

The Quality Management System implemented in select certified organisations in West Bengal, India: current status and the tendency

Raju Roy¹, Dr. Debomalya Ghose²

¹Research Scholar, Department of Business Administration, Jawaharlal Nehru School of Management Studies, Assam University, Silchar - 788011, Cachar, Assam, INDIA

²Associate Professor, Department of Business Administration, Jawaharlal Nehru School of Management Studies, Assam University, Silchar - 788011, Cachar, Assam, INDIA

raju_roy2011@rediffmail.com

ABSTRACT

The study is exploratory that examines the current effectiveness of the implementation of the ISO 9001 based Quality Management System. The actual purpose of the study is to identify the current quality status in corporate organisations and their preparedness to cope with future business challenges. The study is on QMS certified corporate organisations in North Bengal (West Bengal, India) mostly manufacturers, where the focus is to collect primary data. It also explores potential ties between organisational development and the implementation QMS. Descriptive Statistical Analysis, Friedman's ANOVA Test and Principal Component Analysis (PCA) will attempt to assess whether or not there is any substantial difference between the application and use of QMS practices. The findings of this study will help stakeholders take action as well as incorporate and improve quality in their products or services.

Keywords: ISO 9001, Quality Management System (QMS), Corporate, Implementation, Quality Practices

I. INTRODUCTION

Manufacturers assess quality by testing how accurately the product or service was produced or delivered. A quality product or service holds the capacity to achieve the desired goal with satisfaction and is suitable for the purpose, it was planned. Most of the organisations prefer implementing. Most organisations tend to adopt QMS based on ISO 9001, which is an internationally recognised and highly compatible standard that assures the organisation's quality management system. The requirements of quality management system are set by ISO 9001 therefore ensures the customer that the product is safe and certified in terms of quality.

II. NEED OF THE STUDY

The study is important for corporate organisations to recognise their current quality status and their preparedness to cope with potential market challenges. The potential links between organisational growth and the implementation of QMS must be examined. Stakeholders need to take action as well as integrate and enhance the quality of their goods or services. As no scholarly work on this issue has been attempted, there is ample scope for alternative possibilities to explore the field.

III. OBJECTIVES OF THE STUDY

The implementation of the quality management system and its current position to be assessed in selected QMS certified corporate organisations.

IV. RESEARCH QUESTIONS

Based on the literature survey, the questions that will be answered in this research related to North Bengal's selected corporate organisations are as follows:

1. What are QMS's developmental stages?
2. How are the principles of QMS described and the extent of its application within the organisation?
3. What is the procedure according to the QMS norm of elements and requirements?
4. How is the performance delivered by the organisation assessed during QMS implementation?
5. What kind of affirmative conception is there in the organisations about the implementation of QMS?
6. What kind of adverse views is expressed by the organisations on the implementation of QMS?

V. SCOPE OF THE STUDY

The results of the impact of the incorporation of QMS in North Bengal organisations will provide management with an opportunity to increase the level of understanding of QMS within stakeholders, which will help boost the organisation's quality and operational aspect and encourage getting hold of further business opportunities. Besides, QMS is strongly acceptable among organisations, reflecting a suitable environment for more opportunities for businesses and Foreign Direct Investment (FDI) in North Bengal and overall in West Bengal.

VI. LIMITATION OF THE STUDY

Several high-quality QMS certified organisations may be missing in the survey list. The interpretation of the data collected included the researchers' personal experience, and the study's outcome posed a generalised situation that could differ from organisation to organisation. To date, a minimal or lesser analysis has been performed and there is a wide potential for study in this subject area in future and this shows the originality of the research. Larger sample size would have created an opportunity for more accurate findings.

VII. RESEARCH METHODOLOGY AND DATA

The study's target population was QMS-certified corporate organisations in the eight North Bengal/ West Bengal districts. The samples selected were from different sectors specified in MCA, MSME etc., mostly manufacturers. Rowley (2014) stated that questionnaires were prepared and evaluated in pilot surveys and updated to collect relevant data, depending on the nature of the questions [1]. Multiple-choice questionnaires were communicated to the organisations, based on the 5-point Likert Scale (Joshi, Kale, Chandel, & Pal, 2015) [2]. The participants of both the pilot and the main survey were presented with some display material addressing QMS. Out of eighty QMS certified organisations, only fifty-five organisations responded and their responses were collected by interview. Using techniques, viz. observation and survey, the primary data was obtained using the questionnaire to gather information about the population. From various open sources such as blogs, journals, magazines, etc., the secondary information was also collected (Bolarinwa, 2015) [3].

Using the Descriptive Analysis, the SPSS analysed the nominal data of the survey to find out the distribution of information, detect outliers and typos, recognise correlations between variables, etc. (Dhand, 2020)[4]. When the dependent variable being evaluated is ordinal, the Friedman's ANOVA test was used to test for differences between groups (Lund & Lund, 2018) [5] and the Principal Component Analysis was used to take out appropriate data from difficult data set to analyse ordinal data (Pallant, 2010) [6]. The data collected was processed by defining missing and outliers data; translated to desirable data, and evaluated for appropriateness using MS EXCEL and SPSS.

VII. DATA ANALYSIS

RESEARCH QUESTION-1: Developmental stages of ISO 9001 based QMS.

Friedman's ANOVA Test (Research Question: 1)

To find out if the research question has a statistically significant difference among each other or not the test was conducted. The test statistics table was:

Table 1.: Ranks and Test Statistics (Research Question: 1)

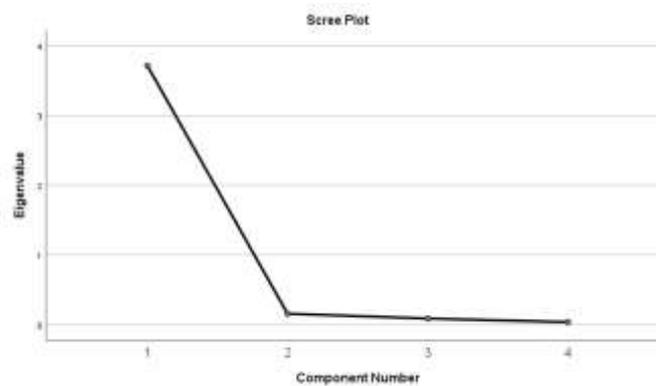
Test Statistics ^a	
N	55
Chi-Square	9.32
df	3.00
Asymp. Sig.	0.02
a. Friedman Test	

There was a statistically significant difference among variables $\chi^2=9.32$, $df=3$, $p=0.02$ (Table 1.).

Principal Component Analysis (PCA) (Research Question: 1)

Correlation matrix - correlation coefficients between variables were strong. All communalities > 0.888 (required - 0.40).

Figure 1.: Scree Plot (Research Question: 1)



Total Variance Explained & Scree Plot - extracted 1 component (Eigenvalues 3.712 > 1.0) (Figure 1.).

Table 2.: KMO and Bartlett's Test (Research Question: 1)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.81
Bartlett's Test of Sphericity	Approx. Chi-Square	320.19
	df	6.00
	Sig.	0.00

KMO test- 0.815 and it was a good value. Bartlett's Test of Sphericity - significant (Approx. Chi-Square = 320.19, df = 6.00, p = 0.00). The variables were significantly correlated (Table 2.). Component Matrix - all items load strongly on the one underlying component (all above 0.942). All the variables - relevant; one-factor solution - no possibility of rotation.

RESEARCH QUESTION 2: The QMS principles and the level of its implementation within the organisation.

Friedman's ANOVA Test (Research Question: 2)

To find out if the research question has a statistically significant difference among each other or not the test was conducted. The test statistics table was:

Table 3.: Test Statistics (Research Question: 2)

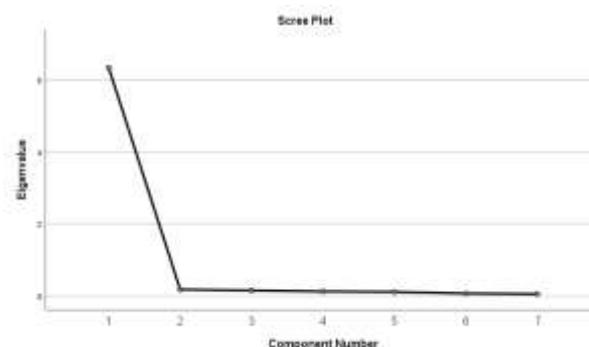
Test Statistics^a	
N	55
Chi-Square	31.25
df	6.00
Asymp. Sig.	0.00
a. Friedman Test	

There was a statistically significant difference among variables $\chi^2 = 31.25$, df = 6.00, p = 0.00 (Table 3.).

Principal Component Analysis (PCA) (Research Question: 2)

Correlation matrix - correlation coefficients between variables were strong. All communalities > 0.868 (required - 0.40).

Figure 2.: Scree Plot (Research Question: 2)



Total Variance Explained & Scree Plot - extracted 1 component (Eigenvalues 6.33 > 1.0) (Figure 2.).

Table 4.: KMO and Bartlett's Test (Research Question: 2)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.93
Bartlett's Test of Sphericity	Approx. Chi-Square	601.74
	df	21.00
	Sig.	0.00

KMO test- 0.93 and it was a good value. Bartlett's Test of Sphericity - significant (Approx. Chi-Square = 601.74, df = 21.00, p = 0.00). The variables were significantly correlated (Table 4.). Component Matrix - all items load strongly on the one underlying component (all above 0.93). All the variables - relevant; one-factor solution - no possibility of rotation.

RESEARCH QUESTION-3: The practice of elements and requirements according to QMS standard.

Friedman's ANOVA Test

To find out if the research question has a statistically significant difference among each other or not the test was conducted. The test statistics table was:

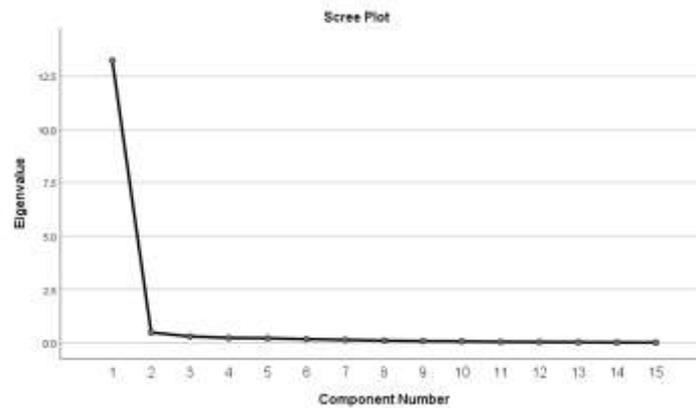
Table 5.: Test Statistics (Research Question: 3)

Test Statistics^a	
N	55
Chi-Square	72.37
df	14.00
Asymp. Sig.	0.00
a. Friedman Test	

There was a statistically significant difference among variables $\chi^2 = 72.37$, df = 14.00, p = 0.00 (Table 5.).

Principal Component Analysis (PCA)

Correlation matrix - correlation coefficients between variables were strong. All communalities > 0.81 (required - 0.40).

Figure 3.: Scree Plot (Research Question: 3)

Total Variance Explained & Scree Plot - extracted 1 component (Eigenvalues 13.24 > 1.0) (Figure 3.).

Table 6.: KMO and Bartlett's Test (Research Question: 3)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.87
Bartlett's Test of Sphericity	Approx. Chi-Square	1748.81
	df	105.00
	Sig.	0.00

KMO test- 0.87 and it was a good value. Bartlett's Test of Sphericity - significant (Approx. Chi-Square = 1748.81, df = 105.00, p = 0.00). The variables were significantly correlated (Table 4.). Component Matrix - all items load strongly on the one underlying component (all above 0.89). All the variables - relevant; one-factor solution - no possibility of rotation.

RESEARCH QUESTION-4: Assessment on organisational performance, after QMS implementation.

Friedman's ANOVA Test

To find out if the research question has a statistically significant difference among each other or not the test was conducted. The test statistics table was:

Table 7.: Test Statistics (Research Question: 4)

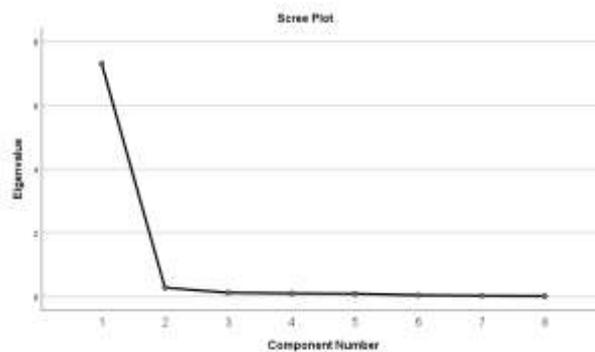
Test Statistics^a	
N	55
Chi-Square	30.31
df	7.00
Asymp. Sig.	0.00
a. Friedman Test	

There was a statistically significant difference among variables $\chi^2 = 30.31$, $df = 7.00$, $p = 0.00$ (Table 7.).

Principal Component Analysis (PCA)

Correlation matrix - correlation coefficients between variables were strong. All communalities > 0.88 (required - 0.40).

Figure 4.: Scree Plot (Research Question: 4)



Total Variance Explained & Scree Plot - extracted 1 component (Eigenvalues $7.31 > 1.0$) (Figure 4.).

Table 8.: KMO and Bartlett's Test (Research Question: 4)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.91
Bartlett's Test of Sphericity	Approx. Chi-Square	846.72
	df	28.00
	Sig.	0.00

KMO test- 0.91 and it was a good value. Bartlett's Test of Sphericity - significant (Approx. Chi-Square = 846.72, $df = 28.00$, $p = 0.00$). The variables were significantly correlated (Table 4.). Component Matrix - all items load strongly on the one underlying component (all above 0.94). All the variables - relevant; one-factor solution - no possibility of rotation.

1.10.2.6. RESEARCH QUESTION-5: Some positive aspects regarding QMS implementation.

Friedman's ANOVA Test

To find out if the research question has a statistically significant difference among each other or not the test was conducted. The test statistics table was:

Table 9: Test Statistics (Research Question: 5)

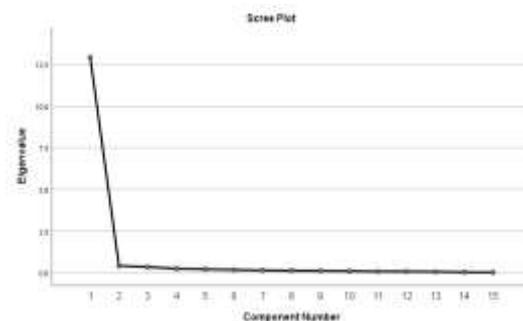
Test Statistics ^a	
N	55
Chi-Square	48.98
df	14.00
Asymp. Sig.	0.000
a. Friedman Test	

There was a statistically significant difference among variables $\chi^2 = 48.98$, $df = 14.00$, $p = 0.000$ (Table 9.).

Principal Component Analysis (PCA)

Correlation matrix - correlation coefficients between variables were strong. All communalities > 0.79 (required - 0.40).

Figure 5.: Scree Plot (Research Question: 5)



Total Variance Explained & Scree Plot - extracted 1 component (Eigenvalues 12.93 $>$ 1.0) (Figure 5.).

Table 10.: KMO and Bartlett's Test (Research Question: 5)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.92
Bartlett's Test of Sphericity	Approx. Chi-Square	1389.53
	df	105.00
	Sig.	0.000

KMO test- 0.92 and it was a good value. Bartlett's Test of Sphericity - significant (Approx. Chi-Square = 1389.53, df = 105.00, p = 0.00). The variables were significantly correlated (Table 10.). Component Matrix - all items load strongly on the one underlying component (all above 0.89). All the variables - relevant; one-factor solution - no possibility of rotation.

RESEARCH QUESTION-6: Some adverse outlook regarding QMS implementation.

Friedman's ANOVA Test

To find out if the research question has a statistically significant difference among each other or not the test was conducted. The test statistics table was:

Table 11.: Test Statistics (Research Question: 6)

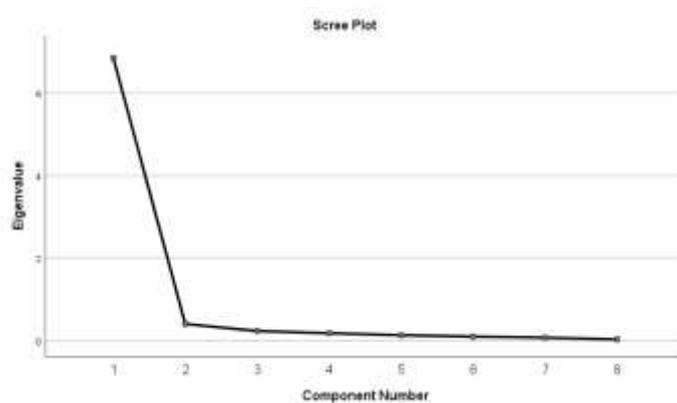
Test Statistics^a	
N	55
Chi-Square	31.14
df	7.00
Asymp. Sig.	0.00
a. Friedman Test	

There was a statistically significant difference among variables $\chi^2 = 31.14$, df = 7.00, p = 0.00 (Table 11.).

Principal Component Analysis (PCA)

Correlation matrix - correlation coefficients between variables were strong. All communalities > 0.83 (required - 0.40).

Figure 6.: Scree Plot (Research Question: 6)



Total Variance Explained & Scree Plot - extracted 1 component (Eigenvalues 6.85 > 1.0) (Figure 6.).

Table 12.: KMO and Bartlett's Test (Research Question: 6)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.87
Bartlett's Test of Sphericity	Approx. Chi-Square	635.15
	df	28.00
	Sig.	0.00

KMO test- 0.87 and it was a good value. Bartlett's Test of Sphericity - significant (Approx. Chi-Square=635.15, df =28, p=0.00). The variables were significantly correlated (Table 12.). Component Matrix - all items load strongly on the one underlying component (all above 0.91). All the variables - relevant; one-factor solution - no possibility of rotation.

FINDINGS

The study's findings and discussion of the study were as:

RESEARCH QUESTION-1: Developmental stages of ISO 9001 based Quality Management System.

The research question was analysed using allocated codes and the findings were discussed as per output received.

Table 13.: Percentage table (Research Question: 1)

Categories	N	%
Extremely Low	0	0.0
Low	16	29.0
Moderate	1	2.0
High	30	55.0
Extremely High	8	14.0
	55	100

OBSERVATION

The consultant's services were essential and they were supportive; and teamwork helped achieve the desired objective (Table 13.).

RESEARCH QUESTION 2: The ISO 9001/QMS principles and the level of its implementation within the organisation.

The research question was analysed using allocated codes and the findings were discussed as per output received.

Table 14.: Percentage table (Research Question: 2)

Categories	N	%
Extremely Low	1	2.0
Low	15	27.0
Moderate	1	2.0
High	21	38.0
Extremely High	17	31.0
	55	100

OBSERVATION

The principles of ISO 9001 / QMS and the level of compliance within the organisation was strong and appropriate to most organisations (Table 14.).

RESEARCH QUESTION-3: The practice of elements and requirements according to ISO 9001/ QMS standard.

The research question was analysed using allocated codes and the findings were discussed as per output received.

Table 15.: Percentage table (Research Question: 3)

Categories	N	%
Extremely Low	0	0.0
Low	14	25.0
Moderate	3	6.0
High	27	49.0
Extremely High	11	20.0
	55	100

OBSERVATION

Quality policies, training records, quality documents were introduced in the practice of components and specifications of QMS; priority was given to customer expectations; complete support was provided; frequent verification of work instructions, implementation plans and workmanship; proper document maintenance; on-time calibration of equipment; proper corrective steps were taken on time, the quality system was reviewed by external auditors; continuous improvement was encouraged (Table 15.)

RESEARCH QUESTION - 4: Assessment of organisational performance after QMS implementation.

The research question was analysed using allocated codes and the findings were discussed as per output received.

Table 16.: Percentage table (Research Question: 4)

Categories	N	%
Extremely Low	0	0.0
Low	17	31.0
Moderate	0	0.0
High	31	56.0
Extremely High	7	13.0
	55	100

OBSERVATION

Organisational efficiency improved after QMS implementation, the respondents observed (Table 16.).

RESEARCH QUESTION-5: Some positive aspects regarding Quality Management System (QMS)/ ISO 9001 implementation.

The research question was analysed using allocated codes and the findings were discussed as per output received.

Table 17.: Percentage table (Research Question: 5)

Categories	N	%
Extremely Low	0	0.0
Low	15	27.0
Moderate	2	4.0
High	27	49.0
Extremely High	11	20.0
	55	100

OBSERVATION

For the growth of the organisation, most of the respondents considered it helpful (Table 17.)

RESEARCH QUESTION-6: Some adverse outlook regarding Quality Management System (QMS)/ ISO 9001 implementation.

The research question was analysed using allocated codes and the findings were discussed as per output received.

Table 18.: Percentage table (Research Question: 6)

Categories	N	%
Extremely Low	0	0.0
Low	29	53.0
Moderate	9	16.0
High	6	11.0
Extremely High	11	20.0
	55	100

OBSERVATION

QMS was considered beneficial by the respondents and they did not agree with the negative views (Table 18).

VIII. CONCLUSION

The research observed the impact of quality management system implementation in selected North Bengal corporate organisations. The current status of the Quality Management System implementation in certified organisations has been improved and the QMS principles based on ISO 9001 and the standard of its implementation within the organisation have been high and appropriate for most organisations. To achieve the ultimate objective of encouraging and strengthening sustainable business management and organisational practice, the result of this research can be further extended and revised.

REFERENCES

- [1] Rowley, J. (2014). Designing and using research questionnaires. *Management Research Review*, 37(3), 308-330. doi: <https://doi.org/10.1108/MMR-02-2013-0027>
- [2] Joshi, A., Kale, S., Chandel, S., & Pal, D. (2015). Likert Scale: Explored and Explained. *British Journal of Applied Science & Technology*, 7(4), 396-403. doi: 10.9734/bjast/2015/14975
- [3] Bolarinwa, O. (2015). Principles and methods of validity and reliability testing of questionnaires used in social and health science researches. *Nigerian Postgraduate Medical Journal*, 22(4), 195–201. doi: 10.4103/1117-1936.173959
- [4] Dhand, N. (2020, January 09). Descriptive Analysis: Take it easy! Retrieved June 06, 2020, from <http://www.statulator.com/blog/descriptive-analysis-take-it-easy/>
- [5] Lund, A., & Lund, M. (Eds.). (2018). Friedman Test in SPSS Statistics. Retrieved May 29, 2020, from <https://statistics.laerd.com/spss-tutorials/friedman-test-using-spss-statistics.php>
- [6] Pallant, J. (2010). *SPSS survival manual: A step by step guide to data analysis using SPSS* (4th ed.). New York: McGraw-Hill.