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Emotional Intelligence, Leadership, Governance and Management Strategy: Key Drivers of Business Sustainability in Engineering Services

Marirajan Murugan [1,*] and M.N.Prabadevi [1]

[1] Faculty of Management, SRM Institute of Science and Technology, Vadapalani Campus, Chennai 600026, India.

* **Corresponding author:** mm0589@srmist.edu.in.

ABSTRACT: *Purpose:* The paper deals with plant engineering services based on global engineering standards and it aim to meet the project budget and timeline by minimizing unproductive hours, obtaining design inputs for the design and procurement, compromising quality and sharing resources. This research paper aims to explore the business sustainability of engineering service companies in the Gulf Cooperation Council (GCC) countries. *Design and methodology:* In order to gather information for this research, researchers have gathered data from one hundred and fifty-two respondents from engineering services companies that have received approval to provide engineering services to oil and gas operating companies across the Gulf Cooperation Council (GCC). Researchers have then used XLSTAT version 2024.2.2 to analyze the data. *Findings:* Researchers found a strong correlation between an entrepreneur's emotional intelligence, leadership abilities, governance, and management strategy and the business sustainability of their organization. *Research, Practical & Social Implications:* According to researchers, the primary aspect contributing to the sustainability of the engineering services industry, is resource use. Building solid business relationships requires emotional intelligence on the part of entrepreneurs, and the sustainability of the company is largely dependent on how these relationships are managed. In order to improve their management strategy-based business sustainability, entrepreneurs require high emotional intelligence and strong leadership abilities. Main limitation of this study is, the study focuses only in GCC countries. *Originality/Value:* To the best of the author's knowledge, this study, which focuses on emotional intelligence, leadership abilities, governance, and management strategy, may be the first to look into the business sustainability of engineering service companies.

Keywords: business sustainability, emotional intelligence, leadership, governance, management strategy.

I. INTRODUCTION

Engineering services are classified into various project stage gate concepts. Plant engineering services can be stated as a four-stage processes in the Stage Gate processes. The following are some of the industry-generated stages for plant engineering services:

- Stage-1: Concepts, Front End Loading-1, Front End Desig-1, Initiate and Identity,
- Stage-2: Options, Front End Loading-2, Front End Design-2, Feasibility, Optimize, Select and Facility Planning,
- Stage-3: Advance, Front End Loading-3, Front End Design-3, Front End Engineering,
- Design, Define and Project Planning,
- Stage-4: Detail Engineering Design, Engineering for Procurement support.

Engineering services include the areas of Process, Flow Assurance, Health safety environment (HSE), Loss prevention, Material and Corrosion, mechanical (static & rotating), piping, pipelines, Heating, ventilation and air conditioning (HVAC), electrical, instrumentation & control, Telecom, Civil & Structural engineering, Quality, Smart plant administrators, Modelers, Designers and Draftsman. In order to execute plant engineering services, typical execution management strategy is highlighted with the following features:

- Governance,

- Management Strategy,
- Health, Safety, Security and Environment excellence,
- Risk management,
- Design reviews, Health, Safety and Environment Studies and workshops,
- Smart plant systems and software's,
- Optimum workshare delivering value and quality,
- Emotional intelligence, collaborative, and cooperative,
- Provision of high quality, experienced personnel.

Plant engineering service providers across GCC countries have been facing the business sustainability issues due to lags in the above management strategy and governance. According to researchers [1], long term business sustainability can be achieved through digital transformation and researchers have not explored emotional intelligence. According to researchers [4], good governance from leaders will improve Company's sustainable performance.

Engineering service consultants are having monopoly and less competition in some countries among GCC countries and results more profit through the reduction of resources, materials, quality, energy and infrastructure and facilities to have business sustainability at maximum level and these have been mitigated through emotional intelligence, governance, management strategy, leadership skills. Schedule compliance against the delivery and quality are the prime factors for any engineering consultant to justify during their design period and those will be returned as the repeated orders from the client as per their observations and satisfaction based on the feedback during the period.

Agile leaders to be able to create a performance-enhancing culture in their organizations, emotional intelligence skills are required, but they also need to raise the consciousness of their ideals to develop a culture that is ethical, compassionate, and sustainable. The entire value chain of plant engineering services is impacted by the optimization of engineering services for plant design, not only the immediate client. Because items can be created more sustainably and the industry as a whole can operate more sustainably if plants are constructed efficiently or modernized in accordance with the most recent requirements. Reduction in energy, resources, raw material, and material efficiency are the main goals; however, supply chain management optimization and comprehensive collaboration with the whole value chain are also important. Innovative technology and solutions [1] are available from the global engineering sector catering to the oil and gas industry. In order to thrive in their organizations, modern managers and leaders must possess the essential attributes of acquiring knowledge, collaborating effectively, and fostering constructive relationships both within themselves and with others. Additionally, they face fierce competition and significant pressure [6]. In order to ensure the long-term viability and expansion of a company, entrepreneurs employ many strategies to develop sustainable business models. The actual and professed attitudes and behaviours of entrepreneurs towards sustainable business strategies exhibit variability [13]. To improve business sustainability, researchers have utilized emotional intelligence, leadership skills, governance and management strategy. Entrepreneur's characteristics, management strategy, emotional intelligence and governance plays a major role to fill the gaps to attain business sustainability. While mitigating these, entrepreneur's emotional intelligence have to be used extensively to have better relationship between clients, contractors and vendors without affecting plant service providers intention.

This paper aims to examine the plant engineering services providers and their business sustainability in GCC countries. Researchers reviewed the extensive literature review and identified critical factors which have been mostly driven to achieve business sustainability. Furthermore, a well-structured questionnaire and interviews were conducted to collect the responses from one hundred and fifty-two respondents from engineering service industry. Researchers used stratified sampling to collect the data from respondents. The statistical tool used in this study is XLSTAT and Jamovi and data was analysed through descriptive statistics, Reliability analysis, independent samples t-test and one way ANOVA, correlation and Regression. Researchers found that regression model is fit strongly and analysed and observed that the highest correlation coefficient shows the strength and high impact relationship between business sustainability and management strategy and governance rather emotional intelligence and leadership skills are having lower impact positive relationships with business sustainability. Researchers recommend that government to increase the competition of engineering services consultants to have more timely delivery, value added services with quality, improve emotional intelligence, leadership skills and client satisfaction. Gulf Cooperation Council (GCC) countries plant engineering service providers emotional intelligence, governance, management strategy, leadership skills and business sustainability were not evaluated before and it added value in engineering service industry to mitigate their gaps to have long term sustainability.

- What is the impact of governance and management strategy on Business sustainability?

- What is the impact of emotional intelligence and leadership skills on Business sustainability?
- What would be the mitigation of retaining the business sustainability to overcome the issues?

II. LITERATURE REVIEW

The literature review identified twenty-five variables for business sustainability and it thrust through emotional intelligence, leadership skills, governance and management strategy. The literature review identified twenty-five variables for business sustainability and it thrust through emotional intelligence, leadership skills, governance and management strategy. Detailed reviews and in-depth interviews were conducted for the derived variables.

Researchers have extensively reviewed and brought the following specific to governance, management strategy, business sustainability, entrepreneur's emotional intelligence and management strategy.

1. GOVERNANCE AND MANAGEMENT STRATEGY

Management of companies will have a better understanding on the crucial roles of Good Corporate Governance characteristics in improving corporate sustainability [4]. For sustainable businesses for a family owned shall have Family values and succession planning; Stakeholder relations and communication, Risk taking, Inventions, and Technologies and Entrepreneurship and Intrapreneurship [9]. Management to identify and overcome social dilemmas within value networks, i.e. to form and reform relevant business relationships, thus creating and tapping second-order win-win-win potentials through sustainable business model innovation [10]. The sustainable strategic model integrates the theoretical approaches of strategic management, the triple bottom line, and the balanced scorecard to meet the economic, social and environmental challenges of a sustainable management model [14]. Businesses are central actors in any social transition towards sustainability [17]. Researchers observed that management strategies and drivers for sustainable business model includes innovations from a different point of view, corporate social responsibilities, environmental management and investigating cleaner production [24].

2. BUSINESS SUSTAINABILITY

According to researchers [1], long term business sustainability can be achieved through digital transformation and researchers have not explored emotional intelligence. According to researchers [4], good governance from leaders will improve Company's sustainable performance. Companies' management will get a more comprehensive awareness of the vital importance of good business Governance features in enhancing business sustainability. Leadership skills, management strategy and governance concepts were explained with concept linkage through contribution and its barriers to achieve business sustainability and researchers utilized Triple bottom line theory for the concept's linkage. In order for a family-owned business to be sustainable, it should prioritize family values and succession planning, maintain good relationships with stakeholders and communicate effectively, be willing to take risks, embrace innovation and technology, and foster both entrepreneurship and intrapreneurship [9]. Management aims to recognize and resolve social challenges that arise inside value networks. This involves establishing and adjusting company partnerships in order to generate and exploit second-order win-win-win opportunities through sustainable business model innovation [10]. The sustainable strategic model incorporates the theoretical frameworks of strategic management, the triple bottom line, and the balanced scorecard to address the economic, social, and environmental concerns of a sustainable management model [14]. Businesses play a crucial role in driving social progress towards sustainability [17]. The researchers noted that sustainable business models are influenced by various factors, such as innovative perspectives, corporate social responsibilities, environmental management, and the exploration of cleaner manufacturing [24].

3. ENTREPRENEUR'S EMOTIONAL INTELLIGENCE AND LEADERSHIP SKILLS

Research on emotions and leadership highlights the need of utilizing emotions intelligently for effective leadership [2]. Insufficient implementation of effective talent management practices hinders the development and cultivation of strong leadership skills. This has a substantial impact on human resource practitioners, consultants, and policymakers, as it enhances their understanding of talent management and its influence on leadership abilities. The user's text is "[3]." In order to achieve positive outcomes in personal and professional well-being, as well as team effectiveness, a leader must gradually and hierarchically develop and embrace emotional intelligence [6]. According to research, both happy and negative emotions can play a crucial role in driving beneficial changes within collaborative groups [8]. According to research, sustainable leaders have a significant positive impact on sustainable performance through the process of learning, particularly when there is a high level of psychological empowerment [11]. Managers can utilize the connections between various leadership styles, types of organizational performance,

and the discovered mechanisms and conditional elements to inform the leader's decision-making process [12]. The researchers conducted an observation on the connection between entrepreneurial leadership and established management theories, including the resource-based view theory, the dynamic capabilities theory, and the social learning theory. They also examined how these connections affect sustainable development [15]. Emotional intelligence and digital intelligence are indivisible entities [19]. Acquiring new leadership capabilities necessitates either improving current skill sets or acquiring new ones to effectively address future issues. This will facilitate the flourishing of organizations, rather than only ensuring their survival [21]. The concept of sustainability leadership is becoming recognized as a new type of leadership that can effectively address major social challenges by including ethical values, systems thinking, mindfulness, reflective practice, reflexivity, and resilience [22]. An individual's ability to prepare themselves psychologically and emotionally for work is as crucial to the success of any project, much like team cohesion [23].

III. PROBLEM STATEMENT

Plant engineering service providers shall have highest quality of design and deliver in the scheduled time period. Entrepreneur's shall use effective management strategy, leadership skills, emotional intelligence and governance to make this happen. There are gaps within the plant engineering service providers, which have to be mitigated. Leadership characteristics encompass the collective nature and various factors that influence it, including the attitudes, behaviors, and roles of managers, as well as the traits of players in the leadership process and the connection between these participants and managers [25]. The purpose of this paper to examine the plant engineering services providers and their business sustainability in GCC countries. Researchers reviewed the extensive literature review and identified critical factors which have been mostly driven to achieve business sustainability.

IV. DATA COLLECTION

The data were collected from plant engineering service leaders from GCC countries through a well-designed questionnaire based on questions raised, and various interviews and out of which, researchers verified the completeness of the data and considered one hundred and fifty-two respondent's data for data analysis.

V. RESEARCH METHODOLOGY

The researchers employed descriptive research studies for their investigation. A well-designed questionnaire (Refer appendix-1) was developed and produced by the researchers based on the key gaps from literature review, and interviews were undertaken for validation to gather data from one hundred and fifty-two respondents who were entrepreneurs. Stratified sampling technique was used to segregate between engineering service providers characteristics and their services. Fig-1 shows the business sustainability through Plan, Do, Check and Act proposed model in the engineering service industry.

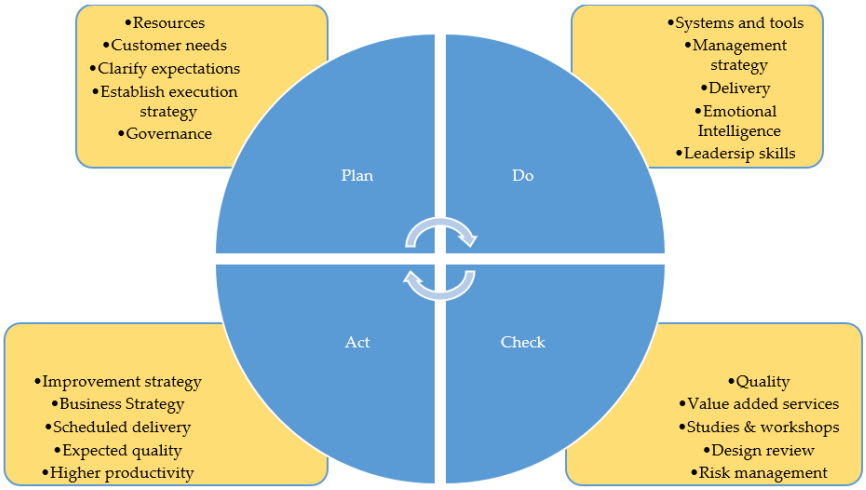

FIGURE 1. Business sustainability (originality: by author).

The researchers employed stratified sampling to get data from the participants. The study employed the statistical software XLSTAT version 2024.2.2 to analyze the data using descriptive statistics, reliability analysis, and correlation.

The following hypothesis was developed based on the earlier researchers and extensive literature reviews described in section 9.0.

- H1: Business sustainability has higher positive impact of relationship with emotional intelligence, leadership skills, governance and management strategy.
- H2: Business sustainability has lower positive impact of relationship with emotional intelligence, leadership skills, governance and management strategy.

VI. PROPOSED WORK (MODEL)

This study article seeks to elucidate the concept of corporate sustainability by examining the role of emotional intelligence, leadership abilities, governance, and management strategy. Figure 2 depicts the suggested approach for achieving corporate sustainability, which is driven by emotional intelligence, leadership skills, governance, and management strategy.

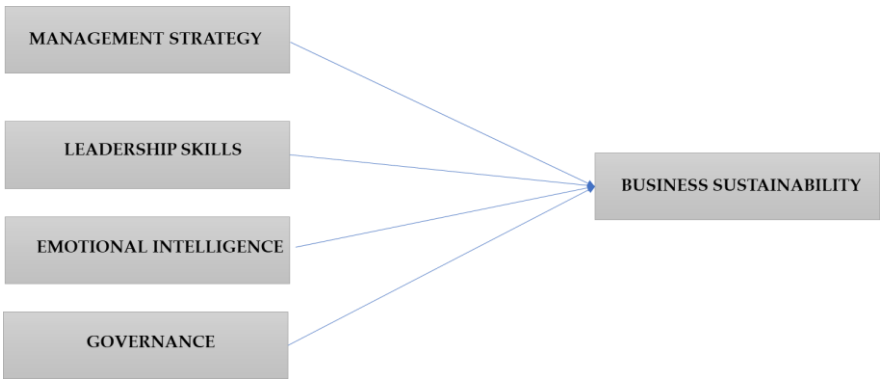

FIGURE 2. Proposed work (model) for Business sustainability through emotional intelligence, leadership skills, governance and management strategy.

VII. DATA ANALYSIS

Data was analyzed through XLSTAT version 2024.2.2. Researchers have validated the data and analysis the data through descriptive statistics, Reliability analysis and correlation analysis to check the relationship between emotional intelligence, governance, management strategy, leadership skills and business sustainability.

VIII. RESULTS and DISCUSSION

Researchers have collected one hundred and fifty-two responses from plant engineering service providers and Entrepreneur's respondent's statistics are given below in below Table-1a.

Table 1a. Statistics – respondents.

	N	Missing	Mean	Median	SD	Minimum	Maximum
Country	152	0	3.44	3.00	1.46	1	6

The average of all variables exceeds 3 in table-1a, the midpoint of the 5-point Likert scale, indicating that the majority of questioned entrepreneurs exhibit a positive disposition towards the factors. The scores for entrepreneurial emotional intelligence and leadership styles are notably elevated, signifying the respondents' substantial emotional engagement and strategic orientation in company. These findings align with previous research that identified emotional factors and self-directed learning approaches as essential in entrepreneurial endeavours. The mean score for emotional intelligence is just below the midpoint yet still indicates a considerable

degree of emotional transfer throughout the surveyed firms. This outcome substantiates the assertion by Barsade and Gibson (2007) that emotions significantly impact organizational management.

Table 1b. Socio-demographic details of the respondents – (n=152), Frequency Statistics – Gender.

Gender	Counts	% of Total	Cumulative %
Male	131	86.2 %	86.2 %
Female	21	13.8 %	100.0 %

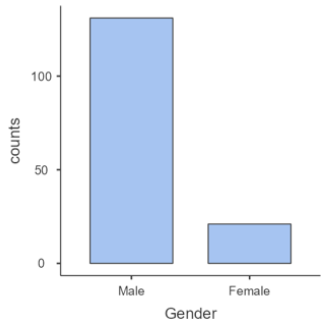

FIGURE 3. Gender frequency.

Table 2. Group descriptives

	Group	N	Mean	Median	SD	SE
BSTotal	Male	131	21.6	20.0	2.19	0.192
	Female	21	21.0	20.0	1.936	0.422
EITotal	Male	131	22.7	25.0	2.72	0.238
	Female	21	19.9	21.0	4.625	1.009
LSTotal	Male	131	24.1	25.0	2.02	0.176
	Female	21	23.7	25.0	2.630	0.574
GNTotal	Male	131	20.6	20.0	3.01	0.263
	Female	21	20.6	20.0	1.499	0.327
MSTotal	Male	131	20.6	20.0	1.49	0.130
	Female	21	20.3	20.0	0.717	0.156

From the above Table-1b and Figure 3, it is clear that of the one hundred and thirty one respondents, 131(86.2%) were male respondents, and 21 (13.8%) were female respondents. Table 2 shows the mean value between the factors and variables exceeds 3.44 in the 5-point Likert scale against the questionnaire.

Table 3. Age group frequency.

Age group	Counts	% of Total	Cumulative %
20-30	39	25.7 %	25.7 %
30-40	60	39.5 %	65.1 %
40-50	44	28.9 %	94.1 %
50-60	4	2.6 %	96.7 %

Age group	Counts	% of Total	Cumulative %
60 and above	5	3.3 %	100.0 %

FIGURE 4. Age group frequency.

From the above Table 3 and Figure 4, it is clear that of the 152 respondents, 39(25.7%) entrepreneurs were in the age group of 20-30, 60(39.5%) entrepreneurs were in the age group of 30-40, 44(28.9%) entrepreneurs were in the age group of 40-50, 4(2.6%) entrepreneurs were in the age group of 50-60 and 5 (3.3%) entrepreneurs were in the age group of 60 and above.

Table 4. Education frequency.

Education	Counts	% of Total	Cumulative %
Diploma	69	45.4 %	45.4 %
Graduate	53	34.9 %	80.3 %
Post Graduate	30	19.7 %	100.0 %

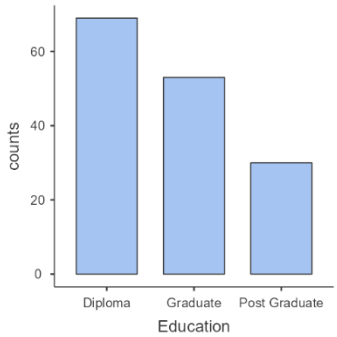

FIGURE 5. Education frequency.

From the above Table 4 and Figure 5, Among 152 agile leaders, 45.4% were diploma, 34.9% were graduates and 19.7% were post graduates.

Table 5. Country frequency.

Country	Counts	% of Total	Cumulative %
Bahrain	9	5.9 %	5.9 %
UAE	38	25.0 %	30.9 %
Saudi Arabia	41	27.0 %	57.9 %
Oman	24	15.8 %	73.7 %
Kuwait	21	13.8 %	87.5 %
Qatar	19	12.5 %	100.0 %

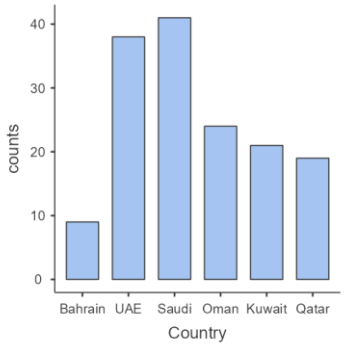

FIGURE 6. Country frequency.

Refer above Table 5 and Figure 6, among 152 entrepreneurs' responses from GCC countries we have observed that 5.9% entrepreneurs from Bahrain, 25% entrepreneurs from UAE, 27% from Saudi Arabia, 15.8% from Oman, 13.8% from Kuwait and 12.5% from Qatar have participated for this study.

1. RELIABILITY TEST

Reliability test was conducted to check internal consistency between the variables and the acquired value exceeds 0.8, indicating that the scale's internal consistency is exceptional and very valid. Table 6 shows the reliability test results.

Table 6. Reliability test.

Scale Reliability Statistics	
	Cronbach's α
scale	0.892

2. INDEPENDENT SAMPLES T-TEST

Table 7. Independent samples T-Test.

	Statistic		df	p
BSTotal	1.0936	[a]	150	0.276
EITotal	3.8438	[a]	150	< .001
LSTotal	0.7922		150	0.430
GNTotal	0.0580	[a]	150	0.954
MSTotal	0.9319	[a]	150	0.353

Note. H_a $\mu_{Male} \neq \mu_{Female}$

[a] Levene's test is significant ($p < .05$), suggesting a violation of the assumption of equal variances

The above Table 7 shows the independent sample t-test between gender of respondents and Emotional Intelligence, Leadership skills, Governance, Management strategy and business sustainability is shown in the table above. The t-test is used to see if there is a difference between two independent groups' means. There is no significance difference between male and female entrepreneurs with regard to factors, since P value is greater than 0.05. Hence the null hypothesis is accepted and gender doesn't have any difference in achieving the business sustainability except emotional intelligence. There is significance difference between male and female entrepreneurs with regard to emotional intelligence for achieving business sustainability, since P value is less than 0.05. Hence the null hypothesis is rejected.

3. TEST OF HOMOGENEITY OF VARIANCES

Table 8. Homogeneity of variances test.

	F	df1	df2	p
BSTotal	4.37	4	147	0.002
EITotal	4.70	4	147	0.001
LSTotal	1.57	4	147	0.185
GNTotal	6.27	4	147	< .001
MSTotal	17.01	4	147	< .001

The above table (Refer Table 8), the assumption's validity and the question of whether the homogeneity of the variable violated depend on homogeneity of variance and there will not be greater probability of falsely rejecting the null hypothesis. For Leadership skills, we will go with the status quo and reject the alternative and we have met the assumption of homogeneity of variance and further to this, we have conducted one way ANOVA.

4. ONE WAY ANALYSIS OF VARIANCE (ANOVA)

Overall, the model appears to be highly significant, indicating that the predictors collectively have a substantial influence on the dependent variable.

Table 9. ANOVA – Group statistics.

	Age group	N	Mean	SD	SE
BSTotal	20-30	39	21.4	2.021	0.324
	30-40	60	21.3	2.119	0.274
	40-50	44	21.3	2.057	0.310
	50-60	4	23.8	2.500	1.250
	60 & above	5	25.0	0.000	0.000
EITotal	20-30	39	23.2	2.787	0.446
	30-40	60	22.5	3.223	0.416
	40-50	44	20.9	3.026	0.456
	50-60	4	22.5	5.000	2.500
	60 & above	5	25.0	0.000	0.000
LSTotal	20-30	39	23.9	1.869	0.299
	30-40	60	24.1	2.266	0.293
	40-50	44	24.0	2.205	0.332
	50-60	4	23.8	2.500	1.250
	60 & above	5	25.0	0.000	0.000
GNTotal	20-30	39	20.7	1.562	0.250
	30-40	60	20.8	2.595	0.335
	40-50	44	19.5	3.481	0.525
	50-60	4	23.8	2.500	1.250
	60 & above	5	25.0	0.000	0.000

	Age group	N	Mean	SD	SE
MSTotal	20-30	39	20.4	0.818	0.131
	30-40	60	20.1	0.873	0.113
	40-50	44	20.8	1.651	0.249
	50-60	4	22.5	2.887	1.443
	60 & above	5	23.0	2.739	1.225

Table 10. One way ANOVA (Fishers).

	F	df1	df2	p
BSTotal	5.034	4	147	< .001
EITotal	4.051	4	147	0.004
LSTotal	0.341	4	147	0.850
GNTotal	6.825	4	147	< .001
MSTotal	8.948	4	147	< .001

From the above Table 10, the one-way ANOVA result between the demographic profile of the respondents age group and Emotional intelligence, Leadership skills, Governance, Management strategy and Business sustainability is shown in the table above. To see if respondents' opinions on factors differed by age group, a one-way ANOVA was performed. From the above Table 10, since P value is less than 0.05, hypothesis is rejected at 5% level with regard to Factors. The table indicates that there is a considerable variance in respondents' opinions and their decisions on Emotional intelligence, Leadership skills, Governance, Management strategy and Business sustainability based on their age group except leader skills. There is no significance difference between age group and leadership skills to achieve business sustainability, since p value is greater than 0.05 at 5% significance level.

5. KARL PEARSON CORRELATION

Researchers have opted Karl Pearson correlation to analyze the relationship impact between the factors and how it relates to business sustainability. The Figure 7 below shows that Entrepreneur's Business Sustainability, Emotional Intelligence, Leadership Skills, Governance and Management Strategy shows strong cor relation and are positively correlated. Below diagram shows correlation map and the dark green colour shows the strong and positive relationship and light colour shows the less and positive relationship between the factors.

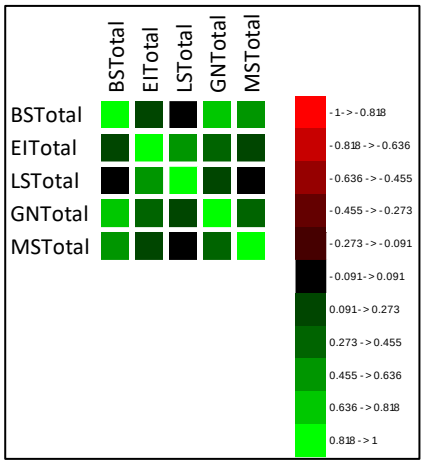

FIGURE 7. Correlation map: Entrepreneur's Business Sustainability, Emotional Intelligence, Leadership Skills, Governance and Management Strategy.

Table 11 shows the highest correlation coefficient shows the strength and relationship between business sustainability and emotional intelligence, Management strategy and governance, thus, proposed hypothesis(H1) is accepted. Entrepreneur's emotional intelligence improves business sustainability. However, the correlation coefficient between Leadership skills and management strategy, governance and business sustainability are lower, which have to be improved, since engineering service providers have to improve management strategy to mitigate the corporate goals for good quality deliverables and deliverables in scheduled time. And correlation coefficient between governance and leadership skills is much lower, which shows entrepreneur's governance needs to be improved a lot in many engineering service providers to meet the client's satisfaction and requirements.

6. CORRELATION MATRIX (PEARSON)

Table 11. Correlation matrix.

Variables	BSTotal	EITotal	LSTotal	GNTotal	MSTotal
BSTotal	**1**	0.271	0.080	0.799	0.572
EITotal	0.271	**1**	0.483	0.431	0.171
LSTotal	0.080	0.483	**1**	0.116	0.074
GNTotal	0.799	0.431	0.116	**1**	0.430
MSTotal	0.572	0.171	0.074	0.430	**1**

Furthermore, Table 11 shows the correlation values are found to be significant. The correlation coefficient between Business sustainability and governance is 0.799 (0.7992 = 0.638), with 63.8% positive relationships between Business sustainability and emotional intelligence. The correlation coefficient between Business sustainability and Management strategy is 0.572 (0.5722 = 0.327), with 32.7% positive relationships between Business sustainability and Management strategy. The correlation coefficient between Business sustainability and emotional intelligence 0.271 (0.2712 = 0.073), with 7.3% positive relationships between Business sustainability and emotional intelligence. The correlation coefficient between emotional intelligence and leadership skills is 0.483 (0.4832 = 0.233), with 23.3% positive relationships between emotional intelligence and leadership skills. The correlation coefficient between emotional Intelligence and governance is 0.431 (0.4312 = 0.185), with 18.5% positive relationships between emotional intelligence and governance.

Figure 8 shows darker colour shows the strong and positive relationships between business sustainability and governance. Lighter colour shows the less and positive relationships between business sustainability and leadership skills.

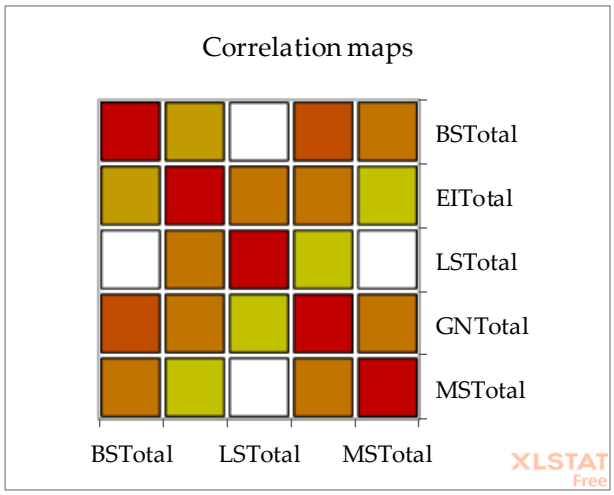

FIGURE 8. Correlation matrix

Scatter plots that data points have positive relationships and the patter trending upwards from left to right and it shows relationship between the factors.

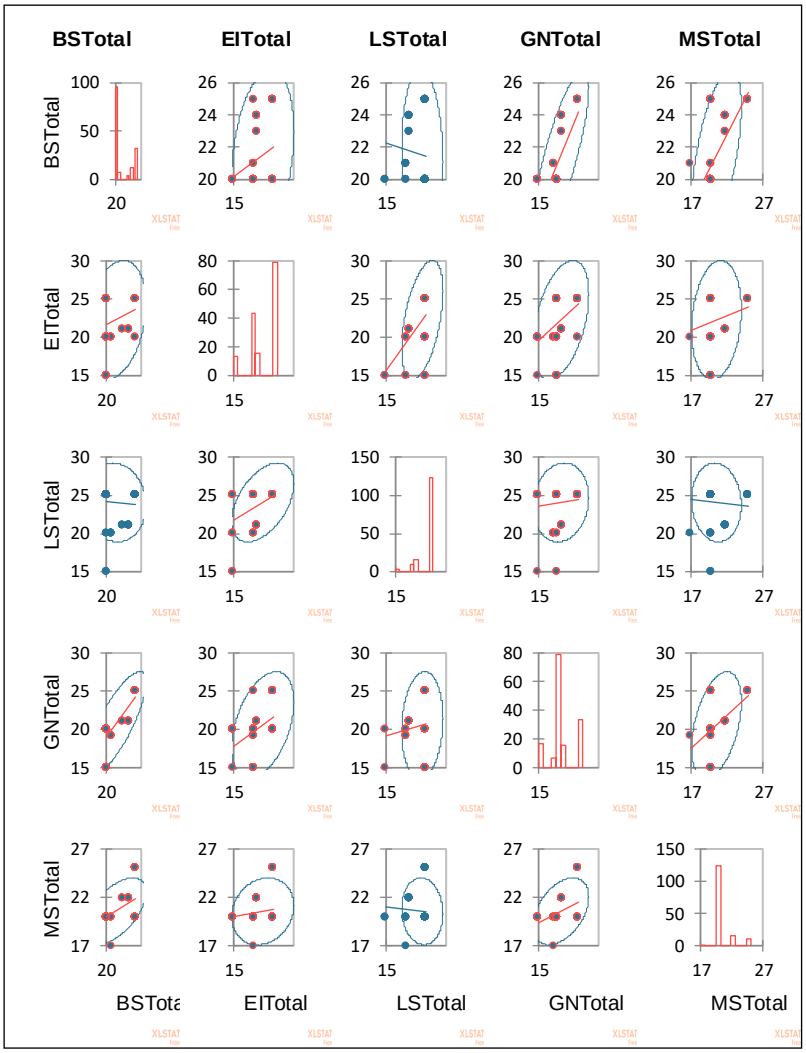

FIGURE 9. Scatter plot.

The strength of a scatter plot is typically characterized as weak, moderate, or strong. The greater the dispersion of the points, the weaker the correlation. A strong association is shown when the points are distinctly clustered or closely adhere to a curve or line.

Researchers found the strength and weakness captured from the scatter plot in Figure 9. A strong association has been observed between Business sustainability and governance. A moderate association has been observed between business sustainability and emotional intelligence and management strategy. A weaker association has been observed between business sustainability and leadership skills.

7. LINEAR REGRESSION

Table 12. Model fit measures.

Model	R	R^2
1	0.850	0.723

Note. Models estimated using sample size of N=152

The above Table 12 shows the regression analysis of business sustainability. From the table it could be inferred that the regression values are found to be significant and model is fit strongly. The multiple correlation coefficient

is 0.850 measures the degree of relationship between the actual values and the predicted values of the business sustainability. Because the predicted values are obtained as a linear combination of emotional intelligence, governance, management strategy, leadership skills and business sustainability. The Coefficient of Determination R-square measures the goodness-of-fit of the estimated Sample Regression Plane (SRP) in terms of the proportion of the variation in the dependent variables explained by the fitted sample regression equation. Thus, the value of R square is 0.723 simply means that about 72.3% of the variation in business sustainability is explained by the estimated SRP that gets impact from emotional intelligence, governance, management strategy, leadership skills.

IX. CONCLUSIONS

Researchers' objective is to examine the engineering service providers across GCC countries who are pioneer in providing plant engineering services and researchers observed that Business sustainability is having strong correlation with higher positive relationship with governance and moderate association with management strategy and emotional intelligence and weaker association with leadership skills and emotional intelligence. The reason was, engineering service providers are strong in governance and in their management strategy. While making the contract for the mitigation of the impacts and during the engineering, their focus is to make the profit with interlocks between the scope definition, risk assessment, contract fine tuning, resource utilization and between only the contract parties.

Researchers observed that some of the engineering service providers are still required to improve their quality, emotional intelligence, leadership skills and engineering seamless delivery in time to have good relationship between the stakeholders to get the repeated orders from the client and to have business sustainability. The highest correlation coefficient shows the strength and high impact relationship between business sustainability and management strategy and governance; thus, hypothesis is accepted. However, the correlation coefficient between business sustainability and emotional intelligence and leadership skills are lower, which have to be improved, since engineering service providers have to improve management strategy to mitigate the corporate goals for good quality deliverables and deliverables in scheduled time. To mitigate this, leadership development programs and emotional intelligence training and integrated workshops can be carried out.

Researchers found that less competitive areas in some of the countries which needs to have more competitive between plant engineering service providers with improved management strategy for timely delivery and good quality to satisfy client in all respect.

X. RECOMMENDATIONS

Plant Engineering Services shall be provided as per the contract scope and to obtain the best client satisfaction through timely delivery and good quality. Researchers have observed that some plant engineering service providers who are having less competitive in their region based on their local client approval. Engineering service firms must enhance their leaders' entrepreneurial skills and emotional intelligence via on-the-job training, govern management through live projects, and develop management strategies aligned with project and client requirements to achieve business sustainability and fulfil organizational objectives.

The government and local sponsors have to promote and provide approval for more plant engineering service providers based on their qualification to have more competitive to get good results as per the client expectation and requirements. And standard contract and their policies have to be updated to invite more plant engineering service providers. Based on government, policy makers and industry leaders' involvement in allowing and approving more plant engineering service providers, competition will be high and delivery will be in time with good quality and cost. Entrepreneurs have to learn governance mechanism and management strategies to have long run business sustainability through integrated learning workshops for emotional intelligence, leadership skills, governance and management strategy. According to researchers [16], Business Sustainability Performance Assessment is required to meet sustainability reporting, monitoring standards and sustainability targets.

XI. LIMITATIONS

This study is confined to the engineering service sector, indicating that the results may not be applicable to other businesses. This sector-specific emphasis limits the relevance of conclusions, recommendations, and findings to entrepreneurs' emotional intelligence, leadership capabilities, management strategies, and governance. Limitation of this study is mainly focused on only GCC countries and leading plant engineering service providers.

The collection of primary data via structured surveys and face-to-face encounters may be affected by respondents' propensity to offer truthful responses, potentially resulting in response bias. Furthermore, temporal

and resource limitations may restrict the extent and comprehensiveness of data collecting. The study's cross-sectional design collects data at one specific moment, potentially failing to represent temporal changes or the evolving characteristics of leadership competencies and business sustainability.

The utilization of main data sources facilitated the triangulation of findings, so augmenting their trustworthiness and validity. Primary data were obtained through structured questionnaires. The questionnaire was carefully crafted to encompass various aspects of emotional intelligence, management strategy, governance, leadership competencies, and company sustainability. Conducting a pre-test of the questionnaire with a small segment of the target population facilitated the identification and correction of ambiguities, hence assuring clarity and comprehensiveness.

XII. FUTURE RESEARCH

Researchers have focused on engineering service providers in GCC countries. Researchers have kept open for future researchers to do research across the world by utilizing the proposed models from this study to understand more across the global regions and more sample sizes based on the competency level to get the expected results in timely delivery and good quality of deliverables.

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Authors Contribution

Marirajan Murugan was involved for the conception, design, data collection, research methodology, analysis, interpretations, conclusions and recommendations. All authors made critical revisions. All authors have read and agreed to the published version of the manuscript.

Conflict Of Interest

The authors have no conflicts of interest linked to this research study.

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APPENDIX-1:

Questionnaire with Source Reference:

SA-Strongly Agree: 5; A-Agree:4; N-Neutral:3; DA-Disagree:2; SD-Strongly Disagree:1

Business Sustainability

Sr. No.	Content	Source
1	Design Efficiency	Magdalena Zioło, et al. (2020)
2	Cutting costs	Magdalena Zioło, et al. (2020)
3	Designing the policies	Magdalena Zioło, et al. (2020)
4	Minimizing the non-productive hours	Magdalena Zioło, et al. (2020)
5	Improving the bottomline	Rosaria Ferlito and Rosario Faraci (2021)

Emotional Intelligence

Sr. No.	Content	Source
1	Understand emotions in oneself	Woramol Chaowarat Watanabe, et al. (2024)
2	Understand emotions in others	Woramol Chaowarat Watanabe, et al. (2024)
3	Ability use awareness	Woramol Chaowarat Watanabe, et al. (2024)
4	To manage behaviour	Woramol Chaowarat Watanabe, et al. (2024)
5	To manage relationship	Woramol Chaowarat Watanabe, et al. (2024)

Leadership skills

Sr. No.	Content	Source
1	Communication	Katarzyna Piwowar-Sulej a, Qaisar Iqbal b (2023)

2	Deep industry knowledge	Aymen Sajjad, et al. (2023)
3	Familiarity with businesses	Alexandrina Maria Pauceanu, et al. (2021)
4	How it operates to its people	Alexandrina Maria Pauceanu, et al. (2021)
5	Focus on relationship building	Alexandrina Maria Pauceanu, et al. (2021)

Governance

Sr. No.	Content	Source
1	Contract	Ingo Pies, Felix Carl Schultz (2023)
2	Value, Quality and Innovation	Ingo Pies, Felix Carl Schultz (2023)
3	Business responsibly	Ingo Pies, Felix Carl Schultz (2023)
4	Openness	Ualison Rébula de Oliveir et.al (2023)
5	Integrity	Ingo Pies, Felix Carl Schultz (2023)

Management Strategy

Sr. No.	Content	Source
1	Structured approach	Simone Häußler1 · Patrick Ulrich (2024)
2	Engineering objectives	Ualison Rébula de Oliveir et.al (2023)
3	Evaluation and control	Ualison Rébula de Oliveir et.al (2023)
4	Define metrics and track progress	Ualison Rébula de Oliveir et.al (2023)
5	Strategy formulation and implementation	Simone Häußler1 · Patrick Ulrich (2024)