African Journal of Hospitality, Tourism and Leisure, Volume 8 (4) - (2019) ISSN: 2223-814X

The effect of strategic re-engineering and Six Sigma techniques on strategic competitiveness in the tourism industry

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Abstract

The main objective of the study is to determine how Six Sigma techniques influence strategic competitiveness and organizational performance through the mediation effect of strategic re-engineering. The methodology consisted of measurements depending on the questionnaire that designed and distributed on a sample selected randomly . the result revealed that there are a high mediation effect of strategic re-engineering between Six Sigma techniques and strategic competitiveness. The results showed that the re-engineering effect on strategic competitiveness is weak and negative, and that the effect is positive and high when adopting Six Sigma technique as a mediator variable. The process of planning, analyzing designing and supporting the implemented process aims at making the competitiveness attainable. The competitiveness of the market is based on the understanding of the consequences that aim at the development of the system for the greater good of the country. The re-engineering process begins with appropriate service quality, good management practices and the lessening of errors in the tourism companies and its effect will evidently be high when adopting Six Sigma as a mediator variable.

Keywords: Planning, analysis, design, implementation, support.

Introduction

Re-engineering is the procedure of redesigning existing processes and structures to suit the needs of the current market forces (Stark, 2015). Iraq has most unfortunately been in wars for many decades since the 1960s and hence tourism has been affected adversely. The progress of other tourism firms in countries where peace and stability have been dwelling for decades have experienced gradual re-engineering process as their services have been facing a driven market and strategic competitiveness form other firms (Chang, 2016). So these companies need a success methodology, which essentially means taking a set of step-by-step approach and policies for enterprises and companies that are used to complete in one or more phases of the evolution cycle.

The researchers presented different methodologies for engineers that can be categorized into different categories. One way to classify projects is how to focus on factors such as technology (Stankiewiczv & Moulijn, 2003). Another way is to look at methodologies through the innovative nature of reengineering. The degree of reliance on re-engineering on innovation and new thinking is much more than relying on current and past experiences. As studies indicate, for reengineering, the organization must start with a blank page (Scharmer,2009). With such a view, it is impossible to define a systematic approach to re-

engineering. On the other hand, other studies indicate a specific framework setting for re-engineering, considering the use of re-engineering experience as insurers to implement a re-engineering project and submit plans and action plans along with training and leadership necessary people which lead to competitiveness strategically (Müller & Thoring, 2012).

Strategic competitiveness is the approach in which a firm sets up value-adding processes which aim at lowering the costs of production, improving quality and putting the products and the entire firm on the course of a competitive market (Zhu et al., 2017). Strategic competitiveness is applied when the number of firms producing the same product targets the same market. A good example is the Iraqi markets which target large firms aiming at rebuilding a devastated economy which has been rocked by wars for a few decades (Chiao, 2017).

Considering the tourism industry in Iraq, the country is projecting that it has a large growth in that sector both for religion and cultural tourism. The course of the reshaping process has been applied in most companies in Iraq to attain the quality needs of the challenging market (Hanieh, 2018).

Due to tough competition, application of Six Sigma standards helps in reducing defects in the process hence promoting the strategic competitiveness of businesses. Therefore this research focused on strategic re-engineering as an independent variable which included sub-variables and Six Sigma techniques as a mediation variable and strategic competitiveness as the dependent variable. The research explored the extant literature about tourism in Iraq and the application of Six Sigma in the achievement of desired quality as in the tourism industry. Academic journals and other relevant sources were used.

Strategic Reengineering

Each organization or company is a socially based entity that has both active and coordinated systems and is linked to the external environment. In the past, when the environment was relatively stable more organizations would take advantage of opportunities to ongoing changes starting gradually and then slightly stopping there (Stark, 2015). With the passage of time, the world organizations found that only incremental changes address the current problems. These are not times for the survival of the organization and what is required are changes which will be made to the organization in an essential and fundamental way (Chang, 2016). Revolutionary change is nowadays globally known as reengineering and it is a process whereby the current tasks of the organization are replaced by the core processes of the business, and thus, the organization moves from the task force to the development of the processes followed. This will accelerate the business processes and reduce costs and, consequently, businesses then become more competitive (Stankiewiczv & Moulijn, 2003). In the reengineering approach, the method of doing work in mass production modes and past organizational hierarchy is important for standardization.

The basis for reengineering is its step-by-step investigations and the removal of old rules and fundamental perceptions that underpin current business practices (Scharmer, 2009). Most companies are crammed full with non-binding rules that have been in place since the decades past. These regulations are based on assumptions about technology, and staff and organizational goals that are no longer functional. Reengineering is rethinking fundamental and radical processes to achieve a breakthrough in critical criteria such as the quality and speed of service (Stark, 2015). New organizations will be companies that are specifically designed for exploitation in today's and tomorrow's world and are not institutions that move from a primitive and glorious era that has nothing to do with today. In reengineering, it is believed that reengineering cannot be implemented with small and cautious steps (Chang, 2016), thus boldness and strong spirits are called for.

The strategic reengineering need a cycle between supplier relationship management and analysis strategy with sourcing as it shown in figure 1.

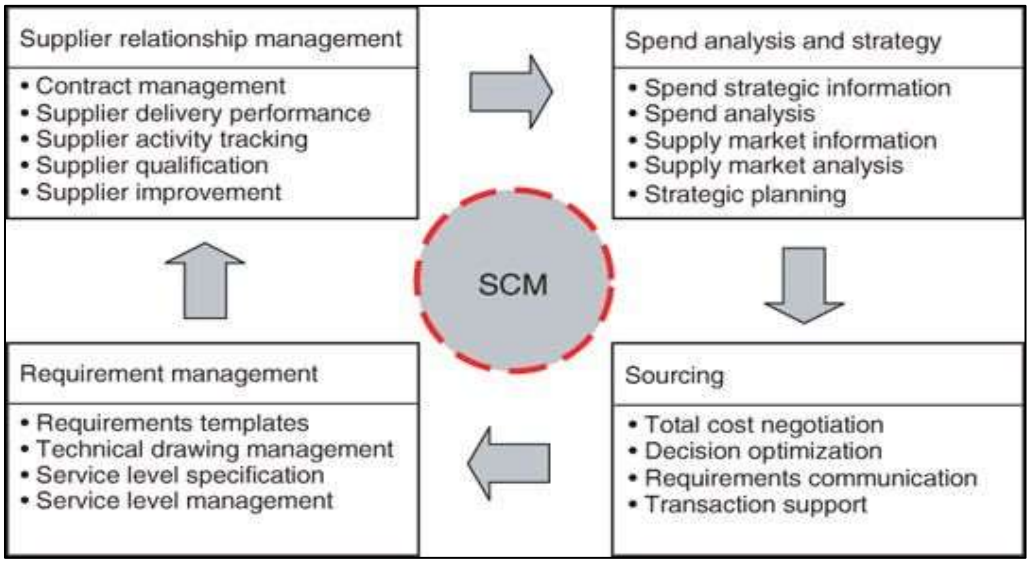

Figure 1. Strategic Reengineering Cycle

The above explanation shows that reengineering usually takes place in the entire structure of an organization or company, and cannot be called a reengineering in only one department of the organization, although it may be possible to reengineer the various work processes of a subset of functions within a given work environment.

According to (Ros et al.,2009) re-engineering methodology consists of five dimensions: Planning, Analysis, Design, Implementation, and then Support, as it shown in figure 2.

Planning

Defining the system, understanding of the customer's voice in line with the needs of the company is the first step in overcoming the problems. At the planning stage problems have been identified as inadequate space and capacity to produce efficiency in accordance with the plan (Kim & Mauborgne, 2014).

Analysis

Re-engineering is based on a preliminary analysis that gives a set of vital points that draw the initial picture of how to make the appropriate decision for subsequent operations. The analysis is done after the planning process that shows the factors to be taken (Mashari & Zairi, 2000), and the analysis can be based on external and internal environmental factors that directly affect the company (Scharmer, 2009). The analysis is based on a scientific methodology whenever it leads to the correct decisions being made.

Design

The methodology is designed for re-engineering based on the results of the analysis conducted, The design must be appropriate with the measures required to bring about the positive changes required. The manufacturing involves processes which need a good design and which eliminate errors. The design influences how the outcome will be useful in the market and meeting the match of the other companies selling the product in the market (Kralisch et al., 2017). Having the system that is well designed invariably serves the purpose of eliminating losses.

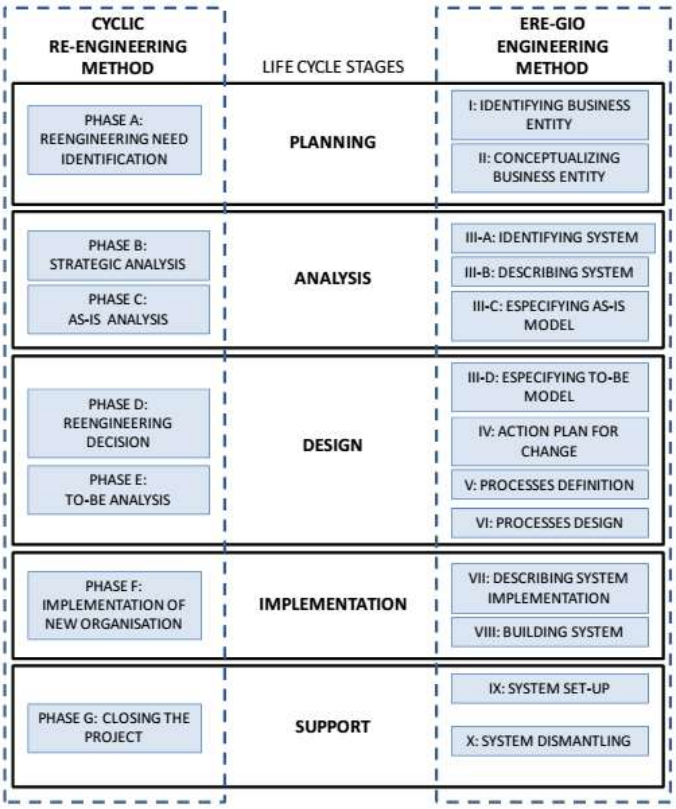

Figure 2. Re-Engineering Methodology

Implementation

The implementation process encompasses the conception of new business strategies and the implementation of change in all its complex technological, human and organizational dimensions, especially continuous improvement, by virtue of its goal of fundamental and radical change rather than iterative improvement (Cummings & Worley, 2014). In order to achieve the key implementation improvements sought by the re-engineering processes, changing organizational variables and other work management methods is often considered inadequate (Newman & Zhao, 2008) in order to be able to reap the fully achievable benefits.

Support

The support comes in two dimensions, the financial support, and control of the manufacturing. The future output is processed in line with quality rules to ensure that any deviations from the target are corrected before a number of defects affect the quality of the entire output (Islam, 2017). The support needed is financial support, which helps in financing the reconstruction of the modern systems in the production of the required output. Also training of employees and expanding market based needs financial support (Yadavet al., 2017).

Six Sigma Techniques

Six Sigma system is adopted for the increased analysis of data and statistics aggregated to identify the defects in the procedures or products, so as to work with the actions form permanently and to try to reduce the proportion of errors to reach the percentage of zero defect wherever possible (Kwak & Anbari,

2006). Six Sigma process or strategy enables enterprises to optimize significantly in terms of their core operations and structure through design, control of daily business activities so as to reduce waste and consumption of sources (time - energy - cost) (Pesic,2009). Six Sigma is a methodology of quality management for companies and tools to improve the capacity of their business operations, these increases or decreases in performance in the different process lead to reduce defects and improve product quality.

Ramphal and Nicolaides (2018) state that Six Sigma then is a process of reducing defects by analyzing the methods and business processes of for example, hotels, which are defective in terms of effectiveness, and then fashioning high quality ideal products and services. Where there are defective processes and services, strategies for change and improvement should be introduced and endorsed, so as to meet and exceed customer needs towards excellence.

For example, quality issues in hospitality can inter-alia arise from poorly trained or un-committed employees, defective equipment, ineffective management within a department, or the organization as a whole. Ethical issues can arise when Six Sigma is implemented and managed. Desired progress cannot be attained unless significant changes are made to the way in which quality improvement is conducted in hotels in an ethical manner (Ramphal & Nicolaides, 2018).

Strategic Competitiveness

We define the competitive advantage as a company's ability to perform better than the industry in which it operates. Customers want goods and services that are cheaper and the best and want to get them faster (Ireland & Hitt, 1999). Competitive advantage is the features and capabilities that enable an organization to maintain its competitive position (Hitt et al., 2012). The competitive advantage is the characteristics or dimensions of any company that enables it to provide better customer service (better value) (Volberda et al., 2011).

“Six Sigma is an ideal quality assurance tool for the hospitality industry as it focuses on prioritizing, recording and efficiently completing processes. Some hotels are using Six Sigma as a means to effectively improve their service provision to guests. However to organize this management theory and integrate it effectively requires training and certification” (Ramphal & Nicolaides, 2018:4).

Material and Methods

Conceptual Framework

Based on the hypothesis, the model is illustrated in Figure 3. Exogenous variables are the Strategic Re-Engineering (SRE), Planning (SRE1), Analysis (SRE2), Design (SRE3), Implementation (SRE4), and Support (SRE5). Endogenous variables are Six Sigma Techniques (SST) and Strategic Competitiveness (SC). At the same time, however, SST act as exogenous variables of SC that serve as endogenous variables. Indicators for the three influencing factors (SRE, SST and SC) are based on the components contained in the three theories applied in the literature.

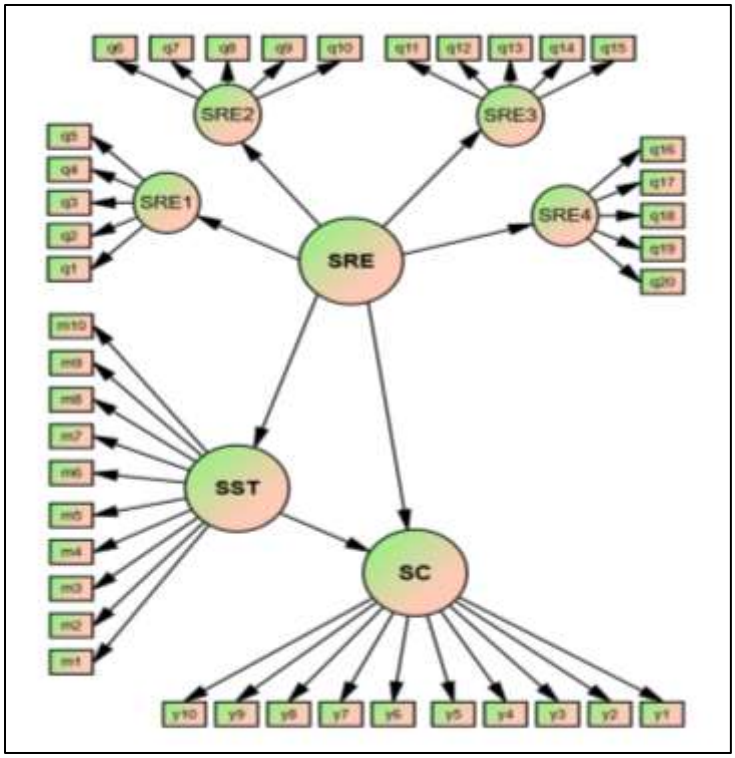

Figure 3. Conceptual Framework

Instrument

This study used a questionnaire developed through the literature study. Five-point Likert scales were used to obtain feedback in terms of perceptions of respondents on the testimonials tested. The development of adapted research instruments from several sources has been identified to measure latent constructs in the conceptual model studied. In this study, constructs of SRE namely SRE1, SRE2, SRE3, SRE4, and SRE5 are measured by 25 indicators. Whereas, the SST construct was measured by 10 indicators and SC construct was measured by 10 indicators . All 45 indicators used for Measuring were tailored to the service industry environment in Iraq. A pilot study was conducted on 30 respondents in the tourism sector. The findings of the structure analysis showed that the instruments were valid, reliable and appropriate.

The population of the study involved workers in tourism companies. For this study, random sampling methods were used. A total of 200 questionnaires were distributed, while a total of 170 questionnaires were returned but only 162 could be used for further analysis after data filtering was carried out. The validation factor analysis of the SRE model, SST measurement model, and SC measurement model was practiced to verify every factor or construct.

After the validity of the measurement model was obtained, the structure model was determined by the causal relationship between the latent variable. The specification of the structural model involved the relationship between the constructs and the other constructs based on the proposed conceptual model such as Figure 3. Analysis of this structural model was done to measure and determine whether the theoretical relationship through the hypothesis formed was supported by the study data obtained. The structural model was carried out using structural equation modeling (SEM) with AMOS version 18 software.

Normality Test

A normal distribution test is one of the most important tests that must be done in order to test the validity of data for statistical analysis, the researcher conducted the test of the normal distribution of data, based on the values of skewness and kurtosis, and in this field most studies indicate that the acceptable values of normal distribution of the values found Between (+ 2, -2) (Raziyeh. & Babak, 2015), A number of other studies indicate that the accepted values are between (-1.96, + 196) depending on the size of the sample and the level of significant. Hence the results are as follows**:**

Table 1 refers to the results of the normal distribution test for SRE , which consists of (25) items distributed in five dimensions. It is clear that the values are within the accepted limits of the normal distribution test based on the values of skewness and kurtosis. Within the accepted limits, hence the data are distributed normally , therefore, it can be adopted in the conduct of statistical analysis.

Table 1. Normality Test for SRE

Variable	min	max	skew	c.r.	kurtosis	c.r.
q25	2.000	5.000	-.460	-1.647	-.509	-.911
q24	1.000	5.000	-.701	-2.510	.714	1.280
q23	1.000	5.000	-.528	-1.891	-.507	-.908
q22	1.000	5.000	-.430	-1.542	-.491	-.879
q21	1.000	5.000	-.606	-2.171	.337	.604
q20	3.000	5.000	.173	.618	-1.563	-2.799
q19	2.000	5.000	-.353	-1.264	-.539	-.966
q18	2.000	5.000	-.328	-1.174	-.581	-1.041
q17	2.000	5.000	-.527	-1.889	-.595	-1.065
q16	2.000	5.000	-.264	-.946	-.930	-1.666
q15	1.000	5.000	-.551	-1.974	-.674	-1.208
q14	1.000	5.000	-.560	-2.008	-.754	-1.351
q13	1.000	5.000	-.166	-.596	-.498	-.893
q12	1.000	4.000	-.425	-1.522	-.783	-1.402
q11	1.000	5.000	-.789	-2.825	-.378	-.678
q10	3.000	5.000	.327	1.172	-1.519	-2.720
q9	2.000	5.000	.134	.479	-.891	-1.596
q8	1.000	5.000	-.552	-1.978	.174	.311
q7	1.000	5.000	-.589	-2.109	-.234	-.419
q6	1.000	5.000	-.530	-1.897	.360	.645
q5	2.000	5.000	-.487	-1.746	-.333	-.597
q4	1.000	5.000	-.285	-1.022	-.846	-1.515
q3	1.000	5.000	-.534	-1.913	-.095	-.170
q2	1.000	5.000	-.826	-2.957	.132	.237
q1	1.000	5.000	-.705	-2.526	.133	.238
Multivariate					271.647	32.438

As for the data of the SST variable ,Table 2 refers to the results of the normal distribution test. It consists of 10 items. It is clear that the values are within acceptable limits for the normal distribution test based on the values of skewness, and kurtosis, which were within acceptable limits, hence the data are distributed naturally and can therefore be adopted in the statistical analysis.

Table 2. Normality Test for SST

Variable	min	max	skew	c.r.	kurtosis	c.r.
m10	2.000	5.000	-.405	-1.451	-1.005	-1.801
m9	2.000	5.000	-.516	-1.848	-1.015	-1.818
m8	1.000	5.000	-.574	-2.056	-.080	-.144
m7	1.000	5.000	-.902	-3.231	.121	.217
m6	1.000	5.000	-1.071	-3.838	1.749	3.133
m5	1.000	5.000	-1.012	-3.626	.740	1.325
m4	1.000	5.000	-.715	-2.561	-.168	-.302
m3	2.000	5.000	-.361	-1.292	.053	.095
m2	1.000	5.000	-.743	-2.662	.863	1.545
m1	1.000	5.000	-.641	-2.295	.797	1.428
Multivariate					41.047	11.625

Regarding SC the data of Table 3 refers to the results of the normal distribution test. It consists of 10 items. It is clear that the values are within acceptable limits for the normal distribution test based on the values of skewness, and kurtosis, which were within acceptable limits, hence the data are distributed naturally and can therefore be adopted in the statistical analysis.

Table 3. Normality Test for SC

Variable	min	max	skew	c.r.	kurtosis	c.r.
y10	3.000	5.000	.327	1.172	-1.519	-2.720
y9	2.000	5.000	.134	.479	-.891	-1.596
y8	1.000	5.000	-.552	-1.978	.174	.311
y7	1.000	5.000	-.589	-2.109	-.234	-.419
y6	1.000	5.000	-.530	-1.897	.360	.645
y5	2.000	5.000	-.487	-1.746	-.333	-.597
y4	1.000	5.000	-.285	-1.022	-.846	-1.515
y3	1.000	5.000	-.534	-1.913	-.095	-.170
y2	1.000	5.000	-.826	-2.957	.132	.237
y1	1.000	5.000	-.705	-2.526	.133	.238
Multivariate					24.853	7.039

Results

The data obtained from respondents which have been subjected to pre-assessment tests and are suitable for use in further analysis. To answer the hypothesis of H1, the correlation test shows a significant positive relationship between SRE and SC ,the value of the correlation coefficient is (0.737) with ($p<0.05$), also the sub-dimensions of SRE (SRE1, SRE2, SRE3, SRE4, SRE5) have a significant positive relationship with SC the value of the correlation coefficient are (0.341, 0.357, 0.769, 0.588, 0.553) respectively . Based on Table 4. the strength of the relationship is moderate ie with reference to the value made by (Cohen & Pallant, 2005; Hood et al., 2014) . The relationship between SRE and SC is positive and shows that any improvement in SRE can improve the SC.

Furthermore, To answer the hypothesis of H2, the correlation test shows a significant positive relationship between SRE and SST ,the value of the correlation coefficient is (0.693) with (p<0.05), also the sub-dimensions of SRE (SRE1, SRE2, SRE3, SRE4, SRE5) have a significant positive relationship with SST the value of the correlation coefficient are (0.280, 0.328, 0.711, 0.602, 0.533) respectively. Based on Table 4. the strength of the relationship is moderate. The relationship between SRE and SST is positive and shows that any improvement in SRE can improve the SST. Finally, To answer the hypothesis of H3, the correlation test shows a significant positive relationship between SST and SC ,the value of the correlation coefficient is (0.818) with (p<0.05), Based on Table 4 the strength of the relationship is moderate. The relationship between SST and SC is positive and shows that any improvement in SST can improve the SC.

Table 4. Multiple Relation Between Variables

	SRE1	SRE2	SRE3	SRE4	SRE5	SRE	SST	SC
SRE1	1	.582**	.447**	.164*	.353**	.696**	.280**	.341**
		.000	.000	.048	.000	.000	.001	.000
SRE2	.582**	1	.372**	.256**	.347**	.690**	.328**	.357**
	.000		.000	.002	.000	.000	.000	.000
SRE3	.447**	.372**	1	.487**	.474**	.795**	.711**	.769**
	.000	.000		.000	.000	.000	.000	.000
SRE4	.164*	.256**	.487**	1	.526**	.681**	.602**	.588**
	.048	.002	.000		.000	.000	.000	.000
SRE5	.353**	.347**	.474**	.526**	1	.744**	.533**	.553**
	.000	.000	.000	.000		.000	.000	.000
SRE	.696**	.690**	.795**	.681**	.744**	1	.693**	.737**
	.000	.000	.000	.000	.000		.000	.000
SST	.280**	.328**	.711**	.602**	.533**	.693**	1	.818**
	.001	.000	.000	.000	.000	.000		.000
SC	.341**	.357**	.769**	.588**	.553**	.737**	.818**	1
	.000	.000	.000	.000	.000	.000	.000	

By following the results of the regression analysis, the results in Table 5 indicate that there is a direct effect of the variable SRE on SC , that the value of the effect was (0.831) and this value is significant depending on the value of the level of significance which recorded (<0.05), In addition to the value of the (F) statistic which scored a high reading, these results prove the verification of H4. Furthermore , the result indicates that there is a direct effect of the variable SST on SC , that the value of the effect was (0.889) and this value is significant depending on the value of the level of significance which recorded (< 0.05), In addition to the value of the (F) statistic which scored a high reading, these results prove the verification of H5.

Table 5. Regression Analysis Result

Model		B	Std. Error	Beta	t	F	R2	Sig.
1	(Constant)	.736	.280		2.630	170.15	0.543	.009
	SST	.831	.064	.737	13.040			.000
2	(Constant)	.461	.231		1.996	218.22	0.669	.048
	SRE	.889	.052	.818	17.007			.000

a. Dependent Variable: SC

For H6 hypothesis testing, mediation testing requirements suggested by Hair et al., (2009) and Khudair et al., (2019) have been followed. Multiple regression tests were conducted to see the effect of SST in the relationship between SRE and the SC . Test series and test results can be referred to in Figure 4.

The results in line with the recommendations by Hair et al., (2009) and Hadrawi (2018). The test results found that SST had acted as a mediating variable in the relationship between SRE and SC. The effect of mediation is seen as full mediation. The tests cannot demonstrate the stage of direct effect.

The Sobel test shows the direct impact of SRE on the SC is at a score of - 0.09 or -9%. And the direct effect of SST on SC is 0.55 or 55 % . When mediators are involved in relationships between SRE and SC, the impact of SRE on SC has changed into indirect effects. This effect has been seen at the score of 0.374 . The value of the indirect effect was greater than the direct effect also the direct effect was negative and not significant. Therefore, based on two types of tests that have been carried out, there are completely mediation effect between variables and the H6 hypothesis is accepted.

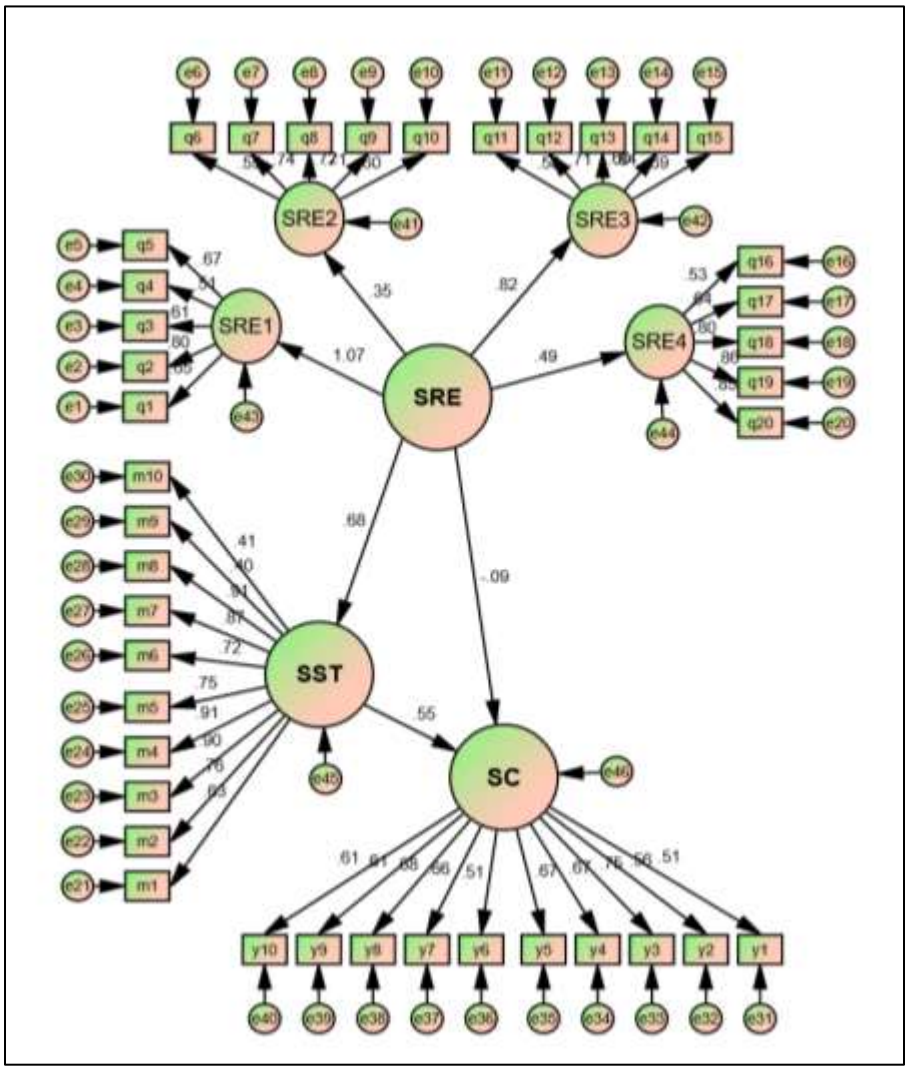

Figure 4. Structural Model for Mediation Effect

Discussion

The pace of innovation and change in the products and services of the communities has accelerated to the point that they have acquired the ability to select and purchase many products and services from customers so that many products do not last for more than a few months. The rapid change in services and goods and the globalization of the economy have had an impact on all kinds of economic institutions, affecting the behavior and culture of all people. Societies and organizations that have not coordinated these changes with each other feel they are lagging behind and economic firms will be destroyed. Competition in leading organizations and companies is so fast and accelerating that it is impossible to imagine that it will become somewhat impossible.

Sophisticated global organizations must have the ability to adapt to the ongoing transformations of the organization to the peaks of success (Stankiewiczv & Moulijn, 2003). Today, we need organizations that are constantly rebuilding themselves, discovering themselves, and reinvigorating them themselves. These organizations are the ones that have undergone re-engineering, that is, organizations that are keen to change It has changed in a certain way, it is clear that, in the face of changes, the approach, that worked well in the past, it will not work in the future at all and will not take on its responsibilities. Reengineering means starting again, being to an extent reborn, or re-starting. Reengineering means transformation, change in mind, mindset, and the attitudes of managers and employees, in cultures and value systems, in processes, in structure and organization, and in the way of using information and communication technology in organizations (Stark, 2015). In reengineering, the root design of the processes, organization, and culture of a company to achieve extraordinary mutation takes on the company's performance, eliminating old and traditional practices, and adopting a new approach to creating an appropriate product or service, as well as giving value to the customer. In reengineering, the goal is to achieve today's needs such as superior quality, service, flexibility, and low costs, and should, therefore, simplify processes (Chang, 2016) .

The present age is in a way that is subject to rapid and constant changes, and these changes also affect the behavior and needs of customers. Therefore, organizations also need to analyze these changes and their impact on the customer, and in the process of activities apply themselves (Norris et al.,2013). Six Sigma methodology helps in understanding and managing user needs and adopting precision in data analysis to reduce process flaws, rapid development and further improvement of the management process, minimize effort and maximize user satisfaction (Cima et al.,2011). This contributes to improved competitiveness and boosts sustainability.

Conclusion

This study aimed to identify how to use Six Sigma techniques as a mediator variable between strategic re-engineering and strategic competitiveness. The results proved that the re-engineering effect on strategic competitiveness is weak and negative, and that the effect is positive and high when adopting Six Sigma technique as a mediator variable. the process of planning, analyzing designing and supporting the implemented process aims at making the competitiveness achievable. Six Sigma then strives for quality that is almost perfect by using a set of quality management methods, that promote quality excellence. Its approach is primarily empirical, and statistical methods are used. The approach creates a distinct infrastructure of employees who are experts in the methodology (Ramphal & Nicolaides, 2018).

The competitiveness of the market is based on the realization of the outcomes that aims at the development of the system for the greater good of the country. The re-engineering process begins with proper service quality, good management practices and the reduction of errors in the tourism companies

and its effect will be high when adopting Six Sigma as a mediator variable. Six Sigma emphasizes that the less there is nonconformity from the mean the better.

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