and the "JIS Mark for a Process" that uses the same logo but inside a circle.

The first protocol allows a firm's product [if it is included in the Designated Products List of the 19th chapter of the Industrial Standardization Law] to hold the "JIS Mark for Products" certification, after it has applied and passed a rigorous examination conducted by MITI with JSA's support.

The second allows a factory to hold the "JIS Mark for Process" [under the same law's 25th chapter regulation] after following a similar screening process. This license applies only to a certain certified manufacturing process and only within the applicant factory.

JSA has an important role in supporting the JIS Marking System:
JSA publishes of all JIS standards prepared by the MITI's Agency of Industrial Science and Technology (MITI-AIST); and
conducts the preparation work of all JIS related with quality control through its Control System Committee (COSCO).

Additionally, since its establishment in 1950, COSCO has been working in the preparation of manuals and texts for the knowledge dissemination of any JIS standard on quality control and other related fields.

JSA carries on training and consulting for companies applying and holding the JIS Mark in their products or processes, general education and training courses, publication of JIS Marking System texts, manuals, and periodicals, and promotes general public awareness on the merits of the JIS Marking System through several mass media channels.

As a result, the JIS Mark stands today in Japan as a widely recognized minimum requirement for quality and safety, and its merits are known throughout the country.

Nowadays, 15,200 products hold the Product JIS Mark and 12,300 processes hold the Process JIS Mark.

With respect to TQC promotion activities, JSA is involved in many:

JSA publishes and distributes a big number of manuals, texts, tables, educational audiovisuals, and materials related to quality. It also offers tools and software for quality control. Up to last year, we have published 8,000 standards and 1,000 texts, about 30% are on QC.

JSA also carries on many training courses, seminars, conferences and symposiums. As is described in the JSA 1990 Activities Program, JSA offers many QC educational courses and seminars, and related educational courses.

Besides the QC Educational Courses, JSA sponsors many other more advanced educational and training events, some are special courses developed from its staff research activities [led by Dr. Genichi Taguchi].

The following deserve special mention:

- The Training course for Department Heads and Senior Managers with a one week schedule.

\[1\] JSA. 1989d.
The Design of Experiments Seminar held from May to August, a five months-20 sessions, educational course on the Taguchi Method.

The Advanced QC and Standardization Seminar in its three levels:
- The Complete Course -held for 15 days.
- The Basic DE Course - in 9 days, and
- The On-line QC Course - in 6 days.

The Mail Course on Statistical Methods -6 months, 15 sessions.

The QCRG (Taguchi QC Engineering Research Group) monthly presentation.

The QC Engineering Annual Symposium, etc.

As you see, we also offer courses on TQC as JUSE does. However, JUSE is specialized on the QC Circles promotion field. On the other hand, JSA concentrates on training and education of industry technicians and staff. JSA is almost not involved in QC Circle Activities, because JSA decided to be active only in those TQC activities that relate with its main objective: Industrial Standardization.

Furthermore, JSA is the only institution set up to educate the staff responsible for the in-company promotion of quality control and standardization, of the companies licensed to hold the JIS Mark. We train their staff in a 3 months course.

Since 1963, JSA conducts research on quality control pioneering fields like Quality Evaluation Systems and Quality Engineering [Taguchi Methods and other] and Design of Experiments through its Quality Control Research Group (JSA-QCRG). Its name is the same of JUSE-QCRG.

JSA is also actively involved in research on standardization methodology, tolerance methods, and the harmonization of standards systems.

JSA also engages in several national promotion activities, both on standardization and on quality control. The most important are:

- The promotion of "JIS Mark System".
- The promotion of its "Standardization Journal".
- The "National Meeting of Standardization".
- The "Quality Month" held jointly every November in cooperation with JUSE and the Japan Chamber of
The co-organization of the "National Standardization Promotion Month", held every August, with MITI and other government offices, and

The National Meeting of Quality Control and Standardization.

In the international field, JSA cooperates actively in the promotion of Standardization and Quality Management and Assurance within several international associations.

Also, for 23 years, JSA has been carrying on training courses for participants from many Developing Countries.

I: What are JSA's financial resources? Is it fully supported by government's subsidies since JSA is a governmental institution?

MK: Basically, JSA must finance its own activities. To establish a JIS standard a big amount of financial resources are needed, this is due to the general consultation process that must be followed during its design stage. Although JSA proposes many issues, other sectors of the society submit their proposals too. After a long and careful process, MITI makes the decision. Then the final project is sent to JSA for its implementation. **JSA prepares, publishes and distributes the standard.** The income from general sales to industry and the general public come to JSA. These profits are used to run all sort of public promotional activities in which JSA is active.

Therefore, JSA's financial resources come mainly from the income derived from the sales of publications and licenses: JIS standards and JIS Certification Mark, books, information, and the sales of software and tools.

As a second financial source are the fees from training and educational courses, conferences, seminars and symposiums.

The third source in importance is government's subsidy.

Subsidies usually come together with a new project assigned by MITI to JSA. For example, the International Standardization of Information Processing is very important because of the crucial importance of any improvement in this field has on the competitiveness of Japanese software. However, Japanese government can not manage this issue directly. Therefore, JSA got the assignment. Likewise, JSA gets many other assignments from MITI to engage in diverse activities, and the financial support
comes together. Because this money does not cover JSA's total operating costs, we have to obtain the rest from fees and sales of services. It does not mean that JSA makes profits using the country's resources. We receive a subsidy that adds to our sales profits and the whole is used for the benefit of the country.

Annual income in 1987 fiscal year was 4.3 billion yen.

Income from membership fees was about 200 million yen, (20,000 yen per associate). The difference was income from sales of services and information.

I: Is JSA planning to carry on standardization activities in the service industry?

MK: This is an issue still under discussion. Up to now, JSA has been active only in the Industrial Standardization field. This is a manufacturing oriented activity, [i.e. in the economic secondary sector]. We are now questioning what to do in the case of firms which provide service to the manufacturing industry. Also those firms in the service sector, like hospitals and communication service companies (e.g. NTT), are very closely linked to the manufacturing industry, therefore we are promoting research groups and seminars on these activities.

JUSE is now much more involved in the QC promotion of the service sector through QC Circle activities. We also have just published a book on QC for the Service Industry.

Through its 176th Technical Committee (ISO/TC 176), the International Standards Organization is active in the work toward the Standardization and Quality Assurance in the Service Sector and JSA is participating very actively. In Japan the central coordinator is Prof. Hitoshi Kume of Tokyo University, also an important element of the JUSE's QC Circle activities and of the JSA's Quality Assurance activities. Last year he received the Deming Prize and, among his merits, is his work for the progress of international standardization.

I: Is JSA actively helping the industry in their in-company standardization activities?

MK: Yes, in a way similar to JUSE, which offers education and training courses to help companies to win the Deming Prize, JSA cooperates by training many companies by sending instructors to their places. We also help them to solve their problems by sending consultants that assist the firm once a month to jointly analyze and discuss problems related
with standardization.

I: Are this consultants JSA staff?

MK: Some are JSA's staff, but most frequently they are university professors.

In the case of JUSE, all development activities are performed by people other than its staff. But in the case of JSA, its staff contributes to the development of JIS standards, because we have a specialists group. For example, when a company needs an on-the spot service related with standardization, JSA usually sends its specialists staff.

I: In the Quality's PDCA cycle [Plan, Do, Check, Act to correct or standardize], standardization is an important step. Is JSA helping the industry in this direction?

MK: Yes. We offer the Seminar for In-company Standardization. We also help the firms to teach In-company Standardization inside their facilities. For companies licensed to use the JIS mark, In-company Standardization activities are compulsory and have a stronger effect on the quality of their products and processes than QC Circle activities, because of the priority those companies place on the conformance of the JIS Mark requirements that they are committed to keep. On the other hand, QC Circles are oriented toward the solution of more general quality issues.

As a result, JSA is involved only partially in TQC activities. JUSE is totally.

I: Is JSA performing research in metrology?

MK: Yes. In the extent that Taguchi method is closely related in to metrology. Specially in case-by-case rational control.

Many people related with QC do not pay enough attention to metrology. When they get data they do not care much about their validity. In contrast, Taguchi Method works on data rationalization.

Our mail course is designed for metrologists. In addition, Japan has several metrology research centers and associations. We also cooperate with them in the application of Taguchi Method.

I: About JSA's training activities for Developing Countries, do you train Mexican participants? and under what sponsorship do they usually come?
MK: Yes we train Mexican trainees. They usually come under Mexican government's sponsorship. But participants from other countries come more frequently and in bigger numbers.

I: To give you some examples, today we are starting a two month course for foreign trainees on the JIS Marking System and Certification related issues.

This summer, we are offering a course from June to September on Quality Control Practice for Businesses for foreign trainees.

In November, we are offering a three week Quality Control Senior Seminar. Participants from Mexico will attend.
IV.1.3.

Interview with Dr. Shoji Shiba.  
Professor of Business Administration.  
Tsukuba University.  
and  
Advisor.  
of the QC Circles Association  
Ibaragi Chapter. Kantô Branch. *

by Antonio R. Flores.

* (This report is a transcription of selected issues from the interview held by the author with Dr. Shoji Shiba in Tsukuba, Ibaragi, Japan. January 13, 1990.)

Note: I: Interviewer      SS: Prof. Shoji Shiba's answers.

INTerview

I: In what way is the QC Circle Promotion Association organized?

SS: The QC Circles Association is an organizational network divided by regions:

Hokkaidô, Tôhôku, Kantô, Chûbu, Kansai, Chûbu, Kansai, Shikoku, Kyûshû and Okinawa, and led by a Headquarters in Tokyo.

The Kantô Branch divides again into several chapters, one of them is the Ibaragi Chapter.

The relation each chapter has with JUSE is informal and in many ways very independent. Branches and chapters receive no money from JUSE, but are supported by its member companies, although there is no fee to join the association. Our chapter is very active and has many very experienced collaborators.

I: Who integrates the chapters?

SS: Any branch or chapter is integrated by companies. Most of JUSE member companies are also active members of the QC Circle Association.

The QC Circle Association is a very strong organization. For
example, the QC Circles Magazine reaches about 170,000 copies per month. It also edits other books, such as the "QC Circle Koryo", "How to Manage a QC Circle", and many other.

Every branch is structured in a very similar way, there is a leading group formed by a Director Company and an Assistant Company (or Sub-Director Company) elected by all member companies in a General Conference, to serve as leaders of the association's one year activities. Each of the two elected company appoints a Director and a Manager.

There is also a person, usually from academy, that has been asked to act as an Advisor. That is my role in the Association.

Every chapter has also the same leading group structure for the same temporal responsibility. Participation is voluntary.

QC Circle Association's organization follows this pattern:

For the detailed coordination of each activity, we have the Secretary Companies, elected among the best in the General Conference.

The Ibaragi Chapter has 300 member companies that constitute the General Conference, and from them, 41 Secretary Companies elected among the best.
The Secretary Companies undertake the task of organizing each year's activities. To support their special responsibility for one year, they provide the association with a one full-time staff person (generally a Department Head, and 2 or 3 other part-time collaborators to help him. As a whole, our chapter has 92 secretaries actively working in the organization of this year's activities. The election of succeeding leader companies is made in advance. We already know which companies will be the leaders for the next three years.

Among these 41 Secretary Companies, 10 coordinators are selected to serve in different specific activities.

I: What is the Advisor's role:

SS: First of all, the Advisor's appointment is a honorific position. An Advisor is selected from an academic field to assist in the association's policy design, to offer philosophical direction and to advise on educational matters.

I: What kind of activities does the chapter organize?

SS: The activities currently run by our chapter are such as:

- QC Circles Top Managers Course.
- Coordinators Presentation Course.
- Secretaries Course.
- Leaders Course.
- Middle Managers and Department Heads Course.
- Spring, Summer and Fall Conferences.
- The Beginners Conference.
- The Female Leaders Course and Conference.
- The Factory Visits.
- Training manuals and texts preparation.
- The New Seven Tools for Management Research activities.
- Etc.

Our chapter carries out all his training activities, including texts and instructor manuals preparation, on its own. Member companies provide also instructors from their staffs and sponsor outside guest speakers.

The association also organizes several events for the local

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1 For more details, please refer to the QC Circle Association Organization Chart in JUSE's Profile Appendix.
community, among them are the eight conferences for the public scheduled per year.

I: How are these activities financed?

SS: Most of the big events must be self financed. Take for example last year's Spring Conference:

Total participants were 1,099. 999 paid, the rest were invited.
Income from the conference was 3,522,301 ¥.
Total expenses were 2,276,938 ¥. The profit will be used to support other less self-supportable activities.

I: What benefits do companies get from participating in the association's activities?

SS: The benefits are:

(1) QC Circle Activities are necessary for a company. Because companies' efforts, if they are isolated, are very weak. Exposure to other companies activities is a very good chance to get ideas and to make stronger a company's. They can send their people to other companies to see how they are active, thus stimulate our own ideas. In short, this becomes a learning system.

(2) By sending them to participate, companies can stimulate their own QC Circle coordinators. They can discuss and share experiences with their peers.

(3) Association's participation fits a company's sense of social responsibility. For example, Ibaragi Prefecture has many Hitachi subsidiaries and plants in its geography. Therefore, being a big company, Hitachi is committed to give back to the community some of the benefits it gets. They feel they have to do something about it.

I: How do you frame QC Circle activities within Total Quality Management?

SS: QC Circle activities are not the same as TQC, but they are one of its very important elements. Many people misunderstand their meaning and indistinctly use them as synonyms.
In reality:  

TQC $\neq$ QC Circles.

But in the minds of Japanese public:

QC Circles = TQC.

Therefore, QC Circle activities give TQC a lot of its strength. They also give TQC a great deal of popularity. Their impact on Japanese society is considerable.

I: What set of activities encompasses TQC?

SS: Functionally, TQC implies during the product design stage the use of several methodologies, such as the New Seven Tools, QFD, Value Engineering, Reliability, Design of Experiments, and the Taguchi Method.

At the production stage, it implies the use of SPC, the Seven Tools, Standardization, Industrial Engineering, Operations Research, Pokayoke (or fool-proof devices and measures), the Five "S" (or housekeeping principles), Just in Time, Total Productive Maintenance, Sensory Analysis, etc.

TQC implies quality of the organization, quality of the human resources, and quality of the company.

In essence, TQC is a set of tools for improving the company.

TQC is different to Operations Research in the sense the latter's definition is limited, while the first is open and expanding.

The meaning of Total in TQC is:

(1) In the sense that it implies all organizational functions.
(2) Its implication of all hierarchical levels and functions' activities.

(3) Its implication of top executive's leadership.

I: What percentage of all companies really have TQC?

SS: I do not know the answer to that question, but certainly of the many companies involved in Japan in QC Circle activities promotion, only a segment have TQC in its full meaning.

<table>
<thead>
<tr>
<th>Japanese companies involved in QC Circle activities promotion</th>
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<tr>
<td>Companies involved in TQC</td>
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I: How does this happen?

SS: In Japan, the workers social class is very strong, therefore QC Circle activities can survive in a company even without its top and middle managers support.

I: How is TQC evolving in Japan?

SS: (a) It is shifting from manufacturing to service industries.

(b) It is moving upstream: from customers to product design and supply.

(c) It is moving upwards to low labor intensive industries with automatized and computer controlled operations. (This implies a new way of TQC and QC Circles for a higher level of education work force).

(d) It is moving toward internationalization, both for overseas Japanese companies and for foreign corporations. (This implies TQC for non Japanese people).
(e) The concept of quality has evolved as follows:

1950's: Conformance to standards.
1960's: Fitness for use.
1980's: Satisfaction of customers latent (or implicit) requirements.

I: What do you consider essentially cultural in Japanese TQC?

SS: (1) It has a long range perspective.

(2) It implies activities beyond the limits of a single company.

(3) Much of TQC has achieved with a sense of patriotic interest. ("Do it for Japan").

(4) It has had good management leadership. Pioneers and followers worked in the same direction. No divisions.

(5) Expertise transfer is not done through consultants. (Actually consulting has been a low status profession in Japan).

(6) Management has created work-force loyalty for the company.

(7) QC Circles popularity and strength. QCC activities can be implemented even with part-time workers.
APPENDIX IV

IV.2. INTERVIEWS IN MEXICO.

IV.2.1.

Interview with
Mr. Francisco Gonzalez Prado
General Director.
and
Mr. Agapito Gonzalez.
President.
of the
Mexican Institute of Quality Control (IMECCA).*

by Antonio R. Flores.

* (This is a transcription of selected issues from the
interview held by Mr. Jose L. Flores with Mr. Agapito Gonzalez
at IMECCA Headquarters in Mexico City. January 20, 1990.)

Note:  I: Interviewer  A: Answer, (FG) Francisco Gonzalez
(AG) Agapito Gonzalez.

INTERVIEW

I: What was the first event on the promotion of Quality Control
in Mexico?

A: (AG). The first recorded event was the establishment in the
1950's of the Mexican Chapter of the American Society of
Quality Control (ASQC) which in 1955 became the National
Association of Statistics and Quality Control ¹ . Before,
the Mexican government had made several indirect efforts to
promote quality. An example is the establishment of the
National Norms Office ² in 1943.
The emphasis the Mexican government has put on quality has
varied with each President's administration. Later, another
event was the establishment of the Mexican Packing Institute ³.
During the President Echeverria's administration (1970-76)
other institutions started giving indirect support to the

¹ Asociacion Nacional Mexicana de Estadistica y Control de
Calidad, (ANMECC).

² Dirección General de Normas, (DGN).

³ Instituto Mexicano de Empaque y Embalaje.
development of quality in Mexico:

The Mexican Institute for Foreign Trade \(^1\) had an Office for Quality Control Inspection of export goods.

The National Laboratories of Industrial Promotion \(^2\) also cooperated indirectly, running tests and research related with quality control. (Later The Mexican Export Bank \(^3\) took over them).

The National Commission for Fruit Industry \(^4\) helped to improve quality in its field.

I: When was your association founded?

A: (AG). We founded IMECCA in May, 1973. Our main objective was the promotion of quality for the improvement of Mexican products. Its genesis is the study Mr. Francisco Gonzalez P., our General Director, made in Stanford on the design of a national quality promotion program. Later, he and myself, founded IMECCA as a private non-profit civil association. Formerly, I had been a member of ANMECC, the ASQC Mexican Chapter. IMECCA has two types of membership: individual and companies memberships. IMECCA requires an annual membership fee and offers a discounted fee to members for conferences, seminars, and training courses. Since its foundation, both founders have held the association technical and administrative control. Notwithstanding, the association's direction is open to any member. IMECCA operates mainly in the training and consulting fields.

I: In your personal opinion, what has been the historic evolution of Quality Promotion Activities in Mexico?

A: (AG). This is a difficult question. First, I could not even say if it has followed a good path. There has been more competence than cooperation. Every association has stuck to its own philosophy, there is no leadership and cooperation has been almost absent. It has been present only in isolated cases. Trying to join efforts has been very hard,

\(^1\) Instituto Mexicano de Comercio Exterior, (IMCE).

\(^2\) Laboratorios Nacionales de Fomento Industrial, (LANFI).

\(^3\) Banco Mexicano para la Exportacion, (BANCOMEX).

\(^4\) Comision Nacional de Fruticultura. (CONAFRUT).
and this is to be regretted. In other words, for a long time synergism and complementariness have been absent. Discrepancy has been the common rule. In my opinion this has been the general pattern of evolution of Quality Control promotion activities in all Latin American countries.

In 1982, the Monterrey Institute of Technology \(^1\) through an agreement with Ford Motor Co. started its Quality Control Education and Consulting Program and established a Quality Center in several of its campuses. They offer courses on SPC \(^2\), Quality Control, Quality Circles, TQC \(^3\), and QFD \(^4\).

Until 1982, \(^5\) Progress of Quality Promotion activities had been very slow. Then after, it has shown more vitality and generalized interest.

I: What is IMECCA's philosophy?

A: (AG). Our philosophy is based in three principles:

1. Only by joining everybody's efforts we will be able to solve Mexico's problems.
2. We all can contribute:
   - by learning from other people and
   - by teaching other people.
3. The pleasure of giving is great people's gift, let us be great.

I: What international school of quality control has had the strongest influence in IMECCA's philosophy.

A: (AG). We are open to all currents. Along time and with experience IMECCA has developed its own philosophy and training methods. We believe we are pretty well approaching Mexican needs and idiosyncrasy. When we founded IMECCA, since I had worked for General Electric Co., I had the opportunity to work under the direction of Dr. Feigenbaum,

\(^{1}\) Instituto Tecnologico de Estudios Superiores de Monterrey (ITESM).

\(^{2}\) Statistical Process Control.

\(^{3}\) Total Quality Control.

\(^{4}\) Quality Function Deployment.

\(^{5}\) 1982 was the year when Mexico faced a financial and economic crisis which threw it in default to service its foreign debt on schedule. Concern about solvency and social and political stability arose. (Weintraub, S. 1984: 38).
therefore, our approach was at first influenced strongly by his TQC philosophy. I believe Dr. Feigenbaum's work has influenced all later quality control developments and philosophies.

We are now an active member of several international quality control organizations such as: WCPS ¹, FLCC ², APQCO ³, and AQP ⁴.

I: To follow the principles you mentioned, How does IMECCA orient its activities?

A: (FG). We have worked to implement a Mexican style Quality Control System. It is not possible to address Quality issues to Mexican workers, many of them illiterate, in the same way as in the developed countries.

Our main contributions have been IMECCA approaches to quality promotion through "Dynamic Management", "Management Quality Circles", "Integral Quality Circles", and the "Progress Triad: Planning, Controlling and Improving".

We emphasize the importance of motivation at managers level, as Juran and Crosby advocated, and Quality Circles as a management style and a new way of working. SPC has not been a successful approach in many Mexican firms because has not been understood as an element of an integral system and has been practiced in isolation. With respect to Quality Circle activities, we Mexicans have made the same mistake the U.S. have: Failure to realize that carrying on Quality Circles in a company is only a way to achieve an objective: quality improvement. In other words, Quality Circle activities shall not be carried on per se, but as a mean to improve quality.

Since 1973, we have worked with several companies based in Monterrey ⁵, in establishing their quality systems. We believe that quality improvement leads to productivity improvements. Therefore, our first stage objective is to

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¹ World Conference of Productivity Science.

² Federacion Latinoamericana de Control de Calidad.
   (Latin American Quality Control Association).

³ Asian Pacific Quality Control Organization.

⁴ Association for Quality and Participation. Formerly, until 1987, the International Association of Quality Circles, IAQC.

⁵ Monterrey is Mexico's second largest industrial city located near the Texan U.S. border.
contribute to the cost competitiveness of Mexican products and in a second stage, to improve the Mexican worker per capita income, at least until a level when a worker will be able to afford to buy a pair of shoes with half of his daily salary.
APPENDIX IV.

IV.2. INTERVIEWS IN MEXICO

Interview with
Ms. Keiko Toda de Miyamoto
Corporate Director of Quality Assurance
Celanese Mexicana S.A.

by Antonio R. Flores.

* (This is a transcription of selected issues from the interview held with Ms. Keiko Toda de Miyamoto at Celanese Mexicana Headquarters in Mexico City. January 22, 1990.)

Note: I: Interviewer KT: Ms. Keiko Toda's answers.

Notes: The author conducted a series of interviews with Mexican quality executives and experts in search for their experiences and opinions on the current state of quality promotion activities in Mexico.

Celanese Mexicana S.A. is a leading company in the synthetic fibers and chemical industry in Mexico and has 8,000 employees. Ms. Keiko Toda has been responsible for 7 years of its in-company quality promotion activities and is recognized as a quality expert in Mexican industry.

INTERVIEW

I: How do you perceive the need for national quality promotion activities in Mexico?

KT: I believe remaining isolated is a big mistake.

I: Please describe your company's activities related with this issue.

KT: First, I became a member of a group formed for this purpose by only 4 Quality Vice-Presidents from Policyd, IBM of Mexico, 3M of Mexico and Celanese. This group does not exist any more: The first member became a quality consultant, the second quitted because his company declared to have achieved its goal, and the third was promoted.

There is another group formed by several companies such as Kimberly Clark, Bacardi of Mexico, Condumex, and Conduatel, a consultant from Crosby International, and others. They meet once a month and function as a committee. I attended without regularity. But I quitted because I had problems with their
meeting's schedule and also because I felt, at least at the beginning, that I was giving more than what I was receiving and I was losing attention for my company's duties.

I believe these groups are the most important contributors to these activities in our industrial environment.

I: There is another group formed by the American Chamber of Commerce of Mexico City, formed mainly by U.S. based companies subsidiaries. Are you members?

KT: No we are not. But we know about them. The Monterrey Productivity Center is also very active.

I: What is currently your main up-dating source on quality technology?:

KT: In Mexico we have benefited from ITESM. We are implementing the Taguchi philosophy of quality prevention from the design stage and trying to harmonize it with our existing corporate culture, originally influenced by Philip Crosby's ideas.

Our principle is that any new tool must be incorporated to the existing framework to prevent loose pieces proliferation.

We have other sources of inspiration and information. We are open to all currents, books, and conferences. We have benefited also from Prof. Ichikawa's lecture (JUSE) on the new 7 tools, an event organized in Mexico City by IMECCA. Then I traveled to Japan to observe their application to be able to implement the tools which could be useful for our company. Again, we are open to any current and new advance, but we try to assimilate it to our own culture, we "CELANize" them, as we say.

Other example is Just In Time, we first heard about it in the U.S. We understand the importance of top management decisions in the design stage of a process to allow a future development of this concept. Other times we get new ideas from visits to Japan.

I: Do you participate in experience exchange events in the industrial community?

KT: Yes. Frequently we are invited to present works in industrial seminars and meetings. However, we try not to speak about theory but to present some practical experience from our company, successful or not. In our addresses, we advocate the transformation of all organizational functions in a company introducing TQM.
I: Going back to the subject of inter-company knowledge and experience exchange. Do you think there is a need for a more intensive activity in this field?

KT: I believe there is a need to continue the exchange of knowledge and experiences in specialized forums on quality, but I see a more urgent need to introduce the concept of quality in other subjects and in all other forums. In other words, to introduce the concept of quality in sales, marketing, safety, health, etc. Any other subject traditionally perceived as not related with quality. This is a more difficult task but it must come first and is a more urgent need. Only quality specialists attend to specialized quality forums, thus, the dissemination of quality improvement becomes encapsulated. We need to address quality in all top management meetings. Managers must decide when and how they want quality, and act accordingly. Also, we must include quality in corporate objectives. We need to find a place for quality in every role and function.

I: How do you perceive the evolution of the activities of promotion of quality at a national level?

KT: There is some progress. Although the new National Quality Prize might still have some flaws, it is a testimony of Mexican government's interest on the quality issue. After getting its commitment, government, as anybody else, will have to go along its own learning curve.

I: Credibility might be a problem related with the National Quality Prize and its administration. For example, the official certification mark for quality has for long time lacked the credibility other similar marks have, such as the Japanese "JIS" Mark, and the German "DIN" Mark. Almost only the companies related with Mexican federal government have been interested in getting the DGN certificate. It is a fact that the DGN mark is not publicly perceived as a reliable certificate of the quality of products. Likewise, if the Quality Prize could not get enough credibility, it would not achieve its objectives. What is your opinion?

KT: I believe it is very important to have government's participation. For example, if some day, our Ministry of Education decides to incorporate the philosophy of quality into all its curricula and programs, it would be a very important step for the promotion of quality in Mexico. Of course, companies like Celanese, with a history of experience in quality improvement efforts, should help too. We believe that President Salinas understands well this issue. Any way, we must try to go faster in our country's learning curve. Learning by doing must be the way.
APPENDIX V

COMPARATIVE TABLE OF HISTORIC DEVELOPMENTS.

TECHNOLOGY AND NATIONAL PROMOTION
OF QUALITY AND STANDARDIZATION.¹

EXPLANATORY TABLE:

YEAR:

HISTORICAL FRAMEWORK:

INTERNATIONAL AND NATIONAL EVENTS, SCIENTIFIC AND INDUSTRIAL
DEVELOPMENTS IN OTHER FIELDS WHICH INFLUENCED THE PROGRESS
OF QUALITY MANAGEMENT AND STANDARDIZATION.

COUNTRIES' EVENTS RELATED WITH QUALITY:

<table>
<thead>
<tr>
<th>JAPAN</th>
<th>USA</th>
<th>MEXICO</th>
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<tbody>
<tr>
<td>RELEVANT EVENTS IN THE NATIONAL PROMOTION OF QUALITY CONTROL AND STANDARDIZATION IN JAPAN.</td>
<td>THE SAME FOR THE U.S.A.</td>
<td>THE SAME FOR MEXICO.</td>
</tr>
</tbody>
</table>

( ): FOOTNOTES AND REFERENCES.

NOTE: Otherwise noted, original titles of all works cited are in each country's language.

¹ Source of Data, otherwise noted, from:
All data with bibliographic references were supplied by thesis author (mainly on U.S.'s, Mexico's, and international events). Translation of Fujita's work: Keiko and Antonio R. Flores.
1764: U.K.: James Hargreave invents the spinning jenny. The Industrial Revolution starts.(3)
The concept of interchangeability of manufactured parts develops.(1)

1840-1870: U.K.: Mass production process. Parts assembling concept and Permissible tolerance concepts develop. (2)

(2) Ibid.

1894: U.S.: Underwriters Laboratories is founded. (1)

(1) JSA. 1989b: 171.

1901:

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<tr>
<th>JAPAN</th>
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</table>

1902:

The American Society of Testing Materials (ASTM) is founded.(1)

(1) JSA. 1989b: 124.

1911: Mexican Revolution (1910).(1)

Taylor: Principles of Scientific Management.
1913: World War I starts.

1916:

<table>
<thead>
<tr>
<th>JAPAN</th>
<th>USA</th>
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</thead>
<tbody>
<tr>
<td>Japanese Re-industrialization starts.</td>
<td>New labor-day (8 hrs/day) in Carbon Industry</td>
<td></td>
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</table>

1918:

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<thead>
<tr>
<th>JAPAN</th>
<th>USA</th>
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<tbody>
<tr>
<td>The American Engineering Standards Committee (AESC) (Later the American National Standards Institute [ANSI]) is founded. (1) Under the cooperation of ASME, ASCE, ASTM, AIEE, and ASMME. (2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) Burek, Deborah M. 1990: 5410.
(2) JSA. 1989b: 112.

1919: U.S.: The American Petroleum Institute is founded. (1)

(1) JSA. 1989b: 117.

1921:

The Study Committee for the Normalization of Industrial Products: Industrial Standards Norm Japanese Engineering Standards (JES).

Gilbreth: Industrial Engineering (IE) Symbols.
1922:

Radford, G.S.: The Control of Quality in Manufacturing. Inspection is linked to Quality Control. (1)


Shewhart: First presentation of his Theory on QC.

1926: The International Standards Association (ISA) (Predecessor of ISO) is established. Work on the International Harmonization of Standards.
<table>
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1928:

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<tbody>
<tr>
<td></td>
<td>The American Engineering Standards Committee (AESC) is renamed: The American Standards Association (ASA). (1)</td>
<td></td>
</tr>
<tr>
<td>(1) Burek, Deborah M. 1990: 5409.</td>
<td></td>
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</table>

1929: Great World Economic Depression

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<tr>
<th>JAPAN</th>
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<tr>
<td>The Study Committee for the Normalization of Industrial Products joins ISA (former name of ISO).</td>
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1930:

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<tr>
<th>JAPAN</th>
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<tbody>
<tr>
<td>The Ministry of Industry and Commerce becomes the Provis.ional Promotor of Industrial Rationalization (JES and Simplification).</td>
<td>Shewhart's methods are adopted by the American Society of Mechanical Engineers (ASME), and the</td>
<td></td>
</tr>
</tbody>
</table>

372

(1) Kumami, Tokisuke. 1982: 5.

1931: Japan: Invades Manchuria. 
U.S.A.: Mogensen: Advocates the 11 principles of Industrial Simplification (WSP).

<table>
<thead>
<tr>
<th>JAPAN</th>
<th>USA</th>
<th>MEXICO</th>
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</thead>
<tbody>
<tr>
<td>Shewhart: Economic Control of Quality of Manufactured Products.</td>
<td></td>
<td></td>
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</table>

1932: 

Ishida, T.: Introduces SPC charts (then on called "the charts") to Light Bulb Production Process.


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<tr>
<th>JAPAN</th>
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<tbody>
<tr>
<td>Introduces Probability Methods to the Production Standards of Incandescent White Light Bulbs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presentation (Later: Z 1.1-1.3)</td>
<td></td>
</tr>
</tbody>
</table>

Pearson: The Application of Statistical Methods to Industrial Standardization and Quality Control (Later became the BS 600). 
British war aircraft production follows the strategy: "Quality First" with sacrifice of productivity. (2)

Japan: Textiles made up of 57.4% of its exports and textile raw materials 43% of its imports. 21% of its exports to the U.S. and 35% of its imports from the U.S. (1)

(2) Smith, Bruce L. 1990: 8.
1938: Shino-Japanese War (1937-).

Enactment of Aircraft Production Methods Norms (Japan Aircraft Standards).

1939: World War II starts.

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<thead>
<tr>
<th>JAPAN</th>
<th>USA</th>
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<tbody>
<tr>
<td><strong>Japanese Provisional Standards</strong> <em>(JES Standards). First set.</em></td>
<td>Shewhart: <em>Statistical Method from the Viewpoint of Quality Control</em>&lt;br&gt;The American Standard Association <em>(ASA)</em> develops American War Standards <em>(AWS)</em> to be applied in arms production.(1)&lt;br&gt;Early War Torpedo production fails 50 % in its way to the target.(2)</td>
<td></td>
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1940:

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<th>JAPAN</th>
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<tbody>
<tr>
<td><strong>War Department:</strong> A committee <em>(ASA)</em> is formed to draft standards in the area of quality.</td>
<td></td>
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</tbody>
</table>
1941: The Pacific Ocean War.  
Osborn: Brain Storming Method.  
Work Factor Co.: Introduces its WF method.

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<tr>
<th>JAPAN</th>
<th>USA</th>
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<tbody>
<tr>
<td>The Japanese Research Association for Statistical Sciences is founded.</td>
<td>ASA:</td>
<td>AWS standards:</td>
</tr>
<tr>
<td>113 Japanese Aircraft Standards are issued.</td>
<td></td>
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U.K.: Dudging-Jennett: Quality Control Chart (BS 600 R)

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<tr>
<th>JAPAN</th>
<th>USA</th>
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</thead>
<tbody>
<tr>
<td>The Ministry of the Interior (Technical Office) takes over Provisional JES and Aircraft Standards.</td>
<td>ASA:</td>
<td>AWS standard:</td>
</tr>
<tr>
<td>Several Probability Scholars: Application of Statistics to Industrial Production (metals, aircraft, batteries).</td>
<td>Z 1.3 (Control Chart Method of Controlling Quality During Production).</td>
<td></td>
</tr>
<tr>
<td>Training Courses with Text based on Z 1.1 and Z 1.3. (34 times, 2000 participants).</td>
<td>Dodge-Romig inspection tables are applied to AWS standards.</td>
<td></td>
</tr>
</tbody>
</table>

1943: Japan: First Japan Productivity Conference. The Ministry of the Interior (Hashimoto) leads OR Research.

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<th>JAPAN</th>
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<tbody>
<tr>
<td>Ishida &amp; Yamauchi:</td>
<td>Dodge: Continuous</td>
<td>The Mexican General</td>
</tr>
<tr>
<td>Lead QC in Toyo Bearings and</td>
<td>Production</td>
<td>Norms Office</td>
</tr>
<tr>
<td>in military production.</td>
<td>Sampling</td>
<td>is</td>
</tr>
<tr>
<td>Masuyama:</td>
<td>Inspection. (CSP-1).</td>
<td>established. (Direccion</td>
</tr>
<tr>
<td>Organization of Small Samples</td>
<td></td>
<td>General de Normas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[DGN]). (1)</td>
</tr>
</tbody>
</table>


The Ministry of the Education establishes several Statistics Research Centers.

QC Research in the All Japan Union of Scientists and Engineers Unions.

The Society of Quality Control Engineers (SQCE) is founded. The first U.S. journal on QC was published (later became Quality Progress, the official magazine of the ASQC).

Dodge-Romig: Sampling Inspection Tables Acceptable Quality Level (AQL) concept. (2) Quartermaster Corps (QMC): Inspection Handbook

(2) Ibid.: 9.
1945: End of World War II.
Winning the war, the U.S. confirm their technological and scientific superiority.(4)
Japan: The General Headquarters of the Allied Forces (GHQ) banned all Japanese industries that might possibly enable re-arming (aircraft production and operation). Industries allowed to develop were those that could sustain the national economy at the lowest level to re-start industrial operations.(3)
The United Nations Organization (UN) is founded.

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<th>JAPAN</th>
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<tbody>
<tr>
<td>The Association for the Study of Standards is transferred to the Patents Office of the Ministry of Industry and Trade, (MITI).</td>
<td>Wald: Multiple Sampling Inspection Method.</td>
<td>The first set of Mexican Industrial Norms is issued.(2)</td>
</tr>
</tbody>
</table>

JSA: The Japanese Standards Association (JSA) is founded and starts working on the dissemination of Industrial standards.

(2) Ibid.
(3) CHU-SAN-REN. 1988: 11.
(4) Smith, Bruce L. 1990:8.
        Japan: U.S. Rice Team arrives Japan to inspect
             Japanese statistical sampling methods.
             Economic Depression.
             New Industries Association is founded (SHIN-
             SAN-REN).(1)

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<thead>
<tr>
<th>JAPAN</th>
<th>USA</th>
<th>MEXICO</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Industrial Normalization Study Committee is founded.</td>
<td>Grant: Statistical Quality Control.</td>
<td>ASQC: The American Society for Quality Control (ASQC) was founded.</td>
</tr>
<tr>
<td>Begins working on New Japanese JES Standards.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

JSA:
Standards and Standardization
Journal first issue.

The General Headquarters of the Allied Forces (GHQ), CCS: Magil arrives to lead QC at NEC for production of diode.

JUSE:
The Japanese Union for Scientists and Engineers (JUSE) is founded and starts working on the introduction of QC, Industrial Engineering, Operations Research, and Marketing Research technologies.(2)

(1) CHU-SAN-REN. 1988: 11.

        Japan: Marshal Plan.
        The International Standards Organization (ISO) is founded.

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<th>JAPAN</th>
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<tr>
<td>25th Anniversary Conference of Standardization Activities.</td>
<td>BS 1313 Fraction-defective Chart for Quality Control.</td>
<td></td>
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</tbody>
</table>
AIIE is founded.


U.K.: The Tavistock Institute: Glacier Metal Co. research (1948-51).

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<tr>
<th>JAPAN</th>
<th>USA</th>
<th>MEXICO</th>
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</thead>
<tbody>
<tr>
<td>Under the guidance of GHQ, CCS, Sarasohn, NEC Implements QC based on Z 1.1-Z 1.3.</td>
<td>SRG, University of Columbia: Sampling Inspection.</td>
<td></td>
</tr>
</tbody>
</table>


(1) CHU-SAN-REN. 1988: 11.

U.S.A.: FEAF starts MTP courses.

Brussels: 26th International Statistics Conference: QC and Sampling are addressed.

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<thead>
<tr>
<th>JAPAN</th>
<th>USA</th>
<th>MEXICO</th>
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</thead>
<tbody>
<tr>
<td>GHQ's Civil Communication Section:</td>
<td>JAN-STD-105 is issued.</td>
<td></td>
</tr>
<tr>
<td>The Assoc. of Applied Dynamics:</td>
<td>The Federal Property and Administrative Services Act: Federal Specifications and Standards. (2)</td>
<td></td>
</tr>
<tr>
<td>Applied Statistics.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Japan Productivity Association (JPA): Starts QC training for Industries. First Production Technicians QC Conference.</td>
<td></td>
<td></td>
</tr>
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</table>

JSA: Starts the QC Education Seminar. 2 day course. The first in Japan.

JUSE: The QC Research Group is formed and starts QC research activities. "QC Basic Course" for staff A 6 months Seminar starts.

Wakizawa: QC Theory Small Samples Control Chart.

The MITI-Agency of Industrial Science and Technology (AIST): The Industrial Standardization Law and the Japanese Industrial Standard (JIS) System is established. Application of Industrial Standardization Methodology. First Japan Industrial Standard.: JIS C 0901 for
Electric Appliances Safety Regulation.

(2) JSA. 1989b: 138.

1950: The Korean War.

Japan: Supply Boom.
The Japanese Industrial Management Research Society is formed.
Agriculture and Forestry Standards.

U.K.: Trist, El. Tavistock Institute: Socio-technical teams. (1)

U.S.S.R.: The Office of Science and Technology: QC Seminar

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<tr>
<th>JAPAN</th>
<th>USA</th>
<th>MEXICO</th>
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<tbody>
<tr>
<td>Sunrise of Japan's QC: Seeds of Japanese TQC (3) &quot;Take Quality into the production process&quot;, &quot;Let's all make QC&quot; are the slogans. (4)</td>
<td>Cochran-Cox: Experimental Design.</td>
<td>The Mexican Chapter of the ASQC is founded. (2)</td>
</tr>
</tbody>
</table>

Dr. Edwards W. Deming arrives to Japan to give Lectures on Statistics for Government Offices.
8 days QC Seminars in Every Region: Basic philosophy, statistic methods, control charts, sampling.

JSA:
JIS (Standards and Norms) Journal (Monthly)
The Quality Control Methodology Research Committee (JSA-QCC) is founded and starts incorporation of Sampling Inspection and Control Charts into JIS Standards.
Edits Foreign Industrial Standards (FIS) containing ASA Z 1.1-1.3, BS 1313, and BS 600R.

**JPA:**
Starts the QC Seminar.
Translation of Shewhart's book.

**MITI-AIST:**
Based on the Industrial Standardization Law, the JIS Indication System develops.
The Japanese Industrial Standardization Research Group is established. Then on it will deal with JIS related to QC.

**Masuyama:**
*Introduction of Design of Experiments for Industry Technicians*

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</tbody>
</table>

(1) FUNDAMECA. 1989: 8.
(2) Flores, Jose L. 1989.
(4) Ibid.: 11.
Japan: Foreign Assets Import Rationalization and  
Regulation. U.S. Technology Utilization  
Activities start.  
JUSE: Reports of Statistical Application  
Research, JUSE.  
Box-Wilson: On the Experimental Attainment of Optimum  
Condition.  

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<tr>
<th>JAPAN</th>
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<th>MEXICO</th>
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</table>

Taguchi, Gen-ichi:  
Quality Control, work on Design of Experiments. Presents his new method.  
The Japan Steel Association sets its QC Committee.  
Kanagawa Industrial Research Association:  
QC Introductory Course, QC Intermediate Course.
1952: Japan: Industrial rationalization to guarantee development.
U.S.A.: Walker & Guest: The Man on the Assembly Line advocated "work enrichment".

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<tr>
<th>JAPAN</th>
<th>USA</th>
<th>MEXICO</th>
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<tbody>
<tr>
<td><strong>JUSE:</strong></td>
<td>The U.S. Department of</td>
<td></td>
</tr>
<tr>
<td>The Sampling Research Committee is established.</td>
<td>State: Advisory Group</td>
<td></td>
</tr>
<tr>
<td><strong>JSA:</strong></td>
<td></td>
<td>The Defense Cataloging and Standardization Act: The Military Specifications and Standards are created.</td>
</tr>
<tr>
<td>Design of Experiments and Sampling Inspection Seminars.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Japanese Industrial Standardization Study Committee joins ISO.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Statistical Science Society: New Statistic Factors Table</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koyanagi, K. presents Japanese QC at the Annual ASQC Conference. ASQC Japan Branch.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHU-SAN-REN: QC Basic Course.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ishida: Industrial Sampling.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taguchi: Applies L-27 (3-13) to Tokay Electrodes.</td>
<td></td>
<td></td>
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<tr>
<td>Fujita:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-R Control Chart Guidelines.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Japanese groups start their QC Seminars. (1949-1957: 2-13 Groups, 350 events, 40,000 participants). ASQC's Japan Chapter is founded. (1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) Kumami, Tokisuke. 1982: 12.
(2) JSA. 1989b: 150.
1953: End of the Korean War.
Japan: Industrial Rationalization shows progress in the Electricity, Steel, Chemical and Textile Industries.
JUSE: Operations Research (OR) Seminar. The Central Japan Institute of Industrial Management is founded. (1)
U.K.: Sheppard, V.W. Productivity experiment at Bolsover Colliery. (2)

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<tr>
<th>JAPAN</th>
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<th>MEXICO</th>
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<tbody>
<tr>
<td>JIS Office: Training on Production Scientific Control Techniques. First award of: - The Prize for the Best Factory on Industrial Standardization, - The MITI's Minister Prize, - The Agency of Industrial Science and Technology (AIST) Prize, and - The MITI Office Director's Prize. The Japanese Communications Industry Association: &quot;CCS Managers Seminar&quot;. Ishikawa, K.:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

385
Cause-Effect (Fish-bone) Chart. First application in Kawasaki Steel.

Moriguchi:
Mini-Max Sample Inspection Method.

(1) CHU-SAN-REN. 1988: 12.
(2) FUNDAMECA. 1989: 7.

ISO/STACO: Standing Committee for the Study of the Principles of Standardization.
Austria: Hamaker: SSS Inspection Sampling Tables using P-0.5.
U.S.A.-Japan: MSA Agreement.

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<tr>
<th>JAPAN</th>
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<tbody>
<tr>
<td>MITI-AIST:</td>
<td>First</td>
<td>Reliability and Quality Control</td>
</tr>
<tr>
<td>JIS Z 9003 (Single Sampling Inspection Plans having Desired Operation Characteristics by Variables), Z 9021 (Control Chart Method).</td>
<td>Quality Control Symposium.</td>
<td></td>
</tr>
</tbody>
</table>

JUSE:
Factors Table

Dr. Joseph Juran arrives
Japan:
Top Management and Middle Management Courses.

Nikkei QC Prize.

JSA:
The Kansai Branch QC Seminar.

Industrial Standardization Promotion Week (11/1-7).

JIS Index System.
Survey of QC Education Status.
JIS Factory Pocket Book.

U.S.A.: Morinaga Milk Poisoning Accident. U.S.' share of world's economy: 40 %.

Germany: Becomes the Center of European Industrial Activity. QC Education.

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<thead>
<tr>
<th>JAPAN</th>
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<tbody>
<tr>
<td>JUSE:</td>
<td></td>
<td>The Mexican National Association of Statistics and Quality Control</td>
</tr>
<tr>
<td>Middle Managers and Department Heads QC Seminar. Sensory Inspection Committee. DE Seminar.</td>
<td></td>
<td>(ANMECC) is founded and becomes the Mexican chapter of ASQC. (1)</td>
</tr>
<tr>
<td>JSA:</td>
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<tr>
<td>Quality Control Committee: In-company Standards.</td>
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</tbody>
</table>

(1) Flores, Jose L. 1989.
1956: Japan: Joins The United Nations.
JUSE: Operations Research.
The Japan Productivity Center (JPC): IE Seminar. (JPC and JPA make Industrial Engineering, IE, popular).
USA: Barnes: Work Sampling.
Europe: The European Organization for Quality (EOQ) is founded.
ISO: The Pan American Technical Standards Commission (COPANT) is organized.

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<tr>
<td>MITI-AIST:</td>
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<td>DGN joins</td>
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<tr>
<td>JIS Z 9006 (Single Sampling Inspection Plans with Screening by Attributes), Z 9031 (Random Sampling Methods), Z 8101 (Glossary of Terms Used in Quality Control).</td>
<td></td>
<td>COPANT as an active member.</td>
</tr>
</tbody>
</table>


JSA:
QC and Standardization Seminar:
Regular and Advanced Courses.
Statistical Methods Course.
Design of Experiments Seminar.
JPC: Industrial Observation Group Trip (3S) to Europe.

JUSE:
QC Introductory Seminar. (6 months schedule).

Short Wave Broadcasting:
QC Course.

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<tr>
<th>JAPAN</th>
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<tr>
<td>Quality Control Committee-</td>
<td>Sampling</td>
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<tr>
<td>Kansai Branch.</td>
<td>procedures and</td>
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<tr>
<td>(JSA-QCC-OsAKA).</td>
<td>Tables for</td>
<td></td>
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<tr>
<td>JUSE:</td>
<td></td>
<td>Inspection by</td>
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<tr>
<td>First QC Spring Conference.</td>
<td>Variable for</td>
<td></td>
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<tr>
<td>QC Seminar. Executive</td>
<td>Percent</td>
<td></td>
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<tr>
<td>Director's Course.</td>
<td>Defective</td>
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</tbody>
</table>

Sensory Inspection Seminar.

Deming Prize for Small and Medium Businesses.

MITI-AIST:
JIS Z 9008 (Sampling Inspection Plans for Continuous Production by Attributes).

From this year on, Radio Broadcasts of QC and Standardization Courses became popular:
Broadcasting Series:
Radio Tokyo:
JIS Mark ('57).

The Japan Broadcasting Co. (NHK):
2nd Production Control Course ('58),
Introduction to Production Control ('59),
Production and In-company Standardization ('60),
Easy Quality Control ('61),
Easy Process Control ('61),
Progress in Quality Assurance ('61),
Applied Statistics ('62),
QC Introduction ('62).
The Export Inspection Law is enacted.(1)

JSA-QCC in ISO:
Research on Statistics
Terminology.
JSA becomes ISO Operating
Office (1957-59).

JSA:
In-company Standardization.
Short-wave radio broadcasting
program.

(1) IAQ. 1988a: 165.

1958: U.S.A.:

 Likert: Effective Supervision. Management
 Styles study.(1)

 Japan:
 JPC: Top Management Seminar.
 Mundel's IE Seminar.
 The Japan Steel Association: IE Research.
 Dr. Hideki Yukawa receives the Nobel Prize, a
 positive stimulus for the postwar Japanese
 society.(2)

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<tr>
<th>JAPAN</th>
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</table>
| The Japan Productivity Center:
 QC Observation Group to the
 U.S.A. |

JSA:
Fukuoka and Shikoku Branches
establish their respective QC
Research Groups.

First National Standardization
Conference.

Standardization Research
Prize.

Edition of:
Techniques for In-company
Factory Standardization and
QC Guidebook

Starts selling:
Control Charts Slide Set.
Konishi and Taguchi:
Orthogonal Arrays Method
Plotting Chart.

JUSE:
Reliability Research
Committee.

(2) CHU-SAN-REN. 1988: 12.

1959: Japan: The Japan IE Association is founded.
Drucker P.: Lectures in several locations.
Achieves the level of prewar exports.

U.S.A.: Herzberg, Mausner, Snyderman: Motivation to
Work, starting the study of work motivation.
(1)

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<tr>
<th>JAPAN</th>
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<tbody>
<tr>
<td>MITI-AIST:</td>
<td>Kao: Probability Paper.</td>
<td>The Market-In concept (take the user's requirements into the production process) as opposed to the Product-out concept (sells what is produced) develops as a reaction to economic recession.</td>
</tr>
<tr>
<td>JIS Z 9022 (Median Control Chart), Z 9023 (x Control Chart).</td>
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<tr>
<td>Dr. Shewhart's Lectures in several places.</td>
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<td>JSA: QC Course for Middle Managers.</td>
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<td>Inspection Seminar.</td>
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<tr>
<td>MITI-AIST and JSA: Survey of In-company Standardization and JIS use.</td>
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<tr>
<td>MITI-AIST: 10th Anniversary of Industrial Standardization Practice. Edition of Our Japan's Industrial Standardization</td>
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</tbody>
</table>

Taguchi, G.:
Accuracy Cumulative Method.
Factorial Method.
Itoh, K.:
Control Charts Notes.

(1) FUNDAMECA. 1989: 8.
1960: World trade liberalization.
Western Block Organization for Economic Cooperation and Development (OECD) Conference.
International Statistic Society: 32th Conference.
Japan: First IE National Conference.
The Japan Industrial Engineering (IE)
Association: IE Review.
Industrial Productivity Seminar.
X-Y Theory.
Domestic firms hold 97% of U.S. consumer
product market. (1)

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<tr>
<th>JAPAN</th>
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</table>


Ishikawa, Kaoru: The 10 Ruling Principles of Customer-Supplier Relations.

JUSE: Deming Prize Anniversary.

Sensory Analysis Seminar.

JSA: QC Progress Committee.
QC and Standardization Seminar (Nagoya).

English Booklet on Japanese Standardization Activities.
Overseas PR.

JSA-JUSE: First Quality Month (November). "Q" Banner.
Seminars in 11 Branch Sections. Quality Month Text.
Posters. Seeds of Japanese TQC.

The Union of All Japan Technical Schools Directors:
QC Seminar.

NHK Education TV:
Start Education Course
Broadcasting on QC and
Standardization:
The Factory From Now On ('60).
Factory Management Series
('60).
QC Series ('60).
Standardization Series ('60).

Japan ISO Office:
Mineral Sampling Methods.

(1) Smith, Bruce L. 1990: 10.

The Asian Productivity Organization (APO) is founded.
Japan: Governmental policy to promote the successful
transference of foreign technology.
The Japan Consumer Association is founded.
Objectives (MBO).

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<tr>
<th>JAPAN</th>
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<tbody>
<tr>
<td>JSA: QC and Standardization Seminar in three new locations.</td>
<td>Dr. Armand Feigenbaum: Total Quality Control.</td>
<td></td>
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<tr>
<td>JUSE-JSA: Second Quality Month:</td>
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</table>

NHK TV Broadcasts:
Life Wisdom and Daily Life Economics for the dissemination of QC.

CHU-SAN-REN:
QC Middle Managers Course.
QC Foremen Course.

Japan becomes ISO/TC (Technical Committee) Manager Office.

Japan is elected as IEC Directive country. (1962-68).
1962: Japan: Decision to Liberalize Trade in 88%. The Overseas Technical Cooperation Agency (OTCA) is founded by the Ministry of the Exterior. 88% of commerce liberalization. Slogan: "The world for Japan" (1) The Japan Steel Association, IE Committee: IE for Steel Industry.

U.S.A.: Martin Co. starts the Zero Defects movement in its Orlando plant. President John F. Kennedy: Consumer Protection Act. Right for safety, right to be informed, right for choosing, right to be listen. (2)

APO: QC Seminars in several asiatic countries.

<table>
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<tr>
<th>JAPAN</th>
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<tbody>
<tr>
<td>JSA: JSA/QCC is reorganized into the Control System Committee (COSCO).</td>
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<tr>
<td>Quality Control Seminar, Special Course for Administrative Staff.</td>
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</table>

**JUSE-JSA:**
Addition of the Consumers Conference to the activities of the Quality Month.

(1) Kumami, Tokisuke. 1982: 11.
(2) Ibid. 1982: 20.

U.S.A.: "The Great Society". Government attempts to intervene in failing industries. (1)

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<tr>
<th>JAPAN</th>
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<tr>
<td>First QC Survey Team travels to the U.S.A.</td>
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<td>Top Management Conference is added to the Annual QC Conference.</td>
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</table>

**JSA:**
QC Research Group (QCRG) is formed.
Q-8 Report in English edition. (Q-8: Quality and Standardization.)

**MITI-AIST:**
JIS Z 9011 (Single Sampling Inspection Plans by Attributes with Adjustment), Z 9050-53 (Mean Interval Estimation Methods).

(1) Thurow, Lester. 1985: 5.

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<tr>
<th>JAPAN</th>
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**JSA:**
First Q-S Seminar.
First edition of the Standardization and QC Journal

Koyanagi, Ken-ichi:
Receives the ASQCs Edwards Medal.

**JUSE:**
QC Circle activities become distributed in the four first branch offices:
(Kansai, Tokai, Kinki and Hokuriku Regions).
In each region a QC Conference is held.

NEC research on Zero Defects (ZD) movement.

USA-Japan: Joint Symposium on Sampling of Grain scaly mixtures.

USA: East Coast Blackout due to a system failure.

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<tr>
<td><strong>JUSE:</strong></td>
<td>ASQC:</td>
<td><strong>MEXICO</strong></td>
</tr>
<tr>
<td>The Japanese concept of Company Wide Quality Control (CWQC) known abroad as</td>
<td>Annual Conference.</td>
<td>Los Angeles.</td>
</tr>
<tr>
<td>Japanese Type Total Quality Control (TQC) is born.</td>
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<tr>
<td>TQC for Japanese companies international competitiveness.</td>
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<td>Reliability Seminar.</td>
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<td>Introductory Course.</td>
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FQC Prize for the best case published in *Genba to QC* First QC Symposium. (Twice a year).

QC Circle Shikoku Branch is established.

**JSA:** Tōhoku QC Research Group.

New Product Development Study Sessions.
Screw Thread Improvement Committee.
Introduction of ISO screw standards into, JIS first revision. Explanation meetings in each region.

NEC starts practicing Zero Defects method.(3)

(1) Flores, Antonio. 1990a. [Interview with Dr. Noguchi, (JUSE)]
(3) Ibid.: 19.
1966:  Japan: Record-breaking economic activity. The Science of Action is presented. Start of research. Japan sends to representatives to both EOQC and ASQC.

IAQ: The International Association for Quality (IAQ) is founded. (1)

UNIDO: Gives QC training to the Arab countries.

EOC: In the 10th EOQ Conference a special session on QC Circles is held.

U.K.: The Tavistock Institute, Emery, F.E.: The Democratization of the Work Place.


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<tr>
<td>MITI-AIST:</td>
<td>The American</td>
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<tr>
<td>JIS Z 9054-9059 (Significance Test and Variance Interval Estimation Methods).</td>
<td>Standards Association (ASA) is reorganized in The U.S.A. Standards Institute.</td>
<td>(2)</td>
</tr>
<tr>
<td>Taguchi, G.:</td>
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<tr>
<td>Statistical Analysis</td>
<td></td>
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<tr>
<td>The SN ratio is presented.</td>
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<tr>
<td>JUSE:</td>
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<tr>
<td>Reliability Seminar. Middle Managers Course.</td>
<td>(Later the American National Standards Institute [ANSI]).</td>
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<td>QC Computer Course.</td>
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<td>MITI:</td>
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<tr>
<td>Industrial Standardization Law amendment. Start applying the JIS Mark System to Tooling Technology.</td>
<td></td>
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</table>

(2) Ibid.: 5409.
Pollution Control Law.
Third world biggest GNP.
The World Health Organization (WHO): QC production of health and medicine related chemicals.
ECFAE: The Asian Standards Advisory Committee (ASAC) meets in Bangkok.
ISO/R645: *Statistical Terminology and Symbols.*
ICQCC: The International Conference of Quality Control (ICQCC) is founded.

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<tr>
<td>QC Course for Supervisors.</td>
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<td>JSA:</td>
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<td><em>First National Meeting of Quality Control and Standardization (Q-8). Then on, every May.</em></td>
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</table>

1968: Japan: NHK TV: Computer Program Series. 1 million copies of text distributed.
The Japan Value Engineering Association (JVEA): First Conference.
Liberalization of Foreign Technology Import Policy. Rapid increase of technology imports.
Consumer Protection Law.
Kawakita, J., Kobyashi, Noda: *Theory of Team Work.*
Second biggest GNP in the non-communist world.(1)
APO: First QC International Training Course. Tokyo.
Mexico: Olympic Games. Student Demo Movement.

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<tr>
<td>Quality Assurance for user's advantage concept spreads in Japan.</td>
<td>ASQCs I.Q.C. journal renamed</td>
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<td></td>
<td></td>
<td>Quality Progress.</td>
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<tr>
<td>JUSE:</td>
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<tr>
<td><em>First QC Circle Team Observation Trip to the U.S.A.</em></td>
<td>Safety</td>
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</tbody>
</table>
QC Course for Administrative Personnel.

QC Circle Kyûshû Branch.

JSQA:
Edition advocating Reliability for QC The Reliability Friends Group is formed.

MITI-AIST and JSQA:
National survey of economic results on the use of JIS and Standardization.

MITI-AIST:
JIS Z 9041. (Presentation and Reduction of Data)

JPA:
Zero Defects National Conference.
(Every year's July in Tokyo).
OTCA (Later, the Japan International Cooperation Agency [JICA]): QC and Standardization Courses.


The Japan Steel Association:
Starts practicing Jishu Kanri Groups (self-steering teams).

(3)

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(2) FUNDAMECA. 1989: 13.
1969:  IAQ: The International Academy of Quality (IAQ) is founded by members of ASQC (U.S.A.), EOQ (Europe) and JUSE (Japan). (1)

Japan: Major government recalls to Japanese auto-makers (2.5 million cars found defective). (2)

Becomes second largest GNP in the free world.

Technology Assessment is presented.

Third International WF Conference. Tokyo.

CIOS: 15th Management Simplification Meeting.

Tokyo.


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<tr>
<td>JPA: Kansai Zero Defects</td>
<td>The American</td>
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<tr>
<td>Presentation Conference.</td>
<td>Standards Association (ASA) is reorganized into the American National Standards Institute (ANSI). (2)</td>
<td></td>
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<tr>
<td>First Tochigi Prefecture Q-S Conference. First Tōhōku Prefecture Q-S Conference.</td>
<td>MITI-AIST and JSA: National Survey on In-company Standardization and Quality Control.</td>
<td></td>
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<tr>
<td>MITI-AIST: Our Country's Progress in 20 years of Standardization.</td>
<td>Japan Steel Association: (Self-steering Groups, Jishū Kanri or JK Groups): JK Groups Activity Promotion Committee</td>
<td></td>
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<tr>
<td>First JK Conference for Steel Industry (twice a year). First Overseas Observation Trip. (Once a year).</td>
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</table>
1970: U.S.A.: President Nixon established the National Commission on Productivity. (1)
U.S. economy becomes internationalized.
Foreign competition starts hurting domestic industry.
International exchange rate disturbances affect U.S. relative competitive advantage.
U.S. firms lose more than 25% of domestic market in many segments. First response:
Protectionism. (4)

ISO: 1970/10/14: First "World Standard Day":
Official Advocacy for Standardization.

Japan: Asia Productivity Conference. Tokyo.
ICPR (Industrial Management International Meeting).

JUSE: Establishes the Ishikawa Prize.

Taiwan: First QC Circle National Presentation Conference.

Mexico: The National Council for Science and Technology (CONACYT) is founded. (2)
Foreign debt: $7 billion. (3)

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<tr>
<td>JUSE:</td>
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<td>First Sensory Analysis</td>
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<td>Overseas Observation Team</td>
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<td>Trip.</td>
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<td>Establishes Japan Quality Control Prize.</td>
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<td>Mail Course:</td>
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<tr>
<td>Reliability Seminar for Foremen and Supervisors (6 months long)</td>
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<td>QC Circle Headquarters:</td>
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<td>Edits QC Circle Koryo (QC Circle General Principles) to convey precisely the meaning of QC Circles.</td>
<td></td>
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<tr>
<td>Ishihara, K.: Introduction to QC Circle Activities.</td>
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</table>
MITI-AIST:
JIS Z 8115. (Glossary of Terms Used in Reliability).

The International System of Units (SI) is applied to JIS system.

In the First World Standard Day:
Official recommendations for Standardization.

\[ \text{Standardization Mission Team visits the U.S.S.R.} \]

JSA:
\textit{Standardization Journal}.

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<td>(2)</td>
<td>CIPD/IABAFIN. 1989: 120.</td>
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1971: Japan: Nixon Shock. Yen appreciation against dollar.(1)
Thalidomide Problem poses questions to reliability of statistical methods.
Defective problems of prefabricated houses, food, and drugs arise.
Start up of team activities based on TKJ method.
IEC General Conference: Electronic Parts Certification System.
Development of Failure Mode Effect Analysis (FMEA) and Fault Tree Analysis (FTA) methodologies.(3)

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MITI-AIST:
JIS Z 9015 (Sampling Inspection Procedures and Tables by Attributes with Severity Adjustment).

JUSE:
\textbf{First Reliability Symposium.}
First "University Over the Sea" or QC Circle Cruising Course.
QC Circle Association
Headquarters:
Edition of
How to Operate QC Circles.
QC Circle Hokkaido Branch.

QC Circle Branch Director Prize to stimulate QCC activities.

First: All Japan Best QC Circles Conference.

The Japanese Society of Quality Control (JSQC) is founded Quality Journal first edition.

JSQA:
Management Practice Research Committee takes international role: ISO/TC 69 (Application of Statistical Methods). Standardization and Power Efficiency Observation Team trip to the U.S.A.

First Shizuoka Prefecture Q-S Conference.

Some Japanese firms reset their quality improvement goals to achieve parts per million defects instead of percentage basis (2)

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U.N.: COPANT Norms to regulate trade among Free Trade Latin American Association (ALALC).

Mexico: 1/3 of the 300 largest firms in Mexico are U.S. based controlled. (1)

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<th>JAPAN</th>
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<th>MEXICO</th>
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</table>

**JUSE:**
First Reliability Overseas Observation Team Trip to the U.S.A. and Europe.

**QC Circle Promoters Course**


**JSA:**
Statistical Factors Table, JSA-1972.

**MITI:**
Residential Housing Industrial Production Quality Certification Law.

International Standards Organization, ISO/TC 102 (Mining):
SC1 (Sampling methodologie.) SC2, -3, and -4, Meetings in Tokyo.

**MITI-AIST:**
Japan Industrial Standards Research Committee: Application of SI Policies to JIS.
Mitsubishi Kobe Shipyard:
Quality Function Deployment
Method (QFD) is developed (2)

The Asian Productivity
Organization (APO):
Japan Quality Control Circles.
English Edition is published

(2) Hauser, John and Clausing, Don. 1988: 63.

1973:  First Oil Shock. 21% price increase and 25% production cut down. OPEC Cartel.
Volutility of exchange rates.
U.S.A.:  Secretary of Health Education and Welfare:
Work in America. advocates participatory management.(1)
Europe:  European Community Committee: Advocates abolition of the convoyer production system.
Middle East:  4th War. Oil supply under risk.
Japan:  Yen speculation.
Steel production: Record production 119 million Ton.
Oil Kombinat plant explosion.

<table>
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<tr>
<th>JAPAN</th>
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<tbody>
<tr>
<td><strong>JUSE:</strong></td>
<td>Lockheed Missile and Space Co. QC Circle Specialists Observation Team Trip to Japan.</td>
<td>The Mexican Institute of Quality Control (IMECCA) is founded. (3)</td>
</tr>
<tr>
<td><em>Genba to QC magazine is renamed: FQC.</em></td>
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<tr>
<td><strong>First Product Liability Overseas Observation Team Trip to the U.S. and Europe.</strong></td>
<td>GM and UAW sign agreement to establish joint Quality of Working Life (QWL) efforts. (2)</td>
<td><strong>IMECCA:</strong> First National Congress on Quality Control. (4) The Ministry of Trade and Industry: Quality Normalization and Certification Law</td>
</tr>
<tr>
<td>The Pharmaceutical Producers Association sets Voluntary Regulations and JGMP Committee for QC.</td>
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<tr>
<td>Ishikawa T.: Product Liability</td>
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</tbody>
</table>
1974: Japan: Prices chaos. For the first time in postwar years the economy shows a negative growth: -0.5\%. Heavy Industry production historic record: 17 million Ton.


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<tr>
<th>JAPAN</th>
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<tr>
<td>MITI:</td>
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<tr>
<td>Residential Housing Industry</td>
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<tr>
<td>QC Research Committee.</td>
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<td>Asaka:</td>
<td></td>
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<tr>
<td>Good Manufacturing Practice (JGMP). Medicine Production QC Registration is advocated.</td>
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</table>

"ITI:
The Industrial Structure Assessment Committee's Intermediate Report (Vision of the 1975-85 Decade):
Standardization, Simplification and Specialization are defined as central strategy issues.

1975: First Western Hemisphere Summit. France.
U.S.A.: President Ford establishes the National Center for Productivity and Quality of Working Life. (1)
Japan: Worst economic situation in postwar period. 1/3 of all corporations show red numbers. Passenger car exports to the U.S.: 800,000. More than half of U.S. car units imports are from Japan. People employed by the tertiary industry exceeds 50 % of those working for primary and secondary sectors. 59 Banks start operation of Automatic Cash Tellers.
IAQ: Reaches full operation.(3)
Korea: The Department of Industrial Promotion starts QC activities. First National QC Convention and Contest. First QC and Standardization Conference.
Mexico: IMECCA: First Latin American QC Congress. CONACYT: Establishes the Technical Information Center (INFOTEC). (4)

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<tr>
<th>JAPAN</th>
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<tbody>
<tr>
<td>QC Circle Headquarters:</td>
<td></td>
<td>IMECCA:</td>
</tr>
<tr>
<td>500th QC Circle Convention.</td>
<td></td>
<td>3rd National Congress on QC.</td>
</tr>
<tr>
<td>Registered Circles: 72,475.</td>
<td></td>
<td>(2)</td>
</tr>
</tbody>
</table>

(2) IMECCA. 1975.
(3) IAQ. 1988: 292.
(4) INFOTEC. 1989.
China: Mao Tse Tung dies.
OPEC: Price increase decision due to double pricing.
Japan: CATV Research.
Steel exports to the U.S.: 6.9 million Ton.
U.S. criticism strengthens.
Exports:Machinery 25 %, Steel 18 %, Cars 14%.
33 % to Asia and 26 % to the North America.
Imports:Imports 36 % oil. 51.4 % from Asia
and 22 % from North America.
Mexico: Consumer Protection Law.(2)
Mexico faced the worst economic crisis in
forty years. A first currency devaluation: 84
% marks the end of a long period of fixed
exchange rate at 12.5 peso/U.S.$ since 1954,
and enters a period of small devaluations.
(3)
Foreign Debt: $ 17 billion (143 % bigger than
in 1970).(7)
Mexico is the 3rd largest market for U.S.
merchandise exports after Canada and
Japan.(4)

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<tr>
<th>JAPAN</th>
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<tbody>
<tr>
<td>Takenaka Komuten Co. Ltd.</td>
<td></td>
<td>IMECCA:</td>
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<tr>
<td>(Building Subcontractor)</td>
<td></td>
<td>4th National</td>
</tr>
<tr>
<td>Pioneers TQC in Japanese</td>
<td></td>
<td>Congress on QC. (5)</td>
</tr>
<tr>
<td>Construction Industry</td>
<td></td>
<td>CONACYT:</td>
</tr>
<tr>
<td>MITI-AIST:</td>
<td></td>
<td>First Group</td>
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<tr>
<td>Establishes The Study</td>
<td></td>
<td>of Trainees</td>
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<td>Committee for the Basic</td>
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<td>on QC to a</td>
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<tr>
<td>Problems of Industrial</td>
<td></td>
<td>JUSE-AOTS 7-</td>
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<tr>
<td>Standardization.</td>
<td></td>
<td>month program. (6)</td>
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<th>JAPAN</th>
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<tr>
<td>Sanwa Bank: Starts &quot;Clover Circle&quot; activities. Pioneers QC Circle activities in Japanese Finance and Insurance Industry.</td>
<td>The International Association of Quality Circles, (IAOC) is founded. Later, since 1987, the Association for Quality and Participation, (AQP). (1)</td>
<td>The Mexican Office of Standards (DGN) is reorganized and the Mexican Institute for Normalization is founded. (2)</td>
</tr>
</tbody>
</table>

(1) Burek, Deborah M. 1990: 718.  
(2) Ibid.: 249.  

1978: Japan: The Central Association for Work Accident Prevention, (Chūō Ródō Saigai Hoshi Kyôkai): Develops the Risk Prevention Training Method (KYT Method) and trains the Sumitomo Production Workers Group.  

ICQCC: ICQCC'78-Tokyo. Theme: "International Cooperation to Solve Quality Problems". At the same time: ICQCC (QC Circle International Conference).  

Mexico: 3rd Latin American QC Conference.

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<th>JAPAN</th>
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<tr>
<td>JUSE: New Seven QC Tools Research Committee starts activities.</td>
<td></td>
<td>IMECCA: 6th National Congress.</td>
</tr>
</tbody>
</table>
1979: Tokyo Summit.
U.S.A.-China: Interchange Agreements
U.S.A.: Three Miles Nuclear Power Generation Plant
Leakage Accident.
Second reaction to lost international
competitiveness: ASME grant program to
universities for research and training in
production engineering. IBM $ 50 million
grant to 5 universities.
Semiconductor Industry Association is formed
to improve technical competitive base. (4)
Japan: JSA: Edition of Industrial Management Series,
(20 vol.).
Mexico: Foreign Debt: $ 29 billion.
Service/export ratio: 62.1 %.
ISO: ISO/TC 176 (Quality Assurance new
regulations).

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<tr>
<td><strong>JUSE:</strong> QC Research Committee for Service Industry.</td>
<td>Martin Marietta, Michoud Division start &quot;integrated teams&quot; activities. (1)</td>
<td>IMECCA: 7th National Congress on QC.</td>
</tr>
<tr>
<td>MITI-AIST: JIS Z 9080 (1979) (Sensory Analysis Methods).</td>
<td></td>
<td>The Monterey Institute of Technology (ITESM): Quality Control</td>
</tr>
<tr>
<td>Surveys on JIS application and Industrial Normalization, results published in the Standardization Journal.</td>
<td>The Juran Institute Inc. is established. (2)</td>
<td></td>
</tr>
<tr>
<td>Survey on In-company Standardization and QC activities, results published in the Standardization and Quality Control Journal.</td>
<td>The American Productivity Center: Starts its first seminar.(5)</td>
<td>DGN: Official Standards Catalog.</td>
</tr>
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<td></td>
<td>ASQC: 32,000 individual members.(6)</td>
<td></td>
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</tbody>
</table>

(3) ITESM. 1990.
(6) ASQC. 1990h: 1.
1980: Iran-Iraq War
U.S.A.-Japan: Semiconductor IC trade favors Japan.
U.S.A. Chrysler near bankruptcy. Government loan guarantee.(7)
NBC documentary: IF Japan Can...Why we can't?
U.S. share of world's economy: 40 % in 1955, 22 % in 1980.
Hewlett-Packard's executive speech criticizing the quality of U.S.
semiconductor chips shakes industry.(8)
APC: First International Conference on Productivity Research. (10)

Japan: NBC documentary is broadcasted by NHK
and produces a TQC boom in Japan.
Becomes world biggest producer of cars (11 million units) and steel (111
million Ton).

Mexico: Foreign Debt: $ 55 billion (686 % bigger
than in 1970).(5)
Decides to postpone its GATT entrance
fearing lack of competitiveness.
Oil and natural gas made up 67 % of
total exports.(1)
U.S. share of Mexico's foreign trade:
65 % of imports and 70 % of exports. 45
% of Mexican exports to the U.S. were
from affiliated companies of U.S. based
companies.(2)

Colombia: 4th Latin American QC Conference.

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<tr>
<th>JAPAN</th>
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<tr>
<td><strong>JSQC, Japanese Society of</strong></td>
<td>Participatory Management</td>
<td>IMECCA:</td>
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<tr>
<td><strong>Quality Control</strong></td>
<td>becomes popular among U.S.</td>
<td>8th National Congress on QC.</td>
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<td><strong>JSQC News.</strong></td>
<td>firms.</td>
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<td><strong>MITI-AIST:</strong></td>
<td></td>
<td></td>
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<tr>
<td>The Industrial Standardization</td>
<td></td>
<td>ITESM:</td>
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<td>Law: Start JIS mark system</td>
<td></td>
<td>Dr. Ichiro</td>
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<tr>
<td>application to Japanese</td>
<td></td>
<td>Miyauchi</td>
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<tr>
<td>overseas companies.</td>
<td></td>
<td>(JUSE)</td>
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<td>In Japan: Public Inspection</td>
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<td>lectures on</td>
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<tr>
<td>System is introduced to JIS</td>
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<td>Company Wide</td>
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<td>certified plants.</td>
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<td>Quality</td>
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<td>The Normalization Department:</td>
<td></td>
<td>Control</td>
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<td>Design of a Standards</td>
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<td>(CWQC).</td>
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<td>Information Management System</td>
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<td>to help in the development of</td>
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<td>ISO Information Network.</td>
<td></td>
<td>Management</td>
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<td>Education Program.</td>
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</table>
Ishikawa Kaoru: programs.(9) MIT-ITESM 
In the 17th Presentation 
Conference of the Japanese 
Society of Quality Control 
proposes Japanese Style 
Quality Control as a 
Management Revolution.(6) 

JUSE: 4th and last 
QC Circle Koryo, English 
Trainees 
edition is published. Group on QC 
to JUSE- AOTS 
Program.(4)

(1) Weintraub, Sidney. 1984: 68. 
(2) Ibid.: 18-19. 
(3) ITESM, .1990. 
(8) Ibid.: 15. 
(9) Ibid.: 15-17. 
(10) APQC. 1989: 8.

1981: ICQCC: Second QC Circle International Conference 
( ICQCC'81-Tokyo). 
International Oil Prices fall dramatically. 
Mexico: Revenues from oil exports, the largest source of financing, plunge down accordingly. Oil accounted for 75%.

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<tr>
<td><strong>Kansai Denryoku introduces TQC. The first among Power Generation Japanese companies.</strong> Then on TQC spreads in this industry.</td>
<td>Mc Donnell</td>
<td>ITESM: &quot;1st</td>
</tr>
<tr>
<td><strong>1000th QC Circle Conference. (Tokyo).</strong></td>
<td>Douglass, General Dynamics, Raytheon, GE, Lockheed, Northrop, Westinghouse, initiate their quality programs. Emphasis on Quality Assurance and Quality from the design stage.</td>
<td>Encounter Mexico-Japan. QC Circles. Dr. Kaoru Ishikawa (JUSE) lectures.</td>
</tr>
<tr>
<td><strong>JUSE:</strong> First QC Symposium for the Software Production Industry. <strong>FQC magazine's monthly circulation: 93,000.</strong></td>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>MITI-AIST:</td>
<td></td>
<td><strong>IMECCA:</strong> 9th National Congress on QC.</td>
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<tr>
<td>JIS Z 8101 (1981)</td>
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</tbody>
</table>
(Restructuring of the Glossary of Terms Used in QC).
JIS Z 8115 (1981)
(Restructuring of the Glossary of Terms Used in Reliability).

JIS Mark Certification
Inspection Index is published in the Official Gazette.

For any JIS Mark Certified Factory to appoint a Promoter responsible for in-company QC and Standardization activities becomes compulsory. (MITI, Transportation Ministry, Health Ministry).

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(1) ITESM. 1990.


Japan: Increased violence in High Schools.
Japan-China: JUSE and the China-Japan Economic Association: First "QC Circle Representative Group Visit to China".

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<td>Daiei Co.</td>
<td>Freund and</td>
<td>IMECCA: 10th National Congress on QC</td>
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<td>Ltd.:</td>
<td>Epstein:</td>
<td>and First National Quality Circles Convention.(2)</td>
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<td>Orange</td>
<td>New York Stock of Quality of Working Life.(1)</td>
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<tr>
<td>Circle</td>
<td>exchange survey</td>
<td>ITESM: The Quality Center is founded.(3)</td>
</tr>
<tr>
<td>activities</td>
<td></td>
<td>Staff Training on Top Mgmt. Models. (4)</td>
</tr>
<tr>
<td>Pioneers QC Circle activities in Japanese supermarkets</td>
<td></td>
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<td>Japanese Manufacturing Techniques.</td>
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(2) IMECCA. 1989b: 4.

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<tbody>
<tr>
<td>TQC boom on its peak.</td>
<td>NASA starts &quot;NASA Employee Teams&quot; (NETS).</td>
<td>IMECCA: 11th National Congress on QC.</td>
</tr>
<tr>
<td>Many editions on QC Circles and very frequent Seminars.</td>
<td>Martin Marietta trains NASA staff.(1)</td>
<td>ITESM: Second Japan-Mexico Encounter on QC Circles.</td>
</tr>
<tr>
<td></td>
<td>American Productivity Center (APC): Starts Quality Consulting.(4)</td>
<td>Instructor Training programs. Textbooks preparation.(1)</td>
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(2) ITESM. 1990.


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<tr>
<td>The Asian Productivity Organization (APO): Quality Control Circles at</td>
<td>ASQC and APQC: First Quality Month in the U.S.A. (October).</td>
<td>IMECCA: 12th National Congress on QC.</td>
</tr>
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<td></td>
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<td>ITESM: TQC Model for Education.(2)</td>
</tr>
</tbody>
</table>

415
Work, English edition is published. NASA: 2 day conference for all major contractors. (1)

(2) ITESM .1990.


Japan: Expo Tsukuba'85. NTT privatization. Other follow: JNR (Japan National Railroad) becomes JR. Japanese Government Foreign Economic Affairs Planning Department: To reduce international trade frictions sets forth the "Actions Proposal to Improve Japanese Market Access".


IAQ: The International Association for Quality is renamed the International Academy for Quality. New constitution and rules of procedure.

| JUSE: First QC Circle Conference for Service Industry. How to operate QC Circle Activities, English edition is published. | ASQC: Quality Symbol: "Q Mark" is designed. The National Quality Forum is first conducted. (3) | IMECCA: 13th National Congress on QC.(1) |
| JUSE: First QC Circle Conference for Service Industry. How to operate QC Circle Activities, English edition is published. | ASQC: Quality Symbol: "Q Mark" is designed. The National Quality Forum is first conducted. (3) | IMECCA: 13th National Congress on QC.(1) |
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(1) IMECCA. 1989.
(2) ITESM. 1990.
(3) ASQC. 1989a: 7.
1986: U.S.A.: Challenger accident. (1)
Japan: Sex equality of job opportunities.
Manufacturing Industry Crisis worsens.
Trade Balance surplus of: $ 90 billion.
Increasing Trade Friction.
Mexico: Opens its economy. Decision to enter GATT in
a gradual way. As a first step, protectionism
system is modified, import licenses are
almost completely abolished and tariffs are
import tariffs are reduced from 80-100 %
level to 0-45%. (6)
U.S.S.R.: Chernovil No.4 Nuclear Reactor Explosion.
Europe: 30th EOQ Annual Conference. (5).
Colombia: Ishikawa's book What is Total Quality Control
first edition in Spanish.
Geneva: UNCTAD/GATT's: Quality Control for Developing
Countries Export.

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<tr>
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| NHK Education TV: | ASQC: | The National Chamber of
Broadcasts Japan's Face | 40th ASQC | Transformation
program presenting | Congress. | Industries (CANACINTRA)
TQC and QC Circles. | (2) | Queretaro City Branch:
Japanese Society for | | First Course to Improve
Quality Control (JSQC): | | Suppliers
15 years' Progress | | Competitiveness. (3)
edition. | | |

(2) Pozo, Jaime P. 1990: 156.
(3) CANACINTRA. 1989: 8.
(4) IITESM. 1990.
(5) JUSE. 1989: 1.

NICs: Remarkable progress in their international trade becomes apparent.

Yen appreciation. Cost down intensive activity in all industry sectors.

ICQCC: "ICQCC '87". International Conference. Tokyo.

ISO: IS 9000-9004 ISO standards on Quality
Reliability.

IAQ: 64 members of 25 countries in 4 Continents. (1)
7th Triennial Conference. Tokyo.

Mexico: Enters GATT. Enactment of a series of new import Tariffs directed to liberalize trade.
Mexico opens its market to foreign goods.

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</table>
| **QC Circle**
Headquarters: The International Association of Quality Circles,
25th Anniversary of IAQC is renamed as the Association for Quality and Participation, AQP.
Activities.
Commemorative Conference. 25 years history. (2)

**The U.S. Congress:**
"Malcolm Baldridge National Quality Improvement Act". (3)

**CANACINTRA**
Queretaro Branch: The Quality Institute is founded.

**Second Suppliers Competitiveness**
Course. (4)

**IMECCA:**
15th National Congress on QC.

**ITESM:**
Education and Consulting in Design of Experiments (DE).
and Quality Function Deployment (QFD). (5)
First International Symposium on Quality.


(1) IAQ. 1988: 292.
(2) Burek, Deborah M. 1990: 6635.
1988: **Mexico:** Foreign Debt: $105 billion (1400 % bigger than in 1970). Second in the developing world.(8)
IMECCA organizes the 8th Latin American Congress on Quality Control.

**Europe:** The European Foundation for Quality Management is founded.

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<tr>
<td><strong>The Asian Productivity Organization (APO):</strong></td>
<td><strong>The National Bureau of Standards becomes the National Institute of Standards and Technology (NIST).</strong></td>
<td><strong>The Mexican Government:</strong> The Federal Law on Metrology and Normalization is issued: The National Quality Prize is established, the National Metrology Center, and the National Commission for Normalization are founded.</td>
</tr>
<tr>
<td><strong>Mizuno's Company Wide Total Quality Control.</strong> English edition is published.</td>
<td><strong>The American Productivity Center (APC) is reorganized as the American Productivity and Quality Center (APQC).</strong> (1)</td>
<td><strong>The National Calibration System and the Official Quality Certification Mark are established.</strong> (3)</td>
</tr>
<tr>
<td><strong>President Reagan:</strong> Kickoff of the Malcolm Baldrige National Quality Award (MBNQA) Program. (2)</td>
<td><strong>Motorola Inc., the Commercial Nuclear Fuel Division of Westinghouse Electric Corporation and Globe Metallurgical Inc. received</strong></td>
<td><strong>CANACINTRA Queretaro Branch:</strong> 3rd Course for Suppliers. First Training Team to Japan (Chu-San-Ren) (4)</td>
</tr>
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<td><strong>ITESM:</strong> Top Management Program gets strengthened.</td>
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<td></td>
<td>Mr. Myron Tribus visit. Mr. George Box audit of the Quality Center academic programs.</td>
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<td></td>
<td></td>
<td><strong>Taguchi Method study and research. Dr. Genichi Taguchi visit.</strong> <strong>Quality Reliability Models dissemination to the Industry.</strong> <strong>Relationships with government organizations and state-owned firms.</strong> (5)</td>
</tr>
</tbody>
</table>
the first M.B.N.Q. Award.

ASQC:
The National Quality Forum is broadcasted with an audience of approx. 100,000 people. (5)

Dr. Daniel Meade (ITESM) receives The American Supplier Institute's "Taguchi Method Promotion Prize" for his educational method. (6)

ITESM-AOTS:
Dr. Ichiro Ichikawa:
First Seminar on the New 7 Tools.

FUNDAMECA:
The Mexican Foundation for Total Quality is founded.
"First Mexican Inventory on Total Quality Efforts and Processes".
First Seminar on Total Quality for Service Industry.

CPM/ERIAC:
1st Quality- Productivity Seminar.

Mexican Association for Quality is founded.

The Mexican Association of Mechanical and Electrical Engineers (AMIME):
First Quality Assurance Seminar

Ogliastri, Enrique' book:
Q Circles in Latin America: Gerencia Japonesa y círculos de participación.

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<td>(1) Burek Deborah M. 1990: 249.</td>
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<td>(5) ITESM. 1990.</td>
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<td>(7) FUNDAMECA. 1988.</td>
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<td>(9) ASQC. 1990b: 5.</td>
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<td>President Bush: Mexican Government:</td>
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<td>Second Malcolm The National Quality Prize</td>
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<td>Baldrige Awarding Regulations</td>
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<td>National Quality are issued.</td>
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<td>Awards: (1)</td>
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<td>Milliken &amp; CPM/ERIAC:</td>
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<td>Xerox Quality Conference.</td>
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<td>Corporation (Monterrey). (2)</td>
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<td>Florida Power &amp; IIMECCA:</td>
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<td>Light Co. 17th National Congress on QC</td>
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<td>ASQC: ITESM:</td>
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<td>On Q membership Dr. Junji Noguchi, JUSE,</td>
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<td>newsletter is Visits the Quality Center.</td>
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<td>FUNDAMECA: 1st and 2nd edition of &quot;Casos&quot;</td>
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<td>Quality Improving Cases in</td>
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<td>CPM/ERIAC: 2nd Quality-Productivity</td>
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(2) CPM/ERIAC. 1989.
(4) ITESM. 1989.
(5) ITESM. 1990.
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<td><strong>The New England Center for Quality Management</strong> is founded.</td>
<td><strong>The Mexican Government:</strong> First Mexico's National Quality Prize Awarded by President Salinas to CONDUMEX.</td>
<td>The Ministry of Industry and Trade (SECOFI): National Program for Industry Modernization and Foreign Trade:</td>
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<td>ASQC: More than doubles its individual membership in 10 years. (2)</td>
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<td>- Border Zone Industrial Growth Promotion. (2)</td>
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<td><strong>ITESM, ERIAC/CPM:</strong> 5th International Interchange Conference. (1)</td>
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<td>Crosby Associates International Division, Latin America: Latin American Total Quality Congress.</td>
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<td>AMIME-AMC-AIUME: Third Quality Assurance Seminar.</td>
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