

# Building a Model of Suitable Performance Management Framework

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**Abstract**— This paper aims to develop a conceptual performance management framework and a theoretical model to determine a suitable performance management framework. The study uses a systematic approach to determine an appropriate performance management framework, which encompasses the process of identifying issues related to performance management, conducting a thorough literature review, identifying gaps through comparing and contrasting the performance management frameworks, identifying theorised constructs, developing a conceptual framework, and building a theoretical model. The results of this study suggest that the proposed conceptual performance management framework applies an input-process-output-outcome model to indicate performance measurement as part of performance management and to describe a complete process of transforming performance measures data into reliable performance information. Five suggested factors to determine a suitable performance management framework have been identified in a developed theoretical model, which include a useful method for modelling a system, management control tool, framework applicability, performance measurement, and practical guidelines for performance management system. This study identifies and suggests five criteria for determining a suitable performance management framework. Other aspects can be included to develop more robust criteria. Theoretical verification needs to be undertaken to examine the conceptual variables of the proposed framework. The developed theoretical model is subject to empirical testing. This study encourages performance management research concerning a thorough process of developing performance management framework and establishing criteria and a model to determine a suitable performance management framework.

**Keywords**— *Performance management, Suitable performance management framework, Theoretical model*

## 1. Introduction

Some broad themes can be found in a study on performance measurement and management (PMM) frameworks, which include classical and dominant frameworks, holistic and integrated PMM frameworks, frameworks updating BSC approach, context-specific PMM frameworks, and recently developed PMM [49]. Those themes have categorized the existing PMM frameworks found in the literature. One of them is the Balanced Scorecard (BSC), the most popular framework used by organizations, which is called as a performance management (PM) technique [35] or an evolving PM framework [49]. It was originally developed by Kaplan and Norton in 1992 to link financial and non-financial measures. It has been evolving based on accounting perspective [26] to become a strategic management system [27]. Despite these different themes, the searches for a suitable PM framework are still relevant until now.

What does a suitable framework mean? This question leads this study to obtain a better understanding of PM framework. Conceptually, a framework is a useful method to model particular systems [41]. It is important to formulate and develop a conceptual framework for the performance management system (PMS) [30]. The application of appropriate performance management and measurement framework has been clearly understood as a major challenge [49]. Therefore, the selection of a suitable framework is very important for organizations considering to implement PM systems [49].

The above arguments provide a useful insight into the development of a suitable PM framework. The framework must have factors significant to the development of a PMS. It represents a method to

model a PMS. It must also be able to guide the implementation of a required PMS. Furthermore, it needs a theoretical verification for theorised variables found in the literature and an empirical testing for a theoretical model of PM framework.

Previous studies on the implementation of PMS have identified some issues, which are inadequate data for supporting the required information [22], problematic data or data quality issue that poorly supports management reporting [33], shifting in a more analytical direction on performance management [15], and the support of an analytical method on performance management system to provide better business decisions [42].

The analytical capability provides a great opportunity for organizations to dynamically explore their performance data. In this study, this capability has been identified as one of several important constructs composing a conceptual PM framework. All theorised constructs are derived from the literature by firstly comparing and contrasting specific aspects to identify the contributions and limitations of the existing frameworks [47], [49] and secondly recognizing the references that support the identified constructs.

This paper also discusses the adoption of an input-process-output-outcome model in developing a conceptual PM framework, as suggested by [31] and [42]. In this paper, the purpose of the model is to describe a system view of performance measurement. The conceptual framework is regarded as meeting the objective of selecting a suitable PM framework for implementing a PMS. However, the developed conceptual framework needs to be tested to ensure that it has a strong evidence to support the claim. Therefore, a theoretical model to determine a suitable PM framework is developed. The model is presented to develop a set of statements explaining the relationships between the determinant factors of a suitable PM framework. However, the developed model is subject to empirical testing in further research.

The study aims to develop a conceptual PM framework and a theoretical model of suitable PM framework. In order to develop a robust framework, an initial study was undertaken in the context of eye hospital industry in Indonesia. The initial study was based on feedback obtained from a

discussion on the implementation of a PMS in an eye hospital managed by the Indonesian Government. The organization has established PM process that involves determining the strategic direction and priority of the organization, identifying strategic objectives, determining the strategic map to link key performance indicators to the associated strategic objectives, and tracking the progress against organizational strategies.

It was identified that the organization needs to have a better PMS, which is currently based on the BSC framework. The use of the framework is recommended by the Ministry of Health. A further discussion with some officials of the executive office and working units of the organization was subsequently carried out to identify needs that are considered important to improve the BSC framework. The needs are how to ensure the level of success of the achievement of the strategic objectives in realising the organization's vision and how to provide reliable performance information to support business decisions.

## 2. Literature review

The literature review discusses the definition of performance management to distinguish it from performance measurement. It also explains different perspectives of PM framework, limitations in theories of PM framework, and the support of specific capability for a PM framework.

### 2.1 Performance management definition

Although performance measurement and performance management focus on different processes, they are closely related in the organizational context [32]. Performance management can be distinguished from performance measurement [6]. Performance measurement is seen as an information system that enables the effective and efficient process of performance management [6]. This argument provides an understanding that performance measurement should support the management process of planning and budgeting [39] to decision making [29]. The development of a set of good practices can handle the generation of performance information, which can support the transformation of performance measurement to performance management [2]. By using performance management systems, organizations can monitor their performance improvement efforts and

improve information systems [2].

However, the more the number of features, roles or processes to be contained in the definition, the more difficult it will be to differentiate performance measurement from performance management [20]. Therefore, performance management should not only be able to track the progress of the strategy execution by monitoring the organizational performance, but it must also be able to support the effectiveness of the management processes, from planning to controlling, by making use of reliable performance information to support performance improvement and better business decisions.

Some different definitions of performance management can be found in the literature. However, there is no clear performance management definition [29]. Performance management includes processes, information, and systems [4]. Performance management is about how to use performance measurement systems to manage organizational performance [7]. In the healthcare sector, the Regulation and Quality Improvement Authority (RQIA) of Northern Ireland (in [3]) has defined performance management as the use of performance measurement information to find out what matters, organize organizations, and drive sustainable improvements. Rayner (in [29]) defined performance management as methodologies, processes, metrics, and systems that are used to keep track of and manage business performance. Therefore, the concept of performance management is obviously broader than performance measurement, in the context of the management process. Performance management discussed in this paper focuses on organizational performance.

## 2.2 Framework Concept for Performance Measurement and Performance Management

The concept of framework needs to be recognized by researchers focusing on performance measurement framework, PM framework, or performance measurement and management framework. A framework is a useful method for modelling certain systems [41]. A framework points to the active work of certain sets of recommendations, such as the Balanced Scorecard as a structural framework [19]. A framework should be perceived as an alignment, refinement, and learning tool [3].

A number of frameworks can be found in the literature to describe performance management or

performance measurement. Some researchers distinguish the term of performance measurement framework from the performance management framework. Meanwhile, others support the close relationship between performance measurement and performance management [19], [32], [38]. Performance measurement frameworks are used by many organizations to help them measure their organizational performance systematically, while performance management frameworks are devised to establish the process of managing organizational performance. However, performance measurement and performance management are inseparable, as performance management creates the context for measurement [32]. Performance management comes before and goes after performance measurement. More importantly, performance management is supported by performance measurement. In other words, performance management develops upon performance measurement [38].

Some concepts or considerations can be used for developing a PM framework. A framework can use the three important defined functions of performance measurement and management, as suggested by [38]. The first function is performance measurement which is quantifying the input, output, or level of activity of an event or process. The second is performance reporting that provides performance information and some analyzes of actual performance against the performance target. The third is performance management that is action, based on the two previous functions, to deliver improvements in behavior, motivation and processes and to drive innovation. Two types of framework may be considered, as suggested by [19], which are the structural framework and the procedural framework. The structural framework specifies a classification for the management of performance measures (e.g., the BSC, European Foundation for Quality Management), while the procedural framework defines a step-by-step process for developing performance measures from a strategy. A context-specific structural framework was developed by [10] aiming to differentiate input, process, output and outcome measures.

Other reflection may be considered by borrowing from the concept of a business performance measurement system, as offered by [20], which is the combination of features, roles, and processes. The features include performance measure (metrics or data) and supporting infrastructure, which can be separate activities (manual methods of recording data to high-developed information systems and possible supporting procedures including data

acquisition, collection, sorting, analysis, interpretation, and dissemination) within other PM processes. The roles encompass five different categories, which are “measure performance” (to monitor progress and measure/evaluate performance), “strategy management” (planning, strategy formulation, strategy execution, and alignment), “communication” (internal and external communication, benchmarking, and compliance with regulations), “influence behavior” (compensating behavior, managing relationships and control), and “learning and improvement” (feedback, double-loop learning and performance improvement). The processes include “selection and design of measures (identification of stakeholders needs and wants, planning, strategic objectives specification, measure designs and selection, and target setting), “collection and manipulation of data” (data capture and data analysis), “information management” (information provision, interpretation, and decision making), “performance information rewards” (evaluating performance and connecting it to rewards), and “system review” (review procedures).

A system view of a framework may also be considered, as suggested by [8], which provides an analytical framework for managing the complexity of organizational performance. The framework comprises some inputs which are processed into a number of activities, resulting in outputs. The outputs can positively/negatively give an effect or outcome to the individual levels of perception and expectation.

### 2.3 Performance management framework

Some popular frameworks have been marked as PM frameworks by a few researchers, such as the Balanced Scorecard (i.e., [35], [45]), Malcolm Baldrige National Quality Award [16], and the European Foundation for Quality Management [45].

In order to broadly comprehend the development of PM framework, [49] have categorized performance measurement and management frameworks in different themes, as follows:

1. Classical and dominant frameworks that include the Balanced Scorecard, Performance Pyramid, the European Foundation for Quality Management Excellence Model, and Performance Prism;
2. Holistic and integrated performance measurement and management frameworks that

include Integrated Performance Measurement System and Holistic Performance Management Framework;

3. Frameworks updating BSC approach that include Holistic Scorecard, Total Performance Scorecard, “system dynamics based” BSC, and Proactive BSC among others;
4. Context-specific performance measurement and management frameworks that include input-process-output-outcome framework and quantitative models for performance measurement systems among others;
5. Recently developed performance and management frameworks that include Flexible Strategy Game-Card and Sustainability Performance Measurement System.

This paper only reviews some performance measurement and management frameworks that are used as references to identify important concepts for a proposed conceptual PM framework for eye hospital industry. The frameworks include those mentioned in the classification of classical-and-dominant and are currently used in the healthcare sector:

- The Balanced Scorecard introduced by [26];
- The European Foundation for Quality Management (EFQM) Excellence Model described in EFQM Leading Excellence;

Frameworks that support the classification of context-specific are:

- Knowledge-based Performance Management (KBPM) developed by [46], which can be included in procedural framework;
- The multilayer performance management framework (MPMF) suggested by [31] and [42].

### 2.4 Performance management framework

Each framework can represent a different perspective. MBNQA and EFQM reflect a quality management perspective. The BSC promotes a strategic management perspective. RQIAPMF and PHPMF represent a comprehensive management perspective. The last perspective is a context-specific perspective that consists of KBPM which proposes a knowledge-based approach and MPMF which accommodates an analytical method or business analytics approach. Those perspectives, their associated frameworks, and some important concepts derived from the frameworks are summarized in Table 1.

**Table 1.** Perspectives of performance management framework

Perspectives	Frameworks	Important Concepts
Quality management	MBNQA	Leadership, strategic planning, performance meets stakeholder needs
	EFQM	Leadership, strategy, cause-and-effect process
Strategic management	BSC	Strategic planning, financial measures and non-financial measures, cause-and-effect relationships, strategic linkage
Comprehensive management	RQIAPMF	Leadership, strategic planning, action and monitoring, continuous improvement, learning, engagement and consultation, integrated information of performance measures
	PHPMF	Leadership, strategic alignment, standard and target, quality improvement, refine indicators, data systems, collect data, analysis
Specific-context	KBPM	Strategic planning, categorized performance variables, benchmark
	MPMF	Business analytics, context, capture, couple, control, communicate, learning

#### 2.4.1 Quality management perspective

Two PM frameworks are grouped in the quality management perspective. MBNQA is based on the performance system that comprises leadership, strategic planning, customers (leadership triad), workforce, operations and results (results triad), and the system foundation, which consists of measurement, analysis, and knowledge management. MBNQA encourages organizations to apply quality management practice in the provision of their products or services. It considers performance benchmarking to continuous improvement. It accommodates the principle of 'performance meets stakeholder needs' used to ensure stakeholders satisfaction with the improved performance results of an organization [5]. The Baldrige criteria are closer to total quality management (TQM) practice, such as the need for documentation and improvement of key work processes.

Meanwhile, EFQM provides the cause and effect process that addresses the issue of an organizational effort and its impact on the business result. This covers enablers (leadership, people, strategy, partnerships and resources, processes, and products and services) and results (people results, customer results, society results, and business results). EFQM is based on quality management approach that considers customers value on total quality of products, services, people, and the company performance [18]. This is confirmed by [23] who argued that EFQM still uses TQM approach to integrating into business operations.

#### 2.4.2 Strategic management perspective

The BSC is the only framework which definitely promotes the strategic management perspective. The BSC is designed to minimize the use of a number of measures [26]. The BSC translates an organization's mission and strategy into a wide-ranging set of performance measures supplying the framework for a strategic measurement and management system [27]. The BSC facilitates the process of linking strategic objectives and performance measures (financial measures and non-financial measures). The cause and effect relationships identify the influence of performance drivers (lead indicators) to strategic outcome measures (lag indicators). Some modified versions of the BSC have been applied in different sectors, including in the healthcare sector.

#### 2.4.3 Comprehensive management perspective

The RQIAPMF and PHPMF are categorized under the comprehensive management perspective. The RQIAPMF uses almost all factors required by a PM framework. It encompasses elements from planning activities, such as vision and strategic objectives, to control activities, such as review, corrective action, and change. It employs the plan-do-review-revise cycle that integrates planning, action, and monitoring of performance [3]. It covers other important factors for the management of organizational performance, such as leadership and commitment, continuous improvement and

learning, and engagement and consultation with stakeholders [3]. The development and implementation of a framework need to identify key success factors and relevant key performance indicators [3].

The PHPMF has four core components, which are performance standards, performance measurement, reporting progress, and quality improvement. The performance measurement includes develop data systems and collect data. The framework also employs the fifth component, which is visible leadership [16]. This component has four subcomponents, which are transparency, strategic alignment, quality culture, and customer focus. The leadership is defined for the commitment of senior management in the organization to those subcomponents [16].

#### 2.4.4 Context-specific perspective

The context-specific perspective refers to the work of [49] classifying performance measurement and management frameworks. In this paper, the knowledge-based approach and analytics approach are categorized in this perspective. Both approaches are open to the potential use of information system to perform data and information analysis.

##### (a) Knowledge-based approach

In order to reflect a knowledge-based perspective, KBPM framework uses information and knowledge related to organization performance in establishing PMS. It practices strategic planning process, which includes competitive position analysis, to define the vision, mission, and organization strategy. The knowledge-based term is related to the use of an application software to support business decisions, such as obtaining useful information of the linkages among different performance variables through utilizing the software capability. The framework introduces the concept of categorized performance variables or measures, which addresses different performance dimensions associated with management responsibilities [47]. The categories for performance variables are organizational results, internal processes, and resources capabilities. It also accommodates the need for performing internal and external benchmarks [46].

##### (b) Analytics approach

The analytics approach is distinguished from the other approaches since it applies business analytics (BA) which addresses the application of analytical tools for carrying out performance data analysis [31], [42]. The integration of analytics capability

into PM is described in a multilayer performance management framework [31], [42]. Although Klatt's framework and Schläfke's framework use the same number of layers, which are four layers, they are not equal. Both of them have capture, couple, and control layers. However, Klatt's framework has context-layer as the first layer, while Schläfke's framework has communicate-layer as the fourth layer. The context-layer is for identifying the internal and external factors that affect the organization. The capture-layer is for capturing performance drivers. The couple-layer is for indicating cause-and-effect relationships between distinct indicators. The control-layer is for overseeing the determined causal relations to make a regular revision on the coupling of performance drivers. This layer can stimulate an organization-wide continues learning. Meanwhile, communicate layer is for internally and externally communicating the performance drivers. The framework uses business analytics to validate the relationships between inputs, processes, outputs, and outcomes. The framework should also recognize the key success factors in an organization. The analytical method can be used to effectively control key performance indicators [42].

By using analytics, organizations can dynamically explore their performance information. They can perform historical data analyzes, conduct fact-based information analyzes to support better decisions, and foresee business outcomes. These analytical capabilities reflect real needs in the management of today's business activities.

## 2.5 Concepts derived from literature

Some important concepts are derived from all frameworks within those corresponding perspectives. Some others are derived from the explanation of framework concept in the literature. Relevant concepts are taken from literature related to performance measurement frameworks which include Performance Pyramid [13] and Six Sigma Business Scorecard [21]. Those concepts are used to identify relevant constructs in this study.

The concepts are grouped into two performance management processes, as follows:

- Management process which encompasses leadership, planning, action and monitoring, engagement and consultation (communication), and improvement;
- Performance measurement, related to action and monitoring, which consists of data sufficiency, indicator refinement (include causal relations between indicators), strategic linkage refinement, integrated information, reporting,

and analysis.

Leadership means that senior management in an organization must have a commitment and give support to establish PM. The lack of management commitment is one of the problems of PMS implementations. Planning is the effort of management to set an organization's strategic direction that defines what the organization wants to become (vision), what must be achieved (mission), and what resources are needed to achieve the defined strategic objectives. The action reflects how the plan is executed and monitored to track the progress of achieving the objectives. Performance monitoring comprises regular reporting of key performance indicators. It implies the process to keep track of the achievement of the performance target. Performance information needs to be communicated to stakeholders through engagement and consultation. Improvement, as the last concept for the PM process, signifies the need for providing better performance. It is the process of making PM better.

The data sufficiency is derived from the concepts of data systems and collect data specified in PHPMF and from capture data concept introduced in MPMF. The data sufficiency provides performance measures data that are collected from different business activities (e.g., operations, finance, marketing, administrations). The data need to be integrated and transformed into performance information through a process that employs a quality checking mechanism. The integrated information processing is important to satisfy information needs [48]. The information can be used as a good source to support business decisions. However, people will not make decisions based on data that have quality issues [40].

Performance reporting and analysis concepts are used to avoid the use of fragmented information by management [13]. This means that a PM process must provide integrated information of financial and non-financial information to be effectively used by the management. The integrated information concept supports the need for complete financial and non-financial information to provide greater confidence in organization performance [21]. Meanwhile, the refinement of indicators and strategic linkage is for effectively measuring the progress of strategic objectives achievement. Accordingly, they can be refined or updated when necessary. Moreover, the performance of the indicators needs to be consistently evaluated.

## 2.6 Analytics concept in performance management

Performance management was recognized as having a relationship with the information system [6]. At present, studies of PM frameworks are developing to accommodate information system capability and analytical method. Basically, information system capability addresses multiple processes ranging from data processing to information provision. Meanwhile, the analytical method refers to the use of a quantitative method or statistical analysis in business inquiries for appropriate decisions. The integration of information system capability and analytical method for business inquiries reflects the term of business analytics.

The business analytics is often linked to analytics term that precedes it. Analytics refers to the processing of vast amounts of data by applying statistical and quantitative analyzes, explanatory and predictive models, and fact-based management to support decisions and actions [14]. The analytics is part of recent management innovations that can be integrated with a management system that links strategy and operations [28]. Business analytics comprises the application of sophisticated mathematical, statistical, and other quantitative methods to identify, test and verify proposed cause-and-effect relationships amongst various indicators [31]. The concept of integrating business analytics into PM has been promoted by [31] and [42], while the use of analytical method for PM in the healthcare sector has been suggested by [17]. In the context of this sector, BA has been applied to support business performance management [1].

## 2.7 Limitations in theories of performance management framework

The existing frameworks have some limitations addressed by previous researchers. MBNQA is a non-prescriptive framework [16], which is difficult to interpret for an implementation because it is described very generally [11]. EFQM is easy to apply for general practice using an incremental approach. However, quick time to implement the model is not a consideration [24]. The BSC is known as the most popular framework in the world. Despite the widespread adoption of the BSC, it does not mean that the implementation of the BSC is easy [25], [43]. It does not provide practical guidelines for the implementation [44], especially for maintaining the defined measures or metrics [37], [43]. It tends to oversimplify all business conditions, has a misleading causal relationship,

and has the possibility of wrongly controlling the measures that may lead organizational units to achieve performance target without fact [34]. There are some criticisms of defining stakeholder perspective which needs a broader consideration [9]. It lacks supporting facts that indicate a performance improvement after an implementation of the BSC [36]. Although the RQIAPMF accommodates performance measurement in the PM framework, it only functions to monitor and report performance. There is no indication that it also manages performance indicators, in the sense of refining indicators and their linkages to strategy. The PHPMF only focuses on the customer to communicate the performance information. It is better to extend that function to broader stakeholders. Meanwhile, the MPMF should explicitly indicate that the external communication of performance drivers is intended for certain stakeholders (not only customer) who need valuable benefits from the application of business analytics.

The above reviews have addressed the aspects of determining performance measures or indicators, defining the linkage of performance indicators and strategic objectives, having structured or practical guidelines for implementing a PMS, focusing on PM processes that include the provision of fact-based performance information and the application of performance improvement, considering broader stakeholders, and reflecting an easy implementation. However, there must be some other aspects or factors to be considered to support a PM framework. The consideration of the factors is primarily based on the need of providing a reliable performance information and implementing a manageable performance measurement.

The considered factors may include the assurance of data and information quality, the ability to provide management reporting, the ability to analyze business performance data, and the use of integrated information to support better business decisions. The last three factors are closely related to the need for ensuring the level of success of the achievement of the strategic objectives, by employing the capability of an appropriate analytical method to gain a better insight into organizational data. Other factors are the ability to refine performance measures/indicators, the ability to refine the linkages between performance measures and the defined strategic objectives, and the ability to use a particular benefit of PM for benchmarking purposes. The consistency checking should complement the management of performance measures/indicators (identify data sources, refine indicators and strategic linkage),

and support the overall PM control process. The last factor is to consider the applicability of a PM framework in practice, as suggested by [49].

### 3. Methodology

The study was designed to follow a systematic approach. The process of developing a conceptual PM framework and a model of a suitable PM framework should follow several steps, as shown in Figure 1. The first thing to do is to identify different themes of PMM frameworks available in the literature. It is followed by identifying issues related to PMS implementation and PM framework. The next step is to conduct a thorough literature review by focusing on research on the PM framework. Subsequently, the process of comparing and contrasting the reviewed PM frameworks is carried out based on the identified concepts and the limitation of PM frameworks. The fifth step is the development of a proposed conceptual framework based on the identified constructs. The final step is the development of a suggested model of suitable PM framework.

The purpose of the model is to ensure that the proposed conceptual PM framework can meet the criteria for a suitable PM framework. However, in this conceptual paper, authors can only suggest cause-and-effect relationships that need to be empirically tested to validate the theoretical model.

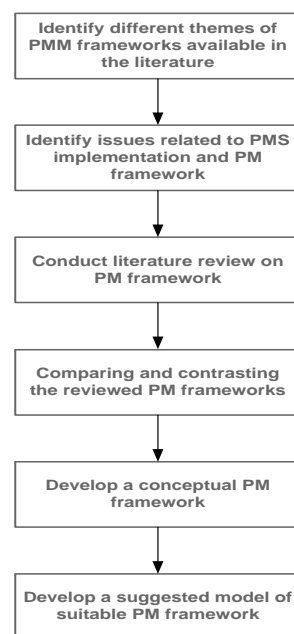


Figure 1. The study process



## 4. Developing a model

The development of a model of a suitable PM framework is preceded by the fourth and fifth steps of the study process.

### 4.1 Comparing and contrasting the performance management framework

As mentioned earlier in the introduction section, the study compares and contrasts the PM frameworks. The process was focused on the popularly used PM frameworks in the hospital industry and two other selected frameworks, which are MBNQA, EFQM, BSC, RQIAPMF, PHPMF, KBPM, and MPMF. It used some aspects as comparison criteria, which were selected from the identified concepts and the limitation of PM frameworks. The process of comparing and contrasting resulted in some gaps that need to be fulfilled by the proposed PM framework, as summarized in Table 2. Those gaps include the practice of leadership, the covering of planning and definition, the need for execution and monitoring, the inclusion of communication with stakeholders, the covering of evaluation and improvement, the implementation of strategic and operational linkage, the covering of financial measures and non-financial measures, the applicability of the framework in practice, the data sufficiency, the assurance of data and information quality, the consideration of an integrated information processing, the covering of management reporting, the need for analytical capability, and the practice of benchmarking.

### 4.2 Constructs for a conceptual performance management framework

The conceptual framework uses some constructs generally identified from the literature and specifically from the adopted concepts, which are mainly applied to the process of comparing and contrasting PM frameworks, as summarized in Table 3.

The constructs for the PM process are leadership, planning (vision, mission, and strategic objectives), key success factors, key performance indicators, strategic linkage, performance targets, performance execution and monitoring, performance communication to stakeholders, learning, performance evaluation and improvement. Strategic objectives are the defined objectives that need to be achieved through the execution of organizational strategies. Key success factors are important

elements for an organization to achieve its ultimate goal. Key performance indicators refer to the selected key indicators that are used to track the progress of achieving strategic objectives. Strategic linkage indicates the relationship between strategic objectives and performance measures. The performance target is about the objective of performance that must be met. Performance execution refers to the process to ensure that the determined activities are done to achieve organizational strategic objectives. Performance communication means the process to deliver the required performance information to the stakeholders. Learning is the process to get a valuable knowledge of managing the organizational performance and PM process. Performance evaluation means the process to review and ensure the achievement of organizational strategic objectives.

The constructs for performance measurement part are organizational data which accommodates data sufficiency concept, data quality, integrated information processing, categorized measures, reporting capability, information visualization, analytical capability, performance information, stakeholders, and benchmarking. Organizational data are relevant data from business activities to support a PMS. The availability, sufficiency, and accessibility must be assured for collecting the organizational performance data. Data quality is the level of data usability and validity to support the delivery of reliable performance information. The integrated information processing means the transformation of the captured data from different business processes into an integrated structure of un-overlapping information. Categorized measures refer to the performance measures that are grouped by the intended outcome categories, such as organizational results, internal processes, and resources capabilities. Reporting capability refers to the ability of a process or a system to provide the required performance information for particular users. Information visualization is the use of graphical techniques to present information to the users. Analytical capability means the ability of a system to provide a means for analyzing performance information, such as performing descriptive, prescriptive, predictive, and other information analysis. Performance information is the output of a system to be accessed by relevant users. Stakeholders refer to individuals, groups, or organizations that have interests in the improvement of organizational performance. Benchmarking is the effort to find and use the best practices in an industry to improve organizational performance.

Table 2. Comparing and contrasting the performance management frameworks

Frameworks	MBNQA	EFQM	The BSC	KBPM	RQIAPMF	PHPMF	MPMF	Proposed Framework
Leadership	Defined	Defined	Not defined	Part of resource capabilities	Defined	Defined	Not defined	<b>Defined</b>
Planning and definition	Covered	Covered	Covered	Covered	Covered	Not explicitly covered	Covered	<b>Covered</b>
Execution and monitoring	Covered	Covered	Covered	Covered	Covered	Covered	Covered	<b>Covered</b>
Communication with Stakeholders	Included	Included	Included for customer and	Included	Included	Included	Included	<b>Included</b>
Evaluation and improvement	Covered	Covered	Unclear	Covered	Covered	Covered	Covered	<b>Covered</b>
Strategic and operational linkage	Defined	Defined	Defined	Defined	Defined	Not clearly defined	Defined	<b>Defined</b>
Financial measures	Covered	Covered	Covered	Covered	Covered	Not explicitly covered	Covered	<b>Covered</b>
Non-financial measures	Covered	Covered	Covered	Covered	Covered	Not explicitly covered	Covered	<b>Covered</b>
Applicability in practice	Applicable	Applicable	Applicable	Applicable	Applicable (focus on healthcare)	Applicable (focus on healthcare)	Applicable	<b>Applicable</b>
Data sufficiency	Addressed	Addressed	Not addressed	Addressed	Addressed	Addressed	Addressed	<b>Addressed</b>
Data and information quality	Addressed slightly	Addressed	Not addressed	Addressed	Not addressed	Addressed	Addressed	<b>Addressed</b>
Integrated information processing	Not considered	Not considered	Not considered	Not considered	Considered	Not considered	Not considered	<b>Covered</b>
Management reporting	Not covered	Not covered	Covered, but not detail	Covered	Covered	Covered	Covered	<b>Covered</b>
Analytical capability	Considered separately	Considered separately	Not clearly considered	Considered separately	Not clearly considered	Not clearly considered	Considered	<b>Covered</b>
Benchmarking	Covered	Covered	Covered	Covered	Unclear	Unclear	Not covered	<b>Covered</b>

**Table 3.** Constructs for performance management framework

No.	Constructs	Supporting References for Constructs
1	Leadership	[3], [5], [16], [18]
2	Planning (vision, mission, and strategic objectives)	[3], [5], [16], [18], [20], [27], [46]
3	Key success factor	[3], [42]
4	Key performance indicators	[3], [42]
5	Strategic linkage	[27]
6	Standard and target	[16], [20], [38]
7	Execution	[3], [20]
8	Monitoring	[3], [20]
9	Communication	[3], [20]
10	Learning	[3], [20]
11	Evaluation and improvement	[2], [3], [5], [16], [20]
12	Organizational data (measures/metrics)	[19], [20], [22]
13	Data collection	[16], [20]
14	Data quality	[33], [40]
15	Integrated information processing	[28], [48]
16	Categorized measures	[27], [47]
17	Performance information	[2], [3], [20], [21]
18	Reporting capability	[3], [13], [28]
19	Analytical capability	[14], [17], [28], [31], [42]
20	Stakeholders	[3], [5], [20]
21	Benchmarking	[5], [20], [46]
22	Input-process-output-outcome	[8], [10], [31], [42]

### 4.3 The development of performance management framework

The development of a PM framework requires relevant constructs and a suggested model to determine whether the developed framework is a suitable PM framework for implementing a PMS. The developed framework applies a common management process for the PM (planning and definition, execution, monitoring, evaluation and improvement) and the performance measurement part.

#### 4.3.1 *Input-process-output-outcome model*

The performance measurement part of the developed framework adopts an input-process-output (IPO) and outcome model, as suggested by [31] and [42]. The framework is also motivated by the following IPO-outcome terms:

- to measure organizational processes, as suggested by [10];
- to manage the complexity of organizational performance, as suggested by [8].

Hence, it is necessary to identify the conceptual components of performance measurement, which are the inputs, processes, outputs, and outcomes.

The inputs are organizational data that consists of performance related data from strategic planning activities (performance targets) and event-based (fact-based) data from business activities. All data

will be transformed into an integrated performance information. This part of the performance measurement also ensures the data quality. The refinement of indicators is managed in the process that is part of the performance measurement. The process also manages the linkage between financial measures and strategic objectives, the linkage between non-financial measures and strategic objectives, and the categorization of performance measures into organizational results, internal processes, and resources capabilities.

Other parts of the performance measurement are information visualization and information delivery that comprise reporting and analytical capabilities to present performance information. The output is the performance information to be accessed or consumed by appropriate stakeholders who can gain valuable performance outcomes. To support performance and process improvement, the performance information can also be used for benchmarking purposes. The feedback mechanism is used to control and evaluate the operation of performance measurement. This IPO-outcome model is also useful for developing practical guidelines for assisting the implementation of a performance measurement system.

#### 4.3.2 *Conceptual performance management framework*

In order to have a complete picture of the proposed

conceptual PM framework, the PM process and the IPO-outcome model of the performance measurement need to be transformed into a detailed depiction of PM components, as shown in Figure 2.

The PM process encompasses the following components:

- Planning and definition: vision, mission, strategic objectives, key success factors, key performance indicators, strategic linkage, performance targets, and sources for performance information;
- Execution: data collection and data quality (referenced by the input and process components of the performance measurement);
- Monitoring: reporting, information visualization, and analytics (referenced by the output component of the performance measurement);
- Evaluation and improvement: review and give feedback to all components of PM.

Those process components are complemented by leadership component along with communication and learning component. Leadership component provides clear direction, commitment, and support to the processes of PM. Meanwhile, communication and learning component is functioned to support the stakeholder needs and the benchmarking purposes.

The performance measurement is associated with the execution and monitoring components of the PM process. It uses an IPO-outcome model as a process logic to transform performance data into a reliable performance information. The details are as follows:

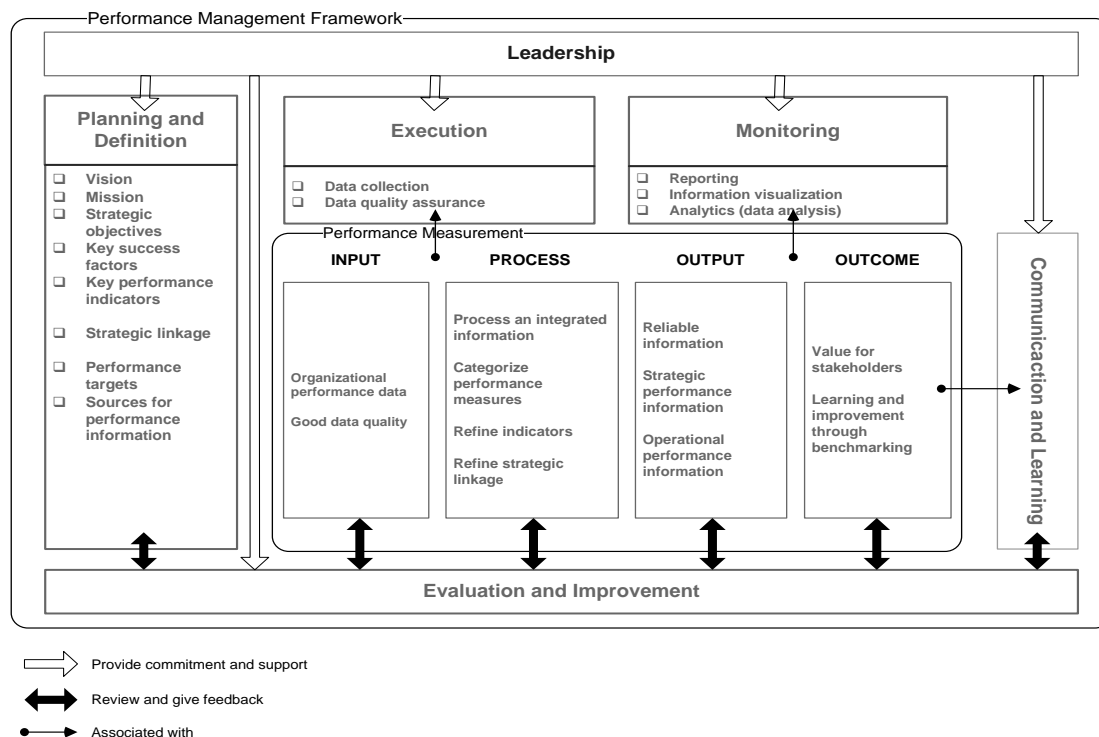
- Input: organizational performance data;
- Process: process an integrated information, categorization of performance measures, refine indicators, and refine strategic linkage;
- Output: quality of information, strategic and operational performance information that can be used to track the progress of achieving strategic objectives through reporting and analytical capabilities;
- Outcome: valuable performance information for stakeholders, performance improvement

opportunities through benchmarking.

The organizational data come from both internal management activities, such as performance targets, and from business interactions between the organization and external parties. These interactions will produce event-based performance data that may comprise financial data, such as revenue per month, and non-financial data, such as the number of training hours per employee (human resources), waiting time in outpatient pharmacy (services), and the number of surgery per month (operations).

Ensuring the quality of performance data is important since an organization has to provide reliable performance information for its stakeholders. As mentioned by [21], the integrated performance information gives greater confidence in organization performance. Measures or indicators that support the achievement of organizational performance are categorized in different perspectives (organizational results, internal processes, and resources capabilities). This is why the indicators and strategic linkage can be refined in the performance measurement.

When required, the performance information can be accessed through reporting and analytical capabilities. Analytical capabilities may cover descriptive analytics, prescriptive analytics, and predictive analytics [1]. Subsequently, the use of those capabilities can bring value and purpose to fulfil the needs of stakeholders, both internal (e.g., employee, medical staff, management, and supervisory board) for feedback and evaluation purposes and external (e.g., patients, partners, suppliers, and government institutions) for consuming relevant performance information. In turn, the organization can use its PM components, such as performance measurement, for benchmarking purposes (e.g., learning other organization's PM process) with similar or different organizations. The outcome of the benchmarking activity can help organization improve its organizational performance.



**Figure 2.** Conceptual performance management framework

This paper regards the developed conceptual PM framework as a suitable PM framework for implementing a PMS.

#### 4.3.3 Drawing a theoretical model of suitable performance management framework

Because the conceptual framework is regarded as meeting the objective of selecting a suitable PM framework for implementing a PMS, a theoretical model needs to be developed. A developed theory requires factors and relationships as its foundation [12]. The following five criteria, which are based on the literature, are applied for determining a suitable PM framework, as follows:

1. A framework must reflect a useful method for modelling a system (adopted from [41]);
2. A framework is able to act as a strategic alignment, improvement and learning tool (adopted from [3]);
3. A framework accommodates performance measurement (based on the arguments from [20], [32], and [38]);
4. A framework is applicable in practice (adopted from [49]);
5. A framework serves as a set of practical guidelines for implementing a PMS (adopted from [44]).

The essences of the criteria are used as the suggested factors to determine a suitable PM

framework. The factors are a useful method for modelling a system (referring to the first criteria), management control tool (derived from the second criteria), framework applicability (referring to the third criteria), performance measurement (referring to the fourth criteria), and a set of practical guidelines for PMS (referring to the fifth criteria). Having identified the factors to determine a suitable PM framework, the relationships between them are required to indicate causality.

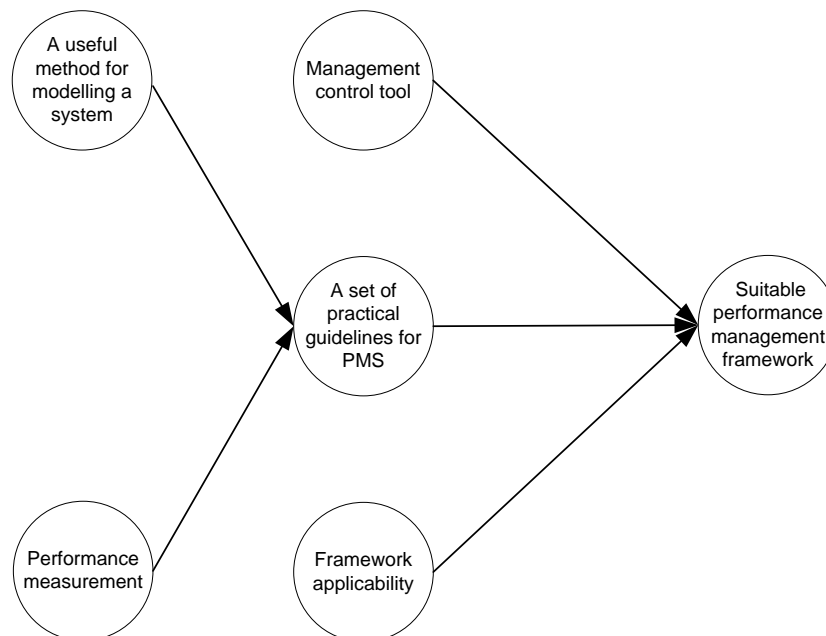
When an organization wants to implement a PMS, it is easier to apply a useful method to model the intended system. The useful method needs to cover the process of collecting the required data and the information dissemination process. The application of the useful method is essentially support the need for a practical guidelines for PMS. The practical guidelines may also accommodate the explanation of the relationship between the conceptual components of performance measurement (IPO-outcome model). A complete practical guidelines is potential to be an important factor for selecting an appropriate PM framework to support the implementation of a PMS. Other possible factors are framework as a management control tool and framework applicability in any requiring organization. Hence, those three factors can practically determine a suitable PM framework.

In order to easily operationalize the suggested factors, a theoretical model reflecting the

mentioned relationships was developed, shown in Figure 2. The model presents all variables which determine a suitable PM framework. The model links four latent exogenous variables to two endogenous variables. The primary outcome variable of this model is a suitable PM framework. It is influenced by two mediated factors, one

mediating factor, and two direct factors.

The mediated factors are useful method for modelling a system and performance measurement. The mediating factor is a set of practical guidelines for PMS. The direct factors are management control tool and framework applicability.



**Figure 3.** Theoretical model of a suitable performance management framework

The developed model resulted in some theoretical propositions. They encompass a set of statements reflecting causal relationships between factors that hypothetically determine a suitable PM framework. The theoretical propositions are as follows:

**Proposition 1:** The suitable PM framework is determined by the ability of the framework as a management control tool.

This means that the alignment of performance indicators to the defined strategy, continuous performance improvement, and learning on organizational performance or other organization's PM process are important to determine a suitable PM framework. The function of this management control tool is to drive an organization to achieve its strategic objectives and to establish a better PM process that can provide reliable information for supporting business decisions.

**Proposition 2:** The suitable PM framework is determined by the applicability of the framework in practice.

This means that the applicability of the framework in practice in any industry, such as the eye hospital industry, or any organization is important to specify a suitable PM framework. The applicability may

include covering common management processes, addressing the way to solve common issues for a PMS, and supporting the need for reliable information.

**Proposition 3:** The suitable PM framework is determined by the ability of the framework as a set of practical guidelines for a PMS implementation.

This means that the ability of the framework as a set of practical guidelines for an implementation of PMS is essential to determine a suitable PM framework. The practical guidelines are aimed at successful implementation of PMS. The guidelines should encourage the management to take a formal decision to make the PMS as a means to manage the organization's performance measures and targets. The decision indicates clear direction, strong commitment, and support to the successful PMS implementation. The guidelines must describe the ability of PMS to provide and deliver performance information.

**Proposition 4:** A set of practical guidelines for PMS influencing a suitable PM framework is determined by a useful method for modelling a system.

This means that a set of practical guidelines for PMS implementation is mediating a useful method for modelling a system to determine a suitable PM framework. In this paper, the IPO-outcome model to describe the performance measurement indicates the need for a useful method for a required PMS. The useful input-process-output-outcome model to transform performance data into valuable performance information can be used as a practical guideline for implementing a PMS.

**Proposition 5:** A set of practical guidelines for PMS influencing a suitable PM framework is determined by the use of a performance measurement.

This means that a set of practical guidelines for PMS implementation is mediating the use of performance measurement to determine a suitable PM framework. A thorough performance measurement is required to describe the transformation process of performance data into a reliable performance information through the processes of data collection, integrated information processing, reporting, information visualization, and analytics. The delineation of a complete performance measurement can be used as a practical guideline for implementing a PMS.

## 5. Conclusion

In general, this study supports the arguments that performance management and performance measurement are not separable [32], difficult to be distinguished [20], and become very mixed [38]. Therefore, this paper concludes that performance measurement is part of performance management. This paper also supports the definition of PM from [4] and Rayner (in [29]). On the basis of the intersection of the definitions of Axson's and Rayner's (processes, systems, metrics), this paper has addressed performance measurement as part of PM process components, a system view to model the processes of performance data capture and information dissemination, and categorized performance measures as the basis of performance metrics or indicators.

Ideally, a PM framework must describe thorough processes of managing organizational performance, from planning to performance evaluation and improvement. The processes also include the performance measurement part, which is linked to the execution-and-monitoring process components. The performance measurement can use a certain approach available in the literature. In this paper, the IPO and outcome model is applied to describe a complete process of transforming performance measures data into reliable performance information from which stakeholders can get

valuable benefits. The IPO model, in particular, represents a system diagram which explains how performance measurement works.

The performance measurement described in this paper supports the studies of [31] and [42], which use the IPO-outcome model to develop a conceptual PM framework underpinned by the analytics capability. The model is also influenced by the use of IPO-outcome terms suggested by [10] and [8]. The model thoroughly describes the performance measurement to distinguish the proposed PM framework from the available PM frameworks.

Furthermore, the conceptual PM framework is designed for modelling a PMS and guiding the implementation of PMS. It is also aimed at solving issues found in empirical research, i.e., the need for data adequacy [22], data quality [33], supporting the need for an analytical direction [15] and an analytical method [42] on PM, and helping organizations keep track of the progress of achieving their strategic objectives and provide reliable performance information to support business decisions.

Five basic criteria, based on the literature, have been suggested for determining a suitable PM framework. However, other aspects that are not identified in this paper can be added to develop more robust criteria. The developed theoretical model emphasises the need for determining a suitable PM framework. The model suggests some propositions to develop a further research question, i.e., "what are the factors constructing a suitable performance management framework?" that needs to be answered in an empirical study.

The study provides a useful direction for conducting research and teaching in developing a suitable PM framework. It also provides a reference model, to be used in research, for determining a suitable PM framework. The proposed framework supports the need for a suitable PM framework which can be applied in practice, particularly for guiding the implementation of PMS.

The study encourages PM research concerning a thorough process of developing a PM framework and establishing criteria and a model to determine a suitable PM framework. However, the study needs to follow scientific processes, to move forward from the conceptual area to empirical area.

Further research will be undertaken to validate the developed theory in practice. The subsequent process is to conduct an empirical testing for a further developed causal model. If everything works as planned, this process will be done in several accredited eye hospitals in Indonesia.

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