

Full Length Research Paper

Total Quality Management in the stock exchange: A case study

Gurcharan Singh, Edward Wong Sek Khin* and Fereidoon Zolfaghari

Faculty of Business and Accountancy, University of Malaya, Kuala Lumpur, Malaysia.

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The purpose of this study is to explore, assess, and identify the implementation patterns of Deming's principles in Malaysia's Kuala Lumpur Stock Exchange. By applying Deming's 14-point quality criteria to these service providers, Deming's significance factors are then ranked to explain the variation in the finance service providing companies sampled. The basis of this research is the degree of consensus between managers of diverse backgrounds using Deming's 14-point quality criteria using a middle management sample base. The main findings of the study are that although companies believe that TQM would have a positive impact on the quality of the final services and products, they did so with little enthusiasm. Results show that, the use of Total Quality Management (TQM) within the Malaysian financial industry to solve quality problems is increasing. The results also show that companies do include their major customers in their quality initiatives

Key words: Quality, Deming criteria, total quality management.

INTRODUCTION

Quality management in financial companies has been a problem, but work in this area focused mainly in developed nations with less focus on third world or less developed countries. This research is to explore the dimensions of quality control management in finance service providers by investigating Malaysia's Kuala Lumpur Stock Exchange as a case study, and applying the Deming system as a measure of service quality.

The purpose of this study is to explore, assess, and identify the implementation patterns of Deming's principles in a Malaysian financial service provider organization. This, by examining the extent that managers of diverse cultural, educational, social, and educational backgrounds perceive and apply Deming's philosophy of Profound Knowledge, and its 14 principles upon their management processes.

LITERATURE

Deming's quality philosophy

Deming's initial work popularizing quality control in Japan

started in the 1950s. His philosophy emphasizes the systemic nature of institutions, the importance of leadership, and the need to reduce variation in institutional processes, but he maintains that an institution must adopt the fourteen points of his system at all levels (Anderson et al., 1994; Evans and Dean, 2003). Deming also believes that quality is to be built into the product at all stages in order to achieve high levels of excellence, and Deming included the managerial dimensions of planning, organizing, and controlling output, and focused on the responsibility of management to achieve quality, as well as the need for goal setting (Boaden, 1997).

Deming developed the Deming Chain Reaction which shows that, as quality improves, costs will decrease, and as productivity increases, more jobs are generated, greater market share is apparent, and long-term corporate survival tends to be assured. Deming stresses worker pride and satisfaction rather than the establishment of quantifiable goals are the basis of quality improvements (Anderson et al., 1994, Kanji, 1990; Swift et al., 1998).

According to Dale (2003), Deming maintains that his 14 points could be applied anywhere, to small institutions as well as to the large ones, from the service industry through to manufacturing. He also stressed that it is the system of work that determines how well the work is performed and it is only managers that can create an

*Corresponding author. E-mail: edwardwong@graduate.uwa.edu.au.

efficient system (Anderson et al., 1994; Capezio and Morehouse 1993; Dale 2003; Evans and Dean 2003; Kelada 1996; Lindsay and Petrick 1998; Neave 1990; Spigener and Angelo 2001; Sarkar 1991; Swift et al., 1998; Waldman 1994).

The perspective of Deming's view of quality has two definitions where he defines "Quality as a multi-dimensional used to produce a product and/or deliver a service that meets the customer's expectations to ensure consumer satisfaction." Through this definition, he equates high quality and customer satisfaction. His essential arguments are (1) that defined quality is in terms of customer satisfaction, (2) quality is multi-dimensional where it is impossible to define the quality of a product or service in terms of a single characteristic or agent, and (3) there are different degrees of quality, because quality equates to customer satisfaction (Deming, 1988). Unlike Deming in manufacturing, Joseph M. Juran, directly addresses the financial service systems. According to Capezio and Morehouse (1993), Lindsay and Petrick (1998), Rao et al. (1996) and Waldman (1994), the Juran Trilogy (a trademark of the Juran Institute, Inc) identifies three areas for quality conversion within a financial institution, namely:

1. Financial planning becomes quality planning (developing the products and processes required to meet customer needs).
2. Financial control becomes quality control (meeting product and process goals).
3. Financial improvement becomes quality improvement (achieving unprecedented levels of performance).

Quality culture

Beside the Deming's quality dimension, there are a multitude of definitions of culture, each with its own slight variation depending on the focus of study, but most suggest culture is the pattern of arrangement, material, or behaviour which has been adopted by a society (corporation, group, or team) as the accepted way of solving problems. As such, culture may be taken to include all the institutionalized ways and the implicit beliefs, norms and values, and premises which underline and govern behaviour (Ahmed et al., 1999). Therefore, culture is the key factor underpinning success in terms of developing the necessary commitment to any form of change (Kotter and Heskett, 1992). However, quality culture is the main ingredient in a successful TQM program (Westbrook, 1993). An organization with a "quality culture" is one having "clear values and beliefs that foster total quality behaviour" (Linklow, 1989). Changing corporate culture or organizational culture is recognized as one of the primary conditions for successful implementation of Total Quality Management (Hildebrandt et al., 1991).

Prominent quality experts, Deming, Juran, and Crosby recognize the importance of an appropriate quality

culture. Their works identify a number of cultural elements that must undergo change in order that a continuous and sustainable quality improvement philosophy is present. They stress the importance of building a quality culture by changing the perceptions of, and attitudes towards, quality as a prerequisite to major quality improvement efforts (Sommerville and Sulaiman, 1997). Therefore, changing culture is partly the purpose of TQM itself, but it is also in many cases a prerequisite to attempt to install TQM (Pike and Barnes, 1994).

Grouping middle management based on ethnicity and extracting their ideas reveals that there are significant differences regarding implementing Deming's principles based on ethnicity, particularly regarding Deming's point 6, and Deming's point's 12 and 13 (Refer to the appendix list). Point 6 explains that "Adopt modern methods of training-on-the-job by teaching employees the best methods of achieving quality in their jobs and the use of tools such as statistical quality control." Point 12 explains "Remove barriers that rob people of the pride of workmanship. Eliminate the annual rating or merit system." Point 13 explains that "Institute a vigorous programme of education and self-improvement for everyone."

Surprisingly these three points suggest ways of self-improvement and personal knowledge development, and different cultures pursue them based on their ideas, values, and beliefs that significantly affect the total organizational culture and organizational performance and have, for a long time, been part of discussions of TQM philosophy.

RESEARCH METHODOLOGY

Based on the above literature, this study seeks to identify the implementation patterns of Deming's principles in Malaysia's Kuala Lumpur Stock Exchange.

H₁: Managers with different ethnic and social background perceive Deming's points differently.

H₂: Deming's 14 points apply only occasionally to some finance service provider organizations.

H₃: Deming's knowledge indicates appreciation for a system where, it can explain variations within the given system; offers a theory of knowledge, and shows that the user's psychological state equally causes variations in quality within service provider's organizations.

In conducting this study, the data obtained are based upon the results of a survey from a sample of 450 employees (middle management) working at the Kuala Lumpur Stock Exchange with a response rate of 64%. The research uses indicators of internal consistency particularly Cronbach's Alpha Coefficient which is ideally above 0.70. From testing the reliability of the survey on the data used, the value of Cronbach's Alpha Coefficient is 0.785.

RESULTS AND DISCUSSION

An ANOVA test checked the differences between perceived qualities based on Deming's 14 points by middle managers grouped by gender, educational

background, and cultural affiliation. This is followed by a Factor Analysis to classify Deming's 14 points based upon our research and to establish whether the findings have common similarities and meanings within Deming's Profound Knowledge system that consists of:

1. Appreciation for a system
2. Understanding of variation
3. Theory of knowledge
4. Psychology

A regression analysis was then performed to observe how Deming's classification of factors as independent variables explains variations in perceived quality, which is a sum total of all 14 points into one variable called Deming Quality Management (DQM) as dependent variable.

The distribution of respondents were male respondents representing 34.5% and the female respondents being 65.5% from the total sample, with educational background of Diploma degree 6.2%, Bachelor degree 68.8%, Masters 21.9% and PhD 3.1% in terms of the ethnicity, Malay 56.2%, Chinese 15.6% , and Indian 28.1% as shown in Tables 1 and 2.

Hypothesis observation

H₁: Managers with different background perceive Deming's points differently. This hypothesis is partially supported and inferred from the following results.

A one-way ANOVA test was performed to see the differences between judging Deming's 14 points between male and females. Only point 10 was significant at .051. Point 10 suggests "Eliminate slogans and exhortations for the workforce asking for zero defects and new levels of productivity." We may infer from this result that perception and the judging of performance, productivity, and quality is different between male and females in an organization.

Difference between educational and implementation of 14 points in financial service organizations

Education is a tool to convey knowledge to employees. Recruitment and selection sensitivity is not equal for different job categories, hierarchal levels, as educational requirements are different to perform a specific task. TQM (Total Quality Management) targets all levels of management in a 3 dimensional model, shown vertically and horizontally in organizational chart terms, where employees have different educational backgrounds. Based on the research there are significant differences between different educational groups (Diploma, Bachelor, Master and PhD degree holders regarding implementation of Deming's principles of points 4 and 8.

Point 4 suggests "End the practice of awarding business and choosing suppliers based on price. Minimize total cost by working with a single supplier," and point 8, "Drive out fear, so that everyone may work effectively for the institution. No one can perform unless he or she feels secure."

H₂: Deming's 14 points apply only sometimes to some finance service provider organizations.

The survey response scale in this research was a Likert 5 point scale (1- Never 2- Rarely 3- Sometimes 4- Often 5- Very Often) to measure implementation of Deming's philosophy in the Kuala Lumpur Stock Exchange. This means that Deming's point 5 "Constantly improve the system of production and service by continually improving test methods and identification of problems, from the very first planning stages right up to distribution to customers, and thus constantly decrease costs" is very often used by middle management in service organizations. Point 3 "Understand Inspection," point 10 "Eliminate Exhortations," and point 12 "Pride in Job" are area of improvement for this organization because respondents indicate that they rarely and sometimes practice these principles in their work. Table 3 shows statistical mean for different Deming points. Our hypotheses of "H₂: Deming's 14 points apply only sometimes to some finance service provider organizations," is not supported fully because mean value is quite different with different standard deviation values.

Factor analysis of 14 Deming's points

Using all 14 points as quality criteria, factors were extracted using Principal Component Analysis. Root criteria where the Eigen value being more than or equal to one are extracted. These factors are rotated using orthogonal approach. We use Varimax with Kaiser Normalization. Higher values of Keiser-Meyer-Okin (KMO) measure of sampling adequacy of 0.5 to 1.0 will indicate factor analysis is appropriate. As indicated in Table 4, the KMO value of 0.799 mean that the analysis was appropriate. Again it factor analysis grouped the factor which have Eigen value more than 1.

Factor loading of 0.5 or more were examined for each factor and a meaning is assigned to each factor based on Deming's Profound Knowledge. In fact, it is a confirmation test to check validity of grouping Deming's 14 points less than 4 parts, that is, appreciation for a system, understanding of variation, theory of knowledge and psychology. Bartlett's test of sphericity supported the use of factor analysis as the Chi-square value of 763.606 ($p = 0.0391$) is significant. Results show that there were 5 components with Eigen value of more than 1.000 with a cumulative percentage variance of 64.615. This is above the cutoff point of 50%. The Varimax rotation is used to simplify the factor structure. That is, a given variable

Table 1. Cronbach's alpha correlation test results.

Deming	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
1. Vision and commitment	150.4375	180.125	0.099	0.786
2. Larn new phylosophy	150.5000	178.710	0.083	0.789
3_Understand inspection	152.0625	177.609	0.114	0.788
4_Acceptance decision criteria cost	150.8750	171.984	0.408	0.776
5_Improve constantly forever	149.8438	178.072	0.192	0.784
6_Institute training	151.2188	189.854	-0.350	0.801
7_Institute leadership	150.5938	177.281	0.207	0.783
8_Drive out fear	151.0625	180.125	0.068	0.788
9_Optimise teamwork efforts	151.2500	169.677	0.423	0.774
10_Eliminate exhortations	152.0938	172.926	0.319	0.778
11_MBO	150.3750	173.790	0.439	0.777
12_Pride in job	151.5625	173.415	0.385	0.777
13_Encourage education self improvement	151.0000	173.613	0.360	0.778
14_Take action on above points	151.2812	175.951	0.281	0.781
DTQM	110.5312	100.064	0.970	0.703
12+ Deming 11	147.8125	164.996	0.486	0.769
7_ Deming 1	146.9062	175.184	0.170	0.786
5	149.8438	178.072	0.192	0.784
13_ 10_ 9	146.0938	151.830	0.558	0.760
4	150.8750	171.984	0.408	0.776
ALL_ Deming ,s points or DQM	116.2812	100.789	0.959	0.705

Table 2. Descriptive profile of middle management sample.

Description	Sex		Educational status				Ethnicity		
	M	F	Dip.	B.Sc.	M.Sc.	PhD	M	C	I
Frequency	11	21	2	22	7	1	18	5	9
%	34.5	65.5	6.2	68.8	21.9	3.1	56.2	15.6	28.1

Table 3. Mean and standard deviation of various deming points.

Position	Deming													
	10	3	12	14	9	6	8	13	4	2	7	1	11	5
Mean	2.0	2.0	2.5	2.8	2.9	2.9	3.1	3.1	3.3	3.5	3.6	3.7	3.8	4.3
N	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Std Dev	0.7	1.2	0.8	0.8	1	0.8	0.9	0.8	0.9	0.8	10.5	0.7	0.7	0.7

should have a high loading on one factor and near zero loadings on other factors. Deming's 14 points items were analyzed to identify the number of factors. The results are in Table 5.

Results show that 5 factors with loading factor value of 0.50 and above are selected. The rotated factor matrix can be identified to explain the underlying characteristics of Deming's 14 points overall philosophy. To ensure that only very significant loadings are considered, the variables for a factor are selected only when the absolute

size of their factor loading is above 0.5.

Factor loading

Factor 1

Deming 12: Pride-In-Job (0.856) + Deming 11_MBO (0.589): Point 11 is interpreted as "eliminate numerical quotas and management by objectives." Many organizations manage by numbers, and in this research

Table 4. KMO and Bartlett's Test.

Kaiser-Meyer-Olkin measure of sampling adequacy		0.799
Bartlett's test of sphericity	Approx. Chi-Square	763.606
	df	78
	Sig.	0.0391

Table 5. Rotated component matrix.

Deming	Component				
	1	2	3	4	5
12_Pride in job	0.856				-0.100
6_Institute training	-0.735			-0.154	-0.226
11_MBO	0.589	-0.333	0.410	0.233	0.137
7_Institute leadership		0.796			
3_Understand inspection		-0.675			0.175
1_Vision and commitment	-0.300	0.493	0.485		
5_Improve constantly forever	0.107	0.138	0.820		
8_Drive out fear	0.131	0.163	-0.711		0.119
13_Encourage education and self improvement	0.291		0.276	0.657	
10_Eliminate exhortations	-0.188	0.331	-0.316	0.612	0.344
2_Learn new philosophy	0.185	0.369	-0.190	-0.600	0.345
9_Optimise teamwork efforts	0.312	-0.247		0.522	
4_Acceptance decision criteria cost	0.113	-0.132			0.927

that investigates Deming's 14 points as applied to Malaysia's Stock Exchange, where their common language is numbers and figures, offers a conundrum. In Deming's viewpoint, improvement is not encouraged if rewards or performance appraisals are tied to meeting quotas. Workers may short-cut quality to reach the goal. Deming acknowledges that goals are useful, but numerical goals set for others without incorporating a method to reach the goal, generate frustration and resentment. Further variation in the system year-to-year and quarter to quarter may make comparison meaningless. Point 12 is interpreted as "remove barriers to pride in workmanship." Deming believed that one of the biggest barriers to pride in workmanship is performance appraisal that may destroy teamwork by promoting competition for limited resources, as it fosters mediocrity because numbers typically drive objectives and that is what the boss wants rather than quality. If all individuals are working within the system, then they should not be ranked. Scholars explain much about the Deming philosophy but they have not classified Deming's 14 points. They explain that Deming's Profound Knowledge System consists of four interrelated parts.

1. Appreciation for a system
2. Understanding of variation
3. Theory of knowledge
4. Psychology

Our research and conclusion from factor 1, may confirm that Deming's Profound Knowledge Psychology related issues are based on, Deming's point 11 and 12 which are correlated as they load factor 1 as seen in Table 1.

Factor 2

Deming 7_Institute-Leadership (0.796) + Deming 1_Vision-&-Commitment (0.493): Leadership, vision and commitment are the essence of factor 2 which are loaded by points 1 and 7 of Deming's approach. Points 1 explains "create a vision and demonstrate commitment." An organization must define values and vision of the future to provide long-term direction for its management and employees. This point has high correlation with leadership function that is subject matter of point 7 "institute leadership." Combining these 2 points by factor analysis signifies the role of vision, leadership, and commitment in financial organizations.

Apparently leadership is not classified as a separate dimension in literature and can be a new classification and category to Deming's Profound Knowledge four interrelated parts that is, appreciation for a system, understanding of variation, theory of knowledge, Psychology, all applicable to improve service quality in a specific financial organization context, and other industries as well.

Factor 3

Deming 5_Improve-Constantly-Forever (0.820): Under factor 5 we received only one component point 5 “improve constantly and forever.” Factor 3 can be interpreted a component of “appreciation for a system” which is first four part of Deming’s Profound Knowledge.

Factor 4

Deming 13_Encourage-Education-&-Self-Improvement (0.657) + (Deming 10_Eliminate-Exhortations (0.612) + Deming 9_Optimise-Teamwork-Efforts (0.522)). Factor 4 can be related strongly to the theory of knowledge that is the third component of Profound Knowledge: Point 10 of Deming, argues “Eliminate Exhortations, statistical thinking and training, not slogans are the best routes to improve quality” which is in line with point 13 “education and self-improvement,” both will lead to point 9 “optimize the efforts of team.” Training is claimed to be one of the essential features for improving quality (Brown, 1994; Patel, 1994; Perry, 1995), and to deliver service quality competently and confidently (Berry and Parasuraman, 1992). Poor training is one of the reasons for a lack of quality in services (Joseph, 1996), and training will be able to minimize the risk of such service failures.

Often teamwork is seen in the academic literature as a means of supporting willingness to deliver service quality (Berry and Parasuraman, 1992). Through support from team members, motivation for providing quality service is likely to continue (Zeithaml and Bitner, 1996), and effective teamwork tends to develop capabilities for delivering a high level of service quality (Tjosvold et al., 1999). Other studies have found that weak service performance is strongly associated with a lack of teamwork, from this, service failure can be minimized by a team working as a team (Redman and Mathews, 1998). When effective, a team tends to develop employee commitment towards customer service, and the capability of delivering a high level of service quality (Tjosvold et al., 1999).

Factor 5

Deming 4_Acceptance-Decision-Criteria-Cost (0.927): Factor 5 is related to the variation theory of Deming. This point suggests that if company maintains long-term relationships with few suppliers it will lead to loyalty and opportunities for mutual improvement. Many condemned this Deming recommendation that “firm should work only with one supplier” because one supplier may adjust price in long run, but in reality, it reduces variations due to reliance on many suppliers and negotiation for price, quality and delivery conditions.

Factors are grouped as follows:

Factor 1: Psychology
Factor 2: Leadership
Factor 3: Appreciation for a system
Factor 4: Theory of knowledge
Factor 5: Understanding variations

Regression analysis results did not support hypothesis that “H₃: Deming’s Profound Knowledge parts that is, appreciation for a system, understanding of variation, theory of knowledge, Psychology, equally explain variations in perceived quality.

Multiple regression is used to analyze and explore the relationship between Deming’s Quality Management (DQM) as a criterion variable and the five factors identified by factor analysis above as independent variables namely, Psychology, Leadership, Appreciation for a system, Theory of knowledge, and Understanding variations.

DQT is sum total of all Deming’s points excluding point 14, which is very general. Independent variables are factors 1 to 5 that are identified by factor analysis. For factor one, we added up point 11+12, factor 2 points 7 +1, and factor 3 only point 5, factor 4 point 13+10+9 and factor 5 point 4 only. This analysis is performed in order to check how much of variations in all Deming’s Quality Management (DQM) are caused by five factors which are Deming’s Profound Knowledge and revisited on the context of this research.

From the Table 6 above, the R square = .888, means that 78.9% of the variation in the dependent variable is explained by the model means 9 points accounts for 78.9% variations in whole system. The remaining may be explained by components that are not classified by Factor Analysis. The adjusted R Square (.749) is much higher which can justify sample size and the number of independent variables.

Next, all the variables are tested at 5% level of significance to find the relationship between each of them and the Dependent Variable. From Table 7, the t-Test shows 4 variables are significant at 5 percent level of significance. These include D12_D11 (Psychology) (p=0.000), D7_D1 (Leadership) (p=.001), D13_10_9 (Theory of knowledge) (p=.000), D4 (control of variations) (p=.000). From these results, it can be seen that these four factors play an important role in explaining the DQM and quality perception in organization.

The following are the estimates of the coefficients:

$\alpha = 10.585$ (Constant); $\beta_1 = 1.208$ (D12_D11); $\beta_2 = .992$ (D7_D1); $\beta_3 = .229$ (D5); $\beta_4 = .824$ (D13_10_9); $\beta_5 = 1.499$ (D4);

Therefore the regression model is written as:

$$Y = 10.585 + 1.208\beta_1 + 0.992\beta_2 + 0.229\beta_3 + 0.824\beta_4 + 1.499\beta_5 + \varepsilon$$

Table 6. Regression test.

Model	R	R. square	Adjusted R square	Std. error of the estimate
1	0.888a	0.789	0.749	1.795

a. Predictors: (Constant), D4, D5, D13_10_9, D7_D1, D12_D11.

Table 7. Coefficients estimates.

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. error	Beta		
(Constant)	10.585	3.202		3.306	0.003
D12_D11	1.208	0.274	0.432	4.407	0.000
D7_D1	0.992	0.262	0.357	3.781	0.001
D5	0.229	0.441	0.049	0.519	0.608
D13_10_9	0.824	0.173	0.451	4.755	0.000
D4	1.499	0.361	0.383	4.148	0.000

a. Dependent variable DQM.

Rearranging the factors based on high beta value resulted in the following equation.

$DQM = \text{Variations} + \text{Psychology} + \text{Leadership} + \text{Knowledge} + \text{appreciation for system.}$

Results of regression analysis reveal that in this particular case, managers are to maintain quality, which is quite natural because variations are hard to predict and control, firstly concern variations. In fact, the next four factors are some kind of variation. Psychology is second concern because in organizations working with figures indicating money counting is very stressful because a mistake can affect the balance sheet and that could upset all finance equations because financial management starts as the accounting (Balance Sheet) finishes. Following psychology is leadership, which is our new dimension to Deming's Profound Knowledge and lacks emphasis in previous research. The Theory of knowledge comes after leadership, which deals with training, education, and self-improvement. It is clear that appreciation for the system comes last because unless the system identifies its variations, it cannot rectify its psychological factors by implementing employee's knowledge to minimize such issues as the raising of quality. This can be done under an effective leadership.

Conclusion

This study has attempted to analyze the importance of quality related issues in financial companies using data from Bursa Malaysia. One of the main findings of the study was that although companies believed that TQM would have a positive impact on the quality of the final products, they did not implement it wholeheartedly. The

results also showed that companies do include their major customers in their quality initiatives. However, the literature suggests that companies usually focus their efforts on improving the quality of the products they receive from their fund providers so that they can pass the improvement on to their customers. This result is somewhat in conflict with the result that quality is the most significant attribute in companies' relationships with their customers and fund providers. Thus, although companies consider quality to be an important factor in their dealings with fund providers, they actually do not allocate enough resources to develop or strengthen such relationships that focused on quality.

The financial industry has numerous problems in getting quality performance because of the complicated nature of the industry. TQM is now increasingly applied to the financial industry to solve quality problems. The implementation of a TQM required a culture change and change in management behaviour. The organizations need to shift from their current culture to a TQM culture that focuses on quality as a key strategy. The results identified some important cultural elements that contribute to successful implementation of TQM, which include leadership and top management commitment, customer management, training and education, teamwork, people recognition and effective communication. This dimension of quality culture should be adopted by the financial organization in implementation of TQM for continuous improvement.

The overall conclusion of this study is that despite managers' awareness of 'soft' TQM concepts and ideas, their knowledge and understanding of these concepts is superficial. The TQM paradigm has not cut deep into financial service organizations in general and managers in particular. It has not yet become a driving force. Managers see TQM from a more pragmatic view in so far

as, firstly, they focus on the importance of the 'hard' side of it and, secondly, they hold a skeptical approach to the actual implications and effectiveness of several 'soft' ideas like empowerment and involvement.

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APPENDIX

Deming's 14 point foundation work in quality

1. Create constancy of purpose toward improvement of product and service with the aim to become competitive and to stay in business, and to provide jobs.
2. Adopt the new philosophy of quality and do not tolerate commonly accepted levels of errors and defects.
3. Stop depending on mass inspection to improve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.
4. End the practice of awarding business and choosing suppliers based on price.
5. Minimize total cost by working with a single supplier.
6. Constantly improve the system of production and service by continually improving test methods and identification of problems, from the very first planning stages right up to distribution to customers, and thus constantly decrease costs.
7. Adopt modern methods of training-on-the-job by teaching employees the best methods of achieving quality in their jobs and the use of tools such as statistical quality control.
8. Adopt and institute leadership. The aim of supervision should be to help people and machines to do a better job.
9. Drive out fear, so that everyone may work effectively for the institution. No one can perform unless he or she feels secure.
10. Break down barriers between departments and staff areas. Create teams of members coming from all areas and sectors of the institution to prevent and solve problems.
11. Eliminate slogans and exhortations for the workforce asking for zero defects and new levels of productivity.
12. Eliminate work standards (quotas) for the workforce and substitute it with leadership. Eliminate management by objectives; eliminate management by Numbers, numerical goals. Substitute leadership.
13. Remove barriers that rob people of the pride of workmanship. Eliminate the annual rating or merit system.
14. Institute a vigorous program of education and self-improvement for everyone.
15. Put everybody in the institution to work to accomplish the transformation. The transformation is everybody's job.