

Developing A Comprehensive Sustainability Balanced Scorecard (SBSC) for Facility Management performance in Iraqi Highrise Buildings

Hussain M. Habib ^{1*}, Kadhim R. Erzaij ²,

¹ Civil Engineering Department, University of Baghdad, Baghdad, Iraq.

² Civil Engineering Department, University of Baghdad, Baghdad, Iraq.

* Corresponding author's e-mail: h.habib1001@coeng.uobaghdad.edu.iq.

ABSTRACT

Buildings are essentially constructed to facilitate and support the activities for which they were intended, buildings are designed to satisfy different performance objectives depending on the purpose for which they are required [1]. The performance measurement basis for development criterion for construction project success has customarily been established on cost, time and quality. management frameworks empower an all-encompassing viewpoint for the assessment of performance management [2]. SBSC is considered a fitting apparatus to degree supportability performance, it can viably degree the supportability performance covers a wide run of administrations and their administration which can contribute to a relative victory or a fractional disappointment of an organization's center commerce [3]. It is crucial to recognize how the project's core goals underpin implementation targets. financial performance measurement frameworks determine which criteria are implemented. As long as the environment and social performance targets ended up portion of the administration control frameworks of a company, it can viably degree the maintainability performance. In any case, traditional performance measurement can't be utilized to the assessment of in general performance and are regularly centered as it were on money related performance. These conventional frameworks are not one or the other comprehensive nor successful for all encompassing performance assess [1]. The performance measurement measure for development venture victory has customarily been established on taken a toll, time and detail. Display day performance measurement frameworks empower an all-encompassing viewpoint for the assessment of venture efficiency [2]. SBSC is considered a suitable apparatus to degree supportability performance.

the purpose of this research is developing a Sustainable Balanced Scorecard (SBSC) framework for assessing facility management performance in in sustainable Iraqi Highrise Building. Usually, the building performance is evaluated based on financial viewpoints, which are slacking pointers in environmental, and can overlook other nonfinancial perspectives. The proposed model establishes a performance measurement framework to help facility managers evaluate the sustainable building performance in real time, in addition to post-occupation evaluation for project retrofitting purposes and development.

Keywords: Balanced Scorecard, Sustainable Buildings, Facility Management, Performance Measurement

Introduction

Buildings are essentially constructed to facilitate and support the activities for which they were intended, buildings are designed to satisfy different performance objectives depending on the purpose for which they are required[1]. The performance measurement measure for development project goals has customarily been established on taken a tool, time and specification. Display day performance measurement frameworks energize all encompassing perspectives for the assessment of project efficiency[2]. SBSC is considered a fitting device to degree supportability performance , it can viably degree the maintainability performance[3]. The supportability performance and measurement tools was created to supply facility managers with a comprehensive and easy-to-use self-assessment instrument that would bolster the assessment of maintainability performance and give measurements to degree improvements[4]. To guarantee that all exercises beneath the facility manager team are well executed and meet with client desire, performance measurement Framework must be actualized. The frameworks of markers created by analysts for development companies and ventures are as a rule based on one of the three performance appraisal models: the balanced Scorecard Show (BSC), the European Establishment for Quality Administration (EFQM), and the Key performance Indicators (KPIs). Be that as it may, past thinks about have proposed their parameters for assessing the performance of development organizations, utilizing these models independently and in combination with one another [5]. Two well-known performance administration systems, the EFQM Trade Greatness Demonstrate and Kaplan and Norton's Balanced Scorecard are surveyed for their suitability inside the field of development management [2]. Both strategies are

centered and dodge enumerating, it addresses restricted number of fundamental categories that unequivocally related to the execution, models is exceptionally comparable; “each comprises of a non-prescriptive format advertising directors a moderately little number of categories of key performance measurements to center on,” [6]. In expansion, half breed frameworks for surveying the performance of development companies, joining a few models, have too been created. For case, Oyewobi in 2015 proposed a show joining the BSC demonstrate with the Commerce Greatness Demonstrate (BEM) to survey the performance of development organizations[7]. On the other hand, Vukomanovic in 2014 moreover proposed models coordination the EFQM and BSC models for benchmarking, recognizing best hones, adjusting methodology with the competitive environment, and selecting key performance pointers Balanced with procedure. [8] Combining these models empower organizations to attain great comes about whereas having a economical competitive advantage and the capacity to adjust their approach to a changing environment based on customary performance monitoring [5]. Among the assortment of accessible multidimensional performance measurement Frameworks (PMSs), the Balanced Scorecard (BSC) has been distinguished as the foremost prevalent and viable PM instrument in most areas. In spite of the fact that BSC is utilized to measure the FM performance in a few divisions, it has not been connected to assess the FM performance in office complexes[9].

Literature reviews

There are numerous sorts of strategies that have been built up to broadly assess the performance of an organization. The Balanced Scorecard (BSC) procedure is one of the foremost far reaching performance

assessment approaches, and it considers both non-financial components and money related elements[64]. Conventional performance measures can't be utilized to the assessment of in general performance and are regularly centered as it were on financial execution. These conventional frameworks are not one or the other comprehensive nor successful for all encompassing performance evaluate[64] [65]. It got to be essential to create a BSC that can bolster supportability administration, and the Feasible Balanced Scorecard (SBSC) was proposed to bolster corporate maintainability performance assessment and administration and to realize maintainability methodologies. The maintainability Balanced scorecard is based on BSC and is characterized as a maintainability performance administration and vital administration device to guarantee the synchronous victory of the three viewpoints of a company: financial, natural, and social [6].

The SBSC, which is determined from the conventional BSC, is characterized by Figge et al. in 2002 [66] as overcoming the lacks of the customary BSC by the consolidation of natural, social and maintainability structures[64]. The SBSC contrasts from the BSC in its design by expressly recognizing natural and social targets and performance measures. [3].

Maintainability Balanced Score Card (SBSC) as a comprehensive measurement tool in arrange to assist companies degree the financial, natural, and social, performance[3]. The SBSC gives financial and non-financial data for each prepare, from the detailing of objectives, KPIs, and activity plans related to supportability methodology, to the estimation, assessment, detailing, and advancement of supportability execution, and the linkage with stipend systems[46].

SBSC has of late been considered as a

fundamental device for planning and accomplishing the key goals of corporate supportability administration, whereas it might too constitute a reasonable setting for recording fundamental data in connection to corporate support ability performance by combining money related and nonfinancial information[67]

Considering maintainability as a primary concern for assorted partners (such as clients, financial specialists, and the government) which can impact the corporate “bottom line”, a supportability Balanced scorecard was hence proposed as an viable instrument to trigger the utilization of the social procedure [17].

The four parts of the SBSC in support ability performance appraisal and [46].

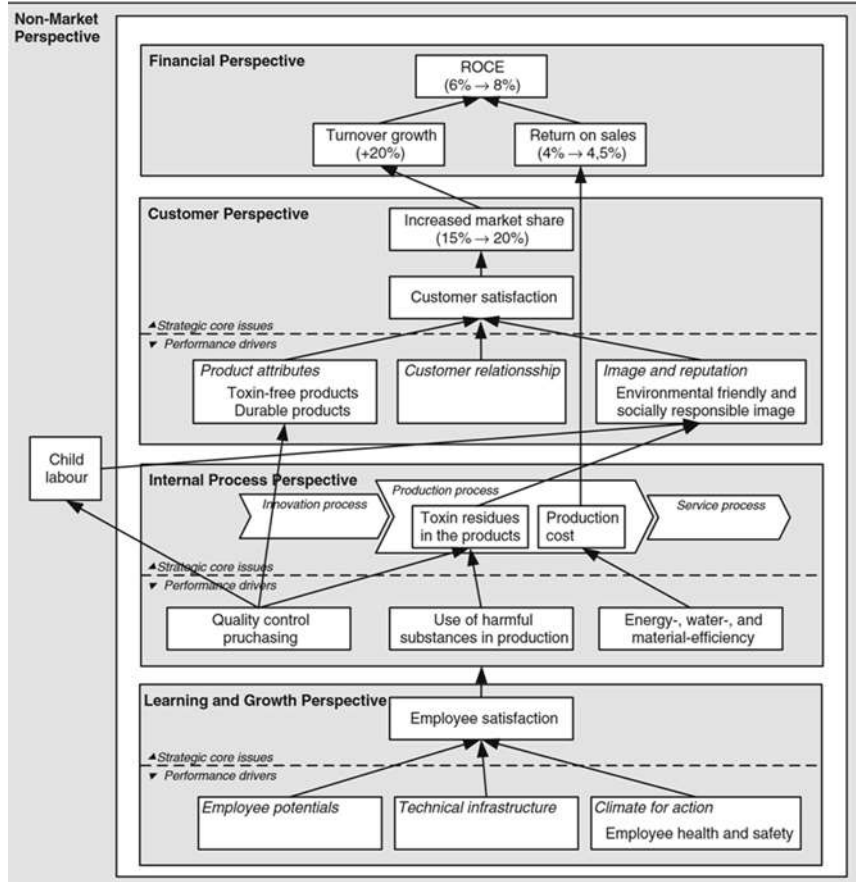
1. Supports the definition and performance of supportability technique objectives,
2. Supports the estimation, assessment, and enhancement of supportability execution,
3. Supports the linkage between supportability performance and emolument frameworks, and
4. Supports the help of inner communication.

the engineering of vital performance estimation and administration frameworks can be examined on the level of both bland performance administration frameworks and firm-specific ones (sample company in

Figure(1).

Figure 1: Strategy map of the SBSC in a sample company[68]

sustainable characteristics, which serves as a valuable tool in the sustainability managing process[47][69]. SBSC contains six perspectives: Financial, Customer, internal process, Learning and growth,



Develop Sustainability Balanced Scorecard (SBSC)

As a result of the BSC's substantial potential for integrating environmental besides social aspects within the overall managing scheme, to build the Sustainability Balanced Scorecard (SBSC) framework, the BSC was combined with

environmental, and social perspectives. Figure 3 clarifies the proposed show of SBSC. Sustainability performance of the complete company. The SBSC is outlined to screen and control the by and large supportability performance of a company. In other words, the SBSC can be utilized to recognize ranges for change in Sustainability Management.

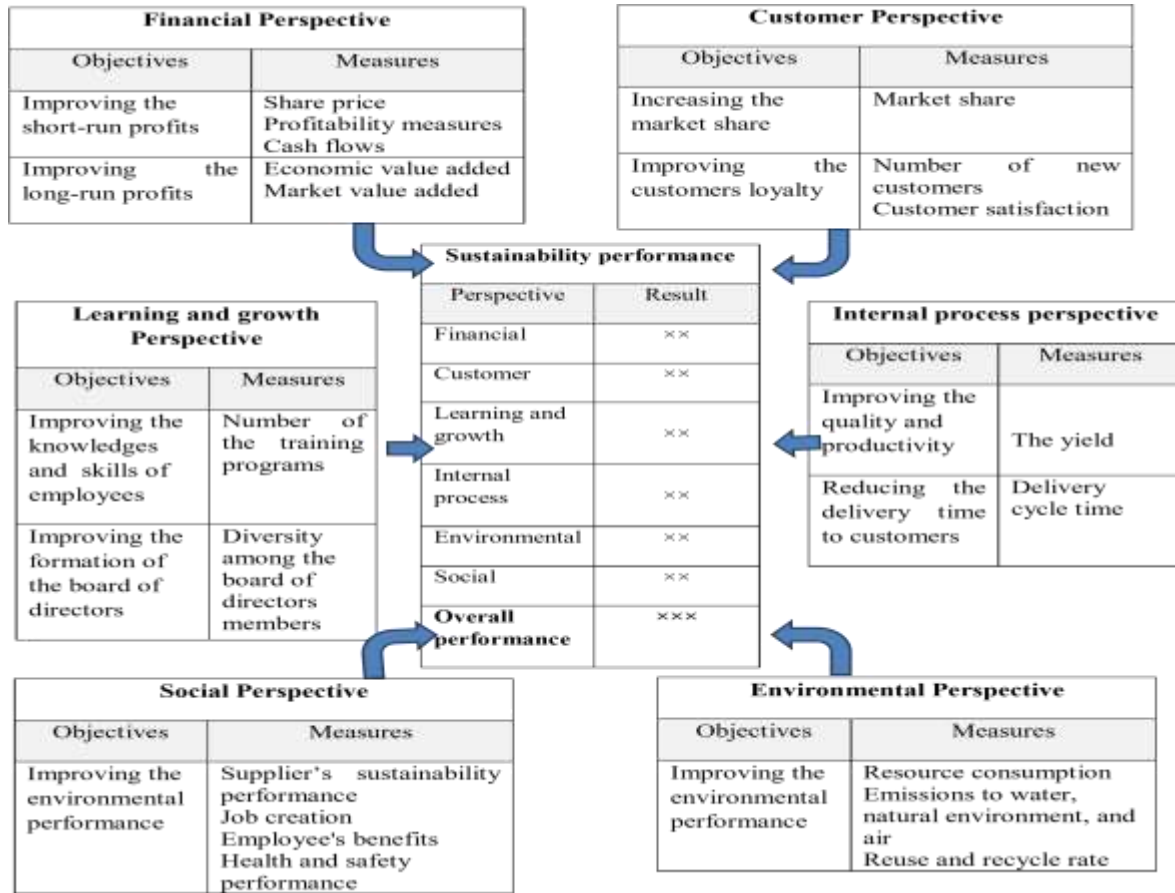


Figure 2: *Sustainability Balanced Scorecard containing six perspectives [1]*

Need for A Performance Measurement System for Facilities Management

FM is an coordinates approach for working, keeping up, progressing and adjusting the buildings and framework of an association in arrange to make an environment that emphatically bolsters the essential destinations of that association (Barrett, 1995). Concurring to Atkin and Brooks (2005), FM makes an environment that's conducive to carrying out the organisation's essential operations, taking coordinates see of the benefit framework, and utilizing this to convey customer fulfillment and best esteem through back for and upgrade of the center trade. Thus, the correct application of FM strategies empowers associations to supply the proper environment for conducting their center trade on a cost-

effective and best esteem premise (Atkin and Brooks, 2005). According to Amaratunga et al. (2000), the administration require for PM is essentially connected to the FM setting as FM is additionally a subset of common administration. Offices methodology of an association recognizes and interprets the organisation's goals and necessities into the ideal frame to meet current and future FM needs. Inside the framework of offices procedure, associations may look for to maximize the performance of its offices (Amaratunga et al., 2000). Subsequently, FM has its basis in performance and so, the thought of performance results is fundamental to advance the performance of FM (Kwok and Warren, 2005). Hence, it is evident that PM is truly at the heart of great FM hone. There has been a developing intrigued in PM all through FM and one of the foremost common claims of FM relates to

performance is that PM is basic for commerce victory which it makes a proactive commitment to trade (Nutt, 1999 cited Amaratunga, 2000). Agreeing to Alexander (1996 cited Amaratunga et al., 2002), PM is one of the three basic issues for the compelling performance of a offices procedure. Kwok and Warren (2005) also asserted the require of PM by specifying it as a crucial prerequisite of FM. Kwok and Warren (2005) assist proposed that the estimation ought to be tired terms of performance Markers (PIs) and results of the exercises. Concurring to Kincaid (1994), there's a wide extend of choices in measuring FM performance reflecting changed nature of areas.

For cases, post-occupancy assessment and benchmarking can be recognized. Be that as it may, in arrange to evaluate esteem, exact strategies and devices of measuring performance are basic (National Health Service, 1998 cited Kwok and Warren, 2005).

RESEARCH METHODOLOGY

In Iraq , the facility management performance within the construction segment is still underneath the worldwide guidelines with respect to productivity compared to other construction markets of comparable estimate and nature and inside other Iraqi construction areas advertise . the investigate technique takes after this arrange: a writing audit of performance measurement (PM) models and after that a ensuing study to confirm the appropriateness of the created show to the standards of the Iraqi construction division. After verification of the demonstrate, the professional population and the correct test measure are found, and after that the confirmed SBCS show is finalized. Once all the data has been collected, the perspectives will be prioritized utilizing the Figure Examination. At that point, to calculate the foremost imperative KPIs into perspectives,

the rule component examination (PCA) strategy will be performed. At final, the demonstrate will be created.

Study population and sample size

The population of interest will be construction engineers, or active parties in Iraqi construction industry. As the populace measure (N) for this consider is 84, by utilizing the taking after equation to calculate the viable test estimate (n): Kish (1965) equation to calculate the compelling test estimate (n):

$$n = \frac{m}{1 + \frac{m-1}{N}} \dots \dots \dots \text{Equation 1[19]}$$

Where:

n is the sample size of the finite population; m is the sample size for the infinite population and N is the sample size for the available population. However, m can be calculated using the following equation [19]:

$$m = \frac{z^2 * p * (1-p)}{\epsilon^2} \dots \dots \dots \text{Equation 2[19]}$$

Where :

z is the confidence level, p is the value of the proportion of the population being estimated (usually set at 0.5 to allow more conservative measurement of the sample size)[20]. and ε is the sampling error.

Using eq. (2) with a confidence level of 95%, sampling error (ε) of 0.05, the value of m is 384.16. Hence, and considering N value of 84, the effective sample size n as calculated using eq. (1) is forty four (44).The appropriate sample size for a survey is generally not straightforward The appropriate sample size for a survey is generally not straight forward decision and can sometimes be very complex. The question is one that usually has no one definitive answer[21].

Questionnaire design

Data was collected through a questionnaire consisting of two sections. The first section is demographics and consists of general questions related to the participant's profile. The second section consists of two parts. The first is related to the six interrelated perspectives that constitute the basic categories of the model. The balanced scorecard seeks to measure the organization's performance based on the experiences of the participants, to indicate the levels of importance for each perspective in the Likert scale with 1 being very low and 5 being very high. The second portion is to recognize the key performance pointers to be utilized and to be measured against a standard beneath each viewpoint based on a five degree Likert scale address to surveys the level to which each proposed performance degree can be utilized within the facility management industry to degree the execution.

In a pilot ponder, an introductory draft of the survey was dispersed among six construction experts in Iraq to survey its clarity and comfort, and the proposals gathered were joined into the ultimate adaptation of the study.

Data and results

Reliability Analysis

According to Pallant suggest that alphas of 0.70 or higher are acceptable it can then be regarded as sufficient[5]. The extend of the esteem of Cronbach’s Alpha for person develops in Perceived Level of Integration (PLOI) is between 0.708 and 0.955 through the six (6) factors (perspectives) see table (7).

Table 7: Cronbach’s Alpha for the model perspectives

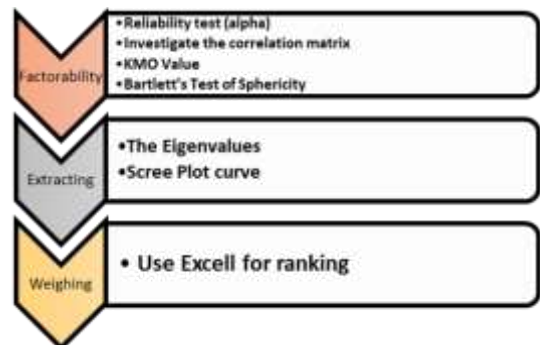
NO .	Perspective	Numb er of Factors	Cronbach ’s Alpha
1	Financials	14	.87
2	Customers	7	.815

3	Interior Process	23	.948
4	Learning and Growth	10	.955
5	Environmen tal	11	.820
6	Social	8	.708
7	Overall	73	.979

Exploratory Factor Analysis

This consider utilizes exploratory calculate examination to look at the information set to distinguish complicated interrelationships among things and gather things that are portion of coordinates concepts. Due to explorative nature of calculate examination, it does not separate between autonomous and subordinate factors. Figure investigation clusters comparative factors into the same figure to distinguish fundamental factors and it as it were employments the information relationship matrix[18]. In this think about, calculate investigation with central components extraction was utilized to look at whether the explanations speak to identifiable variables related to traveler fulfillment. The foremost component investigation (PCA) means the measurable prepare utilized to underline variety for which central information components are calculated and bring out solid designs within the dataset [21].

Figure 3: Factor analysis process



The Correlation Matrix

Within the relationship framework, there are

numerous relationships among .30 in this framework which can be considered a sign that it is suitable to conduct figure investigation on it. Examination of Table 10 found that an expansive number of

relationship values are more prominent than 0.3; this demonstrates satisfactory basis legitimacy (Rubio et al., 2003).

Table 8; Correlation Table

Correlation Matrix ^a							
		Financial	Customer	Inertial processes	Learning and Growth	Environmental	Social
Correlation	Financial	1.000	-.218	.059	.397	-.104	-.120
	Customer	-.218	1.000	.194	.607	.747	.552
	Inertial processes	.059	.194	1.000	.118	.461	.107
	Learning and Growth	.397	.607	.118	1.000	.453	.144
	Environmental	-.104	.747	.461	.453	1.000	.712
	Social	-.120	.552	.107	.144	.712	1.000
Sig. (1-tailed)	Financial		.042	.321	.001	.207	.172
	Customer	.042		.062	.000	.000	.000
	Inertial processes	.321	.062		.177	.000	.200
	Learning and Growth	.001	.000	.177		.000	.129
	Environmental	.207	.000	.000	.000		.000
	Social	.172	.000	.200	.129	.000	

a. Determinant = .84

The Kaiser-Mayer-Olkin (KMO) and Baralett’s Test

Kaiser-Meyer-Olkin (KMO) Degree of Inspecting Ampleness KMO test could be a degree that has been aiming to degree the reasonableness of information for figure analysis[10]. In other words, it tests the ampleness of the test estimate. The test measures examining ampleness for each variable within the show and for the total demonstrate.

Bartlett’s Test of Sphericity tests the invalid theory, H0: The factors are orthogonal i.e. The initial relationship lattice is an personality lattice showing that the factors are unrelated and thus unacceptable for structure discovery. To exam In case Bartlett’s test is noteworthy, at that point this can be considered an sign that it is suitable to calculate analyze the network (as importance demonstrates that the test relationship network is altogether distinctive from an personality lattice).

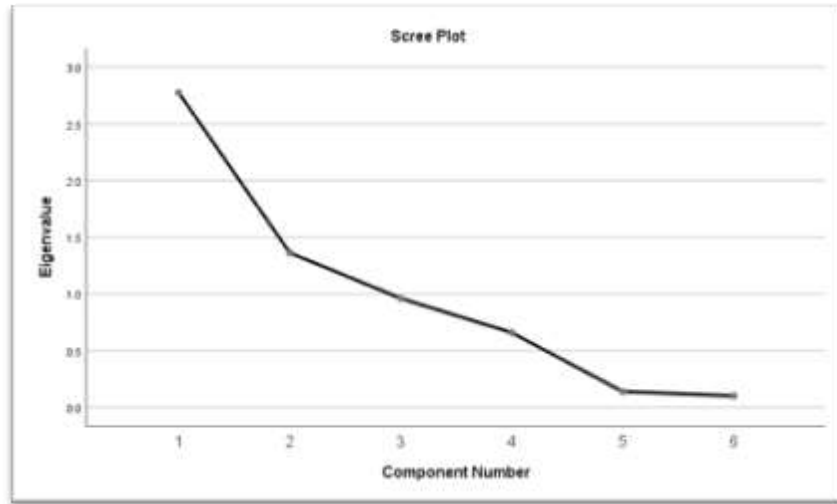
The comes about displayed in table 9 demonstrate that the esteem of Kaiser-Mayer-Olkin was 0.843 and the esteem of Sphericity Bartlett’s test is profoundly critical (p < 0.001), supporting the factorability of the relationship network. the test estimate is appropriate for the figure investigation as appeared in table 9. Presently the information can encourage tried by figure extraction strategy.

Table 9: The Kaiser-Mayer-Olkin (KMO) and Baralett’s Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.843
Bartlett's Test of Sphericity	Approx. Chi-Square	203.270
	df	15
	Sig.	.000

Kaiser-Gutman Rule

Figure 4: The Scree plot



Based on Kaiser-Gutman Rule , Total Variance (10) The results shows that 2 factors having eigenvalue greater than 1 were extracted as per, These factors account reached 100 % of the variation in the data and the rest of the factors account for smaller amount of the variance.

Table 10: Kaiser-Gutman Rule

Component	Total Variance Explained								
	Initial Eigenvalues			Extraction: Sum of Squared Loadings			Rotation: Sum of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.774	46.235	46.235	2.774	46.235	46.235	2.74	45.681	45.681
2	1.364	22.728	68.963	1.364	22.728	68.963	1.38	23.280	68.963
3	.861	14.021	84.984						
4	.600	10.004	95.978						
5	.139	2.315	98.293						
6	.102	1.703	100.000						

Extraction Method: Principal Component Analysis.

Factors Rotation

Based on the nature of the relation among the collected data, the orthogonal relation method was recommended which implies the use of Varimax Rotation as the rotation method. Table 11 expresses the results of the rotated factor. Table (7-16) show the measures distribution within two factors.

Scree Plot

The cut-off point where the curve becomes horizontal as shown in Scree Plot Figure 2, is at factor number 3. Factors above this point to be retained. So, the number of factors retained was 2, this matches the result of the Kaiser-Guttman rule shown in Total Variance table 10 . 2 dimensions/Factors will extract to describe this case.

Table 11: Rotated Factor

$$W_{fi} = \frac{w_{fi}}{\sum_{i=1}^n w_{fi}} \dots \dots \dots \text{Equation (4)}$$

To calculate each extracted factor weight (Table 11) equations below was used

$$w_c = \frac{L_c}{\sum_{i=1}^n L_{c_i}} \dots \dots \dots \text{Equation (5)}$$

$$w_{fi} = \sum_{i=1}^{i=n} L_i \dots \dots \dots \text{Equation (3)}$$

$$Wc = wc * W_{fi} \dots \dots \dots \text{Equation (6)}$$

Table 11: Perspectives Weight

Perspective	Component		w	W
	F1	F2		
Customer	0.89		0.296	0.19
Inertial processes	0.4		0.133	0.09
Environmental	0.94		0.312	0.20
Social	0.77		0.255	0.17
Financial		0.88	0.54	0.19
Learning and Growth		0.74	0.46	0.16
w_{fi}	3.01	1.62		
W_{fi}	0.65	0.35		

below

For example, the weight for the Financial perspective can be calculated by steps

1. Calculate w_{fi} and for each Factor by Equ.1

Rotated Component Matrix ^a		
	Component	
	1	2
Financial		.884
Customer	.890	
Inertial processes	.403	
Learning and Growth	.511	.736
Environmental	.943	
Social	.773	
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.		
a. Rotation converged in 3 iterations.		

$$w_{f_1} = \frac{.89 + .4 + .94 + .77}{3.01} = 0.65$$

$$w_{f_2} = \frac{.88 + .74}{3.01 + 1.62} = 0.35$$

2. Calculate W_{f_i} and for each Factor by Equ.2

$$W_{f_1} = \frac{3.01}{3.01 + 1.62} = 0.65$$

$$W_{f_2} = \frac{1.62}{3.01 + 1.62} = 0.35$$

3. Calculate w_c for Financial perspective by Equ.3

$$w_c = \frac{.89}{3.01} = .296$$

4. Calculate w_c for Financial perspective by Equ.4

$$Wc = .296 * .65 = .19$$

The steps above was followed to determine the weight for all perspectives, Table present the final results for the main perspectives

Table 13 Financial KPI's weights

KPI	F1	F2	F3	F4	w	W	KPI	F1	F2	w	W
FIN2	0.802				13%	0.06	C*1	0.89		0.22	0.16
FIN4	0.781				12%	0.06	CU4	0.87		0.21	0.15
FIN6	0.731				11%	0.05	Cu5	0.87		0.21	0.15
FIN7	0.926				17%	0.08	Cu6	0.87		0.21	0.15
FIN8	0.78				12%	0.06	Cu7	0.70		0.14	0.10
FIN9	0.97				19%	0.09	Cu2		0.82	0.43	0.13
FIN10	0.93				17%	0.09	Cu3		0.94	0.57	0.17
FIN3		0.958			42%	0.09	X	3.55	1.55		
FIN11		0.758			26%	0.06	Z	0.70	0.30		
FIN14		0.842			32%	0.07	<i>Table 16 Learning and Growth KPI's weights</i>				
FIN 5			0.617		16%	0.03	KPI	F1	F2	w	W
FIN12			0.891		34%	0.06	LG3	0.84		0.17	0.10
FIN13			0.813		28%	0.05	LG4	0.78		0.16	0.09
FIN1				0.967	97%	0.10	LG5	0.87		0.18	0.11
X	5.06	2.20	1.84	0.97		0.96	LG6	0.95		0.20	0.12
Z	0.50	0.22	0.18	0.10			LG7	0.83		0.17	0.10

Table 12: Main perspectives weights and ranks

No.	Perspective	Weight
1	Financial	0.19
2	Customer	0.19
3	Inertial Process	0.09
4	Learning and Growth	0.16
5	Environmental	0.20
6	Social	0.17

KPI's

To determine the importance of the KPI in each main perspective Factor Analysis adopted and conducted in same process been applied on main perspectives above, the final results explained in tables 13-19

Table 14: Customer KPI's weights

<i>Table 15: Interior Process KPI's weights</i>							LG1		0.97	0.28	0.12
KPI	F1	F2	F3	F4	w	W	LG2		0.97	0.28	0.12
IP2	0.848				1.00	0.51	LG8		0.71	0.21	0.09
IP8	0.981				1.34	0.68	LG10		0.76	0.22	0.09
IP9	0.922				1.18	0.60	X	4.85	3.40		
IP10	0.909				1.15	0.59	Z	0.59	0.41		
IP12	0.77				0.82	0.42	<i>Table 18: Social KPI's weights</i>				
IP13	0.95				1.25	0.64	KPI	F1	F2	W	W
IP14	0.955				1.27	0.65	SO1	0.926		0.24	0.16
IP15	0.971				1.31	0.67	SO2	0.886		0.22	0.15
IP22	0.943				1.24	0.63	SO3	0.968		0.26	0.17
IP23	0.995				1.38	0.70	SO4	0.768		0.16	0.11
IP1		0.95			0.17	0.05	SO6	0.655		0.12	0.08
IP3		0.892			0.15	0.05	SO5		0.948	0.52	0.17
IP6		0.829			0.13	0.04	SO7		0.916	0.48	0.16
IP16		0.95			0.17	0.05	X	3.6	1.74		1.00
IP17		0.735			0.10	0.03	Z	0.67	0.33		
IP18		0.95			0.17	0.05	<i>Table 1:7 Environmental KPI's weights</i>				
IP19		0.79			0.12	0.04	KIP	F1	F2	F3	w
IP4			0.744		0.26	0.03	EN6	0.771			0.09
IP7			0.775		0.28	0.04	EN7	0.991			0.15
IP11			0.642		0.19	0.03	EN8	0.853			0.11
IP20				0.803	1	0.04	EN1		0.869		0.11
x	8.59	5.35	2.12	0.64			EN3		0.647		0.06
z	0.51	0.32	0.13	0.04			EN4		0.625		0.06
							EN11		0.878		0.11
							EN9		0.568		0.05
							EN2			0.947	0.13
							EN10			0.952	0.14
							X	2.3	2.66	1.8	1.00
							Z	0.34	0.39	0.27	

The SBSC Framework Model

Perspective	Performance measures	weight	performance		Performance level 30%, 60%, 90%	Result
			Actual	Standard		
Financial 0.21	Occupancy cost per annum per square metre / foot	0.1				
	Assets maintenance Management	0.09				
	Value for money	0.09				
	Rent earned by building per square metre	0.09				
	Number of prospective tenants who show interests	0.08				
	Effective utilisation of space	0.07				
	Total operating cost per annum per square metre	0.06				
	Maintenance cost per square metre	0.06				
	Cost management	0.06				
	Market share	0.06				
	Profitability	0.06				
	Average annual percentage of vacancy in property	0.05				
	Cash flow	0.05				
	Total asset value	0.03				
Customer 0.21	Service reliability	0.17				
	Customer relationships Management	0.16				
	Client-service provider relationship	0.15				
	Business ethics	0.15				
	Systematic identification and monitoring of customer requirements	0.15				
	Customer satisfaction	0.13				
	The activity of staff involvement with customers	0.1				
Interior Process 0.06	Business ethics	0.51				
	Roles and responsibilities are clearly defined	0.7				
	Employees Recognition	0.68				
	Management of Organization Culture	0.67				
	Product maintenance	0.65				
	Employee satisfaction	0.64				
	Total Quality Management	0.63				
	Labor practices	0.6				
	Team satisfaction	0.59				
	Management of Innovation	0.42				
	Clash Detection	0.05				
	Human resources management	0.05				
	Workforce and Teamwork Management	0.05				
	Engagement of stakeholders	0.05				
	Predictability of time and cost	0.04				
	Staff commitment	0.04				
	Site Layout Planning	0.04				
	Participation and involvement of stakeholders	0.04				
	Workforce and Teamwork Management	0.03				
	Effective implementation of changes	0.03				
Risk management	0.03					
Facilities management culture	0.03					
Learning and Growth 0.14	Management of Innovation	0.12				
	Innovation, technology & learning	0.12				
	Research and development	0.12				
	Human resources development	0.11				
	Sustainable Innovation Business Model	0.10				
	Skills gaps	0.10				
	Innovation encouragement and managed.	0.09				
	FM service development cycle time	0.09				
	New Service introduction	0.09				
	Management of Organization Culture	0.07				
Environment	Commitment and environmental responsibility	0.15				
	Energy	0.14				

	Natural resources	0.13				
	Eco—efficiency	0.11				
	Commitment and environmental responsibility	0.11				
	Indoor Environment Quality	0.11				
	Management of environmental policies	0.09				
	Management of environmental impacts	0.06				
	Water	0.06				
	Waste management	0.05				
Social 0.16	Financial benefits of environmental and social good practices	0.17				
	Relationships with local community	0.17				
	Management of human rights	0.16				
	Corporate Social Responsibility	0.16				
	Labor practices	0.15				
	Safety and Health	0.11				
	Relationships with suppliers and contractors	0.08				

Based on the findings from the questionnaire, the SCBC had been finalized In the last step as shown in table 19

Table 19: The Proposed Sustainable Balanced Scorecard

The proposed SBSC model contains to seven columns:

- 1- The first column includes the six main perspectives of SBSC with its own proportional weight.
- 2- The second column is for the KPI's of each perspective.
- 3- The Third column include the facility actual performance.
- 4- The fourth column contains the standard performance which targeted and decided by the senior management.
- 5- The fifth column contains the performance level where the actual performance will be compared to the standard performance. therefor there is three cases: the first one the actual performance exceeds the standard performance so the performance level will be excellent, the second case the standard performance exceeds the actual performance so the performance level will be weak, and the third case the two performances are equal so the performance 90, 60, and 30 whereas excellent level takes 90, good level takes 60, and weak level takes 30.
- 6- The sixth column is for the results of the performance measurement. These results be added to each other to count the

sustainability performance. The result of any measure equal the proportional weight of that measure multiply the proportional weight of its perspective multiply its performance level. The sum of all results give us the overall sustainability performance.

Experts' validation

The model findings were presented to nine experts to obtain their feedback concerning its reliability. The selected experts work for construction companies in Iraq with experience ranging from 10 years to 21 years in construction projects.

Interviewees participated in a focus group in which they recommended the model and emphasized its significance and reliability as a potential tool to evaluate the performance of building contractors. The model has been validated by expert feedback, and it was found to be reliable.

Conclusions

The SBSC presents a comprehensive tool to measure all aspects of sustainability. This tool presents a holistic view of all sectors inside the company. Using SBSC motives the managers to address all issues that influence the performance of the company including the financial and nonfinancial issues. The balanced scorecard is a way to

understand facilities management-related issues from the point of view of the support services and working spaces. The facility manager can and should act as integrator in this process. To integrate sustainable practices with an organization's desire for cost-effective facility. Therefore, SBSC

helps improving the financial and nonfinancial performance including the environmental and social performance.

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