

Impact Of Integrated Management System On Industrial Growth

Amina Irfan¹, Asfa Muhammad Din Javeed², Dr. Saima Saleem³

¹(Lecturer, Department of technology The University of Lahore, Lahore, Pakistan)

²(Lecturer, Alfaisal University ,Riyadh, Saudi Arabia)

³(Assistant Professor, Institute of Quality & Technology Management, University of the Punjab)

Abstract:

The Inception of modern management system (IMS) has brought prospects in industrial and technological growth. The integrated management system (IMS) has consolidated the conventional management systems, thus increasing the effectiveness of Organizations.

An empirical study was conducted to identify the efficacy of integrated management system on the growth of various Engineering firms of Pakistan. The research focuses on financial, non-financial and safety performance aspects of organizations and helps to understand the influence of implementation of Integrated Management System (IMS). This research was conducted only on those firm where IMS have already implemented. The data was collected through questionnaire from 45 engineering industries of Pakistan and its reliability is checked by Cronbach's alpha coefficient, which proved to be good and consistent i.e. 0.85. Correlation and Regression analysis has been done with the help of SPSS which shows significant positive relationship between organizational performance and implementation of IMS. Result shows that IMS implementation has improved financial, non-financial and safety performance thus increasing growth of industry. However, for better and authentic results, the research must be extended to study the effects before after implementation of IMS in Engineering Organizations.

Keywords: Integrated Management System, Financial, Non-Financial and Safety Performance, Engineering Firms.

Introduction

In order to integrate the necessities of multiple shareholders into the business procedure the systematical or progressive technique that can be used is called IMS [1]. The association of various topics of QMS (Quality Management System), HSMS (Health and Safety Management system and EMS (Environment Management system) required the need of IMS [2]. Previously, multiple organization worked for the separate management system regarding Quality, Environment and Occupational health and safety and ensured compliance with the requirement of each system. However, these days trend has hugely shifted towards IMS that integrates all the aforementioned systems instead of ensuring the implementation of separate system for same organization.

For competitive and efficient reasons, the main purpose of IMS is to improve the efficiency of the industry. However, there are various problems with the implementation of an integrated management plan. [3]. Quality, Health Safety (QHSE), and EMS, each improve the organizational performance [4 - 6]. In its broader and more comprehensive integrated management system its benefits outweigh the benefits of differentiated management systems Quality, environment, health and safety [3]. The main purpose of this study is to identify the IMS impact on the overall efficiency and effectiveness of many organizations within Pakistan.

Olaru et al. identify the performance indicators used by small and medium sized organizations of Romania. Outcome of the study shown that most of the organizations have implemented integrated quality, health and safety and environment management system, but the integration of social responsibility management system is still in early stages [22].

Gopang et al. conducted a survey to assess the connection among performance and HSE measure. Results of this empirical research reveals that Safety and health management system not performed appropriately within these industries and due to which performance of these industries effected [21].

Zahoor et. al. [7] studied the acceptance & implementation of an integrated management system in construction companies of Pakistan. They concluded that acceptance of IMS is very little amongst construction companies, however, companies having all certifications have effective IMS. A decreasing trend in the implementation of IMS has also been noted from high to low-end companies. The main cause of the reduction in the level of implementation is concluded to be the removal of top administration commitment. [8]

Barbosa et. al. [9] also identified problems in the use of IMS as more expensive resources and a larger number of people to implement the integration process. The different application of QMS, EMS and QHSAS standards have less benefits when it is compared to IMS [3]. Previous test studies were conducted in the cement industry to assess the impact of IMS on production and safety indicators. The results show the safety indicators calculated before and after IMS implementation and there is a significant differences between their values [10].

Fereydoon et. al. [11] conducted an investigation on the Iranian cycling power plant and studied the performance indicators impact of IMS on health and safety. It concluded that during the study period safety is improved and risk indicators were reduced [11].

Chan conducted a study to investigate either integrated management model, that constantly supports processes of a railway corporation, was helping the business growth or not. The results of the study revealed that IMS has been continued to be effective in railway procedures and helped their network expand [12].

Above discussion leads to the following hypothesis.

H1: Organizational financial performance is significantly affected by IMS Implementation

H2: Organizational non-financial performance is prominently affected by IMS Implementation

H3: Organizational safety performance is highly affected by IMS implementation

With the help of this literature and gap following research model have been created

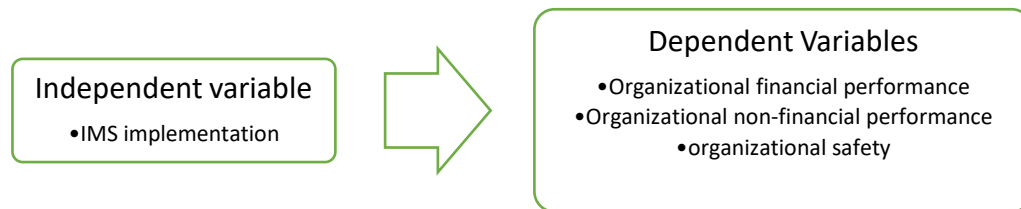


Figure: 1 Research Model

Methodology

As per (1986:10), ‘scientific investigation about regarded organized, measured empirical and fundamental examination of schemes related to assumed connections of several phenomena’. From the goal factor of view, the lookup is divided into 4 types, i.e. descriptive, exploratory, correlational and explanatory research. Correlational lookup emphasizes on identifying or developing connections, co-relations and dependencies amongst factors (two or more) of a circumstance e.g. the have an impact on of one issue upon any other element [13].

Research Instrument

The amended questionnaire is used as a research tool derived from research conducted by the various authors provided in the Appendix.in order to get quick responses and easy answers

Closed ended questions were used. There are four sections of questionnaire. The first section of the questionnaire includes respondent details which are company name, respondent position, qualifications, and job length. In second section, questions related to IMS implementation are added in research [2,15 - 16]. The third section contains questions about organizational performance. [17 - 18]. Finally, section 4 contains questions about the IMS implementation barriers. [19]. Likert scale was also applied in the survey. Likert scale was initialized by Likert in 1932, it Range 1-5, where 1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, and 5 = Strongly Agree.

Sampling Techniques

In this research work Convenience sampling was used to gather the anticipated sample. The private industries of Pakistan were considered as population for this research, which have implemented IMS. As these industries are very few and are spread all over Pakistan, so to collect the data e- survey was the most pertinent method. The targeted persons who were selected from industries were: QHSE Experts, Top Management, Quality and Safety Engineers, Supervisors, and Consultants who have knowledge and certifications in this field.

Questionnaire developed were sent to 115 industries of Pakistan. For data analysis the response of 45 industries were selected because 56 industries did not answer due to their policies, 14 industries provided incomplete questionnaires which were discarded due to insufficient data, so 45 completed questionnaires were used .

Data Analysis Technique

This is a causal/correlation research project. SPSS software was used to analyze the data using inferential statistical tools (Pearson correlation and multiple regressions). The goal of correlation analysis is to quantify and evaluate the strength of a link between dependent and independent variables, whereas the goal of basic regression analysis is to determine the amount of variance in the dependent variable caused by the independent variable. Regression, unlike correlation analysis, is used to determine the direction and strength of relationships. [20]. (Reference is missing)

The following three steps were used to analyze the data:

- (1) Data reliability was verified in the first phase using Cronbach's alpha. To establish the dependability of a review method, this determines the internal consistency or average correlation of items.
- (2) In the second step, Pearson correlation analysis was used to assess the strength of the relationship between the independent and dependent variables.
- (3) The final step is simple regression analysis, which is used to assess the relationship between variables and determine the degree of variation in the dependent variable using the coefficient of determination (R-Square).

Results and discussion

In Pakistan, survey questions were sent to 115 industries, 56 of which were reluctant to reply owing to their policies, questionnaire of were thrown away due to inadequate data, and the remaining 45 completed questionnaires were used for data analysis.

Demographic of Respondent Firms

Males filled out 41 (91.1%) of the 45 questionnaires, while females filled out only 4 (8.9%). The responders' qualifications are listed as follows: 21 of the 45 have bachelor's degrees, 17 have master's degrees, 6 have M.Phil. degrees, and one has a Ph.D. Respondents work in a variety of roles inside the target companies. CEOs made up 4.4 percent of the total, while managers made up 48.9%, engineers made up 35.6 percent, supervisors made up 6.7 percent, and consultants made up 4.4 percent. Data was gathered from a variety of engineering organizations, including those in the energy, engineering & construction, food, manufacturing, oil & gas, pharmaceutical, services, and textile sectors.

Integrated Management System in Studied Firms

Manuals, policies, objectives and goals, structure & responsibilities, work instructions, document control, integral communication trainings, emergency plans, performance indicators, achievements, dealing with non-conformities, inspection equipment control, preventing & correcting activities, and internal & external assessments are all elements and functions that are commonly integrated in Brazilian companies. [15]

Table 1 shows detailed statistical figures for the integration of various parts and functions in the analysed firms. The statistical value for guides, rules, aims and purposes, duties and structures, document management, record control, and emergency plans is almost equivalent to 4, indicating that members of the study firms reported that these elements are integrated inside their organizations. While the mean value for acquisition is 3.2, this indicates that some participants disagree with the integration of these features in their industry, while others are neutral. This could be due to a lack of awareness of the elements' implementation in their organizations, or because the elements were not deployed at all

Elements & Functions integrable in integration	N	Mean	Standard Deviation
Manuals are integrated	45	4.067	0.8367
Policies are integrated		4.022	0.9883
Objectives and Goals are integrated		4.156	0.9034
Structure and responsibilities are integrated		4.178	0.8336

Management Representative is integrated		3.600	1.0745
Work instructions are integrated		3.978	0.9883
Document control is integrated		4.244	0.8569
Record control is integrated		4.022	1.0111
Training is integrated		3.756	1.1708
Internal communication is integrated		3.756	0.9084
Emergency plans are integrated		4.089	0.9492
Performance indicators are integrated		3.733	1.0954
Acquisition is integrated		3.267	0.9863
Treatment of non-conformity is integrated		3.644	1.0478
Equipment control of inspection/ measurement/testing is integrated		3.689	0.9729
Preventing and correcting actions are integrated		3.778	0.9975
internal auditing is integrated		3.911	0.9960
external auditing is integrated		3.800	0.9909

Table 1: Elements and Functions Integrated in respondent firms

IMS Influence on Performance Indicators

Influence on Financial Performance:

Financial performance metrics included market share, sales, profit, investment, return on investment, and assets. Table 2 shows the statistical values for financial performance metrics. All of these numbers are close to four, indicating that the majority of members strongly believed that their financial performance improved after implementing IMS.

Influence on Non-Financial Performance:

Non-financial performance measures included machine utilization, defect rate, on-time delivery, employee turnover, and employee absenteeism. Table 2 shows the statistics for these elements. The statistical value for machine utilization has increased, but the defect rate has fallen to 3.5, indicating that the majority of them are indifferent or disagree on the topic. While participants agreed on other non-financial performance measures, it is safe to presume that the organization's overall financial performance improves because their values are virtually equivalent to 4 and 5.

Influence on Safety Performance:

Different indicators were used to identify the safety performance of the organization. The indicators included the following:

- Safety and security objectives are clearly defined for all professional purposes
- Safety & security objectives are communicated to all the concerned staff members
- Periodical training sessions are conducted for all the staff members
- Accidents have decreased
- Number of Absences due to accidents have decreased
- Personnel's complaints concerning safety measures have decreased

Statistical values for these elements shown in Table 2 are near to 4 and 5 which clearly show that participants agree that the safety performance of their organizations increased after implementation of IMS.

Performance Indicators	N	Mean	Standard Deviation
Financial Performance			
Current Market Share has increased	45	3.911	0.5963
Current sale has increased		3.889	0.6816
Company's profit has increased		4.067	0.7508
Return on investment has increased		3.822	0.7163
Return on assets has increased		3.644	0.7433
Non-Financial Performance			
Machine utilization has increased	45	3.511	1.0140
Defect rate of units has decreased		3.622	0.6839
On-time delivery is achieved		4.022	0.5834
Employee turnover has decreased		3.933	0.8634
Employee's absence rate has decreased		3.978	0.7830
-Safety Performance			
Safety and security objectives are clearly defined for all professional purposes	45	4.022	0.8115

Safety & security objectives are communicated to all the concerned staff members		3.889	0.8318
Periodical training sessions are conducted for all the staff members		3.778	1.0200
Accidents have decreased		4.244	0.8300
Number of Absences due to accidents have decreased		4.044	0.6727
Personnel's complaints concerning safety measures have decreased		3.800	0.8686

Table 2: Descriptive analysis of financial, non-financial and safety performance

Correlation analysis

The Cronbach's alpha coefficient is 0.853 which shows data reliability is good. Table 3 shows that IMS has weak correlation with financial performance, non- financial and safety performance at 0.01 level, where value of r is 0.163, 0.423, and 0.197 respectively. The reason behind correlation is that out of 45 organizations, 8 (17.8%) integrated Environmental and Quality Management System (QMS), 10(22.2%) of them integrated Quality and Health & Safety Management System (QHSMS), 6(13.3%) have integrated Environmental and Health & Safety Management System (EHSMS) and remaining 21(46.7%) integrated Quality, Health & Safety and Environmental Management System.

Variables	IMS	FM	NFP	SP
IMS	1			
Financial performance	.163**	1		
Non-Financial performance	.423**		1	
Safety performance	.197**			1

“**Co relation is significant at the level 0.01 (2-tailed)”

Table 3: Correlation Analysis

IMS influence on Overall Performance of Studied Firms

Table 4 shows the results of regression after the mean of IMS elements and functions (forecasters) were regressed in comparison to the entire mean for organizational performance.

With a p value of 0.023, i.e. 0.05, the value of r (0.339) for IMS suggests that there was a direct and modest positive link between IMS integrated elements and organizational performance. This demonstrates that IMS has a favorable impact on organizational performance. As a result, this research backs up the earlier research [3,10-11]. The study shows that implementing the IMS improves the performance of Pakistani organizations in the long run.

R	R-square	Adjusted R square	F -value	Df	B
0.339	0.38	0.32	16.67281	1	.339

Table 4: Regression analysis

Conclusion

The goal of this empirical study was to see if there was a link between the performance of Pakistani businesses and implementation of IMS. The Primary data gathered in this study is through interrogation conducted through survey based on the findings of other authors' research. To obtain rapid and straightforward answers, closed-ended questions were used. In this study, convenience sampling was utilized to gather the desired sample. A total of 115 industries in Pakistan were sent survey questions, of which 56 did not reply owing to company policies, 14 were eliminated due to inadequate data, and the remaining 45 completed questionnaires were used for data analysis. Experts in QHSE, senior management, quality and safety engineers, supervisors, and consultants with knowledge and credentials in this sector were chosen to respond to the survey questions on behalf of their companies. With the help of SPSS software, inferential statistical tools (Pearson correlation and multiple regression) were utilized to examine the data. A three-step procedure was used to analyze the data: After applying Cronbach's alpha to assess the internal consistency or average correlation of items in a review mechanism measuring their dependability, the initial step was to test data reliability. In the second step, Pearson correlation analysis was used to assess the strength of the relationship between the independent and dependent variables.

According to the findings, half of the companies evaluated have a fully integrated Quality, Health, and Safety, and Environmental Management System. As a result, IMS has a minor impact on organizational performance.

Future study

Only the performance of organizations that have used IMS is examined in this study. When IMS adopters and non-adopters are compared, more accurate findings can be obtained. Real-time financial, non-financial, and accident data are not collected to analyze an organization's financial, non-financial, and safety performance, which might provide more accurate results.

Questionnaires were completed by email, which could introduce bias, whereas more authentic data could be acquired through interviews, reducing the potential of bias.

Several ideas for further research can be suggested.:

- The performance of organizations that integrate and those that do not can be compared to determine the former's competitive advantage.
- For accurate results, industries can collect quantitative data on financial, non-financial, and safety performance.
- To make the study more authentic, data can be obtained through interviews, which reduces the possibility of bias and lack of care in the questionnaire's implementation. However, this type of research will undoubtedly necessitate more time.

Reference

- [1] P.Y. Liew, and C. Luetge, (2016, “Integrated Management System Frameworks for Corporate Social Responsibility and Related Concepts”, *Journal of Management and Sustainability*, 6(3), pp. 12.
- [2] T. Stamou, (2003), “Integrated Management Systems in Small Medium-Sized Enterprises: Theory and Practice”, Master of Science, University of East Anglia, pp. 79, 2003.
- [3] M. Bernardo, A. Simon, and J. Jos, (May 2015) “Benefits of Management Systems Integration: A Literature Review”, *Production*, 94(1), pp. 260-267.
- [4] M.A. Gopang, M. Nebhwani, A. Khatri, and H.B. Marri, (2017), “An Assessment of Occupational Health and Safety Measures and Performance of SMEs: An Empirical Investigation”, *Safety Science*, Volume 93, pp. 127–133.
- [5] S.A. Malik, Muhammad, Z. Iqbal, R. Shaukat, and J. Yong, (January 2010), “TQM Practices & Organizational Performance: Evidence from Pakistani SMEs,” *International Journal of Engineering Technology*, 10(4), pp. 26–31.
- [6] N.M.S.N.M. Suki, (2015), “Management of Environmental Quality”, *An International Journal Article Information, Management Environmental Quality*.
- [7] H. Zahoor, A.P.C. Chan, R. Masood, R.M. Choudhry, A.A. Javed, and W.P. Utama, (2016), “Occupational Safety and Health Performance in the Pakistani Construction Industry: Stakeholders’ Perspective”, *International Journal of Construction Management*, 16(3), pp. 209–219.
- [8] M. Gianni, and K. Gotzamani, (2015), “Management Systems Integration: Lessons from an Abandonment Case”, *Journal of Cleaner Production*, Volume 86, pp. 265–276.

- [9] T.V.M.L, Cesar, F.M. Barnpsa, O.J. De Oliveira (January 2017), “Identification and Analysis of the Elements and Functions Integrable in Integrated Management Systems, Journal of Cleaner Production, 142(4), pp. 3225-3235.
- [10] N. Hamidi, M. Omidvari, and M. Meftahi, (2012), “The Effect of Integrated Management System on Safety and Productivity Indices: Case Study; Iranian Cement Industries”, *Safety Science*, 50(5), pp. 1180–1189.
- [11] Q.F. Laal, M. Pouyakian, R.F. Madvari, A.H. Khoshakhlagh, and G.H. Halvani, (2018), “Investigating the Impact of Establishing Integrated Management Systems on Accidents and Safety Performance Indices: A Case Study”, *Safety Health Work*.
- [12] L. and T. S. Morawska et al., (2015), “Code of Practice on Safety and Health in the Iron and Steel Industry”, *Queensland University of Technol*, 38(4), pp. 6803–6812.
- [13] C.R. Kothari, (2004), “Research Methodology: Methods & Techniques”, New Age International Limited, Publishers, Bangalore, New Delhi.
- [14] W. Nicholas, (2010), “Research Methods: The Basics”, 2nd Edition, Routledge.
- [15] O.J. De Oliveira, (2013), “Guidelines for the Integration of Certifiable Management Systems in Industrial Companies”, Journal of Cleaner Production, Volume 57, pp. 124–133.
- [16] Y. Yusuf, A. Gunasekaran, and G. Dan, (November 2014), “Implementation of TQM in China and Organization Performance: An Empirical Investigation”, *Total Quality Management & Business Excellence*, pp. 37–41.
- [17] H.H. Spangenberg and C. Theron, (2004), “Development of a Questionnaire for Assessing work Unit Performance”, *SA Journal of Industrial Psychology*, 30(1), pp. 19–28.
- [18] E. Bottani, L. Monica, and G. Vignali, (2009) “Safety Management Systems: Performance Differences between Adopters and Non-Adopters”, *Safety Science*, 47(2), pp. 155–162.
- [19] R. Masood, B. Mujtaba, M.A. Khan, and T. Ali, (June 2014), “Adoption of Integrated Management System (IMS) by Construction Firms in Pakistan”, *International Journal of Engineering & Advanced Technology*, 3(5), pp. 342–347, 2014.
- [20] K.H. Zou, K. Tuncali, and S.G. Silverman, (June 2003), “Correlation and Simple Linear Regression, *Radiology*, pp. 617–622.
- [21] M. A. Gopang, M. Nebhwani, A. Khatri, and H. B. Marri, “An assessment of occupational health and safety measures and performance of SMEs: An empirical investigation,” *Saf. Sci.*, vol. 93, pp. 127–133, 2017.
- [22] M. Olaru, A. Hohan, and M. Maftai, (May 2015), “Performance Indicators Used by SMEs in Romania”, *Social and Behavioral sciences*, Volume 109, pp. 949-953.