

An Investigation on Quality Management Model in Bahrain Construction Companies

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Abstract: Bahrain is focusing to increase the foreign trade and tourism by expanding the infrastructural projects. Construction sector is one of the leading sectors that could transform the economy of the country. In this study, it's interesting to investigate on the standards and analyzing the key areas of enablers influencing on the projects. Partial least squares (PLS) PLS statistical evaluation tool are used to understand the influence between the variables in enablers and suggest the measures that could improve performance of construction projects. Each of the response collected through online questionnaire, interview with the ISO body, European Foundation Quality Management EFQM agents, supervisors and secondary sources. 10 hypotheses are developed to investigate in to the relation between these areas and find which areas of the enablers do have more influence on the performance of the construction firm. Conceptual framework developed model is done to investigate on the correlation between the areas of enablers with customer and Return on Investments (ROI). 5 areas of enablers are leadership, people, strategy, partnership and process. Each of these enabler areas is statistically tested to the result areas such as customer satisfaction and financial results. There is a positive correlation between partnership and resources to the customer satisfaction and financial measures. The factors analysis test also have been conducted in which alignment, professionalism and technology have influence on the variables

Keywords: Partial least squares (PLS), European Foundation Quality Management (EFQM), Construction and International Standards Organization (ISO)

1. Introduction

Bahrain the smallest country is focusing to increase the tourism, investments and residential stays by expanding the infrastructural. Construction sector is one of the leading sectors that could transform the economy of Bahrain. This sector focuses on the residential houses, infrastructure and energy projects that could attract tourism and investment. As indicated in Bahrain Construction Market Outlook (2017), Bahrain's development industry esteem an approximate of US\$ 8.8 billion in 2018 to develop infrastructure and housing projects. Projects are principally contracted by private financial specialists with the rest originating from a semi and government reserves. In addition, the tightened budgetary plans has forced various government entities to postponed certain highly investment projects and this has constrain income over the whole industry. The business development is expected to be driven by the Bahrain Economic Vision 2030, under which the administration plans to broaden the nation's economy far from oil and support the monetary development. Low oil costs are relied upon to undermine development prospects yet the administration's initial endeavors to differentiate the economy far from oil by concentrating on non-oil segments will make development open doors for the development business in the coming years.

2. Total Quality Management in Bahrain

Since the 1950s, the total population in the country has been multiplied. Large portion of the population demands for different sizes of buildings and foundations. International Standards Organization (ISO) is the world's biggest engineer of intentional international measures giving advantages to business, government and society through a portfolio of 19 400 measures. The ISO standards have effectively been promoted in the construction industry as a means to assuring

quality by building contractors. ISO standards such as management responsibility, Process control, Quality system etc and many more are on the prime focus for the development. According to the recent list published by Ministry Of Housing there are 56 building contractors that is approved by Ministry Of Housing which could be probably done ISO certification with different bodies.

The second emerging quality model is, The European Foundation Quality Management (EFQM) Excellence Model which was developed on the basis of a set of European values. Regardless on the sectors, each organization needs to discover an appropriate management framework to be successful. It helps the firm to understand the key strength and potential gap in relation to the vision and mission of the organizations. The EFQM Excellence Model is a non prescriptive framework with 9 criteria segmented under enablers and results. The 5 criteria's of enablers are leadership, people, strategy, people & resources, Processes, Products & Services. The remaining 4 criteria's focuses on people result, customer result, business result and society result. The variables of enablers are mostly applied in this study to understand on the level of executions. Majority of the construction companies in Bahrain are least aware on the benefits of European Foundation Quality Management (EFQM) standardization.

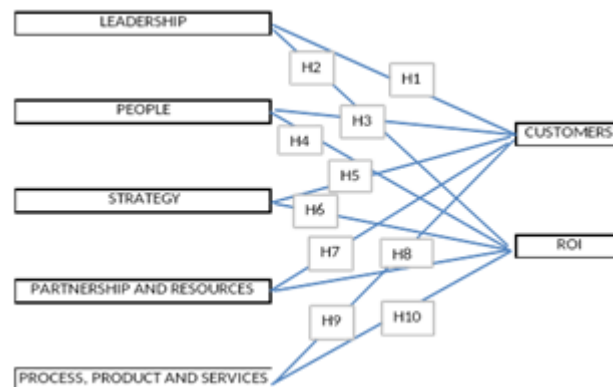
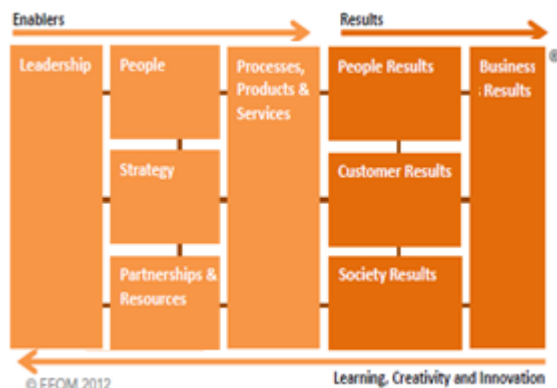


Figure 1: Own Data: Model of the study developed based on the EFQM

3. Statement of Problem

Due to the reduced volume in construction project rewarding has consistently affected the industry. The factors affecting the rewarding of the organization is unclear. Few of the certification provider companies suggest that lower projects and tightness in the competition was one of the few factors that are constraining the companies to get the rewards. Secondly the emerging trend of the technology is one the crucial factor that each of the company faces to satisfy the management and even the demanding customers. Thirdly, the increasing population.

4. Objective of the Study

Few of the construction firms are lacking the standard document procedure, policies and even concern on the health and safety. In this study we have considered few of the criteria's in standardization that in segment in to an enabler group and identify which enabler of the organization to be more influence on the customers satisfaction and Returns on Investment (ROI). This study a factor analysis test is also done to understand on which factor the construction company need to focus and improve. The result of the study will even guide the non certified companies to be more focused on the area for improvement.

5. Hypothesis of the Study

In relation to the situations and the reviews of the studies, we are considering 10 hypotheses to test the relation between the selected variables and find out the reason that contribute to the performance. The selected indicators for measuring the latent variable leadership were communication, unity, rresponsibility, initiative, accountability and Centralization. People variables were measured with alignment, professionalism, participation, recognition, teamwork. Latent variable strategy was measured with expectation, benchmarking and support. Partnership and resources were identified with funds, technology and information. Process, product and services are measured with innovation, customers, opportunity and monitor. The result criteria we customers satisfaction which is consider to be (Customer Result) and ROI (Business Result).

- H1: Is there a correlation between Leadership and Customer
 H2: Is there a correlation between People and Customer
 H3: Is there a correlation between Strategy and Customer
 H4: Is there a correlation between Partnership and Resource and Customer
 H5: Is there a correlation between Processes, Products and Services and Customer
 H6: Is there a correlation between Leadership and ROI
 H7: Is there a correlation between People and ROI
 H8: Is there a correlation between Strategy and ROI
 H9: Is there a correlation between Partnership and Resource and ROI
 H10: Is there a correlation between Processes, Products and Services and ROI

6. Literature Review

As per the researchers (2010) study on "ISO 9001 Vs. EFQM: A comparative analysis based on external independent data" resulted that there is a wider difference in company's external image on the adaptation of the EFQM Model. With the survey done with 107 Spanish companies on implementation of ISO 9001 and the EFQM model ascertains that external image , sales growth ,profit margin, market share has shown a positive progression after the EFQM model has been adapted with the organizations. Secondly it also indicates that improved training for the staffs, improved quality products and services provided by the firm has positively affected the productivity of the companies. In the research study of (2015) ascertains that there is a moderate positive connection between's two factors, the higher the quantity of long stretches of ISO 9001 certifications , the higher the consequences of the association EFQM display assessment and acknowledgment. This backings the suspicion that ISO 9001 International Standard by consolidating huge numbers of the standards present in the EFQM Business Excellence Model is reliable with this model .From the studies by researchers (2012) also suggest that ISO 9001 has comprehensible benefits on organizational, people , operational, and customer results that effects on financial performance . The researcher in (2012) ascertains that EFQM is a good representative of Total Quality Management in construction Industry. The criteria's of enablers such as Policy and Strategy, Leadership and Processes showed a great impact on the performance after receiving the awarding from the bodies. EFQM Model is a method for continual progression

of organization quality, which leads to higher level of quality management, customer satisfaction, success and world market to increasing the culture of whole organization (2018).

7. Research Methodology

For this study 98 respondents of different construction companies are surveyed through the electronic questionnaire and interviews are done with the site managers, ISO certified bodies, advisors, secondary data’s etc to collect the information’s. Each of the survey results are statistically tested with the Partial Least Square (PLS) and developed a path model from the set of hypothesis. 10 Hypothesis are developed for the study. The latent dependent variables are customers result and Return on Investment (ROI). The independent latent variables are the criteria of the enablers such as Leadership, People, Strategy, Partnership &Resource and Processes, Products and Services. To test the correlation of the developed hypothesis the statistical software of Partial Least Square (PLS) are been adapted for the study. The attained results is accepted or rejected based on the negative mean variable and even if the result is lesser than 2.5 T-Value.

8. Analysis

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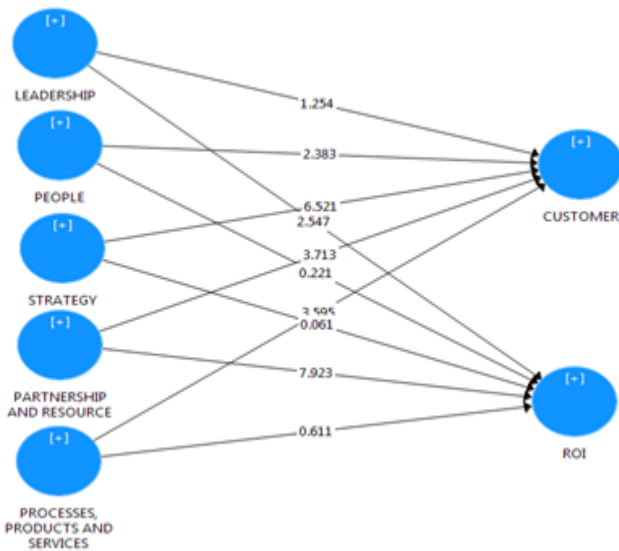


Figure 2: Own Data: the result of the study based on the developed Hypothesis

In above Figure 2. Presenting the result of the study indicates that 5 Hypothesis has been rejected due to variables are having negative relations between each other. In the principles of management indicate that variables of leadership have stronger influence on companies productivity, but in this study it could be seen that H1 has weak significant relations between leadership and customers. In leadership approaches to unite the people to share and achieve the organization’s Mission, Vision and

goals has to be improved. ROI could be raised only with the good leadership. Stress at work places and workload are the causes to have been a factor that constrains to unite the people ideas. In CIPD researches highlights that excessive workload and management style are the top causes of stress at work. It would even impact on the relation to any results of the management. In this study Hypothesis 6 indicate that leadership has moderate level of significant relationship with the Return of Investment (ROI) of the firms. The employees are the strong pillars to organizations. Measuring indicators for the employees adapted were alignment, professionalism, participation and recognition. When the management approaches in the organizations could be rigid which impacted the people performance. The H3 is accepted as it has positive significant correlation between the strategy and customers (6.521). In this study it is observes that the organization is able to gather stakeholder needs and customers expectations for project development. Partnership and resources have resulted in significant positive relation with the customers and ROI. In which it could be ascertained that leaders are provided with accurate and sufficient information to support them in timely decision making. Secondly design the financial planning, control, reporting and review process to support optimal use of available funds. Process structuring is on going system in the company. Safety, scheduled performance, equipments, relations with subcontractors, bidding on government projects are few of the areas that could be seen as a benefit to the organizations. Though the contractors are able to provide satisfactory project services to the customers, few barriers could be notified is the low skill in workers

Table 1: Path Co-efficient Test between Independent and Dependent Variables

Independent Variables	Dependent Variable	(Mean)	(T-Test)	Result
Leadership	Customers	-0.251	1.254	Rejected
Leadership	ROI	-0.816	2.547	Rejected
People	Customers	0.38	2.383	Rejected
People	ROI	-0.151	0.221	Rejected
Strategy	Customers	0.587	6.521	Accepted
Strategy	ROI	-0.034	0.061	Rejected
Partnership and Resources	Customers	0.44	3.713	Accepted
Partnership and Resources	ROI	1.586	7.923	Accepted
Processes, Products and Services	Customers	-0.204	3.595	Rejected
Processes, Products and Services	ROI	0.091	0.611	Rejected

From the above table 1 Leadership is measured with 6 variables such as communication, unity, responsibility, initiative, centralization and accountability. On these selected factors accountability had stronger influence on the leadership perspective. Inspiring people, creating a culture of involvement, ownership, empowering, improvement and accountability through their people’s actions, behaviors and experience is a challengeable process for the supervisors and managers in the construction companies. The leadership of the construction companies do have negative relations with customers and ROI which leads to rejection of H1 (-1.254) and H6 (-2.547). In this study an absence of promoting sustainable practices has been seen and it resulted to reject H2 and H7. Correlation between Strategy and ROI has negative and weak significant relations between each others.

It could be due to the change in the spending behavior of the customers which leads to have an impact on the business. The organizations need to compare their performance with relevant benchmarks to understand their relative strengths and areas for improvement. The capital cost of the infrastructure, new tax policies could be some of the hidden reasons that impacted on the ROI. Partnership and resources have resulted in significant positive relation with the customers at (3.713) and ROI (7.923). Construction sectors are competing to maintain a favorable margin on the profit and even on the customer's satisfaction. When companies are getting certified by the international standards it opens to more challenges and competitions. In this study H4 and H9 are accepted. When the construction companies are not taking the initiative to improve on the skill of the employees it would affect on the efficient performance of the business. With this analysis it could be seen that Processes, Products and Services has a weak relations to the customer's satisfaction and ROI.

9. Findings

- In leadership approaches uniting their people to share and achieve the organization's Mission, Vision and goals need to be improved.
- The leader should focus on providing clear direction. A transformational leadership style should be done in to practical that could encourage the people to provide Return on Investment (ROI) to companies.
- The competency system such as higher performance work system and the motivational strategies should be aligned to the organizational objectives.
- Make the people aware on their responsibilities and provide more of the training specifically on their skills that will lead to involvement and effective practices.
- The construction companies need to benchmark on their performance with the competitors and take necessary training that could improve the performances
- Investigate on the new robotic systems in work places will be a strong hold for the employees to complete the work efficiently.
- The management should make a self assessment with understanding of the ISO and EFQM framework which will prepare of frame them to Excellence awards.
- The companies should work on attain the excellence award being provide by the standardized organization which will open the pathways to collaborate with the international subcontractors.

10. Conclusion

The result of the study indicates that latent variable strategy, Partnership and Resources has significant relation with the customer's satisfaction. In the factor analysis undertaken for the latent variable inspiring people and create a culture of involvement, ownership, empowerment, improvement and accountability through their actions, behaviours and experience was one of the factor that had strong influence with the leadership. The leaders should improve on seeking support and contributions from all relevant stakeholders, they are the centralized decision maker of the organizations. Each of the people plans are aligned to the organization

structure in which the management clearly define the skills, competencies and people performance levels required to achieve Mission, Vision and strategic goals. It could indicate that alignment and professionalism are two factor variables influences the independent variable people. Competition is always on the raise, so the construction companies need to benchmark their performance to the competitors and improve the weaker areas. Benchmark is one of the factors that also influence on the strategy and they need to improve on it. As per the latest study done in (2015) most of the investment is done in the transportation sector. The revenues of these sectors can be generated based on the new technology being implemented. In consideration on the technological adaption, a balanced level of benchmarking with financial analysis should be done to have a sustainable level of Returns on Investment (ROI). In consideration of selected variables Partnership and Resources had stronger influence on the customer satisfaction and ROI (Returns of Investment). The strategy has negative weak relations with Returns on Investment (ROI).

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References

- [1] Sui Pheng, L. and Chen Shiua, S. (2000). The maintenance of construction safety: riding on ISO 9000 quality management systems. *Journal of Quality in Maintenance Engineering*, 6(1), pp.28-44.
- [2] Cheng, J., Proverbs, D. and Oduoza, C. (2006). The satisfaction levels of UK construction clients based on the performance of consultants. *Engineering, Construction and Architectural Management*, 13(6), pp.567-583.
- [3] Saizarbitoria *et al* (2010). ISO 9001 Vs. EFQM: A comparative analysis based on external independent data. [online] www.researchgate.net. Available at: https://www.researchgate.net/publication/266014721_ISO_9001_Vs_EFQM_A_comparative_analysis_based_on_external_independent_data [Accessed 2 Dec. 2018].
- [4] Corredor *et al* 2011. TQM and performance: is the relationship so obvious?, *Journal of Business Research* 64(8): 830-838.
- [5] Kiauta, M. (2012). Idea of quality versus idea of excellence.
- [6] Fonseca, L. (2015). RELATIONSHIP BETWEEN ISO 9001 CERTIFICATION MATURITY AND EFQM BUSINESS EXCELLENCE MODEL RESULTS. *Quality Innovation Prosperity*, 19(1).
- [7] van Schoten *et al* (2016). The EFQM Model as a framework for total quality management in healthcare. *International Journal of Operations & Production Management*, 36(8), pp.901-922.
- [8] Boiral, O. (2012). ISO 9000 and Organizational Effectiveness: A Systematic Review. *Quality Management Journal*, 19(3), pp.16-37.

- [9] Construction 2017: A positive market outlook? | Deloitte United Arab Emirates | ME PoV issue 22. [online] Available at: <https://www2.deloitte.com/ae/en/pages/about-deloitte/articles/closer-than-we-think/construction-2017-positive-market-outlook.html> [Accessed 21 Feb. 2019].
- [10] Technavio. (2019a). Construction Market in Bahrain 2015-2019. [online] Available at: <https://www.technavio.com/report/construction-market-in-bahrain-2015-2019> [Accessed 21 Feb. 2019].
- [11] Invest in Bahrain. (2019b). *Bahrain tourism projects valued at over US \$13 Billion - Invest in Bahrain.* [online] Available at: <https://bahrainedb.com/latest-news/bahrain-tourism-projects-valued-us-13-billion/> [Accessed 21 Feb. 2018].