

## Conference Paper

# A Model of Comprehensive Performance Measurement: Conceptual Implementation on PDAM

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## Abstract

This study aims at measuring the performance of Perusahaan Daerah Air Minum (PDAM) by implementing the developmental concept of balance scorecard as formulated by Kaplan and Norton in 1992, by means of conceptualizing a more comprehensive and measurable one. Researchers have formulated some performance measurement indicators, so that more relevant, comprehensive and measurable. The concept being formulated by the researchers are in the forms of several indicators in the perspective of finance, customers, internal business process, and learning and growth. The indicators are namely the effectiveness of billing as part of the financial aspects; the customer service coverage included into a customer's perspective; the completion rate, the domestic water consumption, the water service continuity, and the product efficiency as explained in internal business processes; and the ratio numbers of employees, employee training, and training costs in the perspectives of learning and growth. The result shows that PDAM is included into a criterion of a good-managed corporate.

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## 1. Introduction

The authority of local government to establish and manage the local government-owned enterprises have been regulated in Government Regulation No. 25 the Year 2000 [1]. Almost all local government in Indonesia have more than one local government-owned enterprises. One of the local government-owned enterprises by almost all regions in Indonesia is PDAM (Perusahaan Daerah Air Minum).

PDAM is one of the local government-owned enterprises that exist in some Indonesia areas. As one of the local government-owned enterprises, PDAM has the objective of organizing its strategic service function in the water sector independently to the community and to help local governments spur regional economic growth as one of

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the tools to increase local revenue source. In order to achieve the vision, mission, and goals, PDAM is required to always improve performance because the benchmark of the success of local government-owned enterprises is reflected in the performance.

Several studies on the financial performance of local government-owned enterprises have been done which resulted from assessment of financial performance and its contribution to PAD [1–4]. Research on the financial and non-financial performance of several local government-owned enterprises in Indonesia has been done by several researchers [5–7]

Local government-owned enterprises performance management has been still conventional, performance measurement based on DP3 (Daftar Penilaian Pelaksanaan Pekerjaan) that tends subjective. As a public service corporation, local government-owned enterprises needs to have effective strategy formulas that move all the elements in achieving the vision and mission that ultimately impact on the achievement of performance.

Local government-owned enterprises performance measurement has been done by BPKP based on financial statements, so that performance measurement like this cannot give a comprehensive performance. Improving the local government-owned enterprises performance needs to involve all elements by implementing performance-based management to improve local government accountability [8, 9].

The performance measurement system that can help management comprehensively is a Balance Scorecard that has four perspectives: financial, customers, internal business processes and learning and growth perspectives [11]. But the indicators in this concept cannot describe the comprehensive performance of local government-owned enterprises. Therefore, this study aims to reconstruct some indicators in four balance scorecard perspectives and implement the concept in PDAM.

## 2. Theoretical Framework

### 2.1. Grand theories

There are several theories that can be used as a reference in research on performance among others:

### **2.1.1. Resource-based theory (RBT)**

Resources based theory suggests that firms have resources that enable companies to have the competitive advantage in order to have good long-term performance using enterprise resources to improve efficiency and effectiveness [11, 12]. Therefore Resources based theory is highly appropriate to explain the research on comprehensive performance measurement.

### **2.1.2. Stakeholder theory**

All stakeholders have the right to obtain information on organizational activities [14]. Stakeholder theories emphasize organizational accountability beyond financial performance, therefore the sustainability of the company requires the support of stakeholders because they are able to control the company's resources [14, 15]. Therefore, this theory is very appropriate to be used as a foundation in research on performance, because customers and regulators are stakeholders.

### **2.1.3. Agency theory**

The agency relationship is a relationship between the company owner (principle) and the manager of the company (agent) [17]. The relationship between local government and local government-owned enterprises is the agency relationship. Local government gives authority to local government-owned enterprises to manage local companies. Therefore this theory is very appropriate as a foundation in research on performance, because local government as a principal and local government-owned enterprises as an agent has a tendency to maximize utility, because of a conflict of interest.

## **2.2. Balance scorecard**

Balance scorecard is a model which provides a comprehensive framework that can translate corporate vision and strategy coherently consisting of four perspectives, namely financial, customers, internal business process and learning and growth [11]. The advantages of Balance Scorecard in strategic planning system are able to produce the strategic planning which has comprehensive, coherent, measurable, balance characteristics through lagging indicator and lead indicator, so it has some advantages in clarifying the vision and strategy [17–19]. Balance Scorecard-based performance

management requires companies to provide a significant contribution to achieving the vision and mission based on the company's basic values [6].

### 2.3. Local government-owned enterprises

According to the East Java Provincial Regulation No. 14 of 2012, the establishment of local government-owned enterprises aims to provide benefits to the community and increase the source of local revenues outside of taxes and levies [21]. In order for increasing local revenues, so the local government-owned enterprises must be managed in proportion and professional in order to have a good performance. Determined 19 factors in formulating performance that led strategies to achieve the company's vision, mission, and goals [22]. Performance measurement results from local government-owned enterprises used as a basis for assessing the success or failure of local government-owned enterprises in achieving the vision, mission, and goals of the corporation. In order for more comprehensive performance measurement, so the performance measurement should include financial and non-financial dimensions so can describe the quality of performance comprehensively [7].

## 3. Research Methods

The purpose of this research at measuring the performance of PDAM by implementing several new indicators of performance measurement comprehensively, therefore qualitative research methods more appropriate used in this research. Sources of data in this research are primary and secondary data. Primary data is obtained directly from the leaders and employees of PDAM, local government, and customers. Secondary data sources are obtained from the web, Badan Pusat Statistik or other sources related to the research object. Data collection techniques in this research through participatory observation, interviews with open questions and document review [23].

## 4. Results and Discussion

PDAM Madiun Performance measurement has been done by Badan Pengawas Keuangan dan Pembangunan (BPKP) so that the performance measurement is only from a financial perspective, and does not reflect performance measurement comprehensively. In this study, researchers have formulated some performance measurement indicators by developing the concept of the balance scorecard and adjusted to the local

government-owned enterprises criteria, thereby reflecting performance comprehensive and measurable. The indicators are as follows:

## 4.1. Financial perspective

### 4.1.1. Profitability

$$1. \text{ Return on investment} = \frac{\text{Earning After Tax}}{\text{Equity}} \times 100\%$$

$$2. \text{ Operating Ratio} = \frac{\text{Operating expens}}{\text{Operating income}}$$

### 4.1.2. Likuiditas

$$1. \text{ Cash Ratio} = \frac{\text{Cash + Cash equivalent}}{\text{current liabilities}} \times 100\%$$

$$2. \text{ Billing Effectiveness} = \frac{\text{total revenue of water account}}{\text{total of water account}} \times 100\%$$

### 4.1.3. Solvency

$$\text{Solvency} = \frac{\text{Total Assets}}{\text{Total Liabilities}} \times 100\%$$

In the financial perspective, the researcher formulated the billing effectiveness indicator to measure the effectiveness of PDAM in obtaining revenue.

## 4.2. Customers perspective

### 4.2.1. Coverage of customer service

$$\text{Coverage of customers service} = \frac{\text{amount the served society}}{\text{amount the service region}} \times 100\%$$

### 4.2.2. Customers retention

$$\text{Customers Retension} = \frac{\text{Amount the old customers}}{\text{total customers}} \times 100\%$$

### 4.2.3. Customers acquisition

$$\text{Customers Acquisition} = \frac{\text{Amount the new customers}}{\text{total Customers}} \times 100\%$$

In customer perspective, the researcher has indicated the coverage of customer service, an indicator of the effective amount of service to society.

## 4.3. Internal business process perspective

### 4.3.1. Completion rate complaint

$$\text{Completion Rate Complaint} = \frac{\text{Amount of complaint resolved}}{\text{Amount of Complaint}} \times 100\%$$

### 4.3.2. Domestic water consumption

$$\text{Domestic Water Consumption} = \frac{\text{Amount of domestic sold water (m}^3\text{)}}{\text{Amount of domestic customers}}$$

### 4.3.3. Continuity of water services

$$\text{Continuity of Water Services} = \frac{\text{Time of distributions water to customers in year}}{365}$$

### 4.3.4. Product efficiency

$$\text{Product Efficiency} = \frac{\text{Product Realization (m}^3\text{)}}{\text{Installed Capacity (m}^3\text{)}} \times 100\%$$

In the internal business process perspective, the researcher includes the complaint compliance rate indicator, domestic water consumption, continuity of water service and production efficiency as an indicator to assess the performance of the business process year after year.

## 4.4. Learning and growth perspective

### 4.4.1. Employees ratio

$$\text{Employees Ratio} = \frac{\text{Amount of Employees}}{\text{Amount of Customers}} \times 1000$$

### 4.4.2. Employees training ratio

$$\text{Employees Training Ratio} = \frac{\text{Amount of Employees Training Participant}}{\text{Amount of Employees}} \times 100\%$$

### 4.4.3. Training costs to employees costs

$$\text{Training Costs} = \frac{\text{Training Cost}}{\text{Amount Employees Costs}} \times 100\%$$

In the learning and growth perspective, the researcher formulated the indicator amount of employees ratio, the employees training and training costs as an indicator that better reflected the learning and growth process of the PDAM.

PDAM performance assessment results are presented in the table below:

TABLE 1: PDAM Performance Assessment Results.

Performance Indikator	Weight	Assessment Score Scale	Score	Total Score (Weight x Score)
Financial Perspectives				
1. Profitability				
a. Return on Investment	5	5 = >10%	21,729% = 5	25
		4 = 7 – 10		
		3 = 3 – 7		
		2 = 0 – 3		
		1 = <0%		
b. Operating Ratio	5	5 = >1,00	0,678 = 2	10
		4 = 0,85 – 1,0		
		3 = 0,65 – 0,85		
		2 = 0,5 – 0,65		
		1 = ≤0,5%		
2. Liquidity				
a. Cash Ratio	5	5 = >100%	4.288,020% = 5	25
		4 = 80 – 100		
		3 = 60 – 80		
		2 = 40 – 60		
		1 = <40%		
b. Billing Effectiveness	5	5 = >90%	87,393% = 4	20
		4 = 85 – 90		
		3 = 80 – 85		
		2 = 75 – 80		
		1 = ≤75%		

Performance Indikator	Weight	Assessment Score Scale	Score	Total Score (Weight x Score)
3. Solvency	5	5 = >200%	937,596% = 5	25
		4 = 170 – 200		
		3 = 135 – 170		
		2 = 100 – 135		
		1 = <100%		
<b>TOTAL</b>	<b>25</b>			<b>105</b>
<b>Customers Perspective</b>				
1. Coverage of Customers Service	15	5 = >80%	100,900% = 5	75
		4 = 60 – 80		
		3 = 40 – 60		
		2 = 20 – 40		
		1 = <20%		
2. Customers Retention	10	5 = >80%	99,956% = 5	50
		4 = 60 – 80		
		3 = 40 – 60		
		2 = 20 – 40		
		1 = <20%		
3. Customers Acquisition	5	4 = >8%	2,044% = 1	5
		3 = 6%-8%		
		2 = 3%-5%		
		1 = <2%		
<b>TOTAL</b>	<b>25</b>			<b>130</b>
<b>Internal Business Process Perspective</b>				
1. Completion Rate Complaint	15	5 = >80%	100% = 5	75
		4 = 60 – 80		
		3 = 40 – 60		
		2 = 20 – 40		
		1 = <20%		
2. Domestic Water Consumption	10	5 = >30m3	218,676m3/custom = 5	50
		4 = 25 – 30		
		3 = 20 – 25		
		2 = 15 – 20		
		1 = <15%		
3. Continuity of Water Service	5	5 = 21 – 24 hours	24 hours/day = 5	25
		4 = 18 – 21 hours		
		3 = 15 – 18 hours		
		2 = 12 – 15 hours		



Performance Indikator	Weight	Assessment Score Scale	Score	Total Score (Weight x Score)
		1 = <12 hours		
4. Product Efficiency	6,25	5 = >90%	65,419% = 2	12,50
		4 = 80 – 90		
		3 = 70 – 80		
		2 = 60 – 70		
		1 = <60%		
<b>TOTAL</b>				<b>162,50</b>
<b>Learning and Growth Perspective</b>				
1. Employees Ratio	6,25	5 = <6 people	3,611 = 5	31,25
		4 = 6 – 8 people		
		3 = 8 – 10 people		
		2 = 10 – 12 people		
		1 = >12 people		
2. Employees Training Ratio/Competency Improvement	6,25	5 = >80%	100% = 5	31,25
		4 = 60 – 80		
		3 = 40 – 60		
		2 = 20 – 40		
		1 = <20%		
3. Training Cost to Employees Cost	6,25	5 = >10%	1,836% =1	6,25
		4 = 7,5 – 10		
		3 = 5 – 7,5		
		2 = 2,5 – 5		
		1 = <2,5%		
<b>TOTAL</b>	<b>25</b>			<b>68,75</b>
<b>TOTAL SCORES ACHIEVED</b>	<b>100</b>			<b>466,25 (Good Performance)</b>
Notes: Good performance = Total Score Achieved ≥ 350 Fair performance = Total Score Achieved 260 - 340 Bad performance = Total Score Achieved ≤ 250				

## 5. Conclusion

Based on the result of research can be concluded that:

1. PDAM need to build sustainability performance management by using indicators which reflect corporate's performance comprehensively, so according to with criteria desired by the corporate and stakeholders, especially local government as owner and communities as customers.

2. The addition of several new indicators in the financial perspective, customers perspective, internal business process perspective, learning, and growth perspective proved to more reflect PDAM's performance comprehensively, so the concept can be used as a performance measurement tool sustainability.
3. The result of analyzed by using some new indicators in balance scorecard concept shows that PDAM performance has included the good category with total score 466.25, thus the performance of PDAM has an expectation of the management, local government, and society.

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