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The Impact of Quality Management System Practices on Perceived Business Performance- A Sri Lankan Perspective

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Abstract

The objective of this paper is to investigate the impact of Quality Management System (QMS) practices on Perceived Business Performance of ISO 9001 Quality Management System certified manufacturing firms of Sri Lanka. The study conducted a comprehensive literature review and identified several sub-variables that can be used to measure quality management system practices. A well-designed questionnaire was used to collect data from a sample selected using a simple random sampling technique from a known population and SPSS software is used for survey data analysis. The major finding indicates that quality management system practices have a positive effect on perceived business performance and it can be measured using top management commitment, process management, and supplier quality management. Furthermore, the results indicate that top management commitment is the most important factor that has to consider when installing quality management system practices as that provides a significant contribution to enhance business performance. Moreover, the results of the study are very much useful for manufacturing firms in Sri Lanka which are interested in installing of ISO 9001 based quality management system as it provides the variables that need to be considered.

Keywords: Quality Management System Practices, Perceived Business Performance, Top Management Commitment, Process Management, Supplier Quality Management

1. Introduction

With globalization and the development of science and technology manufacturing firms have introduced different kinds of products to the market paving the way to have a wider selection for the consumers in purchasing the relevant product. As a result, stiff competition has created among manufacturing firms to sell their products while remaining in the business. To be competitive in the markets one important factor is to give priority to building quality at all levels of the manufacturing firm as that leads to a reduction of creating defective products ensuring a sound bottom line and focusing on the manufacturing of quality products which helps to attract and retain more customers. With this notion right throughout the world manufacturing firms have taken steps to adopt and implement ISO 9001 Quality Management System based practices and according to ISO survey, 2018 results as of 31st December the total number of valid certificates issued is 878 664 covering a total number of 1 180 965 sites in the world. According to Raisinghani et al. (2005), ISO 9001 Quality Management Systems implementation within manufacturing and service organizations is a need to become productive competitors. A study conducted to determine the benefits of ISO 9001 Quality

Management Systems Practices by considering SMEs found that attraction of new customers, acquisition and entry into new markets (Rayner & Porter, 1991). In furtherance, a study conducted using Australian and New Zealand firms concluded that ISO 9000 certification and Business Performance had no positive relationship (Terzioski et al.,1995).

The manufacturing sector is one of the largest contributors for the economy and in Sri Lanka separate Free Trade Zones are established providing facilities for an interested industrialist to establish their business following the rules and regulations set by the Government of Sri Lanka. In addition to that, some industries are located outside the Zones and those manufacturing firms are also doing well. However, in Sri Lanka, most of the manufacturing firms have installed ISO 9001 based Quality Management Systems and implemented those Systems and achieve ISO 9001 certifications. These firms are doing their business locally and internationally. However, very little research studies were carried out in the Sri Lankan manufacturing sector to ascertain the impact of Quality Management Practices on Business Performance and therefore this study was done to cover up that gap as the findings of the study would support to understand the impact of Quality Management System Practices on Perceived Business Performance of the Sri Lankan ISO 9001 certified manufacturing firms. Moreover, the study further support (a) to investigate the influence of top management commitment on perceived business performance (b) to examine the influence of supplier quality management on perceived business performance and (c) to investigate the influence of process management on perceived business performance

2. Literature Review

The extant literature is filled with quality management related empirical studies and most of such studies are based on total quality management (TQM) or ISO 9000. According to Crosby (1979), a quality management system is a road for the prevention of defects or mistakes. This indicates that the installation of a quality management system within an organization helps to develop an interconnection and interrelation of all functions like a network within the organization which provides an organization to identify any potential symptoms in advance paving the way to take actions to prevent occurring the problem. ISO 9001 is a Quality Management System standard developed by the International Organization for Standardization (ISO) detailing requirements to establish a sound quality management system within an organization and it became a very popular system right throughout the world. ISO 9001 standard includes several clauses as requirements that an organization needs to fulfill to have a sound quality management system within an organization to provide better results.

2.1 Quality Management System Practices and Perceived Business performance

However, literature does not provide a strong conclusion concerning the application of ISO 9001 and its influence on financial performance as the findings provide mixed results. Tsekouras et al. (2002) concluded that the adoption of ISO 9001 provides benefits in the long run in enhancing financial performance and not within a shorter period. Moreover, Wayhan et al. (2002) conducted a study to examine the connection between ISO 9001 certification and firm performance and concluded that there was no competitive edge for ISO 9000 certified firms over not certified ISO 9000 firms. This finding was contradicted by another study that indicated ISO 9001 certified firms gain higher profits than non-certified firms and certified firms do have a sound awareness on quality and the manner of improving the system using measurements (Yahya & Goh, 2001). Brown et al. (1998) and Poksinska et al. (2006) indicated that as per most of the study's findings external factors were influenced by organizations to obtain ISO 9001 certification. Nwankwo (2000) indicated that many firms do not use their time to determine the effect of the implementation of the ISO 9001 QMS standard. Further, it was concluded that ISO 9001 certification and operating performance have a strong positive relationship (Feng, Terziovski, & Samson, 2008). Similarly, Psomas (2013) indicated the money utilized for ISO 9001 QMS has not always provided the results. Moreover, it was reported that that ISO 9001 certified firms had better operating performance than non-certified firms (Aba, Badar, and Hayden, 2015). Furthermore, according to Anyango et al. (2012), the question of whether ISO certification provides superior business results or not is still not yet answered properly. Given the above, it is hypothesized that:

H_1: Quality Management System practices have a positive impact on perceived business performance.

2.1.1 Top Management Commitment and Perceived Business performance

Top management of any organization plays a major role to ensure continuing business success. The ISO 9001 Quality Management System standard includes requirements to be fulfilled by an organization's top management to have sound quality management practices within that organization. According to Bryde (2008), as per the extant literature, top management support is an influential factor for a successful firm. Gutierrez et al. (2010) mentioned that top management authorizes and motivates employees for managing and resolving quality issues. According to Zakuan et al., (2012) success of any critical decision of organizations is dependent on the top management support and commitment. Top management commitment is one of the vital elements for the effective implementation of TQM (Arshida & Agil, 2012). Cooper and Edgett (2006) indicated that one of the most important factors to achieve organizational goals is to have demonstrated top management commitment. Given the above, the following hypothesis is proposed:

H_{1a}: Top management Commitment has a positive effect on perceived business performance

2.1.2 Supplier Quality Management and Perceived Business performance

Raw materials are supplied to organizations by suppliers and those raw materials are used to manufacture products. Hence if the quality of the raw materials is not up to the standard then the organization has to face issues in the manufacturing of quality products to satisfy the customers. In ISO 9001: 2015 standard one of the eight quality management principles is "mutually beneficial supplier relationships" which indicates that the organizations need to manage the relationships with suppliers and partners professionally so that both parties will be benefitted. Liao et al. (2010) indicated that short -term and long-term relationships with the supplier is considered a supplier partnership. An organization's performance output is influenced to a greater extent by the supplier input (Forker,1999). According to Lambert, Cooper, and Pagh (2014), Supplier Quality Management is a strong mechanism to achieve operational performance. Furthermore, based on a study using manufacturing firms it was found that Supplier Quality Management Practices contributed significantly to operational performance (Lo, Sculli & Yeung, 2015). Given the above, the following hypothesis is proposed:

H_{1b}: Supplier Quality Management has a positive effect on perceived business performance

2.1.3 Process Management and Perceived Business performance

To be competitive in the markets, the organizations need to sell their products at competitive rates and in that regards organizations have to monitor and improve the processes as uncontrolled processes create errors/mistakes/defects paving the way to increase the internal costs which ultimately add to the price of the product. Flynn et al. (1995) and Cua et al. (2001) proved the above-mentioned argument through their empirically-based studies. In ISO 9001: 2015 standard one of the eight quality management principles is "process approach" which indicates that an expected result is achieved more efficiently when activities and related resources are managed as a process. According to Sandhu and Gunasekaran (2004), the purpose of process management is to control and uplift the processes of the firm. Given the above, the following hypothesis is proposed:

H_{1c}: Process Management has a positive effect on perceived business performance

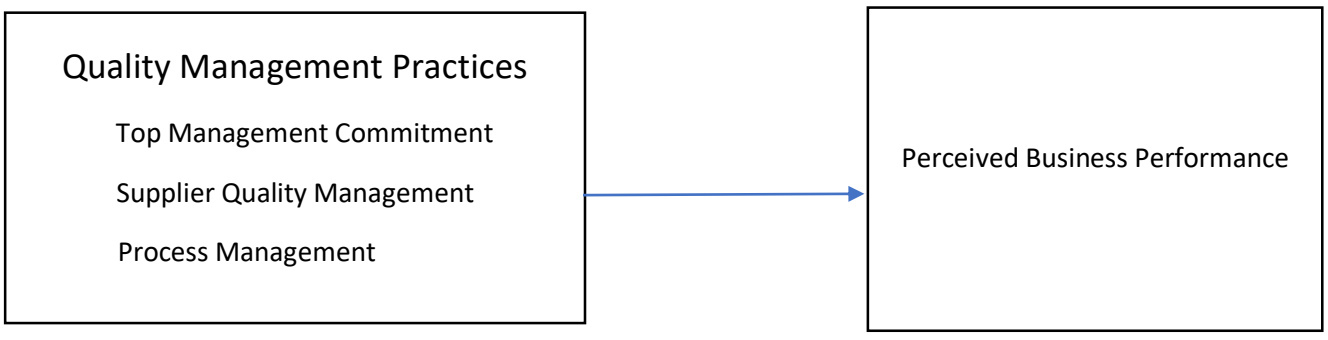

Figure 1- Hypothesized Model

3. Methodology

3.1 Pilot Study

A pilot study was conducted using a well-structured questionnaire with each dimension with a 5 point Likert scale having questions categorized under each dimension separately. This questionnaire was developed based on the understanding of the in-depth review of the literature and using previously validated items by different scholars. However, the questionnaire was refined based on the inputs of scholars and industry experts to make it more appropriate to the Sri Lankan context. The questionnaire was distributed among 35 randomly selected ISO 9001 certified manufacturing firms and the researcher received 32 completed questionnaires. The researcher performed Exploratory Factor Analysis with Varimax rotation to determine the construct validity of the items used in the questionnaire and to ensure the reliability of data by conducting Cronbach's Alfa value tests. The researcher found that the questionnaire items fulfilled all the test requirements satisfactorily and hence it was used for field surveys to collect the data for the research.

3.2 Population and Sampling

The population of the study obtained from the ISO 9001 Quality Management Systems certified manufacturing firms of Sri Lanka. A simple random sampling technique was used to select the sample using Sekaran and Bougie (2010) sampling tables and also taking into nonresponse rate of the pilot study 269 manufacturing firms as the actual sample size for the study. The main respondents to this study were managing directors, senior directors, managers, executives who are knowledgeable in the application of ISO 9001 quality management system practices within the manufacturing firms. After reviewing the received questionnaires, and eliminating incomplete ones for the study 210 usable questionnaires were used.

3.3 Data Analysis Techniques

The study used the SPSS software 21 version for the analysis of data. Furthermore, the researcher performed several tests such as screening for missing data, normality tests, validity & reliability test, descriptive statistics analysis, Linearity test, homogeneity test, and multicollinearity tests to determine the suitability of data for further analysis. Moreover, multiple regression analysis techniques were used for the tests of hypotheses.

4 Results and Discussion

4.1 Demographic characteristics of respondents

Table 1- Demographic Profile of the Respondents

Demographic Variable	Category	Frequency	Percentage
Job Category	Senior	18	8.6
	Middle	101	48.1
	Junior	91	43.3
	Total	210	100

Note: Survey Data, 2019

The above analysis shows that the research study respondents comprise 8.6% of senior managers and 48.1% middle level managers and 43.3% Junior Managers. The results further revealed that the highest percentage of respondents are in the middle management category and the total percentage of Senior and middle-level management represented 56.7% of the total respondents. Furthermore, 91.4% percentage consists of middle and junior level employees who are the real executors of the implementation of quality management practices.

Table 2-Educational Qualifications of the Respondents

Variable	Qualifications	Frequency	Percentage
Educational Qualifications	O/L	1	0.5
	A/L	29	13.8
	Trade Certificate	97	46.2
	Degree	83	39.5
	Total	210	100

Note. Survey Data 2019

The above table shows that 46.2% of respondents were having trade certificates, 39.5% having degree certificates and that shows 85.7% of the respondents were professionally qualified. Therefore, the respondents do have a better understanding of the functions of these firms which help to provide better answers to the statements given in the questionnaire. Hence it is possible to indicate that the respondents may have given the true picture of the firm in answering the questions.

To use descriptive statistics analysis of mean, and standard deviation (SD) of the items in the questionnaire three levels were used as "High", "Moderate" and "Low". The level of each item mean is calculated using (highest point in Likert scale – the lowest point in the Likert scale) / number of the levels used. Therefore, the interval between each level and the another = 1.33 (5-1/3) and the following criterion is obtained:

"Low"- 1- 2.33, "Moderate" -2.34- 3.67 and "High"- 3.68- 5. This criterion is used to interpret the descriptive statistical analysis results. Based on this the study results are as follows:

4.2 Quality Management Practices

The mean and Standard deviation were used to analyze Quality Management System Practices and details are presented below:

4.2.1 Top Management Commitment

Table 3- Level of consideration given for Top Management Commitment

Rank	Item	Descriptions	Mean	Standard Deviation	Mean Level
1.	2	Top Management has taken every step to implement and maintain the "Quality Policy" statement within the firm.	3.75	0.788	High
2.	1	Top Management has defined a "Quality Policy" statement considering the strategic direction of the firm.	3.73	0.786	High
3.	3	Top Management has set "Quality Objectives" at different functions and levels of the firm	3.72	0.769	High
4	5	Top Management takes the leading position on guiding quality-related issues within the firm	3.71	0.700	High
5.	4	Top Management creates the proper working conditions that employees need to achieve quality objectives	3.70	0.807	High
6.	6	Top Management establishes trust and commitment to promoting quality improvement by driving out fear within the firm.	3.69	0.699	High
7.	9	Top Management has assigned the responsibilities and authorities for relevant roles for different functions ensuring that Quality Management practices conform to requirements	3.67	0.728	moderate

8	11	Top Management provides resources to implement the Quality Management System practices within the firm	3.66	0.657	moderate
9	7	Top Management ensures that Quality Management System practices are integrated with the business processes of the firm	3.65	0.698	moderate
10	10	Top Management has assigned the responsibilities and authorities for relevant roles for different functions ensuring that Quality Management practices conform to requirements	3.63	0.728	moderate
11	8	The top management has ensured that Quality procedures are documented and Communicated within the relevant sections/departments of the firm.	3.61	0.744	moderate
12	12	Top Management reviews the results of the Quality Management practices at planned intervals to meet the needs of the firm.	3.60	0.687	moderate
		Total Score (Overall)	3.68	0.733	high

Note. Survey Data, (2019)

The overall mean score of 3.68 indicates that Top Management Commitment activities of the ISO 9001 QMS certified manufacturing firms are given the highest consideration as that is the most vital aspect required to have a sound Quality Management System within the firm. The mean value of top management commitment items varied within (3.75 -3.60) when compared with the overall mean value of 3.68. As per the analysis the highest mean value was 3.75 for the statement "Top Management has taken every step to implement and maintain the "quality policy" statement within the firm" with a standard deviation of 0.788 indicates that these manufacturing firms top management has taken positive steps to develop a quality culture within the firm. However, in general, it appears that Top Management Commitment is at the highest level of consideration within these firms.

4.2.2 Supplier Quality Management

Table 4- Level of Consideration Given for Supplier Quality Management

Rank	Item	Descriptions	Mean	Standard Deviation	Mean Level
1.	4	There is a supplier corrective action system based on re-evaluation and monitoring the past performances of the suppliers as a basis for establishing the levels of control	3.84	0.731	High
2.	7	The purchase orders are reviewed and approved before the issue.	3.83	0.696	High
3.	1	The firm has a criterion to evaluate and select the suppliers based on	3.82	0.742	High

		their ability to meet with the firm requirements.			
4	8	The firm has a criterion to establish and implement the inspection or other activities necessary for ensuring that purchased product meets specified purchase requirements	3.81	0.738	High
5.	3	The firm has a mechanism to apply control over the suppliers' dependent on the subsequent impact of the materials intended to purchase from the suppliers.	3.80	0.752	High
6.	6	The firm purchasing documents contain data clearly describing the product ordered.	3.79	0.715	High
7.	5	The firm ensures that the function having responsibility for approving supplier quality systems has the authority to disapprove the use of sources based on performance	3.77	0.750	High
8	2	The firm maintains a register of approved suppliers that includes the scope of approval.	3.75	0.716	High
		Total Score (Overall)	3.80	0.730	High

Note. Survey Data, (2019)

The mean value of supplier quality management varied within (3.84 -3.75) when compared with the overall mean value of 3.80. As per the analysis the highest mean value was 3.84 for the statement "There is a supplier corrective action system based on re-evaluation and monitoring the past performances of the suppliers as a basis for establishing the levels of control" with a standard deviation of 0.731 indicates that these manufacturing firms are taking appropriate action to create a culture that suppliers are considered as partners of the firm. However, in general, it appears that Supplier Quality Management is at the highest level of consideration within these firms.

4.2.3 Process Management

Table 5- Level of Consideration Given for Process management

Rank	Item	Descriptions	Mean	Standard Deviation	Mean Level
1.	13	All manufactured products are subjected to test based on samples testing as per the stipulated product-specific standard requirements.	3.85	0.727	High
2.	11	The firm has a system to identify the day's productions.	3.84	0.778	High

3.	14	The results of the tests are used to decide on the release of such manufactured products.	3.83	0.702	High
4	9	Proper corrective actions are initiated to avoid any process problem to recur.	3.81	0.744	High
5.	5	Work instructions are issued to low-level employees on the production floor to ensure work activities are carried out properly	3.79	0.773	High
6.	15	Any non- conforming products are handled by using the accepted quality management practices.	3.78	0.689	High
7.	10	In-process quality control results are recorded and analyzed.	3.77	0.764	High
8	6	Proper tools and equipment are provided to ensure proper in-process quality controls within the manufacturing process.	3.76	0.805	High
9	12	The firm once a particular production is completed, that product is kept for quality inspections and tests.	3.75	0.793	High
10	3	Documented. process performance evaluating criteria are established.	3.74	0.780	High
11	4	Well documented responsibilities, authorities are given to employees who are managing the processes	3.73	0.819	High
12	1	A well-prepared production plan is used to manage the manufacturing processes	3.72	0.727	High
13	8	Personnel in the process are well trained.	3.71	0.763	High
14	7	All critical points of the processes are monitored and measured.	3.70	0.805	High
15	2	The Firm always uses a suitable infrastructure and environment for the operation of processes.	3.68	0.776	High
		Total Score (Overall)	3.76	0.763	High

Note. Survey Data, (2019)

The mean value of process management varied within (3.85 -3.68) when compared with the overall mean value of 3.76. As per the analysis the highest mean value was 3.85 for the statement "All manufactured products are subjected to test based on samples testing as per the stipulated product-specific standard requirements" with a standard deviation of 0.727 indicates that these manufacturing firms ensure the products manufactured comply with the appropriate standard to assure

the quality of such products. However, in general, it appears that Process Management is at the highest level of consideration within these firms.

4.2.4 Perceived Business Performance

Table 6- Level of Consideration Given for Perceived Business Performance

Rank	Item	Descriptions	Mean	Standard Deviation	Mean Level
1.	16	The firm has an approach for defect prevention	4.09	0.778	High
2.	15	Quality awareness within the firm has increased.	4.08	0.734	High
3.	14	Firm product defects levels have reduced.	3.99	0.761	High
4	2	Market share of the firm has improved	3.96	0.701	High
5.	10	Customer satisfaction levels have increased	3.93	0.776	High
6.	13	Firm products are delivered on time	3.90	0.706	High
7.	11	The cycle time of activities of the Firm has improved.	3.89	0.707	High
8	9	Firm employees are happy with their job	3.88	0.709	High
9	3	Return on assets of the firm has increased	3.86	0.670	High
10	12	The firm has a positive impact on society.	3.85	0.746	High
11	1	Sales of the firm have grown	3.83	0.690	High
12	5	Firm cost efficiency has improved	3.82	0.720	High
13	6	Firm absenteeism has reduced	3.80	0.740	High
14	4	Profits of the firm have grown	3.78	0.738	High
15	8	Firm labor turnover has reduced	3.74	0.764	High
16	7	Firm employee morale has increased.	3.73	0.761	High
		Total Score (Overall)	3.88	0.731	High

Note. Survey Data, 2019

The overall mean score of 3.88 indicates that the Perceived Business Performance of the ISO 9001 QMS certified manufacturing firms is given the highest consideration which is an important requirement to implement ISO 9001 QMS effectively. The mean value of perceived business performance varied within (4.09 -3.73) when compared with the overall mean value of 3.88. As per the analysis the highest mean value was 4.09 for the statement “Firm has an approach for

defect prevention" with a standard deviation of 0.778 indicates that the employees working within these manufacturing firms are having an understanding about the necessity of following a preventive path as it is the most important activity to reduce the generation of wastages within these firms while carrying out the job tasks leading to improvement of the bottom line. However, in general, it appears that Perceived Business Performance is at the highest level of consideration within these firms.

4.2.4 Summary of Descriptive analysis of Dimensions

In summary, the descriptive statistics analysis as given below table 7 indicated that the majority of respondents' given positive answers to the dimensions that are assessed in this study. All means values are higher than the mid-value of 2.5 with the standard deviation varying within a range between 0.73 to 0.76 which indicated a narrow spread around the mean. To ascertain the reliability of the data, the researcher performed Cronbach's Alfa value test. According to Cooper and Schindler (2008), if Cronbach's Alfa value is greater than 0.7 the data is reliable. Table 7 given below shows the reliability analysis of survey data and since all values are above 0.7 the data is reliable and can be used for further analysis.

Table 7- Overall Mean, Standard Deviation and Reliability values

Variable	Cronbach's Alfa Coefficient scores	Alfa Interpretation	Overall Mean Value	Overall Standard Deviation Value
Top Management Commitment	0.942	Reliable	3.68	0.733
Supplier Quality Management	0.934	Reliable	3.80	0.730
Process Management	0.821	Reliable	3.76	0.763
Perceived Business Performance	0.875	Reliable	3.88	0.731

Note: Survey Data 2019

4.3 Hypothesis Testing

To test the hypotheses multiple Regression Analysis was conducted and the study results are given below in Table 8.

Table8- Multiple Regression Analysis Results

Dimension	R	R^2	Adjusted R2	F Value	Sig*	Standardized Beta	t-value	Sig*
	0.702	0.493	0.398	5.181	0.001			
Top Management Commitment						0.678	3.405	0.004
Supplier Quality Management						0 .439	4.426	0.000
Process Management						0.546	2.342	0.001

Since the R^2 value is 0.493 the model is considered as fit to be used for multiple regressions with the data. As per the above table 8 the correlation coefficient R= 0.702 that reflects there is a positive correlation between Quality Management System Practices and Perceived Business Performance. The results show that three sub-variables together explained 49.3%

of the variance, where (R^2 =0.493, F=5.181, Sig.=0.001). Therefore, the alternative hypothesis is accepted, which indicates that there is an impact of Quality Management System Practices (Top Management Commitment, Supplier Quality Management, Process Management) on Perceived Business Performance, at level (α≤0.05). Moreover, this finding is in line with the results of Aba, Badar, and Hayden (2015) that indicate Quality Management System certified firms had a better operating performance.

Furthermore, table (8) shows that the top management commitment sub-variable has the highest contribution to perceived business performance, where (Beta=0.678, sig. =0.004). In other words, top management commitment sub-variable is the most significant, and it positively and directly regresses to perceived business performance. Hence H1a is supported at level (α≤0.05). The finding is in the agreement of Cooper and Edgett (2006) as they indicated top management commitment is the most important factor to achieve organizational goals. The second highest contributor is the process management sub-variable, where (Beta=0.546, sig. =0.001), and therefore H1c is also supported at level (α≤0.05). This finding is consistent with the previous research finding of Cua et al. (2001). Furthermore, the table shows the supplier quality management sub variable, where (Beta=0.439, sig. =0.00) and therefore H1b is also supported at level (α≤0.05). This result is in agreement with the findings of Lambert, Cooper, and Pagh (2014).

5. Conclusions

The research concluded that Quality Management System practices have a positive impact on the perceived business performance of the ISO 9001 quality management system certified manufacturing firms. This is a very important finding for potential manufacturing firms that are intended to adopt and practice the Quality Management System. Furthermore, the highest contributor to perceived business performance is the top management commitment. This gives an important message to the top-level senior managers of the manufacturing firms that to gain the expected results or in other words to achieve the set goals they need to get involved in the implementation of quality management system practices with the other employees of the firm. Moreover, the findings indicate that process management is the second-highest contributor to perceived business performance. This indicates that in the manufacturing firms monitor, control and improve the processes should be a continuous thing so that any gaps in between the processes can be identified leading to a situation of preventing errors, mistakes or defects rather than keeping a room for to happen or to create waste. Finally, results also showed the importance of having a close rapport with the suppliers which lead to a situation of getting quality raw materials so that unwanted delays of production be avoided without keeping room for productivity and profitability losses.

6 Research Limitation

The research was conducted using a Likert scale questionnaire and therefore the respondents did not have an opportunity to express their idea even though sometimes those may be more relevant to the study. The study conducted using ISO 9001 certified manufacturing firms and hence it limits to consider the application of results to service sector firms.

7. Future Research Direction

Future research can be done in a more focused manner by selecting specific sector-based manufacturing firms or specific service sector firms so that the findings are more appropriate to that sector. Furthermore, for future research, a moderating or mediating variable may be included. Moreover, for future research different sub-variables of Quality Management System practices can be selected from the ISO 9001 Quality Management System standard.

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