Quality Management Practices of SME in Developing Countries: A Survey of Manufacturing SME in Pakistan

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Abstract

SME present unique challenges to canonical Quality Management practices since they have distinct characteristics which distinguish them from large businesses. Being resource constrained by nature, they usually can not invest in formal certifications and establishment of Quality Management systems. Particularly, the performance and business practices of SME in developing economies remain much lower than those of SME from developed economies.

This paper presents a survey of 107 SME businesses in northern Pakistan, aimed at developing an understanding of the quality management related awareness among SME managers. The knowledge of Quality Management techniques that SME entrepreneurs possess is empirically reported besides presenting the extent to which these techniques are used in SME businesses in Pakistan. The effectiveness of using these techniques is also presented along with the current and intended future usage of these techniques. The paper also discusses why certain techniques are adopted and others are not. The results are the first insight of Quality Management practices in Pakistani SME. Besides being of use for public policy making, the results will be of interest to firms in developed economies that outsource their business activities to South Asia.

Key Words: Business Improvement Techniques, Developing Economies, Pakistan, Quality Management, SME.

Introduction

Pakistan's industrial performance has been on a consistent decline for the last three decades. This decline has been the foremost contributor to increase in trade deficit and decrease in job creation; thus negative employment of a workforce predominantly composed of youth. These problems have manifested themselves

in economic and social outfalls such as ever increasing poverty levels, lack in education and health related infrastructures and a shift of unemployed youth towards negative activities, including terrorism.

SME (Small and Medium Enterprises) form more than 99 percent of the total businesses in Pakistan. They have a huge share in country's industrial employment and manufacturing exports. In manufacturing and other sectors, 87 percent of SME employ less than five people while a staggering 98 percent employ less than 10 persons. SME sector caters for 25 percent of manufacturing exports in Pakistan, while its share in value addition is 28 percent.

While an overwhelming percentage of Pakistani businesses are SME, the performance of SME sector has remained dismal and has contributed to low performance of larger businesses as well. Since there is a direct relationship between the health of SME sector in an economy and the overall strength and growth of that economy, the poor performance of Pakistani SME has been one of the main reasons for the poor performance of the country's economy.

Being the primary suppliers to most exporting firms, or being exporters themselves, performance of the SME sector is a significant determinant of the overall performance of any economy. Developed economies such as the OECD[1] members are marked by robust and vibrant SME sectors while developing and underdeveloped economies have weak and frail SME sectors. Since this sector also provides a major share of total value addition and industrial employment in almost all economies, its contribution to the industrial development and growth remains unarguable.

The quality of SMEs products also affects the performance of large businesses since they sub-contract a significant portion of their final products to smaller businesses. SME sector of Pakistan thus needs a particular focus of policymakers, larger businesses and academia for effecting any sustainable and realistic growth in Pakistan's economy.

Despite the overwhelming importance of SME in Pakistani business environment, there is a general dearth of research work carried out pertaining to this sector. Majority of studies on quality management and practices in Pakistan (See for example Hussain et al. 2009, Fatima & Ahmad 2005, 2006, 2006b; Awan & Bhatti 2003; Moosa 1999) have focused on larger businesses. Rana

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[1] The Organization for Economic Co-operation and Development (OECD) has 30 member countries. The members include 19 of the 25 EU member states, one candidate country and three of the remaining European countries. The other seven countries are Australia, Canada, Japan, Korea, Mexico, New Zealand and the United States.

(2005) has shown a positive relationship between the use of quality control procedures and the health of a small business in Pakistan. No attempt has, however, yet been made to evaluate the extent to which quality and business improvement related activities are practiced in Pakistani SME. This paper reports the quality management practices of Pakistani SME. A survey has been conducted in the northern industrial belt of Pakistan, covering 107 SME. The research focuses on investigating the level of knowledge that SME managers possess regarding different business improvement techniques. It also looks into the effectiveness of the use of these techniques, besides reporting their current and intended future use. The research therefore offers a first insight into the quality management related knowledge and practices of SME in Pakistan.

Literature Review

SME are generally defined world wide based upon three attributes, namely:

a. Number of employees,
b. Paid-up Capital, and
c. Annual Revenues.

The cut-off values for these three attributes are however different in different economies. Developed economies such as USA, Germany, Japan, EU and UK etc. have much higher cut-off values for paid-up capital and annual revenues when compared to developing economies. Many economies also stagger these definitions among micro, small and medium enterprises. For example, India came up with a specific definition of SME in Oct 2006 through Micro, Small and Medium Enterprises Development Act. Before that, the term Small Scale Industries (SSI) prevailed with generalized definitions, which can at best be referred to as a subset of the SME sector. There are also some definitions that vary in the above attributes for services and products sectors and other economies have divided the sectors further. SME definition in Pakistan came about nine years after the establishment of SMEDA (SME Development Authority), recommended in the SME policy 2007; the same is shown in Table 1.

Table 1: SME Definition by SMEDA

Employment	Upto 250 people
Paid-up Capital	Upto Rs. 25 m
Annual Sales	Upto Rs. 250 m

Source: www.smeda.org

There are 3.2 million economic establishments operating in Pakistan, out of which, the number of SME is stated variably by different agencies. The Economic Survey of Pakistan (2008) reports that over 93 percent of the 3.2

million entities fall in the category of SME. The Economic Census of Pakistan (Also called Census of Establishments), published in 2005, reports this figure to be approximately 99 percent.

The Economic Census of Pakistan reports the share of SME in industrial employment to be approximately 78 percent. Nearly 53 percent of all SME activity is in retail trade, wholesale, restaurants and the hotel business whereas the contribution of industrial establishments and those involved in service provision is 20 percent and 22 percent respectively. Among the SME involved in retail, wholesale and restaurant business, 98 percent employ less than five persons and 99 percent less than ten persons. The manufacturing and other sectors also follow a similar pattern with 87 percent employing less than 5 persons and 98 percent employing less than 10 persons. The share of SME in the manufacturing value addition is estimated to be around 35 percent.

Many researchers (Fatima & Ahmad 2005, 2006, 2006b; Awan & Bhatti 2003; Moosa 1999, Kureshi et. al. 2006, 2009) have compared the 3.2 million SME in Pakistan with the few hundred businesses that adhere to some type of standards or formal quality standards. They have reported that most SME have minimal quality systems in place, thus their product quality is either not being ensured, or is being ensured through informal phenomenon. Thus there is a great need to develop a greater understanding the quality systems in Pakistani SME.

Table 2: SME Sector of Pakistan

Total Number	32,00,000
As percentage of total businesses	99 %
Share in industrial employment	78 %
Share in value addition	28 %
Manufacturing exports earning	25 %
Contribution to GDP	Over 30 %
Exports value	Rs. 140 Billion
87 % employ less than 5 people	
98 % employ less than 10 people	

Source: Economic Survey of Pakistan – 2007-08, SME Policy, Pakistan, 2006.

Various studies have been carried out to evaluate the current status of quality management practices in Pakistan (See for example: Fatima & Ahmad 2006, 2006b). They have overwhelmingly focused on Pakistan's textile industry. Generally, they have reported quality management to be in various stages of development with firms focusing mainly on the quality inspections. Bhutta et al.

(2007) have pointed out that extreme scarcity of scientific data about SME in Pakistan is the largest barrier facing scientific study in this sector. Economic Surveys of Pakistan (2006, 2007 and 2008) and SMEDA offer little scientific information on SME. Bhutta et. al. have studied the Pakistani SME sector in a global context, and have concluded that performance of SME is on a decreasing trend. They have also reported that SME show little optimism about the future of their businesses. About 71 percent of SME believe that business will either stagnate or will perform even worse in next one year. Only 5 percent of the SME export their products. They have reported that the businesses which supply only to the domestic market perform poorly in general.

The Economic Survey of Pakistan (2005-06) states that "Nothing portrays the reality of Pakistani business environment better than ... its SME sector". The better the SME sector performs; the higher the quality of goods and services produced in Pakistan. In addition to the literature discussed above, the available data on Pakistani SME consist of a few empirical studies carried out by public sector organizations such as the Economic Survey of Pakistan (published every year since 2005), Census of Establishments (2005) and some studies by donor organizations such as Asian Development Bank (ADB). In his seminal survey of 453 respondents from more than 40 countries on the use of benchmarking (informal and formal) and other quality management related techniques, Mann (2008) has reported a widespread use of quality management techniques. The focus of Mann (2008), however, remains on benchmarking and no country specific trends can be drawn for Pakistan, owing to the small number of respondents.

Quality is often defined imprecisely in textbooks (Allen 2006) in terms of a subjectively assessed Performance Level (P) of the unit in question and the expectations (E) that customers have for that unit. Allen (2006) has suggested a general formula for quality (Q) as follows:

$$Q = \frac{P}{E} \qquad\qquad (1)$$

The terms TQM and Business Improvement have been used interchangeably in contemporary literature. McAdam (2000) has concluded that the terminologies associated with TQM have been found to be synonymous with those used for Business Improvement. He has further observed that manufacturing organizations might not like to use the word quality due to its connotations of Quality Control and Assurance and therefore they generally prefer the term Business Improvement. The quality of a product is widely considered a global value judgment criterion, and a critical basis of achieving and maintaining competitive advantage. It is of foremost importance for all manufacturing organizations. Quigley & McNamara, (1992) have suggested linking the ability

of a firm to deliver the appropriate quality to its purchasers' ability to source products to match its quality needs.

SME performance is one of the critical determinants of an economy's performance. Owing to the wanting situation of Pakistani SME described in relational literature presented above and the unarguable importance of quality management in development and performance of any business, The research at hand attempts to fill in the literature gap by presenting initial insights into the quality management related knowledge and practices of Pakistani SME. By presenting the current health of quality management in Pakistani SME, this research lays the foundation upon which sector specific investigations can be made into SME quality management knowledge and practices.

Research Design

The survey design is based on Mann (2008), attempting to find results specific to the business conditions and culture of Pakistan. The questionnaire used is an amended version of the one used by Mann (2008). Amendments were made to ensure the inclusion of the quality management techniques most relevant to this research.

Sampling Procedure

There is no complete population list or publication that contains a record of the manufacturing sector SME in Pakistan. Some information on the non-SME manufacturers, however, is available in certain publications such as Jamal's Yellow pages[2]. Therefore, several sources were used to obtain the population of SME. These resources consisted of several scholarly works, websites of Karachi, Lahore and Islamabad Stock Exchanges and relatively outdated government publications such as Census of Establishments Government of Pakistan, 1988; Directory of Industrial Establishments, Government of Punjab, 2002, and Economic Survey of Pakistan 2006-07-08. Area Sampling and Snowball Sampling methods were used in this research. Most manufacturing areas in Northern Pakistan such as Islamabad, Rawalpindi, Hattar, Peshawar, Haripur, Nowshehra etc. were included. Both production and geographical criteria were followed in order to ensure the representativeness of this sample. Moreover, due to the very low response rates from mailed surveys, the snowball sampling provided the only reliable method of enhancing the sample size. Owing to the limitations described above, the sample may thus not be considered as truly random.

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[2] Jamal's Yellow Pages is considered the most reliable business directory in Pakistan. It is available online at http://www.jamals.com

Instrument Validity & Reliability

To ensure inclusion of those techniques which were most relevant to Pakistan's businesses, particularly the SME, a list of techniques was generated from various sources including text books and scholarly works. Techniques not yet adopted by businesses in general and those still in the research phase were not included. The initial list included the 36 techniques shown in Table 3. These techniques were then reduced through Delphi sessions and discussions with experts to fit the qualification criteria discussed above. Many techniques such as ISO 9000 and ERP Systems, which are used widely in Pakistani large businesses, but not by SME were thus excluded. Besides this, the opinion of experts in scholarly publications (For example, the researchers used findings by Taylor and Mc Adam; 2003; justifying limited diffusion of IIP in UK) were also considered. After the incorporation of expert opinions and the formal Delphi sessions, the modified list of techniques included the 19 BI techniques highlighted in grey Table 3.

The test/retest method was used to ascertain the reliability of the designed questionnaire. The correlation coefficient between responses to the first and second stage of the 20 firms pilot survey was 0.94. The change of 6% in responses can be explained by the different experiences and attitudes that respondents may have encountered from the time between the first and second test. Similarly non-response bias was tested using Krause and Scannel (2002) method and representativeness bias was tested using Cai, Yang & Hu (2008) method. No statistical significance was found supporting presence of these biases in the research.

The Questionnaire

A questionnaire, containing a possible 91 questions to be answered, was then designed to assess the following four aspects of each business improvement technique:

a. Level of Awareness of the manager filling the questionnaire, about each technique: 5 point likert scale (None, somewhat, average, above-average & high)
b. Use of each technique by the business of the respondent manager. 2 point scale (Yes & No)
c. Effectiveness of each technique used: 5 point likert scale (Don't know, Ineffective, Little Effective, Moderately Effective & Highly Effective)
d. Possible use of each technique in next three years, if not being used now: 2 point scale (Yes & No)

In addition to the contact details of respondents and their length of affiliation with the organization, the questionnaire also sought information about the

businesses he or she represented; including headcount, age, revenues, percentage of female employees and major business activity of the organization.

Table 3: Business Improvement Techniques

1. Best Practice Business Improvement (BPBI)	2. Benchmarking	3. Balanced Scorecard
4. Business Process Reengineering (BPR)	5. Business Excellence Models (BEM)	6. Customer Focus
7. Corporate Social Responsibility (CSR)	8. Customer Surveys	9. Delegated Teams
10. Employee Suggestion Scheme	11. ERP Systems	12. Investors in People (IIP)
13. Improvement Teams	14. Information System	15. Integration Internal Audits
16. ISO 9000	17. Knowledge Oriented Improvement Process	18. Knowledge Management
19. Lean	20. Mission and Vision Statements	21. Plan-Do-Check-Act (PDCA)
22. Quality Function Deployment (QFD)	23. Quality Management System (QMS)	24. Quality Awareness Program
25. Six Sigma	26. Supplier Development	27. Supplier Evaluation
28. SWOT Analysis	29. Supplier Improvement Activities	30. Statistical Process Control
31. TL 9000	32. Taguchi	33. TQM
34. Voluntary Teams	35. 360 degree assessment	36. 5 S

Questionnaire Administration

First, a covering e-mail letter and survey questionnaire were mailed to a sample of 530 managers of registered companies. Ten days after the initial mailing, a reminder e-mail was sent to those managers who had not responded yet. This was followed up one month after the initial mailing, by sending a second covering e-mail and survey. This was done in line with the total design method suggested by Dillman (2000). Parallel attempts were made to administer the same survey through structured interviews. 60 completely filled questionnaires were received back from e-mail survey, yielding a response rate of 11.3%. Structured interviews produced 47 usable responses with a response rate of 47%. The overall response rate came at 16.9%.

Classification of Respondent Firms

Approximately 89% percent of the respondent firms were operating in the private Sector. 92% of the firms were from the manufacturing sector, of which 38% were from capital goods manufacturing, 8% were from food related manufacturing, 5% were from textile manufacturing while 19% were from other manufacturing categories. Approximately 79% of the sampled firms had gross annual sales of less than Rs. 100 million. Similarly, approximately 51% of the respondent firms had 100 or less employees and approximately 82% of the respondents had 250 or less employees. This is in accordance with the defining characteristics of an SME. Approximately 78% of the respondents' firms had 5% or less female employees in their workforce while 84% had 20% or less female employees in their workforce. This appears to be typical of the SME in the manufacturing sector SME in Pakistan.

Results and Analysis

Results from the survey are presented in this section followed by brief analysis. A broad overview of the results from the survey has been presented in Table 10, while a more detailed picture is given in Table 11. The statistical representations of the data have been generated through analysis using Minitab-15 statistical software. Each of the 19 Business Improvement techniques is discussed and analyzed in the following subsections. Each subsection starts with the definition of the Business Improvement technique that was provided to the respondents. The discussion and analysis is based on the responses to the set of questions described above.

Benchmarking

Benchmarking is the process of comparing one's organization to the best performing organization in the same sector. The outcome is often an effort for making changes and brining improvements.

Benchmarking appears to have diffused into Pakistani businesses to a high extent. More than 85% respondents said they had average and above knowledge of it. The lower variance (0.94) also indicates fairly centered results. Skewness (-0.34), Kurtosis (-0.4) and A-Squared (4.9) values also show a symmetrical distribution of responses. The three outlier firms that did not have any knowledge of Benchmarking were in food manufacturing and capital good manufacturing. When asked if they currently use this technique in their organizations, 63% of the managers responded positively. This result supports the previous finding that benchmarking has diffused into Pakistani businesses. Regarding the future use of Benchmarking, of 37% not using this technique, approximately 52% said their firms are likely to adopt this technique in the next three years. The remaining 48% of the managers did not expect to adopt it.

Regarding the fourth question about the effectiveness of this technique, a mean response of 4.23 was reported on a scale of 5.

The Pearson Correlation Analysis in Table 4 indicates a very weak positive relationship of the awareness of this technique with the reported revenues of the businesses. Similarly, the correlations of the level of awareness of Benchmarking with number of employees and percentage of female employees is very weak.

Balanced Scorecard

The Balanced Scorecard is used to act in the long term interest of an organization by focusing not only on financial outcomes but also on the operational, marketing and developmental inputs to these. The underlying rationale is that organizations cannot directly influence financial outcomes, as these are "lag" measures, and that the use of financial measures alone to inform the strategic control of the firm is unwise.

Table 4: Benchmarking Correlation with firms' data

	Benchmarking Awareness	Revenue	Number of Employees
Revenue	0.473	-	-
	0.000	-	-
Number of	0.467	0.758	-
Employees	0.000	0.000	-
% of Female	0.237	0.353	0.369
Employees	0.000	0.000	0.000

Cell Contents: Pearson Correlation Value / P - Value

Balanced Scorecard awareness has a significantly lower mean (2.299) compared to Benchmarking. The higher variance (1.5324) value indicates scattered results. Higher Skewness (.32), Kurtosis (-.22) and A-Squared (7.11) values also support the reported variance. The two outlier values of high knowledge come from manufacturing firms with revenue above Rs. 250 million. The results show a general lack of knowledge about this technique in Pakistani Industry. The trends of correlation with firm's data are approximately similar to Benchmarking, with no significant correlation with any of the reported firm data. Approximately 61% of the respondents have indicated that their firms do not use this technique. Approximately 72% of the firms not using this technique are unlikely to adopt this technique in the coming three years. Mean effectiveness of approximately 3.5 was reported for Balanced Scorecard on a scale of 5. The results show a higher perceived effectiveness of this technique, though it must be noted that the data set for effectiveness has been significantly reduced because 61% of the respondents did not use this technique.

Business Process Reengineering (BPR)
Business process reengineering is the process of making paradigm changes in one's business processes by looking at them from a "clean slate" perspective and determining how one can best reconstruct these processes to improve the business.

More than 80% respondents have indicated having average and above knowledge of BPR. The variance value (1.2513) is on the higher side, with a negative skewness (-0.35) and Kurtosis (-0.7). The four outlier values of no-knowledge come from SME with low number of employees and lower revenues. No significant correlation with firm data is deducible form the correlation analysis. Approximately 76% of the respondents have indicated that their firms use this technique. Of the 24% not using this technique, approximately 73% said their firms are unlikely to adopt this technique in the coming three years while the remaining did expect its adoption. Over 90% of the firms not expecting to use BPR in future were represented by the respondents who had average or below understanding of this technique. Mean effectiveness of approximately 4 was reported on a scale of 5. The responses show a fair fit around mean with no entries reporting ineffectiveness. The results support a generalized perceived effectiveness of this technique.

Corporate Social Responsibility (CSR)
Corporate Social Responsibility is a corporate self-regulation which requires businesses to monitor and ensure their adherence to law, ethical standards, and international norms.

Mean awareness of CSR remained between average and above-average, excluding the two outlier values. The outlier values come from manufacturing SME with low revenue and low number of employees. The results show a generally acceptable level of knowledge about this technique in Pakistani Industry, though significant improvement gaps are visible. The Pearson Correlation indicates strong linear relationship between:

a. Knowledge of CSR and Revenues of a firm; and
b. Knowledge of CSR and percentage of female employees

While the data available to ascertain the tail direction of these correlations is not enough at this time, these findings are significant. A positive use of these results can be made by business manager and policy makers after the tail direction of these results is established. That is however beyond the scope of this research and has been discussed in future research section. The results are not surprising,

since institutionalization of CSR, at-least in the shorter run, imply significant expenditures. Approximately 54% of the respondents have indicated that their firms use this technique. Of the remaining 46%, approximately 88% have indicated a higher probability of adopting this technique in the next three years. The firms not having adopted CSR are generally those with lower revenues and least number of employees. Considering a general lack of presence and effectiveness of public policies encouraging CSR, these results are very encouraging. They also indicate a general philanthropic attitude of Pakistani business, which can obviously be strengthened and used effectively if complimenting public policies are instituted and implemented. Approximately 88% of respondents believe that CSR is moderately or highly effective in business.

Customer Surveys
Customer Surveys are techniques of asking the customers to give their opinion on the products and services of one's business.

Customer Surveys level of awareness were 4.16 on a scale of 5. Approximately 81% of the respondents reported above-average to high understanding of this technique. The lower values of less knowledge have come from firms not dealing directly with the consumers, thus indicating a lack of customer definition. The Pearson Correlation Analysis in Table 5 indicates strong linear relationship between Knowledge of Customer Surveys and number of employees. This correlation suggests a possible use of dedicated employees by firms to undertake customer surveys. This finding is supported by the fact that the services of professional customer survey businesses are not frequently utilized by Pakistani Industry. This is however not a direct result. Approximately 63% of the respondents have indicated that their firms use this technique. Of the remaining 37%, approximately 93% have indicated a higher probability of adopting this technique in the next three years. The firms not using this technique and not expecting to use it in future are those with lowest revenue levels. Approximately 75% of respondents believe that Customer Surveys are highly effective in business.

Table 5: Customer Surveys Correlation with firms' data

	Customer Surveys Awareness	Revenue	Number of Employees
Revenue	-0.107	-	-
	0.274	-	-
Number of Employees	-0.006	0.758	-
	0.950	0.000	-
% of Female	-0.087	0.353	0.369
Employees	0.371	0.000	0.000

Cell Contents: Pearson Correlation Value / P - Value

Employee Suggestion Scheme

An Employee Suggestion Scheme is a formal mechanism, which encourages employees to contribute constructive ideas for improving their organization.

Employee Suggestion Scheme awareness has a mean of 3.7 on a scale of 5. The Pearson Correlation trends have no significant correlation with any of the reported firm data. Approximately 90% of the respondents have indicated that their firms use this technique. It may be noted that the use covers both formal and informal use of it. Approximately 67% of the non users have indicated a likelihood of adopting this technique in the coming three years. The results show a higher perceived effectiveness of this technique, though it must be noted that the data set for effectiveness comes both from formal and informal use of this technique.

Improvement Teams

An Improvement Team is a small team or people from different parts of an organization, set-up to work on a specific improvement project to achieve the defined output.

Pakistani businesses seem to have very little awareness of Improvement Teams. Approximately 70% respondents have average and below knowledge of it and the mean of awareness is at 2.9 on a scale of 5. The data seems almost perfectly normal around the mean, with variance of 1.25, Anderson-Darling Normality Test result of 3.54 and coefficient of variation at 38.10. Skewness (0.007) and Kurtosis (-0.64) are also very low. There are no outlier values. The Pearson Correlation Analysis indicates positive correlation between Revenue of the firms and the awareness of this technique. No other correlation is present. 52% of the respondents have indicated that their firms do not use this technique. This result supports the low awareness described above. Of those not using this technique, approximately 90% said that their firms are likely to adopt this technique in the next three years. The responses show a higher degree of effectiveness for those

who have adopted this technique. It must be noted however that majority of the respondents are non-adopters.

Knowledge Management
Knowledge Management comprises several practices used to identify, create, represent, distribute and enable adoption of all available knowledge within a business.

Knowledge Management is another technique with very low awareness level. Approximately 74% respondents indicated that they have average or below understanding of it (Mean: 2.87/5). The Pearson Correlation Analysis shows a positive correlation between firms' revenues and the knowledge of this technique. A similar correlation is noticeable between number of employees and knowledge of this technique. Approximately 60% of the respondents have indicated that their firms do not use this technique. This result supports its lack of diffusion into Pakistani businesses. Of those not using this technique, approximately 58% said their firms are likely to adopt this technique in the next three years. A mean of approximately 4.2 was reported for effectiveness of this technique. The responses show a poor fair fit around mean with no entries reporting ineffectiveness. It must however be kept in mind that majority of the respondents were non-adopters.

Lean
Lean is a production practice that considers using resources for any goal other than the creation of value for the end customer to be wasteful, and thus a target for elimination.

Lean is another technique with very low awareness level. Approximately 75% respondents indicated that they have average or below understanding of it (Mean: 2.57/5). There is no considerable correlation of the awareness of this technique with firms' data. Approximately 70% of the respondents have indicated that their firms do not use this technique. This result supports its lack of diffusion into Pakistani businesses. Of those not using this technique, approximately 81% said their firms are not likely to adopt this technique in the next three years. This is an important finding as this technique is considered absolutely imperative for cost cutting in businesses and its non adoption can be related to higher costs of doing business in Pakistan.

Mission and Vision Statements (MVS)
These are formal expressions of a desired future state of a business, and are made to help align all the efforts within a business with the desired future state.

MVS has a mean awareness level of 3.4 on a scale of 5 with approximately 81% respondents indicating average or above understanding of it. Few outlier values of no knowledge come from SME with lower revenues and low number of employees. The Pearson Correlation Analysis in Table 6 indicates strong linear relationship between:

a. Knowledge of Mission and Vision Statements and Revenues of a firm; and
b. Knowledge of Mission and Vision Statements and number of employees.

While insufficient data exists to explain the latter, the former is understandable as firms with higher revenues tend to define their Mission and Vision Statements. Approximately 51% of the respondents have indicated that their firms do not use this technique. Of those not using this technique, approximately 55% said that their firms are likely to adopt this technique in the next three years. Approximately 80% of the respondents found the use of this technique as moderately or highly effective.

Table 6: MVS Correlation with firms' data

	MVS Awareness	Revenue	Number of Employees
Revenue	0.643	-	-
	0.000	-	-
Number of	0.566	0.758	-
Employees	0.000	0.000	-
% of Female	0.317	0.353	0.369
Employees	0.001	0.000	0.000

Cell Contents: Pearson Correlation Value / P - Value

PDCA

PDCA is an iterative four-step problem-solving process typically used in business process improvement. The steps include *Plan, Do, Check and Act,* thus the acronym PDCA. Its iterative nature allows businesses to achieve continuous improvements in their processes. PDCA is another technique with very low awareness level in Pakistani businesses. Mean awareness level is 2.19 on a scale of 5 with approximately 80% respondents indicating average or below understanding of it. Approximately 42% of the responded had no knowledge of it. Smaller firms seem to have the least awareness of this technique. The Pearson Correlation Analysis in Table 7 indicates strong linear relationship between:

a. Knowledge of PDCA and Revenues of a firm; and
b. Knowledge of PDCA and number of employees.

Approximately 80% of the respondents have indicated that their firms do not use this technique; 80% of whom said their firms are not likely to adopt this technique in the next three years. Approximately 95% of the respondents found the use of this technique as moderately or highly effective. However, with N=22, the results should be used with caution.

Quality Function Deployment (QFD)
Quality Function Deployment is a method to transform user demands into design quality, and ultimately to specific elements of the manufacturing process.

QFD also has the least awareness levels in Pakistani businesses. Mean awareness level is 2.38 on a scale of 5 with approximately 78% respondents indicating average or below understanding of it. Approximately 31% of the responded had no knowledge of it. Smaller firms and those not selling directly to consumers seem to have the least awareness of this technique. This finding shows significant contrast with that of Khan (2002) who has reported that only 5% of the Medium Businesses have non-zero knowledge of QFD. This contrast can be explained by the following facts:

a. Khan (2002) is not supported by empirical evidence.
b. The studies have a temporal gap of approximately 6 years.

Table 7: PDCA Correlation with firms' data

	PDCA Awareness	Revenue	Number of Employees
Revenue	0.666	-	-
	0.000	-	-
Number of	0.576	0.758	-
Employees	0.000	0.000	-
% of Female	0.319	0.353	0.369
Employees	0.001	0.000	0.000

Cell Contents: Pearson Correlation Value / P - Value

Approximately 68% of the respondents have indicated that their firms do not use this technique, approximately 84% of whom said their firms are not likely to adopt this technique in the next three years. Approximately 53% of the respondents found the use of this technique as moderately or highly effective.

Quality Management System (QMS)
Quality Management System is an organization wide system aimed to improve the quality of products and processes. It integrates the various internal processes

within the organization and intends to provide a process approach for execution of all business functions.

QMS has a fairly high level of awareness in Pakistani businesses. Mean response is approximately 3.6 on a scale of 5 with approximately 87% respondents indicating average or above understanding of it. The results are not surprising by any means since QMS models have solutions for all business sizes. Approximately 85% of the respondents have indicated that their firms use this technique. Of the 15% not using it, approximately 94% said that their firms are likely to adopt this technique in the next three years. Approximately 86% of the respondents found the use of this technique as moderately or highly effective. With a high N of 91, the results are fairly reliable and represent almost all sub sectors of the data set.

Six Sigma
Six Sigma is application of various quality management techniques including statistical processes to identify and remove the causes of defects and errors in manufacturing and business processes.

Six Sigma is among the techniques with least awareness levels in Pakistani businesses. Mean response is 2.18 on a scale of 5 with approximately 88% respondents indicating average or below understanding of it. Approximately 41% of the responded had no knowledge of it. The few firms which reported above average awareness had higher revenue levels. The Pearson Correlation Analysis shows moderately positive correlation with the awareness of Six Sigma and firms revenues. The tail of this correlation is not clear with the available data. No other correlation is present. Six Sigma probably presents the most dismal picture in terms of current adoptions. Approximately 96% of the respondents have indicated that their firms do not use this technique. However, approximately 75% of non-adopters said their firms are likely to adopt this technique in the next three years. It is important to highlight that all respondents found the use of this technique as moderately or highly effective. With N=4, the results should be generalized before use for application or scholarly purposes.

Supplier Development & Supplier Evaluation
Supplier Development is the application of different techniques, including investing in a supplier's operations and training the supplier, to ultimately effect an improvement in the final output of one's own business.

Supplier Development has a fairly high level of awareness level in Pakistani businesses. Mean response is approximately 3.35 on a scale of 5 with approximately 80% respondents indicating average or above understanding of it.

Approximately 71% of the respondents have indicated that their firms do not use this technique, approximately 83% of whom said their firms are not likely to adopt this technique in the next three years. The results indicate a strong presence of SME in the data set, which usually consider themselves as suppliers of larger firms and thus believe that Supplier Development activity should only take place downstream of their place in supply chains. None of the respondents have found this technique as ineffective.

Supplier Evaluation is the process of evaluating suppliers against formal set of standards with an aim to provide transparent feedback and ultimately select the best performing suppliers. Being a technique closely related and complimentary to Supplier Development, Supplier Evaluation shows almost similar patterns to Supplier Development, with results of Use, Intended Future Use and effectiveness within 5% of it.

SWOT Analysis
SWOT Analysis is a strategic planning method used to evaluate the Strengths, Weaknesses, Opportunities, and Threats involved in a project or in a business venture.

SWOT analysis has a generally low understanding in Pakistani businesses with a mean of approximately 2.53. Approximately 81% of the respondents reported average or below understanding of it. The results are not surprising as our data set is predominantly SME based, and such techniques, besides requiring resources to carry out, also require managers that have been through formal business education. The Pearson Correlation Analysis in Table 8 shows strong positive correlation with firms' revenue and moderate positive correlation with firms' number of employees. This supports the finding above that extra resource are required for carrying out such analyses. Approximately 79% of the respondents have indicated that their firms do not use this technique, approximately 82% of whom said their firms are not likely to adopt this technique in the next three years. Approximately 68% of the respondents have found SWOT Analysis ineffective in business improvement, while the other 32% have found it little effective. No business has reported moderate or high effectiveness of this technique.

Table 8: SWOT Correlation with firms' data

	SWOT Awareness	Revenue	Number of Employees
Revenue	0.707	-	-
	0.000	-	-
Number of	0.595	0.758	-
Employees	0.000	0.000	-
% of Female	0.437	0.353	0.369
Employees	0.000	0.000	0.000

Cell Contents: Pearson Correlation Value / P - Value

Total Quality Management (TQM)
Total Quality Management is a business management strategy aimed at embedding awareness of quality in all organizational processes.

TQM has a high level of awareness level in Pakistani businesses. Mean response is approximately 4.3 on a scale of 5 which is the highest for any technique. Approximately 84% respondents have indicated average or above understanding of it. The results are not surprising since TQM is a very broad concept and compare very favorably to all business improvement techniques. It also remained for a long time, and still is, a business buzzword. Approximately 88% of the respondents have indicated that their firms use this technique. Mean value of approximately 4.55 has been reported for the effectiveness of use of TQM (on a scale of 5), the highest among all the investigated business improvement techniques. Approximately 94% of the respondents found the use of this technique as moderately or highly effective. With a high N of 94, the results are fairly reliable and represent almost all sub sectors of the sample. The outlier values of little effectiveness have come from late adopters of this technique.

5S
5S; Representing Japanese words Seiri (Sorting), Seiton (Set in Order), Seiso (Shining), Seiketsu (Standardizing) and Shitsuke (Sustaining); is a method for organizing a workplace, especially a shared workplace (like a shop floor or an office space), and keeping it organized. It's sometimes referred to as a housekeeping methodology; however this characterization can be misleading, as workplace organization goes beyond housekeeping.

5S has a mean awareness level of 3.16 on a scale of 5 in Pakistani businesses. Approximately 78% respondents indicated average or above understanding of it. The results are not surprising since 5S is an easily adaptable concept and any business-person who is given a definition of it can conveniently relate him/her to

it. Approximately 76% of the respondents have indicated that their firms do not use this technique, 72% of whom do not expect to use this technique for business improvement in the next three years. These results present a very dismal picture of use of strategic business improvement techniques in Pakistani businesses since 5S is one of the few cost-less techniques; and its non-adoption can either be due to unawareness (which does not seem to be the reason with as reported mean awareness level of 3.16 on a scale of 5) or a general aversion of the use of formal techniques for business improvement. Of the manager who used 5S, all have found the use of this technique as moderately or highly effective. These results indicate a high perceived value of use of 5S by business managers, accountable both to its effectiveness in business improvement and its no-cost nature.

Summary
 Table 10 offers a summary of the responses of all techniques. The responses for question 1 and 3 have been averaged out to show a percentile. For instance, for "Benchmarking" 34.1% under the heading "Awareness" indicates that when asked to rate their understanding of the technique of benchmarking, the average response of the managers was 34.1 out of 100. The responses for questions 2 and 4 were already in percentiles thus no change has been made.

On average, there is a 14% gap between understanding and implementation, indicating that a large No. of business managers have an awareness of many techniques but do not use them. There are some techniques for which the level of use is greater than the level of awareness. Such deviation can be explained by the variations in professional repertoires of interviewed managers. This research has not investigated the reason behind such nonusage, being out of the scope. The gap, nevertheless, can explain important reasons behind lower performance of Pakistani manufacturing businesses. While there can be various explanations for this gap and a future research might explore it, some of the possible reasons include:

a. Lower employee motivation.
b. Lower empowerment of managers to employ knowledge.
c. Lack of resource commitment to quality management.
d. Lack of the awareness of potential effectiveness of quality management techniques among higher management tiers.
e. Another possible reason could be misreporting/exaggeration by respondents.

It must be kept in mind that these techniques are of western or Japanese origin. Their effectiveness however, indicates that either these techniques have a good cultural fit with Pakistan's business context or they have been successfully

modified for adoption in Pakistani businesses. Non-adopter businesses, therefore, need to adopt these techniques for their business improvement and such adoptions should be encouraged through government policy. A future research can also look into the possible adaptations Pakistani businesses have made to make these techniques work for them.

Table 9: Means Summary

Mean of Means	
Awareness of Techniques	3.1424 on a scale of 5
Use of Techniques	49.684 on a scale of 100
Effectiveness Perceived by Adaptors	4.1021 on a scale of 5
Future use expectation by non-Adaptors	45.105 on a scale of 100

Another important finding is the very low level of perceived future use of these techniques by non-adopters. This finding necessitates an ever greater need for policy interventions designed to encourage and support the use of these techniques, since if left on their own; most businesses do not intend to adopt these techniques.

Discussion, Limitation and Future Research

This paper has provided an insight into the current business practices in Pakistan, particularly the SME, vis-à-vis the perceived knowledge, use and effectiveness of key business improvement techniques. The sample businesses represent Pakistani SME in particular and Pakistani businesses in general, considering that more than 99% of the businesses in Pakistan are SME. (ESP 2007)

It has also exposed significant knowledge-practice gaps that must be covered; though prospects of such cover do not seem forthcoming through the current state policy interventions. The results shown and briefly analyzed above are highly revealing and represent probably the largest formal study carried out in Pakistan on the health of businesses vis-à-vis their quality and business improvement practices. It is important to note here that many of the quality activities discussed can be seen as part of another quality activity. For instance, a PDCA cycle may be considered a sub-set of QMS or TQM. However, all the quality and business improvement activities can be used independently. Based on the brief individual technique results and analyses above, the mean of means are presented in Table 9. These values indicate the vital signs of the health of current quality management practices. Table 10 shows a clear gap between awareness of techniques and their implementation in businesses (On an adjusted percentile scale, 14%). This reveals the state of knowledge management practices by businesses, or indicates a total lack of it. The perceived effectiveness by the

current adopters can be leveraged to provide support and encouragement to potential adopters, since considerable indisposition to a generalized adoption of business techniques was noticed in structured interviews with the respondent managers. The low response index to the questions of expected future use also presents much wanting situation, where serious interventions are required to build-in competitiveness in Pakistani businesses.

Correlation Analysis for Awareness of Different Techniques

Pearson Correlation Analysis figures for awareness data among all BI technique is given in Table 12. Eleven techniques were found out to have strong positive correlation to the knowledge of at-least one other technique (N=20). Similarly all techniques except Benchmarking and TQM were found to have a moderate positive correlation to the knowledge of at-least one other technique (N=36). A Person Correlation coefficient of 0.30 was kept as a cut off figure for moderate positive correlations. These results are considered "expected" as knowledge and use of quality improvement techniques in SME usually come from an entrepreneurial mindset of the owner/manager, and thus use of one technique can certainly encourage knowledge development and use of other techniques.

Moreover, it can be easily appreciated that if a business or business function is being managed by a business graduate, he/she will have the knowledge of many business improvement techniques. The weak correlations of Benchmarking with other techniques can be explained on the pretext of a more "natural" and even involuntary use of it by individuals or businesses by observing a peer or competitor who is perceived as a better performer. The term involuntary is used here to represent an informal benchmarking activity done by a manager or employee, after observing it, or developing knowledge of it from the practices of a competitor; through a social diffusion effect. Thus a business manager, who may not have a formal knowledge of any business improvement technique, should still be expected to carry out formal or informal, and voluntary or involuntary benchmarking.

Similarly, the weak correlations of TQM can be seen emanating from the mother-technique status which TQM seem to have gained over the decade and still seems to hold it. TQM is generally seen as broad, covering-all business improvement phenomenon, around which business processes are built. It is therefore fairly predictable not to have forward tailed correlations of TQM with other business improvement techniques. Same is the explanation of backward tailed border-line moderately positive correlations of other techniques with TQM.

Being a pioneer research, this paper has raised many important questions about the quality management practices of SME in developing economies. The

awareness of many techniques seems to have a positive correlation with firms' attributes such as revenues, number of employees and percentage of female employees. This research has not investigated the tail of these relationships and thus no explanations have been offered. These correlations represent avenues for future research. Similarly, investigations can be made into the awareness, use and effectiveness of these techniques across other sectors besides manufacturing. Another avenue for future research is the investigation into driving forces of adoption (or lack of it) of business improvement techniques.

Table 10: Summary of Pakistani SME Business Improvement Techniques

Technique ▶	BM	BSC	BPR	CSR	CS	ESS	IT	KM	LEAN	MVS
Awareness of Firms' Managers	34%	46%	68%	74%	83%	74%	58%	56%	51%	68%
Use by Firms	62%	40%	75%	54%	62%	90%	47%	40%	30%	49%
Effectiveness of Use	85%	70%	80%	82%	93%	80%	84%	84%	84%	84%
Future Use by Current Non-Users	52%	28%	27%	80%	92%	64%	90%	58%	19%	55%

Technique ▶	PDCA	QFD	QMS	6S	SD	SE	SWT	TQM	5S	-
Awareness of Firms' Managers	43%	47%	71%	43%	67%	66%	50%	66%	63%	-
Use by Firms	20%	32%	85%	4%	29%	33%	21%	88%	24%	-
Effectiveness of Use	91%	91%	70%	95%*	79%	82%	46%	91%	96%	-
Future Use by Current Non-Users	20%	16%	94%	25%	18%	21%	18%	**	28%	-

* N=4, cautious generalization suggested. ** N too low, statistic omitted.
For abbreviations used in techniques titles, see tables 2 and 3.
Figures rounded off to nearest whole number.

Table 11: Summary of the SME Managers' Awareness of Business Improvement Techniques

Statistic ▶ Technique ▼	Mean	Med	St-Dev	Kurt	Skew	A-Sq	95% CI (Mean)
TQM	4.29	4	0.82	0.37	9.81	-1.02	4.14-4.45
CS	4.16	4	0.82	-0.12	7.96	-0.73	4.00-4.32
ESS	3.76	4	1.18	-1.33	7.70	-0.43	3.53-3.99
CSR	3.69	4	0.9	0.63	5.99	-0.51	3.51-3.86
QMS	3.60	3	1.06	-0.84	5.70	-0.09	3.39-3.80
BPR	3.53	4	1.11	-0.70	4.11	-0.95	3.29-3.85
BM	3.41	3	0.97	-0.34	4.90	-0.04	3.22-3.59
MVS	3.40	3	1.11	-0.75	5.44	-0.02	3.18-3.61
SD	3.35	3	1.26	-0.66	4.39	-0.36	3.11-3.59
SE	3.32	4	1.20	-1.41	6.51	0.00	3.09-3.55
5S	3.16	3	1.20	-0.53	5.10	-0.17	2.93-3.40
IT	2.93	3	1.11	-0.64	3.54	0.01	2.72-3.14
KM	2.88	3	0.13	0.32	4.08	-0.56	2.66-3.09
LEAN	2.58	3	1.28	-1.06	4.39	0.20	2.33-2.82
SWT	2.53	2	1.17	0.03	7.90	0.91	2.30-2.75
QFD	2.38	2	1.26	-0.73	4.92	0.58	2.14-2.62
BSC	2.29	2	1.23	-1.22	7.11	0.32	2.06-2.53
PDCA	2.19	2	1.31	-0.71	7.74	0.73	1.94-2.44
6S	2.18	2	1.18	-0.30	6.03	0.71	1.96-2.41

N=107 for all techniques.
Abbreviations: Med: Median. St-Dev: Standard Deviation. Kurt: Kurtosis. Skew: Skewness.
CI: confidence Interval. A-Sq: Anderson-Darling Normality Text with P-Value <0.005.
For other abbreviations used, see Tables 3 and 4.

Table 12: Pearson's Correlations Values among BI Techniques

	BM	BS	BPR	CSR	CS	ESS	IT	KM	Lean	MVS	PDC	QFD	QMS	6S	SD	SE	SWT	TQM	5S
BS	0.085	-																	
	0.383	-																	
BPR	0.100	0.126	-																
	0.303	0.163	-																
CSR	0.017	0.049	-0.04	-															
	0.863	0.613	0.674	-															
CS	0.042	0.088	0.045	0.434	-														
	0.666	0.366	0.647	0.000	-														
ESS	0.248	0.511	0.265	0.416	0.165	-													
	0.010	0.000	0.006	0.000	0.090	-													
IT	0.147	0.328	0.224	0.026	0.032	0.294	-												
	0.132	0.001	0.020	0.787	0.741	0.002	-												
KM	0.037	0.235	0.089	-0.02	-0.20	0.323	0.367	-											
	0.702	0.015	0.362	0.850	0.040	0.001	0.000	-											
Lean	0.269	0.269	0.316	0.424	0.227	0.704	0.264	0.277	-										
	0.005	0.005	0.001	0.000	0.019	0.000	0.006	0.006	-										
MVS	0.195	0.439	0.122	-0.15	-0.12	0.314	0.551	0.391	0.159	-									
	0.040	0.000	0.212	0.130	0.240	0.001	0.000	0.000	0.002	-									
PDC	0.210	0.445	0.159	-0.04	-0.11	0.369	0.452	0.582	0.375	0.661	-								
	0.030	0.000	0.101	0.714	0.266	0.000	0.000	0.000	0.000	0.000	-								
QFD	0.116	0.360	-0.04	-0.10	-0.20	0.293	0.365	0.423	0.153	0.586	0.545	-							
	0.232	0.000	0.690	0.296	0.033	0.002	0.000	0.000	0.116	0.000	0.000	-							
QMS	0.153	0.365	0.134	-0.09	-0.13	0.284	0.464	0.305	0.242	0.440	0.463	0.565	-						
	0.117	0.000	0.168	0.352	0.296	0.002	0.000	0.001	0.012	0.000	0.000	0.000	-						
6S	0.268	0.490	0.259	0.098	-0.00	0.664	0.330	0.278	0.569	0.393	0.541	0.381	0.503	-					
	0.003	0.000	0.007	0.313	0.971	0.000	0.001	0.004	0.000	0.000	0.000	0.000	0.000	-					
SD	-0.07	0.300	-0.06	0.146	0.033	0.151	0.017	-0.02	0.292	0.045	-0.05	-0.04	0.051	-0.05	-				
	0.496	0.002	0.573	0.132	0.739	0.121	0.865	0.872	0.002	0.644	0.622	0.691	0.601	0.600	-				
SE	0.174	0.231	0.213	0.275	0.039	0.688	0.205	0.168	0.439	0.189	0.114	0.022	0.045	0.354	0.345	-			
	0.072	0.017	0.028	0.004	0.691	0.000	0.034	0.083	0.000	0.051	0.242	0.820	0.674	0.000	0.000	-			
SWT	0.252	0.207	0.062	0.111	0.130	0.252	0.443	0.255	0.407	0.555	0.493	0.255	0.362	0.362	0.113	0.149	-		
	0.009	0.302	0.526	0.253	0.183	0.009	0.000	0.008	0.000	0.000	0.000	0.008	0.000	0.000	0.247	0.126	-		
TQM	0.092	0.022	0.061	-0.05	-0.14	-0.14	-0.01	-0.12	-0.16	0.032	-0.06	0.016	0.020	-0.05	-0.08	-0.19	-0.00	-	
	0.395	0.819	0.534	0.594	0.142	0.151	0.925	0.210	0.108	0.742	0.577	0.872	0.838	0.623	0.438	0.057	0.990	-	
5S	0.174	0.288	0.268	-0.15	-0.23	0.139	0.113	-0.01	0.107	0.054	0.122	-0.04	0.127	0.327	-0.01	0.079	-0.06	0.270	-
	0.074	0.003	0.005	0.122	0.019	0.152	0.247	0.898	0.273	0.578	0.212	0.710	0.194	0.001	0.930	0.421	0.560	0.005	-

Cell Contents: Pearson Correlation Value / P – Value. Correlations above 0.500 highlighted in grey. For abbreviations used in techniques titles, see Tables 3 and 4.

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