

DEVELOPMENT OF AN ENTERPRISE EXCELLENCE INDEX FOR INDONESIAN
STATE-OWNED ENTERPRISES USING ANP METHOD

BUDI SULISTYO

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ABSTRACT

State-owned enterprises (SOEs) have retained a strong presence in the Indonesian economy and play an essential role in providing vital infrastructure and public services. Furthermore, the Indonesian government demands SOEs to be more competitive locally and globally. To accomplish this, all 114 SOEs are committed to a business excellence model known as the measurement criteria for performance excellence or *Kriteria Penilaian Kinerja Unggul* (KPKU). To ensure effective measurement and minimise the complexity aspects of performance assessment, it is essential to identify factors that determine the SOE's performance measurement results. So, in this research, an enterprise excellence index (EEI) for Indonesian SOEs is developed. The study is carried out with the following objectives: investigate the implementation level of the KPKU program in Indonesian SOEs through an exploratory survey, analyse a scale of priorities for the EEI criteria using the analytic network process (ANP) method, and develop the EEI for Indonesian SOEs. The exploratory survey reveals that respondents from 30 SOEs provided a positive responses related to the KPKU implementation. In order to improve the effectiveness of the measurement, the index should be developed to reflect the Indonesian SOEs' context. Subsequently, 21 experts were involved in the modified ANP pairwise judgement process to build a framework for the EEI network and calculate the index weights, resulting in a refined composition of the index with high consistency ratios. Finally, an evaluation survey involving seven experts was undertaken to determine the priority weights of categories and items of the EEI. The number of scores was different from the KPKU for the categories of Customer, Measurement, analysis and knowledge management, Workforce, and Results. Based on these findings, the EEI for Indonesian SOEs is suggested as a self-assessment approach for measuring performance according to Indonesian context.

ABSTRAK

Syarikat milik kerajaan (*state-owned enterprise* - SOE) telah mengekalkan kewujudan yang kukuh dalam ekonomi Indonesia serta memainkan peranan yang penting dalam menyediakan infrastruktur utama dan perkhidmatan awam. Selanjutnya, kerajaan Indonesia meminta agar SOE menjadi lebih berdaya saing di peringkat tempatan dan antarabangsa. Bagi mencapai matlamat ini, kesemua 114 SOE perlu komited bagi memenuhi model kecemerlangan perniagaan iaitu kriteria penilaian untuk kecemerlangan prestasi atau dikenali sebagai *kriteria penilaian kinerja unggul* – KPKU. Bagi memastikan penilaian dapat berfungsi dengan berkesan serta mengurangkan kerumitan penilaian prestasi, adalah amat penting untuk mengenal pasti terlebih dahulu faktor-faktor yang menyumbang kepada keputusan penilaian prestasi. Sehubungan dengan itu, melalui penyelidikan ini, indeks kecemerlangan syarikat (*enterprise excellence index* - EEI) untuk SOE Indonesia telah dibangunkan. Kajian ini telah dilaksanakan dengan objektif-objektif berikut: mengkaji aras pelaksanaan program KPKU di SOE Indonesia melalui tinjauan soal selidik, menganalisa skala keutamaan bagi kriteria EEI dengan menggunakan kaedah proses rangkaian analitik (*analytic network process* - ANP), dan membangunkan EEI untuk SOE Indonesia. Tinjauan soal selidik ini mendedahkan bahawa responden dari 30 SOE memberikan maklumbalas positif terhadap pelaksanaan KPKU. Bagi menambah baik keberkesanan penilaian, indeks yang dibangunkan perlu mencerminkan situasi SOE Indonesia. Seterusnya, seramai 21 orang pakar telah memberikan maklumbalas terhadap proses penilaian ANP berpasangan yang telah diubahsuai untuk menyediakan rangka kerja bagi rangkaian EEI dan mengira pemberat indeks bagi mengemaskini komposisi indeks dengan nisbah konsisten yang tinggi. Akhir sekali, soal selidik penilaian telah dilaksanakan di mana ia melibatkan tujuh orang pakar bagi menentukan tahap keutamaan bagi sesuatu kategori dan item EEI. Jumlah markah adalah berbeza daripada KPKU bagi kategori Pelanggan, Analisa Pengukuran dan Pengurusan Pengetahuan, Tenaga Kerja dan Keputusan. Berdasarkan kepada hasil kajian ini, EEI

untuk SOE Indonesia telah dicadangkan sebagai pendekatan penilaian sendiri bagi menilai prestasi berdasarkan situasi di Indonesia.



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LIST OF ABBREVIATIONS

ADLI	-	Approach, Deployment, Learning, and Integration
AHP	-	Analytic Hierarchy Process
AKI	-	Industry Excellence Award
ANP	-	Analytic Network Process
ASEAN	-	Association of Southeast Asian Nations
BE	-	Business Excellence
BEF	-	Baldrige Excellence Framework
BEM	-	Business Excellence Model
BUMN	-	Indonesian State-Owned Enterprise
CI	-	Consistency Index
CR	-	Consistency Ratio
EI	-	Enterprise Excellence Index
EFQM	-	European Foundation for Quality Management
ELECTRE	-	<i>Elimination et Choix Traduisant la Realite</i>
FEB	-	SOEs Excellence Forum
ISM	-	Interpretive Structural Modelling
KMO	-	The Kaiser–Meyer–Olkin
KPKU	-	Assessment Criteria for Performance Excellence
LeTCI	-	Levels, Trends, Comparisons, and Integration
MBNQA	-	Malcolm Baldrige National Quality Award
MCDM	-	Multi Criteria Decision Model
MPC	-	Malaysia Productivity Corporation
MOORA	-	Multi-Objective Optimisation based on Ratio Analysis
NIST	-	National Institute of Standards and Technology
OECD	-	Organisation for Economic Cooperation and Development
PM	-	Performance Management



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PQA	-	Philippine Quality Award
PROMETHEE	-	Preference Ranking Organisation Method For Enrichment Evaluation
RI	-	Random Index
SEM	-	Structural Equation Modelling
SOE	-	State-Owned Enterprise
SQA	-	Singapore Quality Award
SQC	-	Singapore Quality Class
TOPSIS	-	Technique for Order of Preference by Similarity to Ideal Solution
TQA	-	Thailand Quality Award
TVCN	-	The National Standards of Vietnam
TQM	-	Total Quality Management
VQA	-	Vietnam Quality Award



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CHAPTER 1

INTRODUCTION

1.1 Introduction to the chapter

This chapter explains the research background, problem statement, research aim and objectives, research scope, the significance of the research, and the thesis's outline.

1.2 Background of the research

The business excellence model is a phrase that is used for the purpose of helping to communicate the importance of the word "excellence" in all aspects of the business, not just product quality and process (Tickle et al., 2016a). This model provides guidelines and criteria for evaluation and is used by companies worldwide as groundwork for continuous improvement (Toma & Marinescu, 2018). It is also identified as a comprehensive practice in managing organisations and achieving results based on a set of fundamental concepts or values. These practices were developed into a framework called a business excellence model for how excellent organisations must operate (Mann et al., 2012). The business excellence model (BEM) has been developed through extensive studies to assess and improve their highest work practices and performance (Mohammad et al., 2011). Many countries have developed their models and used this as a framework for assessing and recognising organisational performance, including selecting high-performing organisations for national awards and providing feedback on their applicants (Jayamaha et al., 2009). They also develop and embrace the BEM to encourage the evolution of the products and services with



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high quality (Mohammad, 2019). The BEM's adoption has positively affected organisational practices and outcomes (Mann et al., 2011).

Two of the most famous and widely used BEMs are the Baldrige Excellence Framework (BEF) and European Foundation for Quality Management (EFQM) model. Both were developed after the success of the Deming model in Japan (Gómez-gómez et al., 2016; Adebajo et al., 2015; Krittanathip et al., 2013; Talwar, 2011). The success of the BEF and the EFQM models in developing the performance and competitiveness of companies in their respective countries has drawn considerable global attention (Alanazi, 2021). There are 65 active business excellence awards in 56 nations and regions, with 17 more countries pursuing business excellence initiatives. More than 37 per cent of the model globally use the EFQM excellence model, while 14 per cent use the BEF (Ghafoor et al., 2021). The BEM is used to assess how well business excellence elements of success are embedded in an organisation.

The BEM that recognises excellent organisational performance has emerged as a significant component of many countries' productivity and quality promotion strategies. It also plays an essential role in promoting and rewarding excellence in organisational performance and raising companies' quality standards (Tan, 2002). BEM assesses the organisation's strength and provides input on improved and further developed things. It also allows organisations to benchmark their performances and show best practices in their field of activity (Toma & Marinescu, 2018). Here, the BEM functions as an internal business framework; it is an overarching framework for managing and aligning multiple improvement initiatives within the organisation (Mohammad et al., 2011).

Meanwhile, state-owned enterprises (SOEs) have become tools for some countries to better position themselves for the future in the global economy, given the increased international competition for finance, talent, and resources (Price Waterhouse and Cooper, 2015). SOEs play a significant part in many economies, particularly in the success of many country reforms (Mohd Nasir, 2017) (Klovienė & Gimžauskienė, 2014). In this sense, the Organisation for Economic Cooperation and Development (OECD) proposes that the overall goal of state control of enterprises should optimise society's benefit by efficiently allocating capital (OECD, 2015). In the dynamic and rapidly changing environment, an SOE, like other organisations, must design, implement, and effectively manage its performance metric (Agbanu et al., 2016). In line with high-quality internationally recognised corporate disclosure

requirements, an SOE should report material financial and non-financial information about the company, including areas of significant concern for the state as an owner and the public (OECD, 2015, p.24).

In Indonesia, an SOE is a legal entity that undertakes business on behalf of its owner, the government. SOEs have retained a strong presence in the Indonesian economy and play an essential role in providing vital infrastructure and public services. While they conduct commercial activities, they may also have public policy and social objectives. Since 2018, SOEs have regularly contributed more than 16 per cent of Indonesia's Gross Domestic Product (GDP). 114 Indonesian SOEs are clustered in two sectors, industry and service. Industry cluster consists of 1) energy, oil, and gas industry, 2) telecommunication and pharmacy industry, 3) defence and manufacturing industry, 4) mineral and coal industry, 5) food and fertiliser industry, and 6) cement and other industries. The service cluster consists of 1) banking and financing, 2) construction and housing services, 3) insurance and other services, 4) farming and forestry, 5) logistics and tourism, and 6) transportation infrastructure and facilities.

The size and importance of SOEs certainly have a significant impact on the Indonesian economy, which is why the Ministry of SOEs in the 2020-2024 Strategic Plan sets two goals for SOEs; to form a professional SOE and to increase the contribution of SOEs to the national economy (Kementerian BUMN, 2020). For these reasons, Indonesian SOEs' ministry released the assessment criteria for the performance excellence framework, also known as the KPKU, which was adopted from the BEF. The KPKU mission is to improve the effectiveness of controlling SOE performance, optimize efforts to capitalize on SOE potential and accelerate the growth of SOE performance (Kementerian BUMN, 2019b).

The KPKU model is composed of a set of criteria that are interrelated and defines an enterprise as excellent. The criteria are divided into process and result categories. Processes are concerned with what enterprises should do and how to do it. And results are concerned with achievements obtained by the enterprise regarding all interest groups (stakeholders, customers, employees, and society). As in the BEF model, the categories are explained by a set of sub-categories (items) that detail their content. In the same way, each item includes areas to address that clarify the best practices in management and the meaning and scope of each criterion.

This structure (category, item, and areas to address) allows enterprises that use KPKU as a self-evaluation tool to identify their strong points and areas to improve in

each criterion through a scoring system. The KPKU model comprises seven categories addressed to achieve the enterprise's success associated with process management and excellent results: 1) leadership, 2) strategy, 3) customers, 4) measurement, analysis, and knowledge management, 5) workforce, 6) operations, and 7) results. Although this system has been applied since 2012, there is no description of composing these excellence criteria.

The excellence model encouraged businesses to improve quality and productivity in order to gain recognition while gaining a competitive advantage through increased profits (Evans et al., 2012). According to Pannirselvam & Ferguson (2001a), the categories, examination items, and framework of the BEF criteria present the underlying relationships between the various quality management constructs and quality management and organisation performance. Blazey and Grizzell (2019) mentioned that the BEF criteria are built upon a set of interrelated core values and concepts, which are the foundation for integrating performance excellence requirements that create the framework. There are eleven values and concepts that a high-performance enterprise needs to emulate. Simultaneously, the category remains with seven points, with six points focusing on the process and one point discussing the results. These values and concepts include visionary leadership, customer-driven excellence, organisational and individual learning, respect for the workforce and partners, agility, future focus, innovation management, fact-based management, community responsibility, focusing on results and value creation, and systemic perspectives.

To ensure the conditions necessary for the effective measurement functioning and minimise the underlying complexity aspects of performance assessment, it is essential to identify factors that determined the SOE's performance measurement results (Klovienė & Gimžauskienė, 2014). Evans confirms that it is difficult to establish and understand the linkages among all the other categories without a reliable measurement system, develop effective strategic plans, and lead to continued organisational improvements (Evans et al., 2012). Meyer & Collier (2001) reported that the same findings of all the hypothesised causal associations in the BEF groups are statistically relevant.

In contrast to their roles, several studies on Indonesian SOEs performance showed that they underperform and were mismanaged (Nuswantara & Andjani, 2021). According to Muslih & Arsyah (2019), to successfully implement the excellence

model, SOEs should analyse their governance and the impact of the KPKU implementation on their performance. This proposition was explored in a study by Sulistyono et al. (2019), with the results indicating that respondents perceived the implementation of the KPKU criteria as more favourable. Furthermore, it is suggested that to accomplish successful KPKU program implementation, the enterprise excellence index (EEI) should be developed to reflect the context of Indonesian SOEs.

1.3 Problem Statement

Excellence models in modern organisations are now a common practice in many countries. Still, very few studies have focused on the score used in excellence models. A common feature of all models is assigning scores to different dimensions. These scores show the “degree of excellence” of the organisation regarding the model used for self-evaluation. It is also used for prizes associated with these models and benchmarking activities. Unfortunately, selecting the score assigned to the different criteria in each model follows an unknown process, and the underlying logic is not available in any of their publications (Gómez-gómez et al., 2016). Moreover, very few studies focused on the index used in the excellence models (Gómez-gómez et al., 2016). One of them is Metaxas et al. (2016), who proposed a decision-making system to calculate the sustainable business excellence index.

To ensure the necessary conditions as a framework for determining sustainable business excellence index and to minimize the underlying complexity aspects of performance appraisal of the SOEs, it is important to evaluate the understanding and application of KPKU in SOEs. This is in-line with the conclusions of the Indonesian Ministry of SOEs’ research to improve the policies and technical implementation of the KPKU (Kementerian BUMN, 2019a). Nevertheless, there were no clear guidelines on implementing initiatives according to the context, and few studies focused on developing the excellence model index. So, this research proposes an enterprise excellence index (EEI) for Indonesian SOEs.

Several techniques were used to assist in the identification of the factors that determined the excellence model. The analytic hierarchy process (AHP) was proposed as a decision-making technique for rating relative ranking of national quality model awards. However, it does not consider interdependence among the criteria, which is

its limitation (Gupta & Vrat, 2020). Saaty then developed an analytic network process (ANP) to derive relative priority scales of absolute numbers from individual judgments (or actual measurements normalised to a comparative form) that also belong to a fundamental scale of whole numbers (Saaty, 2009). The ANP defines the weight factors of the mutual influences of all the essential elements of the organisation's strategy. Goran (2017) mentioned that the calculation of organisational effectiveness is based on the weight factors and fulfilment of the strategic map measure. However, there is no reference to using ANP to determine the business excellence model index at present.

Unfortunately, when performing pairwise comparisons in the ANP, the number of alternatives/criteria increases, the pairwise comparisons become confusing, and a high level of inconsistency is anticipated (Asadabadi et al., 2019). As a result, the comparisons may be returned to the decision-maker several times to improve. Since the ANP has these disadvantages, applying a modified approach of the ANP pairwise comparison questionnaire would be significant to minimize the inconsistency ratio, reduce comparison numbers, and still fulfil the ANP goals. The modified questionnaire used in this study was mainly to simplify the pairwise comparison questionnaire and simplify the pairwise comparison judgement of the ANP.

Therefore, the EEI for Indonesian SOEs has been developed based on KPKU categories and items. The weights of the EEI categories and items scores were assessed and refined based on Indonesian SOEs context using the ANP method. The research development considered three main elements: investigating the KPKU program implementation, selecting an appropriate strategy for measuring the criteria index, and developing the index based on the Indonesian SOEs context.

1.4 Objectives of the research

This research aims to develop the enterprise excellence index for Indonesian SOEs using the ANP method. Hence, the research objectives are as follows:

1. To investigate the implementation level of the KPKU program in Indonesian SOEs
2. To analyse a scale of priorities of the enterprise excellence index criteria using the ANP method.

3. To develop the enterprise excellence index for Indonesian SOEs.

1.5 Research questions

The research questions are as follows:

1. What is the level of KPKU program implementation in Indonesian SOEs?
2. What is the ANP priority scale of the enterprise excellence index criteria?
3. How to develop the enterprise excellence index for Indonesian SOEs?

1.6 Scope of the research

This research has several scopes of studies, which are:

1. This research focuses on determining appropriate criteria of the enterprise excellence index for Indonesian SOEs based on the KPKU 2019.
2. The categories and items composed in this research adopted the BEF criteria edition 2019-2020 (the latest edition when the study was conducted).
3. The respondents for the exploratory survey are SOE employees who have experience in KPKU implementation. The ANP pairwise comparison judgment and evaluation survey experts are SOEs' managers in the industrial sectors, assessors with experience in business excellence assessment and training, and researchers from educational institutions.
4. Instead of using the conventional ANP questionnaire model, a modified ANP questionnaire method was used to collect pairwise comparison judgements.
5. A software package named Super Decisions was applied to deal with decision-making and shows the alternative theory's applications for various issues to develop the excellence index criteria and analyse the items' priorities weight.
6. This research is intended for business excellence practitioners, assessors, researchers, and SOEs.

1.7 Importance of the research

Developing criteria of Indonesian enterprise excellence index using the ANP method is an essential area of research because of the following principal reasons:

1. The relevance of developing a business excellence framework for the organisation and the nation has been emphasised in many publications (Jayamaha et al., 2009; Mohammad et al., 2011; Talwar, 2011; Tickle et al., 2016). However, none looked at the establishing excellence index criterion for the SOEs. Therefore, developing a criterion index of the excellence framework is crucial for organisations.
2. Criterion weights have always been an important part of the excellence model (Eskildsen et al., 2002). Thus, they require time, resources, and knowledge to apply. To manage the measuring metric properly, it would be better to select the right approach to fit the organisation's context and provide value to the organisation.
3. The method proposed in this research will push for new paradigms that will benefit future discussions in multi-criteria decision-making analysis and may expand the application method in various problems.
4. This research is probably one of the first studies in the world to assess the suitability of KPKU categories and items according to the Indonesian SOEs situation using the ANP method. Since academic journal articles show little attention to implementing the modified multi-criteria decision model (MCDM) and the BEM, this research is crucial for enhancing the pool of reference sources and discoveries on the critical issues.

1.8 Outline of the thesis

This thesis comprises six chapters, as depicted in Figure 1.1. Chapter 1 introduces the background, aim, objectives, scope, and importance of the research. Chapter 2 elaborates a critical literature review on performance excellence criteria, key concepts, and theories that can develop excellence criteria (business excellence model, multi-criteria decision-making model, and ANP method). This chapter highlights the

primary literature and concepts relevant to research and the gap in current knowledge in developing performance excellence criteria.

Chapter 3 describes the design and method of research. This chapter elaborates and explains the selection of research designs and the data collection practices of research procedures. All data collection methods (exploratory survey, interviews, pairwise comparisons survey, and evaluation surveys) are briefly explained in this chapter.

Chapter 4 discusses the research results: investigating the implementation of the KPKU program and reports on the activities' findings. Identifying the development of the ANP framework to build the enterprise excellence index measurement, including modifying the ANP questionnaire, designing the hierarchical network's decomposition, synthesising the limiting priorities, and improving the diagnostic framework; and determining the priorities matrix for the proposed enterprise excellence index composition.

Chapter 5 analysing the enterprise excellence index's development through a validation survey of the index composition alternatives, usability testing, and comparing with different national business excellence models in ASEAN countries.

Finally, Chapter 6 concludes the research objectives' main findings, explains the research contributions, and outlines the research limitations and future research suggestions.



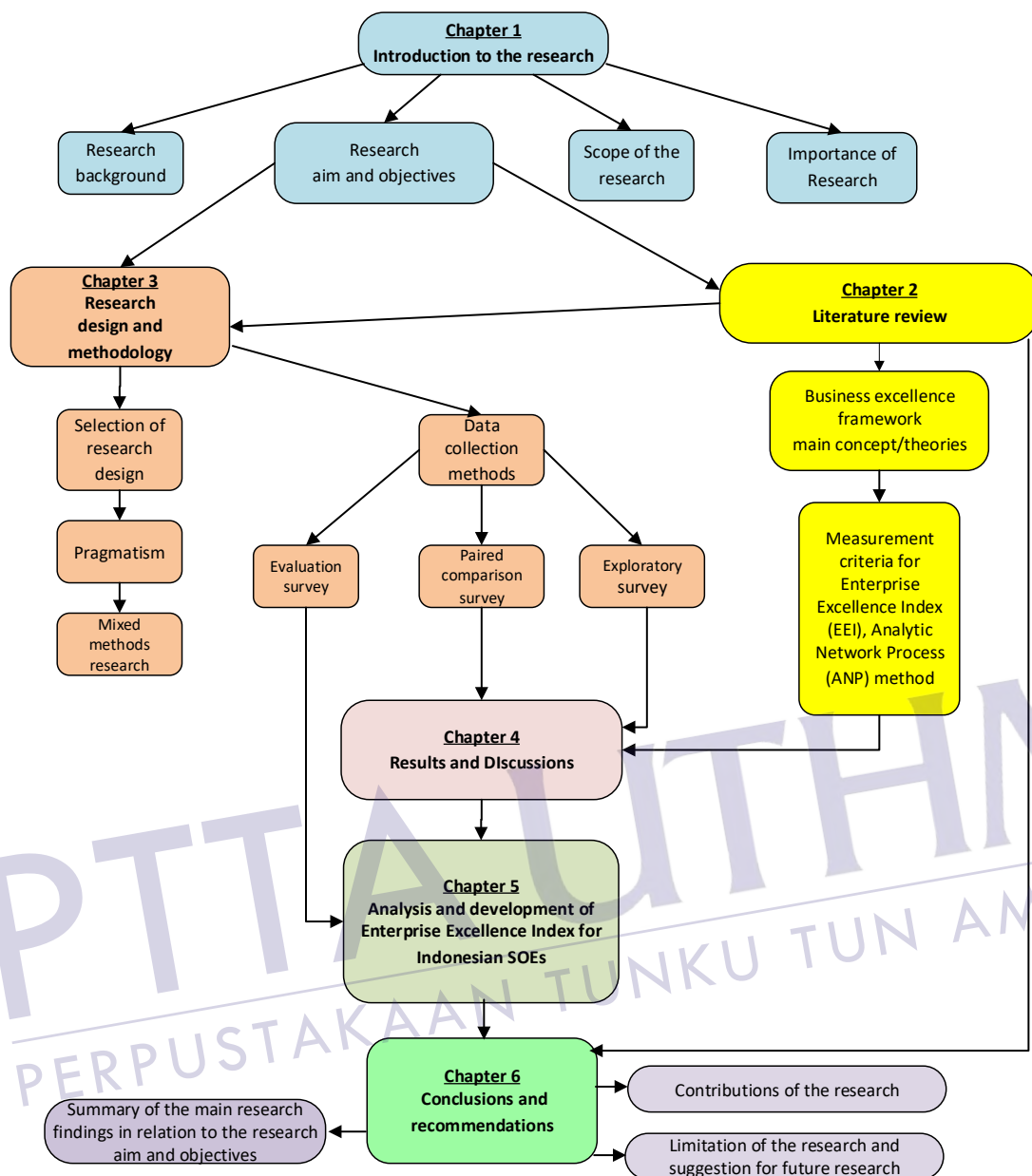


Figure 1.1: Thesis outline and the relationship between chapters

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction to the chapter

This section comprises two sub-sections. The first subsection presents an overview of the business excellence concept and application. Then, in the second sub-section, the essential multi-criteria decision-making (MCDM) method is reviewed with the ANP method described. Finally, a conclusion for this chapter is presented.

2.2 Business excellence model

The business excellence model (BEM), which was formerly called the total quality management (TQM) model, is the current term to help communicate the importance of the word "excellence" in all aspects of the business, not just product quality and process (Mann et al., 2012). These frameworks are employed to measure how well business excellence elements of success are embedded in an organisation. A business excellence model that recognises excellent organisational performance has emerged as a substantial portion of many countries' productivity and quality promotion strategies (Asian Productivity Organisation Tokyo, 2002). BEM provides input on things that must be improved and further developed and provides a holistic method for handlers to direct business and lead to sustainable and measurable success. Here, the BEM functions as an internal businesses framework; it is practised as an overarching framework for managing and aligning multiple improvement initiatives within the organisation (Mohammad et al., 2011). The BEM is also holistic and focuses on all areas and dimensions of the organisation, specifically the factors that drive

performance. It provides a framework to assist the adoption of business excellence principles and an effective way to measure how thoroughly this adoption has been incorporated. According to Mohammad (2019), the model, as depicted in Figure 2.1, has three principal intentions:

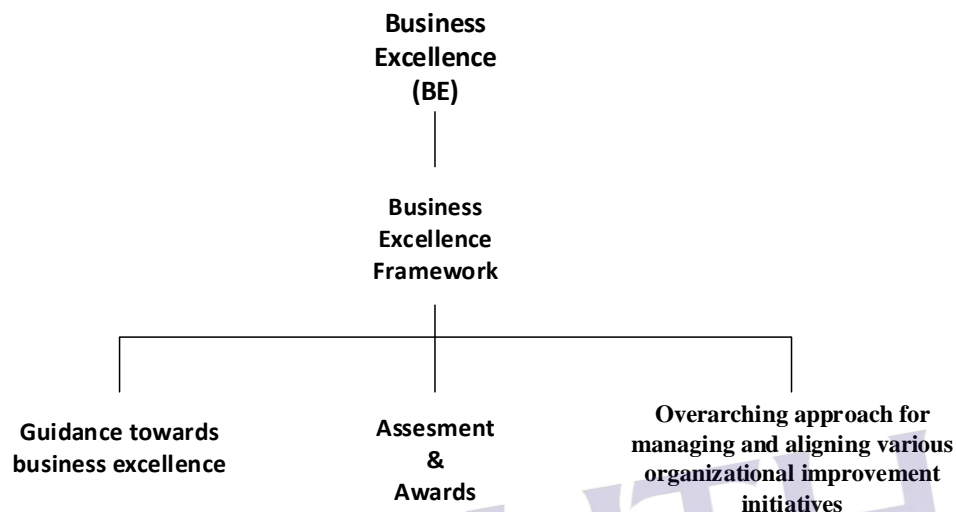


Figure 2.1: Purposes of the business excellence model

(Modified from Mohammad, 2019)

Although BEM has three purposes, it is most widely used for assessment and the foundation to guide organisations in achieving sustainable world-class awards. There are 65 active business excellence awards in 56 nations and regions; most applied the EFQM excellence model and the BEF (Ghafoor et al., 2021). Several countries have set up national and regional quality awards to promote quality and serve as TQM models. The Deming Application Prize, the Malcolm Baldrige National Quality Award, and the European Quality Award are three of the most popular and commonly used TQM structures (Bohoris, 1995). The excellence award was introduced in 1951 and was called the Deming Prize. The Canada Quality Award followed it in 1984. These models were then implemented in the US by establishing the Malcolm Baldrige National Quality Award (MBNQA) in 1987 and the Australian Quality Awards in 1988. Based on the European Foundation for Quality Management (EFQM) model, the EFQM award was then set up in 1991. Simultaneously, several countries in Asia also developed their quality framework during the 1990s mainly by adopting the business excellence model as their reference (Chan & Quazi, 2002). These models

have helped many organisations to improve their processes, customers, and improvement orientations.

To enhance the level of quality implementation and adoption of such business excellence, the custodian in each country is to develop and deploy a framework and conduct award programmes (Mann et al., 2011). Many companies evaluated their performance based on the business excellence model or framework (Ghicajanu et al., 2015). Granting awards of excellence is made in accordance with business models, based on a few criteria and sub-criteria of assessment. Different countries have developed their excellence models as reference frameworks to assess and recognise performance between companies through awards programs (Mohammad et al., 2011).

The BEM is also holistic and focuses on all areas and dimensions of the organisation, specifically the factors that drive performance based on concepts and values (Ghicajanu et al., 2015). It provides a framework to assist the adoption of business excellence principles and an effective way to measure how thoroughly this adoption has been incorporated to pursue business excellence (Chen & Jang, 2011). Bandyopadhyay and Nair (2015) studied the divergent views on the influence of business excellence models on the success of the winning companies for business excellence. They highlighted the need to understand better the gaps in key management practises and processes. Blazey and Grizzell (2019) identified performance excellence refers to an integrated approach to organisational performance management that results in the three following outcomes:

1. Delivery of ever-improving value to customers and stakeholders, contributing to ongoing organisational success.
2. Improvement of the organisation's overall effectiveness and capabilities.
3. Learning for the organisation and people in the workforce..

Companies worldwide have adopted the quality improvement models promoted by either the EFQM or the BEF (Dubey, 2015; Jayamaha et al., 2009). No wonder the BEF and the EFQM Model are recognised worldwide and considered the mothers of other national quality and business excellence awards (Talwar, 2011). Table 2.1 shows the typical BEMs criteria by comparing enablers, results categories, and additional categories.

Table 2.1: Comparison of two common BEMs criteria

BEF categories 2019-2020	The EFQM Model criteria 2019
1. Leadership (120 points)	1. Purpose, vision, and strategy (100 points)
2. Strategy (85 points)	2. Organisational culture and leadership (100 points)
3. Customers (85 points)	3. Engaging stakeholders (100 points)
4. Measurement, analysis, and knowledge management (90 points)	4. Creating sustainable (200 points)
5. Workforce (85 points)	5. Driving performance and transformation (100 points)
6. Operations (85 points)	6. Stakeholder perceptions (200 points)
7. Results (450 points)	7. Strategic and operational performance (200 points)

Mohammad et al. (2011) showed that EFQM and BEF are the most widely used business excellence model globally. The EFQM is primarily used in Europe (e.g., Austria, Northern Ireland, Sweden, and Italy) and Asia (India, Turkey, and United Arab Emirates). Meanwhile, the BEF has been used worldwide, and it has formed the basis for many other countries in developing national quality awards (Islam, 2007a). BEF is widely used in North America and Asia (e.g., China, Taiwan, Japan) and the ASEAN countries (Sulistyo et al., 2020). The next-to-last version from EFQM-2012 has been fully recognised by the management community (not just in Europe) as the most advanced method for achieving long-term sustainability and excellent organisational efficiency (Nenadál, 2020), while BEF focuses on making the criteria more accessible from the user's perspective (Blazey & Grizzell, 2019).

Despite the identified benefits and implications of BEMs, many implementation challenges have been discovered. The models need a lot of resources and contain precise model criteria for participating organizations, making it difficult for companies that don't want to join. The model's resource requirements were occasionally a barrier, especially for small and big enterprises with limited resources. Human resources were needed in addition to financial resources to complete the self-assessment and manage the full process of the external assessors' visits, as doing the self-assessment is a time-consuming activity. It was also discovered that a lack of time, physical, and financial resources were all challenges to BEM (Kiriri, 2019).

2.2.1 Indonesian SOEs performance excellence assessment criteria

Performance excellence assessment criteria for Indonesian SOEs or KPKU is a guide to developing, managing, and empowering SOEs systems and resources to achieve excellent SOEs performance. KPKU is based on Baldrige Excellence Framework (BEF) model version 2019-2020 (BPEP, 2019).

State-owned enterprises (SOEs) had a significant role in many economies, especially when reforms were introduced in many countries (Klovienė & Gimžauskienė, 2014). With increased global competition for finance, expertise, and resources, SOEs have become instruments for some countries to better position themselves for the future in the global economy (Price Waterhouse and Cooper, 2015). In this sense, the Organisation for Economic Cooperation and Development (OECD) guidelines stipulate that SOEs' ultimate aim should maximise society's benefit through efficient resource allocation (OECD, 2015). SOEs have existed in developed and developing countries as a government tool for development (Mohd Nasir, 2017).

The SOEs in Indonesia play an essential role in various industrial sectors. There are currently 114 SOEs contributing more than the US \$30 billion to GDP in 2021 and act as an agent for infrastructure development, financial inclusion, and fostering small and medium enterprises (Ministry of Indonesian SOEs, 2020). According to Agbanu et al. (2016), SOEs shall design, implement, and effectively manage their performance metric. SOEs shall report financial and non-financial information of the enterprise in line with high-quality internationally recognised corporate disclosure standards, including areas of significant concern for the state as an owner and the public (OECD, 2015). For these reasons, SOEs' ministry published the performance excellence assessment criteria (KPKU) adopted from the BEF standards and deployed them to Indonesia's SOEs.

The objectives of the KPKU are to raise the standard performance excellence of the SOEs and be more competitive with other companies in the region (Kementerian BUMN, 2019b). Evans et al. (2012) mentioned that applying an excellent program could improve the SOEs' quality and productivity while gaining a competitive advantage through increasing corporate profits. Ratri et al. (2020) and Muslih & Arsyah (2019) also found that the KPKU assessment positively affected the SOEs' performance.

Meanwhile, many organisations failed to benefit from implementing excellence framework improvement initiatives because no clear guidelines describe when, where, and how to implement initiatives according to the context (Mohammad et al., 2016). Although the KPKU has been implemented since 2012, there are still notes regarding the implementation process. Kharis & Suparno (2014) identified that the enterprise needs a proper approach to show where the organisation is going and how to achieve sustainable growth and achieve comprehensive performance measurement. However, Sulistyono et al. (2020) showed no description of deploying KPKU into performance measurement tools for the SOEs. Therefore, based on the KPKU, the enterprise excellence index (EEI) developed and assessed all its elements that affect the Indonesian SOEs' management, process improvement, and results.

To determine SOEs' excellence, it is essential to evaluate the understanding and application of the KPKU in the SOEs through an exploratory survey conducted in this study. The results are expected to summarise the general conditions of the KPKU implementation, the problems faced, and inputs for developing the EEI of Indonesian SOEs.

The KPKU criteria are built on a set of interrelated core values and concepts:

1. System perspective

The organisation manages all the components as a unified whole to achieve the mission, ongoing success, and performance excellence.

2. Visionary leadership

The company's senior leaders should set a vision for the organisation, establish a customer focus, demonstrate clear and measurable corporate principles and ethics, and set high workforce standards.

3. Customer-focused excellence

Organisations must consider all product and service features and characteristics and all customer access and support modes contributing to customer values.

4. Valuing people

The Organisation values all people who have a stake in the organisation, including customers, community members, shareholders, and others affected by its actions.

5. Organisational learning and agility



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Organisations must be capable of managing risk and changing the ever-shorter cycle time.

6. Focus on success

A standard set of measurable outcome-oriented goals and a focus on the future must guide the organisation.

7. Managing for innovation

The organisation changes to improve the organisation's products, services, programs, processes, operations, and business model to create new value for stakeholders.

8. Management by fact

Organisations must measure and analyse the organisation's performance, both inside and in a competitive environment.

9. Societal contributions

Organisation leaders should stress contributions to the public and the consideration of societal well-being and benefit.

10. Ethics and transparency

Organisations should stress ethical behaviour in all stakeholder transactions and interactions.

11. Delivering value and results

The organisation builds loyalty, contributes to growing the economy, and contributes to society.

KPKU framework, as seen in Figure 2.2, divided into six inter-related process categories and a results category, represent seven critical aspects of managing and performing as an organisation.

1. Leadership emphasises how senior leaders lead the organisation and govern the organisation through societal contributions made.
2. Strategy examines the development of strategy development and strategy implementation.
3. Customers examine the development of the voice of customers and customer engagement.

4. Measurement, analysis, and knowledge management examine how an organisation measures, studies, and improves organisational performance, information, and knowledge management.
5. Workforce examines how an organisation engages its workforce and sets the workforce environment.
6. Operations examine how an organisation designs, manages, and improves its work processes and operational effectiveness.
7. Results examine an organisation's performance and improvement in all vital areas results of product and process, customer, workforce, leadership, governance, and financial and market results.

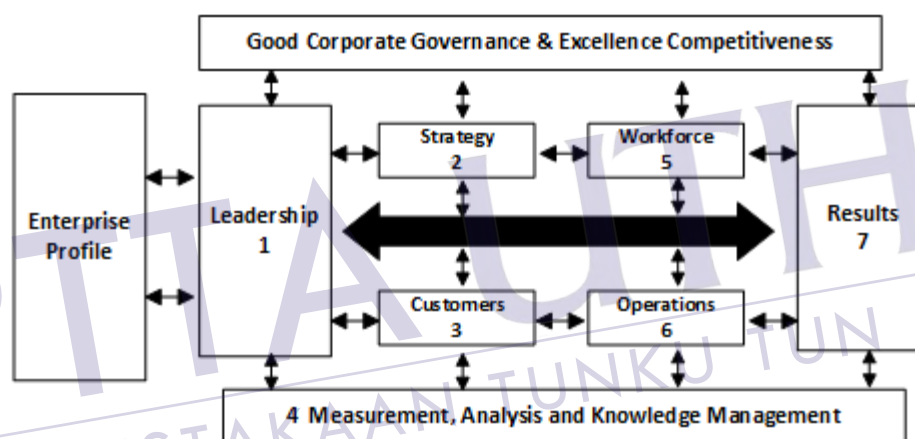


Figure 2.2: KPKU criteria structure (Kementerian BUMN, 2019)

Within each category, a series of questions require the company to explain how they operate the organisation to ensure and enhance competitive success, how they are applied or implemented, and the implementation results. Previous research on the validation of BEF criteria points out that the constructs identified by the categories of leadership, information management, strategic quality planning, human resources, and product and process management are correlated (Pannirselvam et al., 2001b). Unfortunately, selecting the weight assigned to the different criteria in each of the models by their promoting organisations follows an unknown process. The underlying logic is not available in any of their publications (Gómez-gómez et al., 2016). The structure of category, item, and areas to address allows enterprises to identify their strong points and areas to improve in each criterion through a scoring system. As seen

in Table 2.2, the seven criteria and their item scores are distributed differently within each category.

Table 2.2: KPKU categories and items point distribution

Categories and Items	Points
1 Leadership	120
1.1 Senior Leadership	70
1.2 Governance and Societal Contributions	50
2 Strategy	85
2.1 Strategy Development	45
2.2 Strategy Implementation	40
3 Customers	85
3.1 Customer Expectations	40
3.2 Customer Engagement	45
4 Measurement, Analysis, and Knowledge Management	90
4.1 Measurement, Analysis, and Improvement of Organisational Performance	45
4.2 Information and Knowledge Management	45
5 Workforce	85
5.1 Workforce Environment	45
5.2 Workforce Engagement	40
6 Operations	85
6.1 Work Processes	45
6.2 Operational Effectiveness	40
7 Results	450
7.1 Product and Process Results	120
7.2 Customer Results	80
7.3 Workforce Results	80
7.4 Leadership and Governance Results	80
7.5 Financial, Market, and Strategy Results	90
Total Score	1000

A set of questions within each category asks the company to describe the organisation's approaches to ensure and enhance competitive success, how such methods are applied or deployed across the entire organisation, and the results of such deployment. The KPKU criteria, as represented in Figure 2.3, show the criteria structure level, where the seven categories of the KPKU framework are subdivided into items and areas to address. There are 17 items (plus two in the Organisational Profile), each with a particular focus. These items are divided into three groups according to the kinds of information they ask for:

1. The Organisational Profile asks to define the organisational environment.
2. Process items (Categories 1–6) request to determine the organisation's processes.
3. Results items (Category 7) ask to report the organisation's operations results.

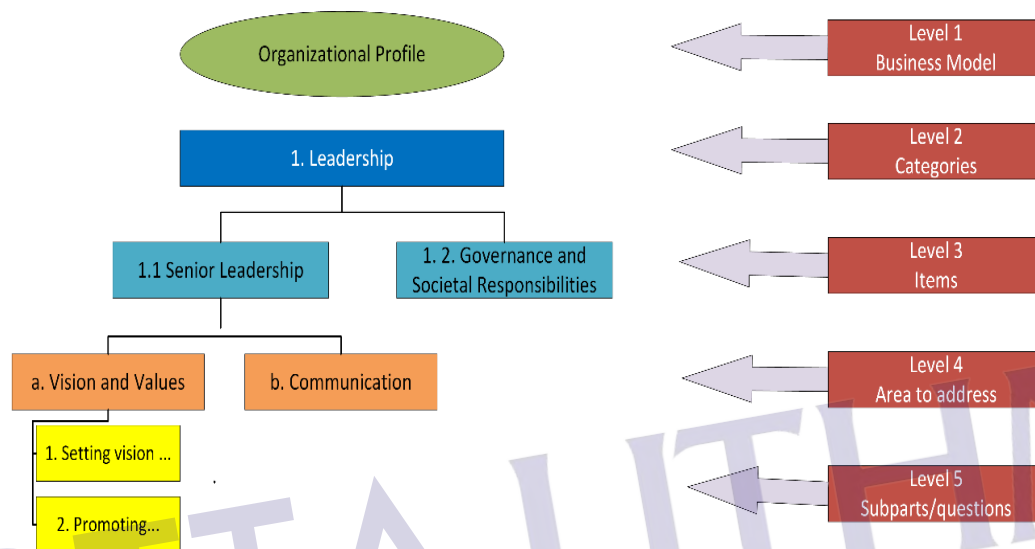


Figure 2.3: KPKU criteria structure (Modified from: BPEP, 2019)

Each item includes one or more areas to address, as depicted in

Figure 2.4, labelled *a*, *b*, *c*. The criteria for excellence consist of questions that organisations must address in their assessment process. Each area to address is divided into subparts or questions, which are expressed on three levels:

1. Basic questions are described in the item titles.
2. Overall questions are expressed in boldface in the shaded box. These leading questions are the starting point for responding.
3. Multiple questions are the individual ones under each area to address, including the one in boldface.

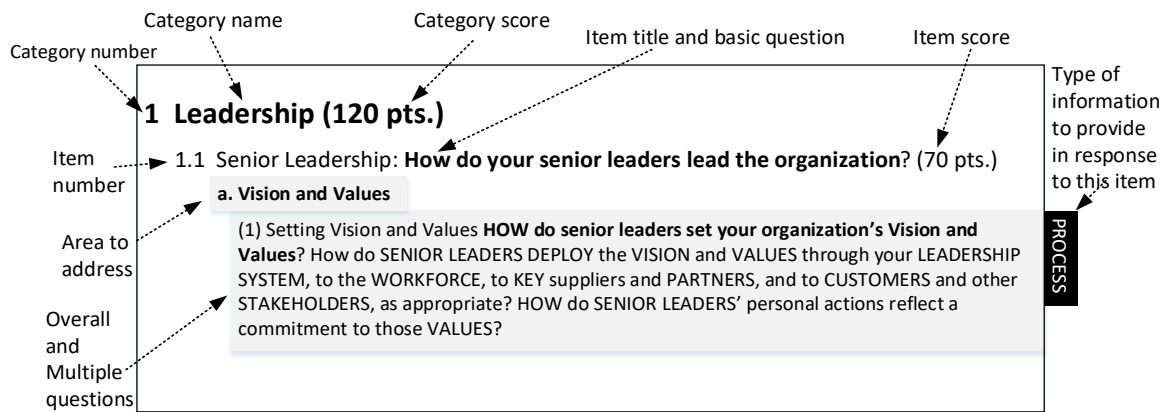


Figure 2.4: Criteria for KPKU structure (BPEP, 2019)

The basic, overall, and multiple questions are responded to the criteria Items based on two evaluating dimensions: processes and results. Process refers to the methods the organisation uses and improves to address the Item questions in Category 1 through 6. To evaluate the maturity of the organisation's processes, four factors are used: Approach (A), Deployment (D), Learning (L), and Integration (I), abbreviated as ADLI. Approach refers to the method used to accomplish the process; Deployment refers to the extent to which the approach is applied; Learning refers to refining the approach through cycles of evaluation and improvement; Integration refers to the time the approach is aligned with the organisational needs.

Results refer to output and outcomes achieved in addressing the questions in Category 7. The factors used to evaluate results are Level (Le), Trends (T), Comparisons (C), and Integration (I), abbreviated as LeTCI. Levels refer to the organization's current level of performance on a meaningful measurement scale. Trends refer to the rate of performance improvements or the sustainability of good performance. Comparisons refer to performance relative to competitors or similar organizations and benchmarks or industry leaders. Integration refers to the extent to which results are measured. Levels (L) and Comparisons (C) are usually analysed together.

When an organization applies for specific levels in the recognition scheme, its practices are reviewed against the model; a panel of assessors assigns a score to each Item based on evidence of actual performance using a scoring guideline (See Appendix G). The 17 sub-criteria must be reviewed during this process to calculate the organization's final index. As a result, accreditation can be given at one of eight excellence levels (Kementerian BUMN, 2013).

The application of KPKU for SOEs in Indonesia brought some findings. Kartikawati et al. (2020) analysed that all categories in the KPKU assessment are interrelated and interconnected with one another. Ratri et al. (2020) examined the relationship between applying KPKU criteria for performance excellence and SOE performance in Indonesia and found a positive correlation. Also, Muslih & Arsyah (2019) show that the performance management system based on KPKU affected SOEs' performance, and the government must continue to develop its application.

Meanwhile, related to the SOEs treatment in other countries, Klovienė and Gimžauskienė (2014) investigate the conceptual framework of an SOE in Lithuania and analyse how the performance measurement system in the enterprises should be constructed when incorporating various regulators. Mohd Nasir (2017) compared SOEs in the United Kingdom, Malaysia, and Japan from the perspective of types, governance structure, and shareholder arrangements, while Agbanu et al. (2016) analysed related research and literature on strategic performance evaluation in state-owned organisations with a comprehensive assessment of some currently proposed metrics.

In either case, to raise the level of quality awareness and adoption of such business excellence, the custodian in each country is developing and deploying a framework and conducting award programs (Mann et al., 2011). Many studies on criteria for performance excellence in the literature employ single or multiple criteria decision-making methods under certainty or uncertainty. In particular, Chan & Quazi (2002) studied the evolution and development of national quality awards in nine selected Asian countries and quality management practices as well. The Asian countries studied in the research are closely linked to the development and evolution of quality management methods. This proximity results from a partnership with the Asian Productivity Organization, which has played a major role in quality management.

Meanwhile, Rawabdeh (2008) analyses 49 companies that took part in the Jordan Award Prize. The Jordan Award, also known as the King Abdullah II Award for excellence, is benchmarked from the EFQM excellence model. The research resulted in a proposal to change the weights of the Jordan Quality Award for Excellence model. At the same time, Jayamaha et al. (2009) validate the three essential business excellence models (Australia, BEF, and Singapore) based on data (item scores) of past applicants of the national quality award. Furthermore, Talwar (2011)

presents a comparative study of the framework, criteria, and criteria weighting of 20 Excellence Models/National Quality Awards, identifies the standard features and contradictions and proposes development suggestions to review the models. Next, Corbett and Angell (2011) examine the alignment, performance and improvement of organisations that have submitted many applications for the New Zealand Business Excellence Award and find that implementing businesses of excellence requires similar actions and criteria to implement quality management.

Many ASEAN countries developed excellence frameworks mainly based on the BEF since this framework symbolises the best practices of total quality management (Mann et al., 2011; Tickle et al., 2016; Shrouy & Tiwari, 2017). Singapore and Malaysia have developed business excellence models tailored to their country needs and characteristics (Ministry of International Trade and Industry, 2018; Enterprise Singapore, 2019). This model is a reference frame for assessing organisational performance and providing national awards based on a business excellence model collected with various criteria and sub-criteria assessment. (Ghicajanu et al., 2015).

Like other frameworks in ASEAN countries, KPKU was initially based on BEF criteria with no modifications, while others have developed their bespoke model based on their context. Sulistyio et al. (2020) presented analytical comparisons of various aspects of the business excellence model, such as goals, award and recognition, categories, and scores in the ASEAN countries' excellence framework. Table 2.3 presents the initial references for the six ASEAN models and the award frameworks. The primary benefit of adopting a highly reputable model is that the framework mainly reflects the best management practices (Tan, 2002).



Table 2.3: Initial reference models in ASEAN countries (Mann, 2016; Kementerian BUMN, 2019; Enterprise Singapore, 2019; Malaysia Productivity Corporation (MPC), 2019; PQA, 2012; TCVN Vietnam, 2016; Thailand Quality Award, 2017; BPEP, 2019)

BE model	BE Awards	Initial Reference Models
Indonesian KPKU framework	KPKU Award	BEF
Singapore Business Excellence Framework	Singapore Quality Award (SQA) Singapore Quality Class (SQC)	BEF, EFQM Excellence Model, Japan Quality Award, and Australian Organisational Excellence Awards
2020-2025 Malaysia Business Excellence Framework	Malaysia Industry Excellence Award (AKI)	BEF
Thailand Business Excellence Framework	Thailand Quality Award (TQA)	BEF, SQA
Philippine Business Excellence Framework	Philippine Quality Award (PQA)	BEF, Australian Business Excellence Award
Vietnam Business Excellence Framework	Vietnam National Quality Award (VQA)	BEF

A comparative analysis of the six business excellence models, as shown in Table 2.4, addresses several categories and items, followed by their value points. The entire model has a total score of 1000, which is divided into process and result points. Meanwhile, a comparative analysis of the six frameworks performed by sorting and grouping each framework's categories and items, as seen in Table 2.5, addressed the general issue, starting with the category "Leadership" and closing with the category "Results." However, Singapore and Malaysia frameworks show different categories with other frameworks compared to other awards. Even though all the six models were adopted from BEF, only two models were the same as BEF with no change, namely Indonesian KPKU and Philippine framework. The Vietnam framework has the same category arrangement, except for an additional item in category seven and the point arrangement differs somewhat from the KPKU.

REFERENCES

- Adams, W. J. L., & Saaty, R. (2003). *Super Decisions Software Guide*.
<http://www.ii.spb.ru/admin/docs/SuperDecisionsHelp2011.pdf>
- Adebanjo, D., Tickle, M., Laosirihongthong, T., & Mann, R. (2015). A study of the use of business improvement initiatives: The association with company size and level of national development. *Production Planning & Control*, 26(7), 507–524.
<https://doi.org/10.1080/09537287.2014.927931>
- Agbanu, P. G., Nayrko, I. K., Agbemava, E., Sedzro, E., & Selase, E. (2016). Measuring Strategic Performance in State-owned Organizations : An Evaluation of Five Proposed Contemporary Metrics. *International Journal of Scientific and Research Publications*, 6(3), 138–153.
- Alanazi, M. H. (2021). Towards a further step in understanding business excellence models: a comparative approach. *Benchmarking: An International Journal*, 1–31.
<https://doi.org/10.1108/BIJ-08-2020-0407>
- Alonso, J. A., & Lamata, M. T. (2006). Consistency in the analytic hierarchy process: a new approach. *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems*, 14(4), 445–459.
- Amponsah, C. T. (2011). Using Multi-Criteria Decision Making to Determine the Critical Success Factors for Procurement of Capital Projects Under Public-Private Partnerships. *International Symposium on the Analytic Hierarchy Process*, 1–7.
- Anand, D., Munjal, A., & Thomas, G. (2020). Attributes Building Business Excellence For Different Class Of Star Rated Hotels Using Fuzzy Logic AHP Approach. *International Journal of Scientific & Technology Research*, 9(02), 2957–2964.
- Apostolou, D. (2019). *Defining customer experience and customer engagement*.
<https://cloudblogs.microsoft.com/dynamics365/bdm/2019/10/10/defining-customer-experience-and-customer-engagement/>
- Aragónés-Beltrán, P., García-Melón, M., & Montesinos-Valera, J. (2017). How to assess stakeholders' influence in project management? A proposal based on the

- Analytic Network Process. *International Journal of Project Management*, 35(3), 451–462. <https://doi.org/10.1016/j.ijproman.2017.01.001>
- Arnau, J., Bendayan, R., & Blanca, M. J. (2013). The effect of skewness and kurtosis on the robustness of linear mixed models. *Behaviour Research Methods*, 45, 873–879. <https://doi.org/10.3758/s13428-012-0306-x>
- Asadabadi, M. R. (2016). A Markovian-QFD approach in addressing the changing priorities of the customer needs. *International Journal of Quality and Reliability Management*, 33(8), 1062–1075. <https://doi.org/10.1108/IJQRM-07-2014-0091>
- Asadabadi, M. R., Chang, E., & Saberi, M. (2019). Are MCDM methods useful? A critical review of Analytic Hierarchy Process (AHP) and Analytic Network Process (ANP). *Cogent Engineering*, 6(1), 1–11. <https://doi.org/10.1080/23311916.2019.1623153>
- Ascarya, A. (2005). Analytic Network Process (ANP): a new qualitative study approach. *Proceeding on Seminar Intern Universitas Trisakti*.
- Ascarya, A. (2013). The Persistent Lack of Profit-And-Loss Sharing Financing in the Persistent Lack of Profit-And-Loss Sharing Financing in Indonesia's Islamic Banks. *The International Islamic Finance Conference, April*, 1–29. <https://www.researchgate.net/publication/301787480>
- Asian Productivity Organization Tokyo. (2002). *The Quest for Global Competitiveness Through National Quality and Business Excellence Awards*. https://www.apo-tokyo.org/00e-books/IS-11_GlobalComp/IS-11_GlobalComp.pdf
- Baldrige Performance Excellence Program (BPEP). (2019). *2019-2020 Baldrige Excellence Framework: Proven Leadership and Management Practice for High Performance*. Gaithersburg, MD: US., Department of Commerce, National Institute of Standards and Technology.
- Bandyopadhyay, P. K., & Nair, S. (2015). Impact of Business Excellence Model on Firm's Business Results (Findings from Literature Survey and Research Agenda). *International Journal of Economy, Management and Social Sciences*, 4(2), 233–236.
- Bayazit, O., & Karpak, B. (2007). An analytical network process-based framework for successful total quality management (TQM): An assessment of Turkish manufacturing industry readiness. *International Journal of Production Economics*, 105(1), 79–96. <https://doi.org/10.1016/j.ijpe.2005.12.009>



PTTA UTHM
PUSAT PENYELIDIKAN DAN PENKAJI TUN AMINAH

- Becker, J., Becker, A., & Saabun, W. (2017). Construction and Use of the ANP Decision Model Taking into Account the Experts' Competence. *International Conference on Knowledge Based and Intelligent Information and Engineering Systems, 112*, 2269–2279. <https://doi.org/10.1016/j.procs.2017.08.145>
- Blazey, M., & Grizzell, P. (2019). *Insights to Performance Excellence 2019 – 2020*. ASQ Quality Press.
- Boateng, P., Chen, Z., & Ogunlana, S. O. (2015). An Analytical Network Process model for risks prioritisation in megaprojects. *International Journal of Project Management, 33*(8), 1795–1811. <https://doi.org/10.1016/j.ijproman.2015.08.007>
- Bohoris, G. A. (1995). A comparative assessment of some major quality awards. *International Journal of Quality & Reliability Management, 12*(9), 30–43. <https://doi.org/10.1108/02656719510101178>
- Brauers, W. K. M., & Zavadskas, E. K. (2012). A Multi-Objective Decision Support System for Project Selection with an Application for the Tunisian Textile Industry. *Economics and Management, 1*(2012), 28–43.
- Chan, T. H., & Quazi, H. A. (2002). Quality Management Practices in Selected Asian Countries: A Comparative Study Quality, Productivity, and Performance Track. *Quality Management Journal, 9*(1), 23–49.
- Chand, M., Bhatia, N., & Singh, R. K. (2018). ANP-MOORA-based approach for the analysis of selected issues of green supply chain management. *Benchmarking, 25*(2), 642–659. <https://doi.org/10.1108/BIJ-11-2016-0177>
- Chang, K. L. (2013). Combined MCDM approaches for century-old Taiwanese food firm new product development project selection. In *British Food Journal* (Vol. 115, Issue 8, pp. 1197–1210). <https://doi.org/10.1108/BFJ-08-2011-0204>
- Chemweno, P., Pintelon, L., Van Horenbeek, A., & Muchiri, P. (2015). Development of a risk assessment selection methodology for asset maintenance decision making: An analytic network process (ANP) approach. *International Journal of Production Economics, 170*, 663–676. <https://doi.org/10.1016/j.ijpe.2015.03.017>
- Chen, C., & Jang, J. (2011). FACT: A comprehensive business excellence model. *Proceedings QMOD Conference on Quality and Service Sciences*, 413–437. <http://www.yzu.edu.tw/>
- Chen, Z. (2019). *the Application of Analytic Network Process for the Sustainable Built Environment*.
- Cheng, E. W. L., & Li, H. (2001). Analytic Hierarchy Process: An Approach to

Determine Measures for Business Performance. *Measuring Business Excellence*, 5(3), 30–37. <https://doi.org/10.1108/EUM0000000005864>

Permanent

Chiang, Y. M., Chen, W. L., & Ho, C. H. (2016). Application of analytic network process and two-dimensional matrix evaluating decision for design strategy. *Computers and Industrial Engineering*, 98, 237–245. <https://doi.org/10.1016/j.cie.2016.06.005>

Corbett, L. M., & Angell, L. C. (2011). Business excellence in New Zealand: Continuous improvement, learning, and change. *Total Quality Management and Business Excellence*, 22(7), 755–772. <https://doi.org/10.1080/14783363.2011.585782>

Creswell, J. W. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (3rd ed.). SAGE Publication Ltd.

Daim, T. U., Udbye, A., & Balasubramanian, A. (2012). Use of analytic hierarchy process (AHP) for selection of 3PL providers. *Journal of Manufacturing Technology Management*, 24(1), 28–51. <https://doi.org/10.1108/17410381311287472>

Davies, J. (2008). Integration: is it the key to effective implementation of the EFQM Excellence Model? *International Journal of Quality & Reliability Management*, 25(4), 383–399. <https://doi.org/10.1108/02656710810865267>

Dubey, M. (2015). Developing an Agile Business Excellence Model for Organizational Sustainability. *Global Business and Organizational Excellence*, 35(2), 60–71. <https://doi.org/10.1002/joe.21656>

Dudovskiy, J. (2018). *The Ultimate Guide to Writing a Dissertation in Business Studies: A Step by Step Assistance*. <https://research-methodology.net/about-us/ebook/>

Duleba, S., & Moslem, S. (2018). Sustainable Urban Transport Development with Stakeholder Participation, an AHP-Kendall Model: A Case Study for Mersin. *Sustainability*, 10(3647), 1–14. <https://doi.org/10.3390/su10103647>

Enterprise Singapore. (2019). *Business Excellence Framework*. http://imcs.sg/wp-content/uploads/2020/04/ESG-Sharing_BE-Seminar_27-Nov-18_shared-edited.pdf

Eskildsen, J. K., Kristensen, K., & Juhl, H. J. (2002). Trends in EFQM criterion weights, The case of Denmark 1998-2001. *Measuring Business Excellence*, 6(2),

22–28. <https://doi.org/10.1108/13683040210431437>

- Evans, J. R., Ford, M. W., Masterson, S. S., & Hertz, H. S. (2012). Beyond performance excellence: Research insights from Baldrige recipient feedback. *Total Quality Management and Business Excellence*, 23(5–6), 489–506. <https://doi.org/10.1080/14783363.2012.669547>
- Flynn, B. B., & Saladin, B. (2006). Relevance of Baldrige Constructs in an International Context: a Study of National Culture. *Journal of Operations Management*, 24(5), 583–603. <https://doi.org/https://doi.org/10.1016/j.jom.2005.09.002>
- Ghafoor, S., Grigg, N. P., & Mann, R. (2021). An investigation of designing, developing and modifying business excellence frameworks. *Measuring Business Excellence*, August, 1–20. <https://doi.org/10.1108/mbe-10-2020-0137>
- Ghafoor, S., Grigg, N. P., Mathrani, S., & Mann, R. (2020). A bibliometric and thematic review of business excellence journal papers from 1990 to 2020. *Total Quality Management & Business Excellence*, 1–33. <https://doi.org/https://doi.org/10.1080/14783363.2020.1847638>
- Ghicajanu, M., Irimie, S., Marica, L., & Munteanu, R. (2015). Criteria for Excellence in Business. *Procedia Economics and Finance*, 23, 445–452. [https://doi.org/10.1016/S2212-5671\(15\)00388-3](https://doi.org/10.1016/S2212-5671(15)00388-3)
- Gladwell, M. (2008). *Outliers - The Story of Success* (1st ed.). Little, Brown and Company.
- Gómez-Gómez, J., Martínez-Costa, M., & Martínez-Lorente, Á. R. (2016). Weighting the dimensions in models of excellence – a critical review from a business perspective. *Measuring Business Excellence*, 20(3), 79–90. <https://doi.org/10.1108/MBE-01-2016-0007>
- Goran, J., Zorana, T., & Borut, K. (2017). Measurement of company effectiveness using analytic network process method. *Materials and Geoenvironment*, 64(2), 103–110. <https://doi.org/10.1515/rmzmag-2017-0007>
- Grady, C. A., He, X., & Peeta, S. (2015). Integrating social network analysis with analytic network process for international development project selection. *Expert Systems with Applications*, 42(12), 5128–5138. <https://doi.org/10.1016/j.eswa.2015.02.039>
- Gupta, N., & Vrat, P. (2020). An evaluation of alternative business excellence models using AHP. *Journal of Advances in Management Research*, 17(2), 305–331.



PTTA UTM
PERPUSTAKAAN TUNJUNG MINAH

<https://doi.org/10.1108/JAMR-06-2019-0101>

- Hemmati, S., & Rabbani, M. (2010). Make-to-order/make-to-stock partitioning decision using the analytic network process. *International Journal of Advanced Manufacturing Technology*, 48(5–8), 801–813. <https://doi.org/10.1007/s00170-009-2312-4>
- HR-Guide. (2018). *Understanding Test Quality-Concepts of Reliability and Validity*. https://hr-guide.com/Testing_and_Assessment/Reliability_and_Validity.htm
- Ighravwe, D. E., & Oke, S. A. (2017). Ranking maintenance strategies for sustainable maintenance plan in manufacturing systems using fuzzy axiomatic design principle and fuzzy-TOPSIS. *Journal of Manufacturing Technology Management*, 28(7), 961–992. <https://doi.org/10.1108/JMTM-01-2017-0007>
- Isalou, A. A., Zamani, V., Shahmoradi, B., & Alizadeh, H. (2013). Landfill site selection using integrated fuzzy logic and analytic network process (F-ANP). *Environmental Earth Sciences*, 68(6), 1745–1755. <https://doi.org/10.1007/s12665-012-1865-y>
- Ishizaka, A., & Pereira, V. E. (2016). Portraying an employee performance management system based on multi-criteria decision analysis and visual techniques. *International Journal of Manpower*, 37(4), 628–659. <https://doi.org/10.1108/IJM-07-2014-0149>
- Islam, R. (2007a). MBNQA criteria in education: Assigning weights from a Malaysian perspective and proposition for an alternative evaluation scheme. *International Transactions in Operational Research*, 14, 373–394.
- Islam, R. (2007b). *The Business Excellence Framework*. www.rafikulislam.com
- Jankalová, M., & Jankal, R. (2018). Sustainability assessment according to the selected Business Excellence models. *Sustainability*, 10(10), 1–24. <https://doi.org/10.3390/su10103784>
- Jayakrishna, K., Vimal, K. E. ., & Vinodh, S. (2015). ANP based sustainable concept selection. *Journal of Modelling in Management*, 10(1), 118–136. <https://doi.org/10.1108/JM2-12-2012-0042>
- Jayamaha, N., Grigg, N., & Mann, R. (2009). A study of the validity of three major business excellence models in the Asia Pacific region. *Total Quality Management and Business Excellence*, 20(11), 1213–1227. <https://doi.org/10.1080/14783360903247536>
- Jayamaha, N. P., Grigg, N. P., & Mann, R. S. (2011). Empirical analysis of the



PTTA UTHM
 PERPISTAKAAN TUNKU TUN MINAH

Baldrige Criteria as both an organisational performance measure and a theoretical model. *Measuring Business Excellence*, 15(1), 20–33.
<https://doi.org/10.1108/13683041111113222>

Jayant, A., Paul, V., & Kumar, U. (2014). Application of Analytic Network Process (ANP) in business environment: A comprehensive literature review. *International Journal of Research in Mechanical Engineering & Technology*, 4(3), 29–37.

Kadoić, N., Ređep, N. B., & Divjak, B. (2017). Decision making with the analytic network process. *Proceedings of the 14th International Symposium on Operational Research, SOR 2017, Sept*(Section 2), 180–186.

Karimi, A., Safari, H., Hashemi, S. H., & Kalantar, P. (2013). A study of the Baldrige Award framework using the applicant scoring data. *Total Quality Management and Business Excellence*, 25(5–6), 461–477.
<https://doi.org/10.1080/14783363.2013.830386>

Karras, D. J. (1997). Statistical Methodology: II. Reliability and Validity Assessment in Study Design, Part A. *Academic Emergency Medicine*, 4(1), 64–71.

Kartikawati, W. D., Munandar, J. M., & Suprayitno, G. (2020). Effectiveness of Performance Measurement in Realizing World-Class Companies in the Perspective of Malcolm Baldrige. *Journal of Applied Management (JAM)*, 18(1), 201–210. <https://doi.org/http://dx.doi.org/10.21776/ub.jam.2020.018.01.20>

Kaur, I., Shri, C., & Mital, K. M. (2018). Performance management model for teachers based on emotional intelligence and social media competencies. *Journal of Advances in Management Research*, 15(4), 414–433.
<https://doi.org/10.1108/JAMR-09-2017-0086>

Kementerian BUMN. (2013). *Assessment Criteria for Performance Excellence (KPKU) of Indonesian State-Owned Enterprises Guideline (S-08/S.MBU/2013)*. Kementerian BUMN.

Kementerian BUMN. (2019a). *Evaluasi Efektivitas Implementasi Kriteria Penilaian Kinerja Unggul (KPKU) Sebagai Perangkat Penilaian Kinerja BUMN*.

Kementerian BUMN. (2019b). *Kriteria Penilaian Kinerja Unggul (KPKU) 2019*. <https://jdih.bumn.go.id/unduh/S-08/S.MBU/2013.pdf>

Kementerian BUMN. (2020). *Renstra Kementerian BUMN 2020-2024*.

Khan, A. U., & Ali, Y. (2020). Analytical Hierarchy Process (AHP) and Analytic Network Process Methods and Their Applications: a Twenty Year Review From

2000–2019. *International Journal of the Analytic Hierarchy Process*, 12(3), 369–402.

Kharis, M., & Suparno. (2014). *Perancangan Sistem Pengukuran Kinerja Terintegrasi Antara Metode Balanced Scorecard dan Kriteria Penilaian Kinerja Unggul (KPKU) BUMN Berbasis Malcolm Baldrige Criteria (MBC) Untuk Mencapai Kinerja Ekselen di PT. Semen Indonesia (Persero) Tbk.* 1–9.

Khojaste-Sarakhsi, M., Ghodsypour, S. H., Fatemi Ghomi, S. M. T., & Dashtaki-Hesari, H. (2018). Energy efficiency of Iran buildings: a SWOT-ANP approach. *International Journal of Energy Sector Management*.
<https://doi.org/10.1108/IJESM-07-2018-0011>

Kiriri, P. (2019). Challenges Facing African Business Excellence Models: A Case Study of Company of The Year Awards (COYA). *Ekonomika*, 65(1), 11–23.
<https://doi.org/10.5937/ekonomika1901011k>

Klovienė, R., & Gimžauskienė, E. (2014). Performance Measurement Model Formation in State-owned Enterprises. *Procedia - Social and Behavioral Sciences*, 156, 594–598. <https://doi.org/10.1016/j.sbspro.2014.11.247>

Krejić, J., & Stoklasa, J. (2018). Aggregation in the analytic hierarchy process : Why weighted geometric mean should be used instead of weighted arithmetic mean. *Expert Systems With Applications*, 114, 97–106.
<https://doi.org/10.1016/j.eswa.2018.06.060>

Krittanathip, V., Rakkarn, S., & Cha-um, S. (2013). A Novel Cluster Analysis on National Quality Awarding in Asian Countries: Thailand, Japan, Singapore and Taiwan. *Procedia - Social and Behavioral Sciences*, 88, 13–19.
<https://doi.org/10.1016/j.sbspro.2013.08.476>

Kumar, R. (2011). *Research Methodology: a step-by-step guide for beginners* (3rd ed.). SAGE Publication Ltd.

Lami, I. M., & Abastante, F. (2014). Decision making for urban solid waste treatment in the context of territorial conflict: Can the Analytic Network Process help? *Land Use Policy*, 41, 11–20. <https://doi.org/10.1016/j.landusepol.2014.04.010>

Larrick, R. P., & Feiler, D. C. (2015). Expertise in Decision Making. In G. Keren & G. Wu (Eds.), *The Wiley Blackwell Handbook of Judgment and Decision Making, First Edition* (1st ed., pp. 696–721). John Wiley & Sons, Ltd.

Lechte, J. (2003). *Key contemporary concepts from abjection to Zeno's paradox*. Sage Publications Ltd. <https://doi.org/10.4324/9781315640051-28>

- Lewis-beck, M. S. (1974). Determining the Importance of an Independent A Path Analytic Solution Variable: *Social Science Research*, 3(2), 95–107. [https://doi.org/10.1016/0049-089X\(74\)90006-4](https://doi.org/10.1016/0049-089X(74)90006-4)
- Li, S., & Fu, H. (2006). The Study of Criteria Weight for Taiwan National Quality Award by Fuzzy Hierarchical Analysis. *Asian Journal on Quality*, 7(2), 83–96. <https://doi.org/10.1108/15982688200600018>
- Lima, R. M., Mesquita, D., Rocha, C., & Rabelo, M. (2017). Defining the Industrial and Engineering Management Professional Profile : a longitudinal study based on job advertisements. *Production*, 27, 1–15. <https://doi.org/10.1590/0103-6513.229916>
- Lin, S. W., & Jerusalem, M. A. (2016). Integrated MCDM for evaluating fashion design schemes. *International Journal of Clothing Science and Technology*, 28(6), 880–892. <https://doi.org/10.1108/IJCST-01-2016-0005>
- Lin, Y., Tsai, K., Shiang, W., Kuo, T., & Tsai, C. (2009). Research on using ANP to establish a performance assessment model for business intelligence systems. *Expert Systems With Applications*, 36(2), 4135–4146. <https://doi.org/10.1016/j.eswa.2008.03.004>
- Liu, F. (2010). A modified ANP and its application in simulation credibility evaluation. *International Journal of Simulation Modelling*, 09(4), 195–207. [https://doi.org/10.2507/IJSIMM09\(4\)3.161](https://doi.org/10.2507/IJSIMM09(4)3.161)
- Mackenzie, N., & Knipe, S. (2006). Research dilemmas : Paradigms, methods and methodology. *Issues in Educational Research*, 16(2), 1–11. <https://www.iier.org.au/iier16/mackenzie.html>
- Malaysia Productivity Corporation (MPC). (2019). *Malaysia Business Excellence Framework 2020–2025*. Malaysia Productivity Corporation.
- Mann, R. (2016). *Business Excellence Models and Awards for the Public Sector*. Asian Productivity Organization. <https://www.apo-tokyo.org/publications/ebooks/business-excellence-models-and-awards-for-the-public-sector-a-guidebook-for-national-productivity-organizations/>
- Mann, R., Adebajo, D., Laosirihongthong, T., & Punnakitikashem, P. (2011). Awareness and impact of business excellence in Asia. *Total Quality Management & Business Excellence*, 22(11), 1237–1258. <http://dx.doi.org/10.1080/14783363.2011.624772>
- Mann, R., Adebajo, D., & Tickle, M. (2011). Deployment of business excellence in

- Asia: an exploratory study. *International Journal of Quality & Reliability Management*, 28(6), 604–627. <https://doi.org/10.1108/02656711111141184>
- Mann, R., Mohammad, M., & Agustin, M. T. A. (2012). Understanding Business Excellence: An awareness guidebook for SMEs. In *Asian Productivity Organisation*. <https://www.apo-tokyo.org/wp-content/uploads/sites/3/2014/07/Understanding-Business-Excellence.pdf>
- Mavi, R. K., Gheibdoust, H., Khanfar, A. A., & Mavi, N. K. (2019). Ranking factors influencing strategic management of university business incubators with ANP. *Management Decision*, Vol. 57(12), 3492–3510. <https://doi.org/10.1108/MD-06-2018-0688>
- Merriam-Webster. (2021). *Dictionary*. <https://www.merriam-webster.com/dictionary/index>
- Metaxas, I. N., Koulouriotis, D. E., & Spartalis, S. H. (2016). A multicriteria model on calculating the Sustainable Business Excellence Index of a firm with fuzzy AHP and TOPSIS. *Benchmarking: An International Journal*, 23(6), 1522–1557. <https://doi.org/https://doi.org/10.1108/BIJ-07-2015-0072>
- Meyer, S. M., & Collier, D. A. (2001). An empirical test of the causal relationships in the Baldrige Health Care Pilot Criteria. *Journal of Operations Management*, 19(4), 403–426. [https://doi.org/10.1016/S0272-6963\(01\)00053-5](https://doi.org/10.1016/S0272-6963(01)00053-5)
- Strategic Plan Ministry of Indonesia SOEs 2020-2024, Pub. L. No. PER-8/MBU/08/2020, 80 (2020).
- Mohammad, M. (2019). Convergence of ISO 9001 and Business Excellence. *Paper Presented at the 9th International Conference on Industrial Engineering and Operations Management, Bangkok*.
- Mohammad, M., Mann, R., Grigg, N., & Wagner, J. P. (2011). Business Excellence Model: An overarching framework for managing and aligning multiple organisational improvement initiatives. *Total Quality Management & Business Excellence*, 22(11), 1213–1236. <https://doi.org/10.1080/14783363.2011.624774>
- Mohammadzadeh, A. K., Ghafoori, S., Mohammadian, A., Mohammadkazemi, R., Mahbanooei, B., & Ghasemi, R. (2018). A Fuzzy Analytic Network Process (FANP) approach for prioritizing internet of things challenges in Iran. *Technology in Society*, 53, 124–134. <https://doi.org/10.1016/j.techsoc.2018.01.007>
- Mohd Nasir, H. B. (2017). State-Owned Enterprises : a Comparison Between the UK,

- Japan, and Malaysia. *International Journal of Economics, Commerce and Management*, 5(2), 114–130.
- Musharavati, F. (2013). Advancing Service Operations: The Changing Role of Industrial Engineering. *Industrial Engineering & Management*, 2(1), 1–7. <https://doi.org/10.4172/2169-0316.1000102>
- Muslih, M., & Arsyah, R. J. (2019). The Role of Performance Measurement Criteria for Superior Performance (KPKU) on SOE Performance, Moderated by Corporate Governance. *South East Asia Journal of Contemporary Business, Economics and Law*, 20(5), 127–139.
- Mustafa, S. Z., & Kar, A. K. (2019). Prioritization of multi-dimensional risk for digital services using the generalized analytic network process. *Digital Policy, Regulation and Governance*, 21(2), 146–163. <https://doi.org/10.1108/DPRG-06-2018-0031>
- Nenadál, J. (2020). The New EFQM Model : What is Really New and Could Be Considered as a Suitable Tool with Respect to Quality 4.0 Concept? *Quality Innovation Prosperity*, 24(1), 17–28. <https://doi.org/10.12776/QIP.V24I1.1415>
- Nilashi, M., Ahmadi, H., Ahani, A., Ravangard, R., & Ibrahim, O. bin. (2016). Determining the importance of Hospital Information System adoption factors using Fuzzy Analytic Network Process (ANP). *Technological Forecasting and Social Change*, 111(2016), 244–264. <https://doi.org/10.1016/j.techfore.2016.07.008>
- Nishom, M., Isnanto, R. R., & Adi, K. (2017). Implementation of Analytic Network Process Method for Decision Support System on Library Services Quality Assurance Based on ISO 9001. *International Journal of Innovative Research in Advanced Engineering*, 03(4), 33–40. <http://www.ijirae.com/volumes/Vol4/iss03/06.MRAE10084.pdf>
- Nuswantara, D. A., & Andjani, W. P. (2021). Do distressed firms manage earnings? *Jurnal Siasat Bisnis*, 25(2), 111–118. <https://doi.org/10.20885/jsb.vol25.iss2.art2>
- OECD. (2015). OECD Guidelines on Corporate Governance of State-owned Enterprises. In *OECD Publishing*. <https://doi.org/10.1787/9789264244160-en>
- Özgen, A., & Tanyas, M. (2011). Joint selection of customs broker agencies and international road transportation firms by a fuzzy analytic network process approach. *Expert Systems with Applications*, 38(7), 8251–8258. <https://doi.org/10.1016/j.eswa.2011.01.005>



- Padhi, S. S., Jena, S. K., Zanger, I., & Kapil, K. (2014). Evolving readiness index for overhauling the retailing sector through retailing process reengineering implementation. *Business Process Management Journal*, 20(6), 844–864. <https://doi.org/10.1108/BPMJ-05-2013-0064>
- Pannirselvam, G. P., & Ferguson, L. A. (2006). A study of the relationships between the Baldrige categories. *International Journal of Quality & Reliability Management*, 18(1), 14–37. <https://doi.org/10.1108/02656710110364468>
- Podvezko, V., & Sivilevičius, H. (2013). The use of AHP and rank correlation methods for determining the significance of the interaction between the elements of a transport system having a strong influence on traffic safety. *Transport*, 28(4), 389–403. <https://doi.org/10.3846/16484142.2013.866980>
- Pourebrahim, S., Hadipour, M., Mokhtar, M. Bin, & Hj Mohamed, M. I. (2010). Analytic network process for criteria selection in sustainable coastal land use planning. *Ocean and Coastal Management*, 53(9), 544–551. <https://doi.org/10.1016/j.ocecoaman.2010.06.019>
- PQA. (2017). *2017-2021 PQA Criteria for Performance Excellence*. <https://pqa.dti.gov.ph/uploads/resources/2017-2021-pqa-business-criteria-50.pdf>
- Price Waterhouse and Cooper. (2015). *State-Owned Enterprises Catalysts for public value creation?* (Issue April). <https://www.pwc.com/gx/en/psrc/publications/assets/pwc-state-owned-enterprise-psrc.pdf>
- Promentilla, M. A. B., Tapia, J. F. D., Arcilla, C. A., Dugos, N. P., Gaspillo, P. D., Roces, S. A., & Tan, R. R. (2013). Interdependent ranking of sources and sinks in CCS systems using the analytic network process. *Environmental Modelling and Software*, 50, 21–24. <https://doi.org/10.1016/j.envsoft.2013.08.013>
- Rahman, M., Islam, R., Rohaida, W., Husain, W., & Ahmad, K. (2019). Developing a hierarchical model to enhance business excellence in hotel industry of Bangladesh. *International Journal of Contemporary Hospitality Management*, 31(4), 1836–1856. <https://doi.org/10.1108/IJCHM-02-2018-0110>
- Ramkumar, M. (2016). A modified ANP and fuzzy inference system based approach for risk assessment of in-house and third party e-procurement systems. *Strategic Outsourcing: An International Journal*, 9(2), 159–188. <https://doi.org/10.1108/SO-12-2015-0030>
- Ratri, M. C., Harymawan, I., & Nowland, J. (2020). Assessment of Criteria for



PTTA UTHM
 PERPUSTAKAAN TUNKU TUN MAMINAH

- Performance Excellence (KPKU) and Firm Performance: Evidence from Indonesia. *Journal of Security and Sustainability Issues*, 9(3), 1077–1088. [https://doi.org/10.9770/jssi.2020.9.3\(31\)](https://doi.org/10.9770/jssi.2020.9.3(31))
- Raut, R., Kharat, M., Kamble, S., & Kumar, C. S. (2018). Sustainable evaluation and selection of potential third-party logistics (3PL) providers: An integrated MCDM approach. *Benchmarking*, 25(1), 76–97. <https://doi.org/10.1108/BIJ-05-2016-0065>
- Rawabdeh, I. A. (2008). Jordan Quality Award (King Abdullah II Award for Excellence (KAIIAE)) - Characteristics, assessment and benchmarking. *Benchmarking: An International Journal*, 15(1), 4–24. <https://doi.org/10.1108/14635770810854326>
- Raziei, S. (2019). EFQM Excellence Model Based On Multi-Criteria Processes Fuzzy AHP, Fuzzy DEMATEL, Fuzzy TOPSIS, And Fuzzy VIKOR; A Comparative Survey. *International Journal of Scientific & Technology Research*, 8(04), 248–260.
- Rosenthal, J. A. (2012). *Statistics and data interpretation for social work* (J. Perillo (ed.); 1st editio). Springer Publishing Company.
- Russo, R. D. F. S. M., & Camanho, R. (2015). Criteria in AHP: A systematic review of literature. *Procedia Computer Science*, 55, 1123–1132. <https://doi.org/10.1016/j.procs.2015.07.081>
- Rusydiana, O. A. S., & Devi, A. (2011). *Aplikasi Metode Analytic Network Process (ANP) Untuk Mengurai Problem Pengembangan Baitul Maal Wat-Tamwiil (BMT) Di Indonesia*.
- Saaty, Thomas L; Vargas, L. G. (2006). *Decision Making with the Analytic Network Process*. Springer.
- Saaty, R. W. (2002). *Decision Making in Complex Environments - The Analytic Network Process (ANP) for Dependence and Feedback*. Creative Decision Foundation.
- Saaty, T. L. (2004). Fundamentals of the analytic network process — multiple networks with benefits, costs, opportunities and risks. *Journal of Systems Science and Systems Engineering*, 13(3), 348–379. <https://doi.org/10.1007/s11518-006-0171-1>
- Saaty, T. L. (2008). The Analytic Hierarchy and Analytic Network Measurement Processes: Applications to Decisions under Risk. *European Journal of Pure and*

Applied Mathematics, 1(1), 122–196. https://doi.org/10.1007/978-3-540-92828-7_4

- Saaty, T. L. (2009a). Applications of Analytic Network Process in Entertainment 1. *Iranian Journal of Operations Research*, 1(2), 41–55. <https://iors.ir/journal/article-1-63-en.pdf>
- Saaty, T. L. (2009b). *Theory and Applications of the Analytic Network Process*. RWS Publications.
- Safian, E. E. M. (2015). *Building and Locational Characteristics' Quality of Purpose-Built Offices in Malaysia and Their Relationship with Rentals* (Issue September). Universiti Teknologi Mara.
- Saunders, M. N. K., Lewis, P., & Thornhill, A. (2019). *Research Methods for Business Students Eighth Edition* (8th ed.). London, Pearson.
- Sawaludin, Surachman, Djumahi, & Rahayu, M. (2013). Quality Management Practices of Malcolm Baldrige National Quality Award (MBNQA) Studies at College in Southeast Sulawesi, Indonesia. *International Journal of Business and Management Invention*, 2(11), 11–25.
- Schoonenboom, J., & Johnson, R. B. (2017). How to Construct a Mixed Methods Research Design. *Kölner Zeitschrift Für Soziologie Und Sozialpsychologie (KZfSS)*, 69(2), 107–131. <https://doi.org/10.1007/s11577-017-0454-1>
- Shrouty, V., & Tiwari, P. (2017). Business Excellence : A Comparative Study of Various Models, Criteria ' s and Awards : *International Research Journal of Engineering and Technology (IRJET)*, 04(06 June), 38–44.
- Si, S., You, X., Liu, H., & Zhang, P. (2018). DEMATEL Technique : A Systematic Review of the State-of-the-Art Literature on Methodologies and Applications. *Mathematical Problems in Engineering*, 2018(1), 33. <https://doi.org/https://doi.org/10.1155/2018/3696457>
- Singh, B., Grover, S., & Singh, V. (2017). An empirical study of benchmarking evaluation using MCDM in service industries. *Managerial Auditing Journal*, 32(2), 111–147. <https://doi.org/10.1108/MAJ-11-2015-1274>
- Slack, N., & Brandon-Jones, A. (2018). *Operations and process management: Principles and practice for strategic impact* (Fifth). Pearson Education Limited.
- Statistical Consulting Institute for Digital Research & Education. (2020). *What Does Cronbach's Alpha Mean?* <https://stats.idre.ucla.edu/spss/faq/what-does-cronbachs-alpha-mean/>

- Sulistyo, B., Amani, H., Widaningrum, S., Mohammad, M., & Ibrahim, R. (2021). Comparative Study of Business Excellence Frameworks and Awards in Southeast Asian Countries. *International Journal of Business and Society (IJBS)*, 22(3), 1123–1142.
- Sulistyo, B., Darmayana, R. A., & Mohammad, M. (2020). Key Performance Indicators of Indonesia State-Owned Enterprise - a Model Using BSC and BEF. *International Journal of Integrated Engineering*, 12(3), 115–121.
- Sulistyo, B., Widaningrum, S., Amani, H., Mohammad, M., & Ibrahim, R. (2019). Awareness and Implementation of Business Excellence Framework of Indonesia State-Owned Enterprises. *Paper Presented at the International Conference on Data Engineering and Information System 2019 - ICoDEIS, Yogyakarta*.
- Sun, Z. Y., Zhou, J. L., & Gan, L. F. (2018). Safety assessment in oil drilling work system based on empirical study and Analytic Network Process. *Safety Science*, 105(June 2017), 86–97. <https://doi.org/10.1016/j.ssci.2018.02.004>
- Supeekit, T., Somboonwiwat, T., & Kritchanchai, D. (2016). DEMATEL- modified ANP to evaluate internal hospital supply chain performance. *Computers & Industrial Engineering*, 102, 318–330. <https://doi.org/10.1016/j.cie.2016.07.019>
- Taber, K. S. (2018). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. *Research Science Education*, 48, 1273–1296. <https://doi.org/10.1007/s11165-016-9602-2>
- Talwar, B. (2011). Comparative study of framework, criteria and criterion weighting of excellence models. *Measuring Business Excellence*, 15(1), 49–65. <https://doi.org/10.1108/13683041111113240>
- Tan, K. C. (2002). A comparative study of 16 national quality awards. *TQM Magazine*, 14(3), 165–171. <https://doi.org/10.1108/09544780210425874>
- Tanjung, H., & Devi, A. (2018). *Metodologi Penelitian Ekonomi Islam* (2nd ed.). Gramata Publishing.
- Taslicali, A. K., & Ercan, S. (2006). The analytic hierarchy & the analytic network processes in multicriteria decision making: A comparative study. *Journal of Aeronautics & Space Technologies*, 2(4), 55–65.
- Tavakoli, M. M., Shirouyehzad, H., & Dabestani, R. (2016). Proposing a hybrid method based on DEA and ANP for ranking organizational units and prioritizing human capital management drivers. *Journal of Modelling in Management*, 11(1), 213–239. <https://doi.org/10.1108/JM2-02-2014-0013>

- TCVN Vietnam. (2016). *Hướng Dẫn Doanh Nghiệp Viết Báo Cáo Tham Dự Giải Thưởng Chất Lượng Quốc Gia*.
<http://dosttn.gov.vn/Files/Images//2021/04/03/Hướng dẫn xây dựng báo cáo tham dự giải thưởng chất lượng quốc gia.pdf>
- Thailand Quality Award. (2017). *Criteria for Performance Excellence Framework*.
- Tickle, M., Mann, R., & Adebajo, D. (2016a). Deploying business excellence – success factors for high performance. *International Journal of Quality and Reliability Management*, 33(2), 197–230. <https://doi.org/10.1108/IJQRM-10-2013-0160>
- Tickle, M., Mann, R., & Adebajo, D. (2016b). Deploying business excellence – success factors for high performance. *International Journal of Quality & Reliability Management*, 33(2), 197–230. <https://doi.org/10.1108/IJQRM-10-2013-0160>
- Toma, S.-G., & Marinescu, P. (2018). Business excellence models: a comparison. *Proceedings of the International Conference on Business Excellence*, 12(1), 966–974. <https://doi.org/10.2478/picbe-2018-0086>
- Upadhayay, L., & Vrat, P. (2016). An ANP based selective assembly approach incorporating Taguchi's quality loss function to improve quality of placements in technical institutions. *TQM Journal*, 28(1), 112–131. <https://doi.org/10.1108/TQM-06-2014-0054>
- Vaidya, O. S., & Kumar, S. (2006). Analytic hierarchy process: An overview of applications. *European Journal of Operational Research*, 169(1), 1–29. <https://doi.org/10.1016/j.ejor.2004.04.028>
- Vatansever, K., & Akgül, Y. (2017). Using multi-criteria decision making approaches for evaluating and selecting websites: a literature review. *International Journal of Current Advanced Research*, 6(4), 3388–3399. <https://doi.org/10.24327/ijcar.2017.3399.0281>
- Velasquez, M., & Hester, P. (2013). An analysis of multi-criteria decision making methods. *International Journal of Operations Research*, 10(2), 56–66.
- Walliman, N. (2011). *Research Methods: the basics*. Routledge.
- Wang, X., Liu, Z., & Cai, Y. (2015). A rating based fuzzy analytic network process (F-ANP) model for evaluation of ship maneuverability. *Ocean Engineering*, 106, 39–46. <https://doi.org/10.1016/j.oceaneng.2015.06.061>
- Wiratno, S. E., Latiffianti, E., & Wirawan, K. K. (2015). Selection of Business

- Funding Proposals Using Analytic Network Process: A Case Study at a Venture Capital Company. *Procedia Manufacturing*, 4, 237–243. <https://doi.org/10.1016/j.promfg.2015.11.037>
- Wu, J. Z., Roan, J., & Santoso, C. H. (2017). Key factors for truly sustainable supply chain management: An investigation of the coal industry in Indonesia. *International Journal of Logistics Management*, 28(4), 1196–1217. <https://doi.org/10.1108/IJLM-07-2014-0103>
- Wu, T., & Liu, X. (2016). An interval type-2 fuzzy ANP approach to evaluate enterprise technological innovation ability. *Kybernetes*, 45(9), 1486–1500. <https://doi.org/10.1108/K-01-2016-0011>
- Wudhikarn, R. (2018). Improving the intellectual capital management approach using the hybrid decision method. *Journal of Intellectual Capital*, 19(4), 670–691. <https://doi.org/10.1108/JIC-07-2017-0088>
- Zaim, S., Turkyılmaz, A., Acar, M. F., Al-Turki, U., & Demirel, O. F. (2012). Maintenance strategy selection using AHP and ANP algorithms: A case study. *Journal of Quality in Maintenance Engineering*, 18(1), 16–29. <https://doi.org/10.1108/13552511211226166>
- Zammori, F. (2010). The analytic hierarchy and network processes: Applications to the US presidential election and to the market share of ski equipment in Italy. *Applied Soft Computing Journal*, 10(4), 1001–1012. <https://doi.org/10.1016/j.asoc.2009.07.013>
- Zeps, A., & Ribickis, L. (2015). Strategy Development and Implementation – Process and Factors Influencing the Result: Case Study of Latvian Organizations. *Procedia - Social and Behavioral Sciences*, 213, 931–937. <https://doi.org/10.1016/j.sbspro.2015.11.507>
- Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2009). *Business research methods* (8th ed.). Pub South-Western College.
- Žukauskas, P., Vveinhardt, J., & Andriukaitienė, R. (2018). Philosophy and Paradigm of Scientific Research. In *Management Culture and Corporate Social Responsibility* (pp. 121–139). Intechopen. <https://doi.org/10.5772/intechopen.70628>



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