

Integration the 6th category Business Excellence Framework, the 8th clause ISO 9001:2015 and the 6th category *KPKU* Indonesia Framework

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Abstract: *KPKU (Kriteria Penilaian Kinerja Unggul)* Indonesia framework 2015 adopted Business Excellence Framework 2013-2014, that is a framework used by the “Ministry of State-Owned Enterprises” of the Republic of Indonesia to assess the performance of SOEs in Indonesia. One of the *KPKU* criteria is the operation, that is the most dominant criteria in company performance. They are proven by the score in Baldrige Excellence Framework (110 point is the highest score) for product and process results which are influenced by operational criteria in the 6th category of BEF. Currently, Indonesia does not have yet business excellence framework based on companies in Indonesia and does not have yet Indonesia operational excellence model, either in Indonesia or based on previous research. Currently, there is no model that integrates (Baldrige Excellence Framework, ISO 9001: 2015, and *KPKU*). This research will develop the Indonesia operational excellence model based on the Baldrige Excellence Framework, ISO 9001:2015, and *KPKU* Indonesia framework. Stage of the research is the literature survey, identifying the 6th Category Baldrige Excellence Framework; *KPKU* and the 8th Clause ISO 9001:2015, and integration the 6th *KPKU* framework and the 8th Clause ISO 9001:2015 to the 6th Category Baldrige Excellence framework. The results of the study are the Indonesian operational excellence framework that consists of 5 criteria and 14 sub-criteria, namely Product and Process Design, Process Management, Process Efficiency and Effectiveness, Process Improvement, and Safety and Emergency Preparedness. This model is appropriate for company performance measurement, especially operational performance.

Keywords: Integration, Baldrige Excellence Framework, ISO 9001:2015, *KPKU*, operational excellence.

1. Introduction

KPKU (Kriteria Penilaian Kinerja Unggul) is a system of management and control of the performance of SOEs (State-Owned Enterprises) based on the Superior Performance Criteria adopted from the Malcolm Baldrige Criteria for Performance Excellence which has been implemented in Indonesian SOEs since 2012. *KPKU (Kriteria Penilaian Kinerja Unggul)* SOEs contains questions - questions consisting of seven important categories that must be considered to achieve the success of the company related to the management of superior processes and results, namely: “leadership”; “strategic planning”; “customer focus; “knowledge measurement, analysis and management”; “focus of workforce”; “operating focus”; and “result” [1].

The Baldrige Excellence Framework is a framework that designed to make companies more sustainable by achieving company goals, increasing company results, and making companies able to compete with other companies. Baldrige categories represent seven critical aspects of managing and performing as an organization, there are

“leadership”, “strategy”, “customer”, “measurement, analysis, and knowledge management”; “workforce”, “operations”, and “results” [2].

Many studies have been carried out on Business Excellence Framework whether it is implementation, integration with other standards, or developing a model. The study of implementing Business excellence framework is Implementing Business Excellence - A Guidebook for SMEs [3]; Implementing business excellence in public sector United Arab Emirates [4]; Application of MBNQA for service quality management and performance [5]. The study of integration or developing model is developing an overarching framework for managing and aligning multiple organizational improvement initiatives [6]; Integration Total Quality Management & Business Excellence Model [7].

ISO 9001: 2015 is an international standard on the Quality Management System, which is used by almost all companies in the world that can help companies to sustain. Benefits for companies when implementing ISO 9001: 2015 are: a) consistently provide products and services that meet customers, regulatory and legal requirements b) opportunities to facilitate increased customer satisfaction c) consider risks and opportunities in accordance with company goals d) the ability to demonstrate conformity to specified quality management system requirements. ISO 9001:2015 Clause represent ten critical requirements of managing and performing as a Quality Management System in the company, there are “scope”, “normative references”, “terms and definitions”, “the context of the organization”; “leadership”; “planning”; “support”; “operation”; “performance evaluation”; and “improvement” [8]. Many studies have been carried out on ISO 9001 whether it is implementation or integration with other standards.

The study of implementing ISO 9001 is Implemented ISO 9001 in food manufacturing company [9]; study about relationship between ISO 9001 and EFQM Business Excellence Model [10].

KPKU Indonesia framework 2015 adopted Business Excellence Framework 2013-2014, that is a framework used by the “Ministry of State-Owned Enterprises” of the Republic of Indonesia to assess the performance of SOEs in Indonesia. Indonesia does not have yet a business excellence framework based on companies in Indonesia. If a company would be going to implement the KPKU, it is necessary to develop categories and sub-categories in more detail which make difficult for the most companies in Indonesia. KPKU is very general, only regulate categories and sub-categories of KPKU. KPKU Indonesia framework is a good standard. Unfortunately, it can’t be used for all companies in Indonesia and can’t be used to measure specifics performance such as operating performance.

Currently, companies in Indonesia use the ISO 9001: 2015, the 2015 Baldrige Excellence Framework, and the KPKU Indonesia framework. The Ministry of BUMN of the Republic of Indonesia requires all state-owned companies to use KPKU as a measure of the Company's performance. This shows that there is a misalignment between the standards used by the company and the performance that must be reported to the BUMN ministry, and this will make it difficult for the company. Based on these problems, it is necessary to create a new framework that can harmonize the interests of the SOE ministry with the company's interests, by creating a new framework that integrates ISO 9001: 2015, Baldrige Excellence Framework, and KPKU. Currently, there is no model that integrates the three frameworks in Indonesia. And to obtain operational excellence model, it should be compiled based on the Business Excellence Framework (Baldrige Excellence Framework, ISO 9001: 2015, and KPKU).

In Indonesia, there is research the company's performance measurement study uses an integrated framework between the balanced scorecard and Malcolm Baldrige National Quality Award at PT. Cement Indonesia [11]; Performance measurement of companies that implement Analytic Network Process and using “Malcolm Baldrige National Quality Award” framework [12]; “MBNQA” category as measuring instrument in performance measurement of the department at University [13]. There is no research about integrates ISO 9001:2015, Baldrige Excellence Framework, and KPKU Indonesia Framework.

Operations are the 6th category of Baldrige Excellence Framework, the 6th category KPKU Indonesia framework, and the 8th clause of ISO 9001:2015. In this research will investigate further the operation, because the operation is the most dominant criteria in company performance. They are proven by a score in Baldrige Excellence Framework (110 point is the highest score) for product and process results which are influenced by operational criteria in the 6th category of Baldrige Excellence Framework. Currently, Indonesia operational excellence framework does not exist, either in Indonesia or based on previous research. The Indonesia operational excellence framework is a new framework and there is no such research, now most studies measure performance based on balance scorecard model, BEF, MBNQA, EFQM and integration between BSC and MBNQA, and EFQM.

The objective of this research are to develop the Indonesia operational excellence framework based on the 6th Baldrige Excellence Framework, the 8th clause ISO 9001:2015, and the 6th KPKU Indonesia framework. Indonesia's operational excellence framework will become a new framework that can be used as an operational reference for companies in Indonesia and can be used to measure the company's operational performance. In addition, research on the integration of the three frameworks as a starting point for further study will be made a model to measure the operational performance of manufacturing companies in Indonesia.

2. Literature Study

This study will develop Indonesia operational framework based on an integration of the 6th category Baldrige Excellence Framework, the 8th clause ISO 9001:2015, and the 6th KPKU Indonesia framework. This study is using

literature review method with the previous lesson study about the integrated framework, manufacturing industry, operational excellence, business excellence, ISO 9001:2015, KPKU Indonesia, and develop operational excellence.

Indonesia operational excellence develop does not only refer to one framework or standard, hopes to get a better framework so that it is developed based on the 6th Baldrige Excellence Framework, the 8th ISO 9001: 2015, and KPKU Indonesia framework. Integration of three frameworks or standards is expected to be complementary and operational excellence is obtained. Many studies are carried out by integrating frameworks or standards with the aim of complementing each other. There are research about integration of Malcom Baldrige National Quality Award, ISO 9000, and ISO 14000 [14]; research about integration quality, environment, and safety in industry [15]; A review of service excellence model with developing integrated framework [16]; The relationships among JIT, TQM and production operations performance [17]; Research on Total Quality Management and Business Excellence models explain limitations, reflections and further development [18].

The Object of the research is industry in SOEs Indonesia and output of the research is Indonesia operational excellence framework for the manufacturing industry. There are a lot of manufacturing industries to use any method, processing, analyzing to get operational excellence. There are several studies in manufacturing industry: Design Selection of an Innovative Tool Holder for Ultrasonic Vibration Assisted Turning (IN-UVAT) Using Finite Element Analysis Simulation [19]; Design Selection of In-UVAT Using MATLAB Fuzzy Logic Toolbox [20]. The Objective of the research is to get the operational excellence, using the tool holder selection method to achieve the operational excellence. There is difference with this paper that will develop operational excellence criteria with the integration of the 6th category Baldrige Excellence Framework, the 6th category KPKU framework, and the 8th clause ISO 9001:2015.

Develop Indonesia operational excellence framework based on the 6th category Baldrige Excellence Framework, the 8th clause ISO 9001:2015, and KPKU Indonesia framework. The objective of the study is to develop KPKU Indonesia framework with the consideration of the 8th clause ISO 9001:2015 and 6th category Baldrige Excellence Framework, expected can achieve a company's business excellence. The 8th clause ISO 9001:2015 can be as a key factor for sustainable development of the companies [21].

At present many studies have been conducted which discuss operational excellence. There are Multi-Objective Optimization for Operational Excellence [22]; Excellence models in the non-profit context [23]; Operational excellence as a means to achieve an enduring capacity to change [24]; Operational excellence through business process orientation [25]; Operational Excellence for Sustainability of Nepalese Industries [26]; Operational Excellence towards Sustainable Development Goals [27]; Operational Excellence Assessment Framework for Manufacturing Companies [28]; Implementing Information Technologies and Operational Excellence [29]; This study using operational excellence too, but In this study we will be developed the Indonesia operational excellence framework that expected to achieve the company's business excellence in Indonesia.

The main objective of this study is to develop the Indonesia operational excellence framework to achieve the company's business excellence. The framework development based on the 6th category BEF, the 8th clause ISO 9001:2015, and KPKU Indonesia.

Several studies have similarity with this study, improving safety for organizational construction organizational developed an operational excellence model [30], Developing of an assessment framework for operational excellence [31], developing measures for performance excellence [32]. The Difference of the study are the final objective, this study has the ultimate goal of achieving the company's business excellence.

3. Research Methodology

The research methodology for investigating integrating the category 6 Baldrige excellence framework, clause 8 ISO 9001: 2015, and the Indonesian KPKU category 6 frameworks carried out in the following stages:

3.1 Document review

Literature has been collected primarily through ISO 9001:2015, Business Excellence Framework, and KPKU Indonesia document, journals or paper within the area of Quality Management ISO 9001, Business Excellence Framework, KPKU Indonesia framework, integrated management system, and operational excellence. The Literature search has been conducted using electronic journal databases, the keywords for the search were "Quality Management System", "Business Excellence Framework", "ISO 9001:2015", and "Business Excellence Framework 2017 – 2018", "KPKU Indonesia", "integration" and "operational excellence".

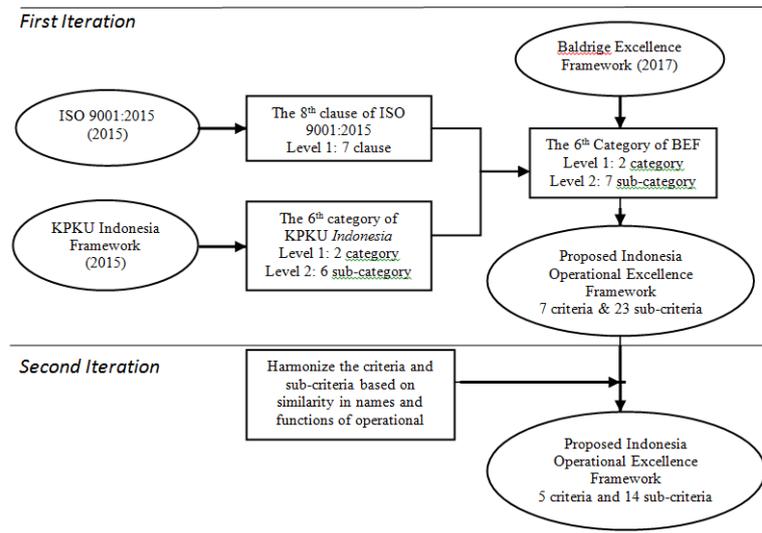


Figure 1. Stages of the Research

3.2 Identifying the 6th Category Baldrige Excellence Framework; KPKU and the 8th Clause ISO 9001:2015

The 6th category Baldrige excellence framework has 20 categories and sub-category that divided become four levels, the first level (category: 1), the second level (sub-category: 2), the third level (sub-sub-category: 7), and the fourth level (sub-sub-sub-category: 10). The 8th clause ISO 9001:2015 have 90 clauses and sub-clauses that divided become three levels, the first level (clause: 1), the second level (sub-clause: 9), and the third level (sub-sub-clause: 79). The 6th category KPKU Indonesia framework has 16 categories and sub-category that divided become four levels, the first level (category: 1), the second level (sub-category: 2), the third level (sub-sub-category: 6), and the fourth level (sub-sub-sub-category: 7). For more detail about the category, sub-category, clause, and sub-clause can see at table 1

3.3 Integration the 6th KPKU framework and the 8th Clause ISO 9001:2015 to the 6th Category Baldrige Excellence Framework

Integration is carried out by 2 iterations, the first iteration integrates Clause 8 ISO 9001: 2015, categories and sub-categories of 6 KPKU into the category 6 Baldrige Excellence Framework, based on similarity in names and functions of the Baldrige Excellence Framework category. In this study, the category and clause were limited to only level 1 and level 2 from Baldrige Excellence Framework and KPKU Indonesia, level 1 for ISO 9001: 2015. The second iteration is done to harmonize the criteria and sub-criteria so that they are more homogeneous. For more detail, the integration process can be seen in figure 1.

4. Results and Discussion

The results of this study are divided into three parts, the results of the first integration, the results of the integration of the second iteration, and the proposal of Indonesia operational excellence.

4.1 The results of the first iteration

The first iteration integrates Clause 8 ISO 9001: 2015, categories and sub-categories of 6 KPKU into the category 6 Baldrige Excellence Framework, the first iteration integration process can be seen in table 1. Clause 8.1 ISO 9001:2015 about operation planning and control integrated with category 6.1.b BEF about Process management and improvement. Operation planning and control (clause 8.1 ISO) and process management and improvement (category 6.1.b BEF) have a similarity process and function, operation and planning control (clause 8.1 ISO) is a part of process management and improvement process (category 6.1.b BEF), so it can be integrated. The Requirement for products and services (clause 8.2 ISO) is a part of the work process product and process design (6.1.a BEF), so it can be integrated. “Design and development of products and services” (Clause 8.3 ISO) have a similarity process with “work process product and process design” (Category 6.1.a BEF), so it can be integrated. “Control of externally provided processes, products, and services” (clause 8.4 ISO), “production and service provision” (clause 8.5 ISO), “release products and services” (clause 8.6 ISO), and “control of nonconforming outputs” (clause 8.7 ISO) are part of process management and improvement (Category 6.1.b BEF), so it can be integrated.

Product and process design (category 6.1.a KPKU) have a similarity process with work process product and process design (category 6.1.a BEF), so it can be integrated. Design concept (category 6.1.a(1) KPKU), product and process requirement (category 6.1.a(2) KPKU) are a part of work process product and process design (category 6.1.a BEF), so it can be integrated. Process management (category 6.1.b KPKU), implementation process (category 6.1.b(1) KPKU), support process (category 6.1.b(2) are part of process management and improvement (category 6.1.b BEF), so it can be integrated. Improved product and process performance (category 6.1.b(3) KPKU) is part of the Innovation management (category 6.1.d BEF), so it can be integrated. Operational effectiveness (category 6.2 KPKU) have similarity with Operational effectiveness (category 6.2 BEF), so it can be integrated. Control the overall cost (category 6.2.a KPKU) is a part of the process efficiency and effectiveness (category 6.2.a), so it can be integrated. Supply chain management (category 6.2.b KPKU) have a similarity process and function with supply chain management (category 6.1.c BEF), so these categories can be integrated. Safety and preparedness for emergencies (category 6.2.c KPKU), Safety (category 6.2.c(1) KPKU), and emergency preparedness (category 6.2.c(2) KPKU) have similarity with safety and emergency preparedness (category 6.2.c BEF), so it can be integrated. Management of innovation (category 6.2.d KPKU) have similarity process and function with innovation management (category 6.1.d BEF), so it can be integrated.

Information Systems Management (category 6.2b Baldrige Excellence Framework) has nothing in common with the KPKU category or ISO clause, but this criterion is very important. So that the management information system is determined to be one of the criteria for operational excellence with sub-criteria defined from the supply chain management sub-category. The first iteration produces 7 criteria and 23 sub-criteria, the 7 criteria are product and process design, process management and improvement, supply chain management, innovation management, effectiveness, management of information systems, safety and emergency preparedness, for more details can be seen in table 2.

4.2 The results of the second iteration

The first iteration produces 7 criteria and 23 sub-criteria. From the seven categories, it can be simplified by grouping it according to the process and functional equations of categories and sub-categories. The first iteration results, the criteria for product and process design consist of 5 sub-criteria: “requirements for products and services”; “design and development of products and services”; “product and process design; design concept”; and “product and process requirements”. The third sub-criteria, product, and process design, that is the same as the first criteria so that the 3rd sub-criteria omitted. The 5th sub-criteria, product, and process function requirements are almost the same as the 1st sub-criteria and the first sub-criteria is part of the 1st sub-criteria, so the 5th sub-criteria are combined with the sub-criteria 1. The 4th sub-criteria the design concept, its function is almost the same as the second sub-criteria and the 4th sub-criteria is part of the second sub-criteria, so the 4th sub-criteria are combined with the sub-criteria 2. So that Indonesia proposed operational excellence for the criteria of the 1st Product and Process design with sub-criteria: requirements for product and services and design and development of products and services.

The second sub-criteria, namely production and service provision, is still used, but there are several sub-criteria which are part of the sub-criteria of production and service provision so that these sub-criteria are eliminated and combined with production and service provisions, namely: “release of products and services” (the 3rd sub-criteria); “implementation process” (the 6th sub-criteria); and “support process” (the 7th sub-criteria).

Process management (the 5th sub-criteria) part of process management and improvement and can be combined with process management (the 2nd criteria). Process and function supply chain management is part of process management so that it is grouped into process management sub-criteria, although it is not a requirement in ISO 9001: 2015 but it is important to obtain operational excellence. The management information system also includes part of process management so that it becomes sub-criteria of process management, although it is not a requirement in ISO 9001: 2015 but it is important to obtain operational excellence.

The results of the second iteration, the process management, and improvement criteria have 8 sub-criteria: “operations planning and control”; “production and service provision”; “release of products and services”; “control of nonconforming outputs”; “process management”; “implementation process”; “support process”; and “control of externally provided processes, products, and services”.

Table 1. Integrate ISO 9001:2015 and KPKU Indonesia Framework to Baldrige Excellence Framework (the first iteration)

Baldrige Excellence Framework Categories 6 : Operations (2017)	Operations	6.1	a	b	c	d	6.2	a	b	c
		Work Process	Work Process Product and Process Design	Process Management and Improvement	Supply-Chain Management (Select suppliers, measure and evaluate suppliers)	Innovation Management	Operational Effectiveness	Process Efficiency and effectiVeness	Management of Information Systems (Reliability of Information System, Security and Cybersecurity information System)	Safety and Emergency Preparedness
ISO 9001:2015 (2015)	Operation									
	8.1	Operations Planning and Control		Operations Planning and Control						
	8.2	Requirements for Products and Services	Requirements for Products and Services							
	8.3	Design and Development of Products and Services	Design and Development of Products and Services							
	8.4	Control of Externally Provided Processes, Products, and Services		Control of Externally Provided Processes, Products, and Services						
	8.5	Production and Service Provision		Production and Service Provision						
	8.6	Release of Products and Services		Release of Products and Services						
	8.7	Control of Nonconforming Outputs		Control of Nonconforming Outputs						
KPKU Indonesia Framework categories 6 (2015)	Focus of Operation									
	6.1	Work Processes								
	a	Product and Process Design	Product and Process Design							
		(1) Design Concept	Design Concept							
		(2) Product and Process Requirement	Product and Process Requirement							
	b	Process management		Process management						
		(1) Implementation process		Implementation process						
		(2) support process		support process						
		(3) Improved product and process performance				improved product and process performance				
	6.2	Operational Effectiveness					Operational effectiveness			
	a	Control the overall Cost						Control the overall Cost		
	b	Supply chain management				Supply chain management				
	c	Safety and preparedness for emergencies								Safety and preparedness for emergencies
		(1) Safety								Safety
	(2) Emergency preparedness								Emergency preparedness	
d	Management of innovation					Management of innovation				

The second sub-criteria, namely production and service provision, is still used, but there are several sub-criteria which are part of the sub-criteria of production and service provision so that these sub-criteria are eliminated and combined with production and service provisions, namely: “release of products and services” (the 3rd sub-criteria); “implementation process” (the 6th sub-criteria); and “support process” (the 7th sub-criteria).

Process management (the 5th sub-criteria) part of process management and improvement and can be combined with process management (the 2nd criteria). Process and function supply chain management is part of process management so that it is grouped into process management sub-criteria, although it is not a requirement in ISO 9001: 2015 but it is important to obtain operational excellence. The management information system also includes part of process management so that it becomes sub-criteria of process management, although it is not a requirement in ISO 9001: 2015 but it is important to obtain operational excellence.

The results of the second iteration, the process management, and improvement criteria have 8 sub-criteria: “operations planning and control”; “production and service provision”; “release of products and services”; “control of nonconforming outputs”; “process management”; “implementation process”; “support process”; and “control of externally provided processes, products, and services”.

Process management and improvement there are two processes, namely process management and process improvement, so it should be separated between process management and process improvement. Process improvement becomes the 2nd criteria and process improvement becomes the 3rd criteria. Sub-criteria operations planning and

control was changed to operations planning (the 1st sub-criteria), control functions were moved and combined with control of nonconforming outputs (the 4th sub-criteria); “control of externally provided processes, products, and services”; become “a control of internal and external products, processes, services and nonconforming outputs” (the 3rd sub-criteria).

Table 2. Integrate ISO 9001:2015 and KPKU Indonesia Framework to Baldrige Excellence Framework (the second iteration)

Baldrige Excellence Framework the 6th Category : Operations (2017)		ISO 9001:2015 the 8th clause and KPKU Indonesia the 6th category		Proposed Indonesia operational excellence framework			
Criteria		Sub-Criteria		Criteria	Sub-Criteria		
1	Product and Process Design	1	Requirements for Products and Services	1	Product and Process Design	1	Requirements for Products and Services
		2	Design and Development of Products and Services			2	Design and Development of Products and Services
		3	Product and Process Design				
		4	Design Concept				
		5	Product and Process Requirement				
2	Process Management and Improvement	1	Operations Planning and Control	2	Process Management	1	Operations Planning
		2	Production and Service Provision			2	Production and Service Provision
		3	Release of Products and Services			3	Control of internally and externally product, process, services and non conforming output
		4	Control of Nonconforming Outputs			4	Supply Chain Management
		5	Process management			5	Management Information System
		6	Implementation process				
		7	support process				
		8	Control of Externally Provided Processes, Products, and Services				
3	Supply chain management	1	Select suppliers, measure and evaluate suppliers				
		2	Supply chain management				
4	Innovation Management	1	improved product and process performance	3	Process Improvement	1	Improved products, services, and processes performance
		2	Management of innovation			2	Innovated products, Services, and processes
5	Process Efficiency and effectVeness	1	Control the overall cost	4	Process Efficiency and effectiveness	1	Cost Control
6	Management of Information Systems	1	Reliability of Information System			2	Control of Efficiency and Effectiveness factors
		2	Security and Cybersecurity information System				
7	Safety and Emergency Preparedness	1	Safety and preparedness for emergencies	5	Safety and Emergency Preparedness	1	Safety
		2	Safety			2	Emergency preparedness
		3	Emergency preparedness				

The process improvement became the 3rd criteria with two sub-criteria: improved products, services, and processes performance; innovated products, services, and processes. Innovation management; improved product and process performance; Management of innovation is part of process improvement.

Process efficiency and effectiveness (the 4th criterion) consists of two sub-criteria cost control (the 1st sub-criteria) and control of efficiency and effectiveness factors (the 2nd sub-criteria). There are changes in sub-criteria, control of efficiency and effectiveness factors are sub-categories of the Baldrige excellence framework.

Safety and emergency preparedness (the 5th criterion) consists of safety sub-criteria (the 1st sub-criteria) and emergency preparedness (the 2nd sub-criteria), although it is not a requirement in ISO 9001: 2015, emergency preparedness is a matter which is important so that it is incorporated into operational excellence criteria.

Process management and improvement (category 6.1.b BEF) have sub-categories of improved product and process performance (category 6.1.b (3)), this is alignment with Improvement (clause 10 of ISO 9001: 2015). This paper discusses integration between category 6 BEF, clause 8 ISO 9001: 2015, and category 6 KPKU, so that clause 10 of ISO 9001: 2015 is not discussed in detail. Nevertheless, sub-clause improvement (clause 10 ISO 9001: 2015) and nonconformity and corrective action (clause 10.2 ISO 9001: 2015) have been included as sub-criteria of operational excellence.

4.3 Proposed Indonesia operational excellence framework

Proposed Indonesia operational excellence obtained by integrating category 6 KPKU and clause 8 ISO 9001: 2015 into category 6 Baldrige Excellence Framework. Integration has been done based on processes and functions similarity from BEF, ISO 9001:2015, and KPKU Indonesia framework. Proposed Indonesia operational excellence consists of 5 criteria and 14 sub-criteria.

The first criteria are “product and process design” and have 3 sub-criteria: “requirements for products and services”; “design and development of products and services”; and criteria for the “processes and the acceptance of products and processes”. The second criteria are process management and have 5 sub-criteria: “operations planning; production and service provision”; “control of the product, process, externally provided process, and non-conforming output”; “supply chain management”; and “management information system”. The third criteria are process improvement and have 2 sub-criteria: “improve products, services, and processes performance”; “innovated products, services, and processes”. The fourth criteria are efficiency and effectiveness of the process that consists of 2 sub-criteria: “cost control”; “control of efficiency and effectiveness factors”. The fifth criteria are “safety and emergency preparedness” that consist of safety and emergency preparedness.

Table 3. Proposed Indonesia Operational Excellence

No	Criteria	Sub-Criteria
1	Product and Process Design	Requirements for Products and Services
		Design and Development of Products and Services
2	Process Management	Operations Planning
		Production and Service Provision
		Control of product, process, externally provided process, and non conforming output
		Supply Chain Management
		Management Information System
3	Process Improvement	Improved products, services, and processes performance
		Innovated products, Services, and processes
4	Process Efficiency and Effectiveness	Cost Control
		Control of Efficiency and Effectiveness factors
5	Safety and Emergency Preparedness	Safety
		Emergency preparedness

5. Conclusion

1. Integration was carried out by two iterations, the first iteration: the 8th clause of ISO 9001: 2015, and the 6th *KPKU Indonesia* integration to the 6th category Baldrige excellence framework where BEF as the criteria and the 8th clause of ISO 9001: 2015, and the 6th *KPKU Indonesia* as a sub-criterion. The second iteration is done to group processes based on the similarity of names and process functions, both for criteria or sub-criteria.
2. The integration of the 6th category Baldrige excellence framework, the 8th clause of ISO 9001: 2015, and the 6th *KPKU Indonesia* produced the Indonesia operational excellence framework consist of 5 criteria and 14 sub-criteria.
3. The Indonesia operational excellence framework can be further developed by identifying sub-criteria or establishing level 3 or 4 processes from the proposed Indonesia operational framework.
4. Before implementing the proposed Indonesia operational excellence framework, verification and validation frameworks are needed, so there is a need for further studies on the verification and validation of the proposed Indonesia operational excellence framework.

References

[1] Ministry of State-Owned Enterprises of the Republic of Indonesia, “Kriteria penilaian kinerja unggul bumn,” 2015.

[2] www.nist.gov/baldrige, “BALDRIGE Excellence Framework,” *Assessment*, no. January, pp. 1–53, 2017.

[3] R. Mann, M. Mohammad, and T. A. Agustin, “Implementing Business Excellence - A Guidebook for SMEs,” p. 48, 2012.

[4] R. McAdam, W. Keogh, A. Ahmed El Tigani, and P. Gardiner, “An exploratory study of business excellence implementation in the United Arab Emirates (UAE) public sector,” *Int. J. Qual. Reliab. Manag.*, vol. 30, no. 4,

- pp. 426–445, 2013.
- [5] S. C. D. Souza and A. H. Sequeira, “Application of MBNQA for service quality management and performance in healthcare organizations,” vol. 3, no. 7, pp. 73–88, 2011.
- [6] M. Mohammad, R. Mann, N. Grigg, and J. P. Wagner, “Business Excellence Model: An overarching framework for managing and aligning multiple organisational improvement initiatives,” *Total Qual. Manag. Bus. Excell.*, vol. 22, no. 11, pp. 1213–1236, 2011.
- [7] M. Mohammad *et al.*, “Total Quality Management & Business Excellence Business Excellence Model : An overarching framework for managing and aligning multiple organisational improvement initiatives,” no. September 2013, pp. 37–41, 2011.
- [8] “BSI Standards Publication BS EN ISO 9001 : 2015 Quality management systems Requirements ... making excellence a habit .,” 2015.
- [9] S. Sumaedi and M. Yarmen, “The Effectiveness of ISO 9001 Implementation in Food Manufacturing Companies : A Proposed Measurement Instrument,” *Ital. Oral Surg.*, vol. 3, pp. 436–444, 2015.
- [10] L. Miguel and C. Fonseca, “Relationship Between Iso 9001 Certification Maturity And Efqm Business Excellence Model Results,” vol. 1745, pp. 85–102, 2015.
- [11] S. Kharis, Mochammad, “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 .,” *Pros. Semin. Nas. Manaj. Teknol. XXI*, pp. 1–9, 2014.
- [12] R. Y. E. Eka Rahayu Estuningsari, Nasir Widha Setyanto, “Pengukuran Kinerja Perusahaan Berbasis Kriteria Penilaian Kinerja Unggul (Kpku) Bumn (Studi Kasus : Perum Jasa Tirta 1 Malang) Performance Measurement Based Company Superior Performance Criteria (KPKU) BUMN (Case study : Perum Jasa Tirta 1 Malang ,” *Univ. Brawijaya*, pp. 476–487, 2013.
- [13] M. L. Singgih, “Penilaian Kinerja Suatu Jurusan Dengan Kriteria Malcolm Baldrige National Quality Award dan Penentuan Ranking Menggunakan Analytic Network Process Moses,” *J. Teknol. Manaj. Inform.*, vol. 6, no. 3, p. , 2008.
- [14] K. F. P. K. S. Chin, H. Lau, and H. Lau, “A self-assessed quality management system based on integration of MBNQA / ISO 9000 / ISO 14000,” 2006.
- [15] J. G. Sanz-calcedo, A. G. González, O. López, D. R. Salgado, and I. Cambero, “Analysis on integrated management of the quality , environment and safety on the industrial projects,” *Procedia Eng.*, vol. 132, pp. 140–145, 2015.
- [16] M. Asif, “A critical review of service excellence models: towards developing an integrated framework,” *Qual. Quant.*, vol. 49, no. 2, pp. 763–783, 2015.
- [17] Z. Chen, “The relationships among JIT, TQM and production operations performance,” *Bus. Process Manag. J.*, vol. 21, no. 5, pp. 1015–1039, 2015.
- [18] J. J. Dahlgaard, C. Chen, J. Jang, A. Banegas, and S. M. Dahlgaard-park, “Total Quality Management & Business Excellence Business excellence models: limitations , reflections and further development,” no. August, pp. 37–41, 2013.
- [19] H. Rachmat, M. R. Ibrahim, S. Hasan, H. Rachmat, M. R. Ibrahim, and S. Hasan, “Design Selection of an Innovative Tool Holder for Ultrasonic Vibration Assisted Turning (IN-UVAT) Using Finite Element Analysis Simulation,” vol. 20029, 2017.
- [20] H. Rachmat, T. Mulyana, S. H. Hasan, and M. Rasidi, “Design Selection of In-UVAT Using MATLAB Fuzzy Logic Toolbox.”
- [21] S. Lukichev and M. Romanovich, “The quality management system as a key factor for sustainable development of the,” *Procedia Eng.*, vol. 165, pp. 1717–1721, 2016.
- [22] H. Y. Alhammadi, *Multi-Objective Optimization for Operational Excellence*. Elsevier B.V., 2010.
- [23] O. Al-tabbaa, K. Gadd, and S. Ankrah, “Excellence models in the non-profit context : strategies for continuous improvement,” 2013.
- [24] A. M. Carvalho, P. Sampaio, E. Rebentisch, and P. Saraiva, “Operational excellence as a means to achieve an enduring capacity to change – revision and evolution of a conceptual model,” *Procedia Manuf.*, vol. 13, pp. 1328–1335, 2017.
- [25] B. Movahedi, K. Miri-Lavassani, and U. Kumar, “Operational excellence through business process orientation,” *TQM J.*, vol. 28, no. 3, pp. 467–495, 2016.
- [26] S. K. Ojha, “Operational Excellence for Sustainability of Nepalese Industries,” *Procedia - Soc. Behav. Sci.*, vol. 189, pp. 458–464, 2015.
- [27] L. E. Quezada, A. Shun, F. Chiu, S. E. Gouvea, and K. H. Tan, “Int . J . Production Economics Operational Excellence towards Sustainable Development Goals,” *Intern. J. Prod. Econ.*, vol. 190, pp. 1–2, 2017.
- [28] S. J. Rusev and K. Salonitis, “Operational Excellence Assessment Framework for Manufacturing Companies,” *Procedia CIRP*, vol. 55, pp. 272–277, 2016.
- [29] A. Sartal and X. H. Vázquez, “Implementing Information Technologies and Operational Excellence : Planning , emergence and randomness in the survival of adaptive manufacturing systems,” *J. Manuf. Syst.*, vol. 45, pp. 1–

- 16, 2017.
- [30] H. Liu, E. Jazayeri, G. B. Dadi, and D. Ph, "Development of an Operational Excellence Model to Improve Safety for Construction Organizations Research Question."
- [31] A. Jaeger, K. Matyas, and W. Sihm, "Development of an assessment framework for operations excellence (OsE), based on the paradigm change in operational excellence (OE)," *Procedia CIRP*, vol. 17, pp. 487–492, 2014.
- [32] M. Asif, A. Raouf, and C. Searcy, "Developing measures for performance excellence: Is the Baldrige criteria sufficient for performance excellence in higher education?," *Qual. Quant.*, vol. 47, no. 6, pp. 3095–3111, 2013.