

QUALITY MANAGEMENT PRACTICES IN THREE MAJOR PHILIPPINE MANUFACTURING SECTORS

by

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INTRODUCTION

There is no doubt that product quality plays a vital role in the survival and growth of any manufacturing organization. The importance of quality as a key success factor is further emphasized when the international nature of the market and of competition is considered. The Philippines is being geared towards becoming a newly industrialized country. There is, furthermore, a growing concerted effort at the national level to promote quality as a way of life. It is in this light that this paper is being presented. Efforts to promote quality consciousness, to give reinforcement and assistance in the form of education and training in quality management, and to engage in research and services in areas related to product quality improvement require an adequate knowledge of the existing situation.

OBJECTIVE, SCOPE AND LIMITATIONS OF THE STUDY

The study which was carried out over a three-month period from January to March 1989 hopes to present a situationer on quality management practices at plant level in the major manufacturing sectors in the Philippines. A total of 265 survey questionnaires were sent out to companies which belonged to the top 1,000 corporate listings as of 1988.

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Seventy-nine (79) companies, or almost 30% of those surveyed responded. The companies surveyed belong to three major manufacturing sectors under the NEDA¹ classification. These are chemical manufacturing which include pharmaceuticals, petroleum, plastics and rubber; food processing which include beverages and tobacco; and metal working which include fabrication, machinery, basic metals and the electrical and electronic industries. The sectors will be referred to simply as chemicals, food and metal. Due to limitations in time and resources, the survey was conducted among companies in the Metropolitan Manila area and in adjoining towns. Information on the nature and type of the company, their quality management set-up or organization, and their practices in different areas which affect product quality have been obtained through this study. Information gathering through a questionnaire, however, has its inherent limitations also. This study should therefore be viewed within these limitations.

PROFILE OF RESPONDENTS

The companies which responded to the survey can be characterized in terms of employee size, nature of ownership, degree of automation employed and number of years of operation. Product categorization has already been described earlier. The respondents in general are medium to large companies in terms of employee size, are more than 10 years in operation, and are using semi-automated processes. They can almost be divided equally as Filipino-owned companies or as local subsidiaries of multi-national or foreign-based companies. In quantitative terms, 83% of the respondents employed more than 100 employees. Forty-five percent (45%) had more than 500 employees. The food and metal products sector reflected a considerable number of respondents with more than 1000 employees. All the sectors were the same in reporting that they employed process with a moderate degree of automation. They accounted for 72% of the respondents. Only four companies (5%) reported that they were highly automated.

% of Firms Who Responded

<u>No. of Employees</u>	<u>Chemicals</u> (26 firms)	<u>Food</u> (22firms)	<u>Metal</u> (31firms)	<u>Total</u>
< 50	15.4 %	9.1 %	0 %	7.7 %
50 - 100	11.5 %	4.5 %	9.7 %	9.0 %
101 - 500	53.8 %	22.7 %	35.5 %	38.5 %
501 - 1000	15.4 %	27.3 %	29.0 %	24.3 %
> 1000	0 %	36.4 %	25.8 %	20.5 %

¹National Economic & Development Authority

% of Firms Who Responded

<u>Type of Ownership</u>	<u>Chemicals</u> (26)	<u>Food</u> (22)	<u>Metal</u> (31)	<u>Total</u>
Filipino Owned	23.1 %	63.5 %	35.5 %	44.3 %
Philippine Subsidiary	53.8 %	18.2 %	54.8 %	44.3 %
Licence/Franchise Holder	7.8 %	18.2 %	9.7 %	11.4 %

<u>Degree of Automation</u>	<u>Chemicals</u>	<u>Food</u>	<u>Metal</u>	<u>Total</u>
Highly Automated	3.8 %	4.5 %	6.5 %	5.1 %
Automated	73.1 %	86.4 %	61.3 %	71.8 %
Barely Automated	23.1 %	9.1 %	32.2 %	23.1 %

Majority of the respondents have been operating for 10 years or more (73.1%).

QUALITY MANAGEMENT SET-UP OR ORGANIZATION

Almost all of the respondents reported that they have a unit in their company which is responsible for quality control or quality assurance - 92% for the chemicals sector, 92% for the food processing sector, and 100% for the metal working sector. In most cases for all three sectors, the head of this unit reports directly to the general manager or to top management. Others report to the head of production, while the rest report to the head of R & D.

In terms of the size of the manpower complement the respondents reported in the following manner:

<u>Size</u>	<u>Chemicals</u> (26)	<u>Food</u> (22)	<u>Metal</u> (31)	<u>Total</u>
< 20	53.8 %	68.2 %	64.5 %	62.0 %
21 - 50	46.2 %	18.2 %	19.4 %	20.3 %
> 50	0 %	9.1 %	25.8 %	16.4 %
Not Indicated		4.5 %	-	1.3 %

STANDARDS AND SPECIFICATIONS

The practice in the use of standards and specifications vary among the sectors for both raw materials and products. It will be noted though that, in general, international standards - more specifically, ASTM, mother company standards, and local company standards are almost equally relied upon by the respondents. Standards adopted by the Bureau of Product Standards (BPS) in the Philippines are also used but not yet on a large scale.

For raw material standards and specifications, the result of the survey shows the following:

<u>Type of Standard</u>	<u>% of Respondents</u>			
	<u>Chemical</u>	<u>Food</u>	<u>Metal</u>	<u>Total</u>
	(26)	(22)	(31)	(79)
ASTM	46.2 %	22.7 %	58.1 %	44.3 %
BPS	15.4 %	27.3 %	25.8 %	22.8 %
Local Co.	42.3 %	31.8 %	45.2 %	40.5 %
Mother Co.	57.7 %	18.2 %	48.4 %	43.0 %

The percentage do not sum up to 100% column wise because the choices or types are not mutually exclusive.

For product standards and specifications the survey shows the following:

<u>Type of Standard</u>	<u>% of Respondents</u>			
	<u>Chemical</u>	<u>Food</u>	<u>Metal</u>	<u>Total</u>
	(26)	(22)	(31)	(79)
ASTM	50.0 %	18.2 %	48.4 %	40.5 %
BPS	19.2 %	18.2 %	29.0 %	22.8 %
Local Co.	46.2 %	36.4 %	45.2 %	43.0 %
Mother Co.	53.8 %	31.8 %	48.4 %	45.0 %

Again, the choices or types are not mutually exclusive.

PRODUCTION

In general, the respondents in all three major sectors claim that they have immediate control on product quality characteristics during production. Problems with machines and equipment had been pinpointed as the major cause of defective products. This is followed by problems with materials. Workers came third and work methods came out last. It is worth noting, however, that for the metal working sector, workers have been identified as the number one reason for having defective products. This is perhaps attributable to the fact that there are many respondents in this sector coming from the semiconductor industry where labor is applied intensively.

<u>Contributor to Defective Product</u>	<u>Ranking by Sector</u>		
	<u>Chemical</u>	<u>Food</u>	<u>Metal</u>
Problems with Machines & Facilities	1	1	2
Problems with Materials	2	2	3
Problems with Workers	3	3	1
Problems with Methods	4	4	4

Under other factors, problems with policies and politics were cited as contributors to defective products.

RELATIONSHIP WITH SUPPLIERS

In general, the respondent companies have established quality control procedures on the materials and components they use in their products. In the chemical sector, 81% of the respondents employ acceptance sampling plans in the evaluation of incoming deliveries. Of this number, 71% uses the Military or ABC Standards. Fifty eight percent (58%) of the respondents have formal agreements with suppliers for the use of acceptance sampling plans. Most of the firms (77%) also rate their supplier's performance.

In the food processing sector, 68% of the respondents claim that they use acceptance sampling plans. Seventy three percent (73%) also reported that they rate their supplier's performance.

In the case of the metal working sector, a good 72% of the respondents reported that they have formal agreements with suppliers regarding the screening of materials delivered for quality.

CUSTOMER RELATIONS

Respondents to questions pertaining to customer relations reveal that companies are highly involved in establishing good customer relations.

Sixty nine percent (69%) and eighty two percent (82%) of the firms in the chemicals and metal working sector, respectively, indicated that their customers or product users are involved in setting product specifications. Many of the respondents in the food sector did not touch on this issue. Eighty eight percent (88%), 81%, and 86% of the respondents in the chemicals, food, and metal sectors, respectively, reported that they have units handling complaints against or suggestions for improvement of their products or services.

Ninety six percent (96%), 91% and 93% of the respondents in the chemicals, food, and metal sector, respectively, reported that they have an existing policy of replacing products found defective by customers in the market. 96%, 96%, and 100% of the respondents in the chemicals, food and metal sectors, respectively, evaluate defective products returned by customers for consideration in product improvement.

Seventy three percent (73%), 36%, and 79% of the respondents in the three sectors, respectively, have experienced improved product market performance due to the incorporation of suggestions for product improvement from consumers or end-users.

MARKET RESEARCH/PRODUCT DEVELOPMENT

Majority of the respondents - 77%, 77%, and 80% respectively in the chemicals, food, and metal sector - engage in market research. They are all in agreement that market research has helped them improve their products.

As far as product development or improvement ideas are concerned, the respondents gave the following ranking:

<u>Source of Ideas</u>	<u>Chemicals</u>	<u>Food</u>	<u>Metal</u>
Marketing	1	1	3
R & D	3	2	2
Production	4	3	4
Top Management	2	4	1

On the whole, marketing tops the list, followed by top management, then by R & D, and finally by Production.

STATISTICAL/ANALYTICAL TOOLS USED

A number of statistical/analytical tools have been listed in the survey form used. The ranking in terms of popularity or number of firms utilizing them, are shown below:

	Ranking		
	<u>Chemical</u>	<u>Food</u>	<u>Metal</u>
Frequency Distribution	1	3	2
Pareto Analysis	6	7	3
Control Charts for Variables	2	1	4
Control Charts for Defects	3	2	1
Control Charts for Fraction	7	8	8
Non-Conforming Items			
Machine/Process Capability Studies	4	4	4
Correlation Studies	4	9	7
Tests of Significance	8	8	9
Analysis of Variance	2	5	6
Reliability Studies	9	10	5
Quality Cost Optimization Studies	5	6	10

It is quite apparent that the simple frequency distribution, the control charts, and process capability studies are the most popular.

DESIRED QC/QA PROGRAM RESULT

The respondents were asked to rank certain desired results in implementing quality control or quality assurance programs. The results are as follows:

<u>Desired Results</u>	Ranking		
	<u>Chemical</u>	<u>Food</u>	<u>Metal</u>
Reputation for Quality	1	1	1
Achieve Zero Defect	2	6	2
Increase Productivity	4	3	3
Minimize Wastage	3	4	4
Increase Profitability	5	2	6
Increase Market Share	6	5	5

The most frequently mentioned area for training in quality programs are those involving statistical process control and statistical quality control.

Fifty seven percent (57%), 82%, and 86% of the respondents in the chemicals, food, and metal sectors, respectively, claim that they have already adopted the quality control concept in their company.

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are drawn from the results of the study:

1. While there is a generally accepted concept today that quality is everyone's responsibility, still an overwhelming majority of firms opt to maintain quality control or quality assurance departments tasked with specific functions and responsibilities. In comparison to manpower size of the firms however, these units consists of relatively smaller size of manpower complement (4%).
2. International standards and mother company standards are used extensively by local manufacturing firms. However, the use of self-developed local standards or specifications are also extensive. Government-developed standards, on the other hand, while already being adopted by many companies, have not yet covered many of our manufactured products and/or have not yet been known by many of our local companies.
3. Problems with machines, equipment and other facilities had been pinpointed as the primary cause of defective products, followed closely by problems with materials. This implies a great need for improvement as far as (a) selection of machines and equipment are concerned, (b) specifying the design or features of machines, equipment and other facilities, (c) training workers on the use of machines and equipment, (d) maintenance of machines, equipment and facilities, and (e) installing adequate control in the use of machines and equipment. Problems with materials may be traceable to the lack of adequate supply, so much so that users of these materials oftentimes have no choice even if they want to implement their screening procedures strictly.
4. There is a need for user firms and vendor firms to plan together, to work closely together, and to support each other in trying to optimize results at both ends.
5. While most firms have units to handle complaints or suggestions for improvement regarding the products or services, it appears that there is still a need to campaign for better producer - consumer relations. Consumer groups plays an important role as far as this issue is concerned.

6. Production people lag behind as far as the generation of product development and improvement ideas are concerned. Perhaps they do not consider this as part of their responsibility, but certainly they are potentially a good source of product improvement ideas considering their technical background. Improvement here is taken with a broad view to include results obtainable from value analysis and value engineering studies.
7. Simple tools like frequency distributions, control charts and process capability studies are quite popular among local firms. Besides being easy to apply, these are the more consciously known tools and are often the subject of training programs for quality control.
Statistical tools like correlation studies, analysis of variance and tests of significance which may oftentimes prove to be very useful have probably not been tried because of lack of knowledge on how to apply them.
8. The principal motivation among firms in embarking on quality control or assurance programs is to gain a reputation for quality. It is encouraging to find that the level of quality awareness among people at the management level has already been raised so much. What is probably more important to know at this point is how much commitment they could give to achieve this desired result.
9. The frequent mention of the need for training in statistical tools could indicate a strong need in this area. However, it could also mean that the dissemination of knowledge about the field of quality management has been confined to these statistical tools, whereas, in fact there are many areas that need to be attended to.
10. While many firms claim that they have adopted the total quality control concept in their company, it is doubtful whether they have the same or the correct notion of the concept. The survey instrument did not give an explanation of the total quality control concept.

The following issues/items are therefore recommended for further study:

1. What kind of specialized training should people to be taken in for QC jobs have?
2. How local firms develop their own standards and specifications.
3. What are the nature of problems encountered with machines, equipment and facilities which lead to the production of defective products?
4. What model could vendor and user firms follow in planning and working closely together to achieve overall optimal results?
5. How far local firms gave in the utilization of value analysis and value engineering concept in their products.

6. Among those who claim that they want their companies to gain a reputation for quality, how much commitment and support have they given towards the achievement of this desired result?
7. What are the perceptions of people at different levels about the concept of total quality control?

It is also recommended that:

1. A training Center for Quality shall be established to provide manpower with adequate skills to take on their QA/QC responsibilities. Training should not be confined to statistical/analytical tools.
2. More support should be given to government efforts towards a more comprehensive coverage of product standards and specifications.
3. Institutions that deal with development and design, testing, and maintenance of machines and equipment should be involved in the national campaign for quality.

This study is limited in scope and in depth but it could pave the way for a better appreciation and understanding of how local firms handle the management of quality and how improvements could be made in this respect.

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