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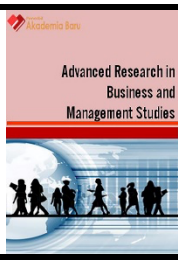

Operational Excellence and Performance Measurement Tool for Organization Self-Assessment in the Sudanese Aviation Industry

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ABSTRACT

Competitive environments and priorities change over time, and effective enterprise management always depends on the effective measurement of performance and results. A sound performance measurement and evaluation system is the first condition to establish, implement, and achieve operational excellence. The development of the performance measurement and reporting process is one of the subfactors of the Improvement dimension. A complete self-assessment tool for Operational Excellence in the aviation industry is currently unavailable. Thus, this study focuses on developing a complete OE self-assessment tool. Using a matrix to evaluate and compare existing self-assessment tools in terms of dimensions, assessed scoring criteria, and usability, a complete self-assessment tool is developed based on combining existing assessment tools and the normalized weights derived from AHP analysis. Additionally, Organizations should assess their current maturity of operational excellence implementation. To satisfy these two conditions, the proposed self-assessment tool used in this study suggests the integration of the EFQM excellence model scoring and the normalized weights derived from AHP analysis to determine the level of maturity in each organization. The scoring matrix is issued by allocating a percentage score to each sub-factor, including each matrix element. And then, by using a scoring record, the percentage of scores given to the sub-criteria are combined to obtain an overall score.

Keywords: Operational Excellence; Critical Success Factors (CSFs); Self-Assessment; aviation industry; Scoring Matrix

1. Introduction

The development of performance measurement and reporting process is one of the subfactors of the Improvement dimension. As part of their desire to succeed and grow, organizations are concerned about whether they are on the right track towards excellence and how their performance can be assessed [25]. Hence, the third component of the proposed operational excellence framework is a self-assessment tool to analyze the effectiveness/maturity of operational excellence in the Sudanese aviation industry. Additionally, Organizations should assess their current maturity of operational excellence implementation. Maturity means knowledge, use, effective deployment, and concrete positive results from a company's operational excellence implementation [22].

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An organizational self-assessment is an analysis and evaluation by the organization's leaders and stakeholders (e.g., board members, staff, volunteers, participants, and key supporters) of its direction and capacity to meet its own goals.

A complete self-assessment tool for Operational Excellence (OE) in the aviation industry is currently unavailable. Thus, this study focuses on developing a complete OE self-assessment tool. Using a matrix to evaluate critically and compare existing self-assessment tools in areas such as dimensions, assessed scoring criteria, and usability, a complete self-assessment tool is then developed based on the combination of existing assessment tools and the normalized weights derived from AHP analysis.

Most assessment tools are designed for large organizations and barely consider the needs of medium-sized enterprises [15]. Due to limited time, monetary resources, and high efforts for preparation and execution, smaller organizations especially encounter problems applying the current assessment methodologies. Consequently, the need for a simplified and user-optimized assessment version is clear [29]. Therefore, a reliable self-assessment tool for organizational performance should measure what it is supposed to measure, and it should be able to measure them correctly [27].

In order to satisfy these two conditions, the proposed self-assessment tool used in this study suggests the integration of scoring of the EFQM excellence model and the normalized weights derived from AHP analysis to determine the level of maturity in each organization. Putri and Yusof [28] used the AHP analysis to identify and calculate an organization's total score. The EFQM scoring system provides a well-founded basis for self-assessment to assist organizations in striving toward business excellence. The EFQM model, Europe's answer to the American Malcom Baldrige Award and the Japanese Deming Price, is widely accepted by academics and industry. However, applying the EFQM ratings, especially regarding Operations Excellence, presents many substantial challenges for enterprises [21].

This study presents the development of a complete Operational Excellence (OE) self-assessment tool. By using a scoring matrix. The second section discusses the development of the main criterion and sub-criterion scoring index, and the next section discusses the Development of the Operational Excellence Self-Assessment Scoring Matrix. The fourth section illustrates the methodology used for scoring the performance of Sudanese aviation companies, and the next section discusses evaluating operational excellence maturity levels in the Sudanese aviation industry. The last section presents the summary of the study.

2. Methodology

The various employed methods to get conceptual background from the literature review on operational excellence and performance improvement, an overview of operational excellence in different industries, review of the different operational excellence frameworks implemented globally, analysis of developed critical factors, barriers affecting implementation, and performance improvements, such as content analysis, related print media, academic and trade journals, official reports analysis and web search engine.

This research design is based on the fact that qualitative analysis is required to identify the Critical Success Factors for achieving Operational Excellence. Researchers agree that qualitative research is beneficial for assessing and testing qualitative study results and generalizing the obtained results.

Online academic databases relating to performance improvement and operational excellence approaches, including Web of Science (WoS) and ProQuest Direct (PQD), were utilized. In this phase, content analysis was carried out to identify and summarize critical success factors affecting the effective implementation of operational excellence philosophy and the study of operational

excellence approaches based on extant literature in this area. The literature was further analyzed, assessed, and presented in a matrix format which showed the conceptual framework for operational excellence.

The Delphi methodology was employed in this research to collect practical information and data to obtain an expert judgment from the consulted experts. Thus, experts from different fields in Sudan were selected. Additionally, the final phase involved deploying the AHP approach in Delphi round 3 to rank the critical success factors for achieving operational excellence by organizations in the Sudanese aviation industry. A set of AHP-related questionnaires was used during interview activities to construct the AHP model. The primary outcome of Delphi Round 3 is to calculate the importance weight of criteria and sub-criteria.

The Delphi Technique is an established research methodology for incomplete knowledge about a problem or phenomenon. It is well suited for doctoral and master's research. It is based on structuring group communication so that the process is effective, allowing individuals to deal with a problem. The method allows consensus among experts on a specific issue or topic by using multi-staged questionnaires.

According to Bourgeois *et al*., [3], "the uniqueness of Delphi lies in its reliability, given the variableness of human opinion, and in its ability to be administered remotely and without direct participant interaction."

This technique offers several advantages, making it a critical research methodology for operational excellence research. It utilizes experts in the field and brings together the collective wisdom of expert panelists in a cost-effective manner.

3. Results and Discussion

The Operational Excellence Self-Assessment Scoring Matrix (OEM_2021_v1.0) was developed to assess the effectiveness/maturity of operational excellence in the Sudanese aviation industry. A scoring matrix is a standard tool that contains a set of checklist-type questionnaires for self-assessment and benchmarking [26]. Organizations in the Sudanese aviation industry may use the Operational Excellence Self-Assessment Scoring Matrix (OEM_2021_v1.0) as a starting point or use them when reviewing their progress and deciding on the appropriate action plans. Many research participants stressed the theme of making the self-assessment process relevant to an organization by the authors [24]. By continuously adding to the document and keeping it relevant, organizations will demonstrate that they are applying the principles of assessment and review to their self-assessment approach.

3.1.= The development of the main criterion and sub-criterion scoring index

Little research has been carried out on the accuracy or otherwise of scoring [17]. The EFQM [20] admits that an initial 3:1 scoring variation is not uncommon, even among experienced assessors. Variation is expected because:

- Scoring is not an exact science;
- People's perceptions of excellence are different;
- People's understanding of the criteria is different;
- People's understanding of the self-assessment tool is different.

The scoring mechanism was determined based on the normalized weightings of the main criterion - critical success factors (CSFs) and sub-criterion (sub-factors) in the AHP analysis. The values of the total score were rounded to a total of 1000 points. The scores values for the main criterion

ranged from 75 to 400, while the scores for the respective sub-criterion ranged from 4 to 77. The score of the main criterion - critical success factors (CSFs) is calculated by multiplying the weight of the critical success factor (CSF) by 1000. As a result, the score is given to the main criterion according to the maximum scale. For example, the score for the first main criterion, leadership, is calculated by multiplying the criterion weight times 1000 (e.g., = 0.402 x 1000 = 402) then the outcome is rounded to 400.

Similarly, the score value for the Sub criterion could be obtained through the same technique. The score value for the respective sub-criterion is calculated by multiplying the obtained main criterion score values times the global weight value of the relevant sub-criterion (Sub factor). For example, the score value for sub-criterion 1.3, Commitment to Operational Excellence principles, is calculated by multiplying the global weight obtained times 400 (= 0.124 x 400 = 49.6) and then rounded to 50. In the end, the conversion factors for each criterion and sub-criteria were calculated to support the scoring matrix checklist development. Table 1 summarizes the scores and conversion factors for each main and sub-criteria to assess the operational excellence implementation by the organizations in the Sudanese aviation industry.

Table 1
List of scores and conversion factors for main criterion and sub-criterion

Criteria (CSFs / Sub-factor)	Global weights	Score Value		Calculations	Conversion factors (Con fac)
1. Leadership (0.402)	**0.402**		**400**	**400/1000 =**	**0.40**
1.1. Influence decision-making processes	0.161	65		65/400 =	0.16
1.2. Develop vision, values, and ethics	0.132	53		53/400 =	0.13
1.3. Commitment to Operational Excellence principles	0.124	50		50/400 =	0.13
1.4. Set and communicate strategies and plans	0.103	41		41/400 =	0.10
1.5. Managing organization performance	0.101	40		40/400 =	0.10
1.6. Ensure Adaptability/Flexibility of the organization	0.091	36		36/400 =	0.09
1.7. Allocate the required resources	0.088	35		35/400 =	0.09
1.8. Act as a role model and inspire other people	0.085	34		34/400 =	0.09
1.9. Stimulating, motivating, and encouraging others	0.068	27		27/400 =	0.07
1.10. Promoting improvement	0.047	19		19/400 =	0.05
2. People Management (0.303)	**0.303**		**300**	**300/1000 =**	**0.30**
2.1. Establish Organizational structure and Job Description	0.258	77		77/300 =	0.26
2.2. Manage recruitment, selection, and hiring process	0.136	41		41/300 =	0.14
2.3. Setting of Career development and succession planning process	0.107	32		32/300 =	0.11
2.4. Promote culture of collaboration and teamwork	0.102	31		31/300 =	0.10
2.5. Encourage employee's involvement and empowerment	0.089	27		27/300 =	0.09

2.6. Development of people's skills and competencies	0.082	25		25/300 =	0.08
2.7. Development of Recognition, Reward and compensation systems	0.068	20		20/300 =	0.07
2.8. Encourage Organizational commitment and loyalty	0.064	19		19/300 =	0.06
2.9. Appraising of the employee's performance.	0.064	19		19/300 =	0.06
2.10. Foster of Creativity & Innovation	0.031	9		9/300 =	0.03
3. Operational Planning (0.144)	**0.144**		**145**	**145/1000 =**	**0.145**
3.1. Establishment of operations targets and objectives	0.514	75		75/145 =	0.51
3.2. Formulation of Operations plans	0.245	36		36/145 =	0.25
3.3. Communicate Operations plans with relevant interested parties and stakeholders	0.125	18		18/145 =	0.13
3.4. Deployment of Operations plans in a structured manner	0.072	10		10/145 =	0.07
3.5. Review of the operations plans and Evaluate results	0.044	6		6/145 =	0.04
4. Asset Optimization (0.079)	**0.079**		**80**	**80/1000 =**	**0.080**
4.1. Ensure Assets Compliance with national and international requirements	0.449	36		36/80 =	0.45
4.2. Establishment of Asset utilization approaches	0.146	12		12/80 =	0.15
4.3. Ensure Reliability and Efficiency of assets	0.125	10		10/80 =	0.13
4.4. Development of Asset lifecycle management plans and systems	0.096	8		8/80 =	0.10
4.5. Adoption of Asset Maintenance strategies	0.08	6		6/80 =	0.08
4.6. Ensure Security of Assets	0.061	5		5/80 =	0.06
4.7. Development of Energy optimization process	0.044	4		4/80 =	0.04
5. Improvement (0.072)	**0.072**		**75**	**75/1000 =**	**0.075**
5.1. Identification of critical Performance characteristics	0.31	23		23/75 =	0.31
5.2. Setting targets and objectives for Performance improvement	0.21	16		16/75 =	0.21
5.3. Selection and prioritization of KPIs and targets	0.149	11		11/75 =	0.15
5.4. Establishing Process management approaches	0.097	7		7/75 =	0.10
5.5. Establishing Process Standardization approaches	0.064	5		5/75 =	0.06
5.6. Ongoing evaluation, monitoring and assessment	0.059	4		4/75 =	0.06
5.7. Developing of Performance measurement and reporting process	0.056	4		4/75 =	0.06

5.8. Review of the efficiency and effectiveness of the key processes	0.055	4		4/75 =	0.06
Total:			**1000**		**1.00**

3.2 Development of Operational Excellence Self-Assessment Scoring Matrix:

The Operational Excellence Self-Assessment Scoring Matrix (OEM_2021_v1.0) was developed to assess the effectiveness/maturity of operational excellence in the Sudanese aviation industry. A scoring matrix is a common tool that contains a set of checklist-type questionnaires for self-assessment and benchmarking [26]. Organizations in the Sudanese aviation industry may use the Operational Excellence Self-Assessment Scoring Matrix (OEM_2021_v1.0) as a starting point or use them when reviewing their progress and deciding on the appropriate action plans. Some participants in the research stressed the theme of making the self-assessment process relevant to an organization by the authors [24]. By continuously adding to the document and keeping it relevant, organizations will demonstrate that they are applying the principles of assessment and review to their self-assessment approach.

The scoring matrix is issued to allocate a percentage score to each sub-factor by including each element of the matrix for each sub-factor. And then, by using a scoring record, the percentage of scores given to the sub-criteria are combined to obtain an overall score. This calculation shows the self-assessment results against the targeted results [26].

In summary, assessment and review seek to establish whether the operational excellence practices are regularly reviewed, whether the organization seeks to learn how the operational excellence might be better carried out and whether improvements have been made. This process would enable the organization to demonstrate the description of approach deployment, a focus on stakeholder needs, a well-defined process, links with other approaches, and support for policy and strategy. Fig 1 shows a sample of the Critical Success Factors (CSFs) assessment input sheet, which is used for the self-assessment and benchmarking of the Enablers side for the achievement of operational excellence by Organizations in the Sudanese aviation industry. It shows that the organization acts upon the raised Areas for improvement and that it learns from other organizations and makes improvements.

Ref	Sub Factor	Description of Deployment	Links to other approaches & results	Targeted Score Value (1 - 100)	Achieved Score Value (1-100)	Standard Score Value	Total Score Value	Areas for Improvement	Owner
5.01	Identification of critical Performance characteristics					23	0		
5.02	Setting targets and objectives for Performance improvement					16	0		
5.03	Selection and prioritization of KPIs and targets					11	0		
5.04	Establishing Process management approaches					7	0		
5.05	Establishing Process Standardization approaches					5	0		
5.06	Ongoing evaluation, monitoring and assessment					4	0		
5.07	Developing of Performance measurement and reporting process					4	0		
5.08	Review of the efficiency and effectiveness of the key processes					4	0		
	Total Score						0		

Fig. 1. Critical Success Factors (CSFs) assessment input sheet

3.3 Scoring the performance of the Sudanese Companies:

The Operational Excellence Self-Assessment Scoring Matrix (OEM_2021_v1.0) was designed to calculate and record the performance score of organizations in the Sudanese aviation industry. An illustrated case for scoring Sudanese aviation companies' performance assumes that companies can achieve 80 percent of scores in all sub-criteria. For example, the score for sub-criterion 1.5, Managing organization performance, is calculated by the score obtained times conversion factor (= 80 % x 40 = 32 points). The first main criterion (Leadership) score is calculated by multiplying the achievement percentage by its conversion factors (= 800 x 0.4 = 320 points). Table 2 shows the total scoring point for Sudanese aviation companies. In the same way, the score for all other criteria and sub-criteria can be calculated, and then the overall performance index can be analyzed. The self-assessment results could serve as a communication means and a basis for deploying consistent performance requirements [26].

Table 2
Summary score point for organizations in the Sudanese aviation industry

Criteria (CSFs / Sub-factor)	Score Value for sub-criteria	Score Value for Main criteria
1. Leadership (0.402)		**320**
1.1. Influence decision-making processes	52	
1.2. Develop vision, values, and ethics	42	
1.3. Commitment to Operational Excellence principles	40	
1.4. Set and communicate strategies and plans	33	
1.5. Managing organization performance	32	
1.6. Ensure Adaptability/Flexibility of the organization	29	
1.7. Allocate the required resources	28	
1.8. Act as a role model and inspire other people	27	
1.9. Stimulating, motivating, and encouraging others	22	
1.10. Promoting improvement	15	
2. People Management (0.303)		**240**
2.1. Establish Organizational structure and Job Description	62	
2.2. Manage recruitment, selection, and hiring process	33	
2.3. The setting of the Career development and succession planning process	26	
2.4. Promote a culture of collaboration and teamwork	25	
2.5. Encourage employee involvement and empowerment	22	
2.6. Development of people's skills and competencies	20	
2.7. Development of Recognition, Reward, and compensation systems	16	
2.8. Encourage Organizational commitment and loyalty	15	
2.9. Appraising of the employee's performance.	15	
2.10. Foster of Creativity & Innovation	7	
3. Operational Planning (0.144)		**116**
3.1. Establishment of operations targets and objectives	60	
3.2. Formulation of Operations plans	29	

3.3. Communicate Operations plans with relevant interested parties and stakeholders	14	
3.4. Deployment of Operations plans in a structured manner	8	
3.5. Review of the operations plans and Evaluate results	5	
4. Asset Optimization (0.079)		**64**
4.1. Ensure Assets Compliance with national and international requirements	36	
4.2. Establishment of Asset utilization approaches	12	
4.3. Ensure Reliability and Efficiency of assets	10	
4.4. Development of Asset lifecycle management plans and systems	8	
4.5. Adoption of Asset Maintenance strategies	6	
4.6. Ensure Security of Assets	5	
4.7. Development of Energy optimization process	4	
5. Improvement (0.072)		**60**
5.1. Identification of critical Performance characteristics	18	
5.2. Setting targets and objectives for Performance improvement	13	
5.3. Selection and prioritization of KPIs and targets	9	
5.4. Establishing Process management approaches	6	
5.5. Establishing Process Standardization approaches	4	
5.6. Ongoing evaluation, monitoring and assessment	3	
5.7. Developing of Performance measurement and reporting process	3	
5.8. Review of the efficiency and effectiveness of the key processes	3	
Total:		**800**

3.4 Evaluation of operational excellence maturity levels:

However, scoring is an imprecise science, and the number assigned by assessors can vary considerably. While the EFQM assigns percentages to scores, this can lead to organizations becoming focused on reaching a particular number, to the extent of specifying a precise numeric target for the organization to achieve, rather than focusing on how to improve [18]. To lessen the focus on a numeric score, the terminology of TQM literature is used to describe the different levels of excellence, based on Dale and Lascelles [19] and as used by Yang *et al*., [35] in the application of evidential reasoning to self-assessment of excellence.

Based on the above discussion, it was evident that the Maturity Level classification index is needed to evaluate the maturity level regarding the implementation of operational excellence by the organizations in the Sudanese aviation industry. Dale and Lascelles [19] suggested the six-level categorization model to be used to evaluate and understand the current organizational situation regarding the degree of implementation maturity. This model identifies six levels in adopting Total Quality Management (TQM) principles, which can be used as a platform for performing the assessment. Based on this model, the six levels of categories an organization may fall under are:

1) Uncommitted, 2) Drifters, 3) Tool pushers, 4) Improvers, 5) Award winners, and 6) World-class.

McCarthy *et al*., [24] made two major modifications to Dale and Lascelles' original classification. The first modification combines tool-pushers and drifters into one group, reducing total classification

groups into 5 only. These can easily be related to the 5 gradings system, and this consistency makes it easier for assessors than if a separate scoring system were introduced. The other modification is renaming "Uncommitted" to "Beginners." This is less judgmental than 'uncommitted,' as organizations scoring at this level may very well be committed but not yet have traveled far along the route to excellence.

The five grades shown in Table 3 match against the numeric scores assigned by the EFQM and is also consistent with Lascelles and Peacock [19], who described scores of between 700 and 800 as award-winning.

Table 3
Organizations score classification [24]

Score	0%	25%	50%	75%	100
classification	Beginners	Drifters	Improvers	Award Winners	World Class

This research also uses the same levels of maturity to assess the status of the application of operational excellence in the Sudanese Aviation Industry. Table 4 shows the guideline score and definition for the five evaluation levels that start from the beginner level to the world-class level.

Table 4
Scoring guidelines and definitions for Sudan, adopted from McCarthy *et al*., [24]

Level	**Score**	**Definition**
Beginners	0 – 125	Organizations are unfamiliar with the concept, practices, tools, and techniques of continuous improvement and Operational Excellence. They are unaware of the approaches and mechanisms of continuous improvement and Operational Excellence approaches.
Drifters	126 – 375	Organizations are those who have become aware of continuous improvement within their organizations, but they are still in the earlier stages of putting the essential elements of Operational Excellence in place. Some may be implemented process excellence techniques, but they are unaware of the broader issues and mechanism of Operational Excellence. These organizations still need clear guidance on what to do to facilitate the Operational Excellence adoption process.
Improvers	376 – 625	Organizations are moving in the right direction and have made real progress, but they still have a long way to go. The improvement process is typically not self-sustaining, and the Operational Excellence efforts may not be internalized throughout the organization. These organizations are often vulnerable to short-term pressures and unexpected difficulties.
Award Winners	626 – 875	Organizations have reached a point of Operational Excellence maturity. The culture, values, trust, capacities, relationships, and employee involvement required to attain internationally recognized standards or specific operational excellence awards have been developed. (Operational Excellence has become total in nature).
World Class	876 – 1000	The world-class organization, improvement of a way of life, empowered employees, their approaches considered as a role model for other originations, sector benchmark, sustained excellent business results.

The self-assessment is considered a practicable means to evaluate the seriousness of Operational Excellence implementation by the organizations in the Sudanese aviation industry. It can be used to compare with previous performance records, target the measure of progress, communicate planned changes, and accelerate improvement. The suggested scoring method can help organizations identify improvement opportunities concerning the evaluation criteria and sub-criteria.

4. Conclusion

One of the major components of the operational excellence framework is a self-assessment tool to analyze the effectiveness/maturity of operational excellence in the Sudanese aviation industry. The development of performance measurement and reporting process is one of the subfactors of the Improvement dimension. Additionally, Organizations should assess their current maturity of operational excellence implementation.

A complete self-assessment tool for Operational Excellence (OE) in the aviation industry is currently unavailable. Thus this study focuses on the development of a complete OE self-assessment tool. Using a matrix to critically evaluate and compare existing self-assessment tools in areas such as dimensions assessed, scoring criteria and usability, a complete self-assessment tool is then developed based on the combination of existing assessment tools and the normalized weights derived from AHP analysis. The Operational Excellence Self-Assessment Scoring Matrix (OEM_2021_v1.0) was developed to assess the effectiveness/maturity of operational excellence in the Sudanese aviation industry. The scoring mechanism was determined based on the normalized weightings of the main criterion - critical success factors (CSFs) and sub-criterion (sub-factors) in the AHP analysis. The values of the total score were rounded to a total of 1000 points.

Based on the above discussion, it was evident that the Maturity Level classification index is needed to evaluate the maturity level regarding the implementation of operational excellence by the organizations in the Sudanese aviation industry.

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References

[1] Chichester, Mark. "A management system approach to operational excellence in the energy industry." (2005).
[2] Jenkins, A., R. Karjian, and M. Niederkorn. "Lean management: New frontiers for financial institutions." *McKinsey & Company* (2011).
[3] Consulting, C. (2006). Capgemini Consulting Operational Excellence Model. Retrieved from https://www.capgemini.com/no-no/wp-content/uploads/sites/28/2017/07/Operational_Excellence_1.pdf
[4] Corporation, C. (2010). Operational Excellence Management System- An Overview of the OEMS. Retrieved from https://www.chevron.com/-/media/shared-media/documents/OEMS_Overview.pdf%20target=
[5] Duggan, Keven J. "Design for operational excellence: A breakthrough strategy for business growth." (2012).
[6] DuPont. (2005). Delivering Operational Excellence to the Market: A DuPont Integrated Systems Approach. Retrieved from https://docplayer.net/2045056-Delivering-operational-excellence-to-the-global-market-a-dupont-integrated-systems-approach.html
[7] Edgeman, Rick, and Jacob Eskildsen. "Modeling and assessing sustainable enterprise excellence." *Business Strategy and the Environment* 23, no. 3 (2014): 173-187.
[8] Excellence, T. S. P. f. O. (2018). THE SHINGO PRIZE for Operational Excellence Handbook.

[9] Fok-Yew, O., and Ahmad, H. (2017). The effect of change management on Operational Excellence in electrical and electronics industry: Evidence from Malaysia. Fundamental and Applied Studies in EU and CIS. Countries, 273.
[10] Gouthier, Matthias, Andreas Giese, and Christopher Bartl. "Service excellence models: a critical discussion and comparison." *Managing Service Quality: An International Journal* 22, no. 5 (2012): 447-464.
[11] Grönroos, Christian. "From scientific management to service management: a management perspective for the age of service competition." *International Journal of service industry management* 5, no. 1 (1994): 5-20.
[12] Grönroos, Christian. "Relationship marketing: strategic and tactical implications." *Management decision* 34, no. 3 (1996): 5-14.
[13] Group, O. E. C. (2016). OEC Operational Excellence model and framework frame work. Retrieved from https://www.operational-excellence-consulting.com/our-opex-model
[14] Institute, S. (2018). The Shingo Prize for Operational Excellence Ltd. Retrieved from https://shingo.org/model
[15] Jäger, Andreas, Kurt Matyas, and Wilfried Sihn. "Development of an assessment framework for operations excellence (OsE), based on the paradigm change in operational excellence (OE)." *Procedia CIRP* 17 (2014): 487-492.
[16] Johnston, Robert. "Towards a better understanding of service excellence." *Managing Service Quality: An International Journal* 14, no. 2/3 (2004): 129-133.
[17] Coleman, Garry D., C. Patrick Koelling, and E. Scott Geller. "Training and scoring accuracy of organisational self-assessments." *International Journal of Quality & Reliability Management* 18, no. 5 (2001): 512-527.
[18] Conti, Tito. *Organizational self-assessment*. London: Chapman & Hall, 1997.
[19] Dale, Barrie G., and David M. Lascelles. "Total quality management adoption: revisiting the levels." *The TQM Magazine* 9, no. 6 (1997): 418-428.
[20] EFQM. (2000). Assessor training modules. EFQM Excellence Model.
[21] EFQM. (2012). EFQM Excellence Model. EFQM Excellence Model.
[22] Garza-Reyes, Jose Arturo, Luis Rocha-Lona, and Vikas Kumar. "A conceptual framework for the implementation of quality management systems." *Total Quality Management & Business Excellence* 26, no. 11-12 (2015): 1298-1310.
[23] J Jäger, Andreas, Kurt Matyas, and Wilfried Sihn. "Development of an assessment framework for operations excellence (OsE), based on the paradigm change in operational excellence (OE)." *Procedia CIRP* 17 (2014): 487-492.
[24] McCarthy, Grace, Richard Greatbanks, and Jian-Bo Yang. *Guidelines for assessing organisational performance against the EFQM Model of Excellence using the Radar Logic*. Manchester School of Management, 2002.
[25] John, S. O. "TOTAL ORGANIZATIONAL EXCELLENCE. Achieving word class performance." *figure* 5 (2001): 62.
[26] Pun, Kit-Fai. "Development of an integrated total quality management and performance measurement system for self-assessment: A method." *Total quality management* 13, no. 6 (2002): 759-777.
[27] Pun, K. F., and C. W. Lau. "Integration of total quality management and performance measurement in government departments: an empirical study in Hong Kong." *International Journal of Business Performance Management* 5, no. 4 (2003): 316-335.
[28] Putri, N. T., and S. M. Yusof. "An empirical investigation of quality tools and techniques practices in Malaysia and Indonesia automotive industries." In *2011 IEEE International Conference on Quality and Reliability*, pp. 331-335. IEEE, 2011.
[29] Rusjan, Borut. "Usefulness of the EFQM excellence model: Theoretical explanation of some conceptual and methodological issues." *Total Quality Management & Business Excellence* 16, no. 3 (2005): 363-380.
[30] Small and Medium Enterprise in Malaysia. SOCIAL SCIENCES POSTGRADUATE INTERNATIONAL SEMINAR (SSPIS) 2016. (Accessed April 2021).
[31] Jäger, Andreas, Kurt Matyas, and Wilfried Sihn. "Development of an assessment framework for operations excellence (OsE), based on the paradigm change in operational excellence (OE)." *Procedia CIRP* 17 (2014): 487-492.
[32] Muazu, Muazu Hassan, and Rosmaini Tasmin. "Operational excellence in manufacturing, service and the oil & gas: The sectorial definitional constructs and risk management implication." *Traektoriâ Nauki= Path of Science* 3, no. 9 (2017): 3001-3008.
[33] Mukhezakule, Maluta, and Orthodox Tefera. "The relationship between corporate strategy, strategic leadership and sustainable organisational performance: Proposing a conceptual framework for the South African aviation industry." *African Journal of Hospitality, Tourism and Leisure* 8, no. 3 (2019): 1-19.
[34] https://www.ajhtl.com/uploads/7/1/6/3/7163688/article_64_vol_8_3__2019.pdf
[35] Yang, Jian-Bo, B. G. Dale, and C. H. R. Siow. "Self-assessment of excellence: an application of the evidential reasoning approach." *International Journal of Production Research* 39, no. 16 (2001): 3789-3812.