



(RESEARCH ARTICLE)



## Implementation of balanced scorecard at drinking water depot

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### Abstract

Performance measurement of a business needs to be done to determine the possibility of target deviations in the implementation of predetermined processes, which can occur at any time. Service or performance at Panca Drinking Water Depot is rated poorly by some consumers because the depot is not optimal for fulfilling high consumer demand. This may be due to limited costs for investment in refill equipment and transportation or other problems, which can makes the slow response time. In order to improve depot services for the future, measurement tools are needed to determine business performances and obtain recommendations for improvement, through the application of a Balanced Scorecard. Balanced Scorecard questionnaires were distributed to 10 workers and 152 consumers with four perspectives evaluation, which are financial, consumer, internal business process, and also growth and learning. The result are that the business has profit rate of 7.40%, cost rate of 7.45%, ROE of 7.25%, customer satisfaction index of 62.02% (satisfied), company index of 68.79% (good), employee index of 69.50% (satisfied), and learning index of 67.75% (good). Although the overall performance result is 71.43% or good service, but with the aim to realize performance results of more than 90% or best service, so the depot needs to improve the integrated information systems, increase advertising and promotions, invest on effective equipment and transportations, expand operational areas, and fix policies.

**Keywords:** Balanced Scorecard; Performance Measurement; Drinking Water Depot; Service

### 1. Introduction

Performance measurement of a business needs to be done to determine the possibility of target deviations in the implementation of predetermined processes, which can occur at any time. The ability of measure performance is needed which involves several important things such as goals, metrics, and assessments. According to [8], performance is a representation from the achievement level of the implementation of an activity program or policy to realizing the organization's goals, objectives, visions, and missions through the strategic planning. While performance measurement is the process of assessing job progress towards goals and objectives in managing resources to produce goods and services, including information related to the efficiency and effectiveness of actions in achieving goals.

Panca Drinking Water Depot is a business as drinking water supplier with operational areas in Demak City, Indonesia. Lastly, service at depot is rated poorly by some consumers because the depot is not optimal for fulfilling high consumer demand at there. This may be due to limited costs for investment in refill equipment and transportation or other problems, which can makes the slow response time. In order to improve depot services for the future, measurement tools are needed to determine business performances and obtain recommendations for improvement.

One of the well-known methods is Balanced Scorecard. Kaplan and Norton [7] introduced a new performance measurement system known as the "Balanced Scorecard" or BSc, which is a management tool designed to translate visions, missions, goals, and strategies into comprehensive, coherent, and measurable strategic goals and initiatives

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through an approach from four perspectives that called financial, consumer, internal business process, and also learning and growth. According to [9], the usage of BSc measurement become a true strategic management tool is able to clarify and translate the organization's mission and strategy which enabling the process of communication, strategic alignment, and organizational learning. From all of available performance measurement tools, the perspective of BSc is needed for measure the depot because its suitable perspectives.

BSc's researches has been carried out with a wide range of research areas, like business, services, knowledge, and many others. Research by [5] present conditions and improvements for the governance and also control of information systems within the university. Research by [11] present the FAHP-FIS-BSc collaboration methods for the sustainability evaluation of SMEs. Research by [6] present the concepts of eco-efficiency BSc for environmental investment decision-making. Research by [3] present the gaps that hinder BSc at the hospitality and tourism industry development. Research by [2] present the BSc-BWM collaboration methods for performance evaluation of the service industry. The novelty of the research is the fact that there has not been an application of BSc There has not been much research on the application of BSs for small businesses with a busy daily routine, such as depot that have many consumers with different areas.

A business or organization, even it is small business, will look for effective performance measurement that can solve various aspects not only economic, but also social skills and knowledge levels, supplier-consumer relationships, and innovative culture [10]. The implementation of BSc will be appropriate for this research problem. This research aims to evaluate performance and provide recommendation for drinking water depot using a balanced scorecard to achieve best service category.

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## **2. Material and methods**

### **2.1. Literature Study**

Literature study is conducted to understand the basic concepts of research that carried out from articles, journals, scientific papers, reports, and other papers. From the problem in introduction, research will evaluate the depot's performance using the Balanced Scorecard (BSc) which explain the business's vision, mission, strategy, goal, and measure to measure performance through four interrelated perspectives. There are financial related to capital income, return on equity, and other financial activities, then consumer related to customer satisfaction and how they can understand products and services, then internal business process related to main competencies of the company, and the last one learning and growth related to how the company maintain and develop products, understand employees for their safety, health, or performance.

### **2.2. Research Design**

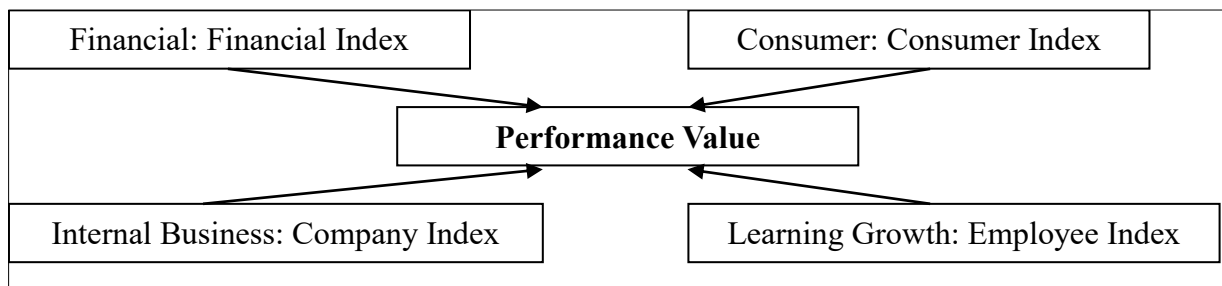
Research design almost consist of 5W1H. Research will evaluate performance and provide recommendation (what) of employee and company (who) because depot rated poorly by consumer (why). Research will conduct in November 2023 for one month (when) at Panca Drinking Water Depot (where) using Balanced Scorecard method (how). Research collect data from primary data (literature study, observation, and depth interview) and secondary data (financial, model, questionnaire, and observation). Based on data [1], financial will use financial index such as revenue, cost, and ratio. Consumer will use a customer satisfaction index such as complaint response time, service and product quality, delivery and access, product reputation and variety, price, consumer level and profits. Internal Business Process will use company index such as innovation, productivity, operation, after-sales service (effectiveness and efficiency), technology and resource use, and time and cost reduction. Learning and Growth will use employee index such as encouragement, initiative, training, performance, research, ability, productivity, and information systems, then learning index such as job search process, work style and motivation, training, job completion time, management.

### **2.3. Conceptual Model**

Research use the indicator of perspectives from previous research listed in Table 1 to make conceptual model seen in Picture 1 and make questionnaire seen in Table 2.

**Table 1** Indicator of Perspective

Perspective	Indicator	Reference
Financial	Revenue Growth, Cost Reduction, Assets Utilization	[13]
	Costs, Financial Ratio	[4]
	Financial Data	[12]
Consumer	Core Value, Performance Value	[13]
	Quality, Price, Delivery, Variety, Profitability Consumer	[4]
	Consumer Satisfaction Level	[12]
Internal Business Process	Innovation, Operation, Post Sales Service	[13]
	Resource, Efficiency, Cost, Sales	[4]
	Morality Employee Level, Productivity and Innovation, Effectivity and Efficiency, Strategic Management, Technology Retention	[12]
Learning and Growth	Employee Capabilities, Motivation and Alignment, Information Systems Capabilities	[13]
	Products, Working Ability	[4]
	Employee Skill Level, Employee Productivities, Satisfaction Level, Consumer Retention	[12]



**Figure 1** Conceptual Model

**Table 2** Statement Indicator of Perspective

Perspective	Statement Indicator
Financial	<i>Financial</i> Revenue, Cost, Financial Ratio (for company only)
Consumer	<i>Consumer Index</i> The depot provides fast response time to consumer complaint The depot provides good and informative service The depot has a wide area and convenient location The depot's reputation is good and has a variety of products The depot provides final (no other extras) and cheaper price The depot conducts monthly consumer satisfaction surveys The depot offers products with good benefit to consumer The depot has good relationship with consumer
Internal Business Process	<i>Company Index</i> The depot's processes are structured and easy to understand and follow

Perspective	Statement Indicator
	The depot has medias to accommodate consumer’s voice The depot has operational benchmarks and efficient usage of resources Business processes, costs, response times, operations are getting better The depot conducts research and development to produce higher quality products
Learning and Growth	<p><i>Employee Index</i></p> The depot conducts training as needed The depot has given encouragement to active work and use initiative The work performance of workers applies good The depot conducts regular training to improve the worker’s qualities The depot conducts research to determine important things for workers and management Workers get salary or income details transparency The management system is efficient and effective The HR management system implements open, consistent, and fair The work’s ability and productivity are good to realize the goals The depot implements good info system to obtains the right information The management provides feedback for depot’s problems Workers are able to provide feedback for depot’s problems The management and attitudes is accordance between words and actions
	<p><i>Learning Index</i></p> The finding worker’s processes is accordance with the depot’s needs The depot workers are always looking for and learning new ways to work Workers give feedback each other how the workers doing great job Workers can complete work within the specified time limit The work processes and systems can always encourage workers to work The depot management can encourage individual/team’s progress to learn The reason for still working at the depot is because it will make regrets if resign and the income is able to meet living needs

**2.4. Questionnaire**

A BSc questionnaire that will be filled out by company, workers, and consumers contain the respondent’s identities (status (company/worker/consumer), name, gender, age, education, occupation, work/buy/sell experience time, house-depot distance), instruction for response the questionnaire, and a statement of indicators (Table 2). There are 5 scale of questionnaire named 1/strongly disagree, 2/disagree, 3/neutral, 4/agree, and 5/strongly agree. Respondents only choose one of the five scales in each statement. The amount of company and worker needed are all worker at depot and the consumers needed are more than 30 peoples with ever bought total 24 gallons a year or twice a month.

**2.5. Collecting and Processing Data**

After collecting data through questionnaire and interview, then process the data. Table 3 listed all of the formulas needed to process the data. Consumer, Internal Business Process, and Learning Growth have the same formulas.

**Table 3** Perspective’s Formula

Perspective	Formula	
Financial	<i>Total Profit (TP)</i> TP = Revenue – Cost	<i>Total Cost (TC)</i> TC = Operational Cost + Other Cost
	<i>Increasing Profit Rate (IPR)</i> $IPR_n = \frac{\text{Total Profit}(n)}{\text{Total Profit}(b)} \times \text{Total Profit}(b)$	<i>Increasing Cost Rate (ICR)</i> $ICR_n = \frac{\text{Total Cost}(n)}{\text{Total Cost}(b)} \times \text{Total Cost}(b)$
	with n = year now, b = year before	
	<i>Profit after Tax (PT)</i> PT = Net Profit – Tax	<i>Return of Equity (ROE)</i> $ROE = \frac{\text{Profit after Tax}}{\text{Equity}} \times 100\%$
Consumer, Internal Business Process, Learning and Growth	<i>Perspective Score</i> $X_j = \frac{\sum f_i x_i}{N}$ with j = perspective, i = indicator	<i>Percentage</i> $P_i = \frac{f_i}{N} \times 100\%$ with p = percentage
	Xj = mean or perspective j score, fi = total respondent indicator i, xi = scale indicator i, fixi = total score indicator i, Σfixi = total score perspective j, Pi = respondent percentage indicator i, N = total respondent perspective j	

**2.6. Result and Discussion**

After process the data, then research analyze the result by categorizing the percentage of result then discuss them all. Table 4 listed all of the categories.

**Table 4** Result’s Category

Score	Category in Consumer	Category in Internal Business Process
81 – 100	Very Satisfied	Best
61 – 80	Satisfied	Good
41 – 60	Satisfied Enough	Good Enough
21 – 40	Not Satisfied	Bad
0 – 20	Very Not Satisfied	Worst

Then the result’s interpretation from result’s category will show the characteristics of an effective measurement system and how far the organization or company is involved in the existing Balanced Scorecard standards. Interpretation calculated by score divided by total indicator. Table 5 listed all of the interpretation [14].

**Table 5** Result’s Interpretation

Score	Interpretation
85 – 100	Companies have had an excellent approach to measuring performance. Companies have a compact database connected to key scorecards and also has a balanced benchmarks. Companies able to use the collected data to make decisions in improving performance as a benchmark for a measurement
70 – 84	Companies have a systemic approach to measurement and can achieve a good balance, but still have something to improve

Score	Interpretation
55 – 69	Companies on a mid-level level and indicates good to start making improvements
0 – 54	Companies are still far from good implementation. Companies do not have a long-term strategic benchmark so the companies have to implement several concepts to improve the performance system

Then research provide conclusions to answering the aim of research and give suggestions for next improvement.

### 3. Results and discussion

The Depot will implement Balanced Scorecard as a business performance measurement tool. The depot has translated the company's vision and mission into four BSc perspectives. The following is a result's explanation of the performance measurement from each perspective.

Financial Perspective: Financial assess the success of achieving company's strategic goals from its revenue, cost, profit, and financial ratio [1]. Profit seen in Table 6, Cost seen in Table 7, and Financial Ratio seen in Table 8.

**Table 6** Profit

Period	Profit n (Billion Rupiah)	Profit b (Billion Rupiah)	Rate (%)
2019	119.5	110.5	8
2020	143.3	119.5	20
2021	157.6	143.3	10
2022	151.8	157.6	-4
2023	155.7	151.8	3

Based on Table 6, it seen that 2020 – 2021 and 2021 – 2022, the profit is decreased due to worse delivery service and have an impact on the total revenue obtained.

**Table 7** Cost

Period	Operational (Billion Rupiah)	Other Cost (Billion Rupiah)	Cost n (Billion Rupiah)	Cost b (Billion Rupiah)	Rate (%)
2019	42.4	1.2	43.6	39.8	9
2020	45.8	1.3	47.1	43.6	8
2021	48.1	1.8	49.9	47.1	6
2022	52.5	1.6	54.1	49.9	8
2023	55.6	1.8	57.4	54.1	6

Based on Table 7, it seen that around 2019 to 2023, the cost is volatile. The volatile is due to the repair costs for the occurrence of problems at that time. In total cost, measuring how much the depot is able to make cost savings in producing services, shows the level of efficiency carried out by the depot to increase profit. After knowing the profit and the cost, then move to the financial ratio in this case is return on equity that mentioned in Table 8.

**Table 8** Financial Ratio

Period	Profit Before Tax (Billion Rupiah)	Tax (%)	Profit After Tax (Billion Rupiah)	Modal (Billion Rupiah)	Rate (%)
2019	119.5	0,5	118.3	-	-
2020	143.3	0,5	141.8	118.3	119
2021	157.6	0,5	156.0	141.8	110
2022	151.8	0.5	151.0	156.0	97
2023	155.7	0.5	154.9	151.0	103

Based on Table 8, it seen that around 2016 to 2020, the ratio is volatile too. Tax of SMEs is 0,5% because of government policy (PP 23/2018). If rate more than 100%, so the depot can optimal to utilize the modal and they can get profit, but if rate less than 100%, so the depot cannot optimal to utilize the modal.

Consumer Perspective: Consumer assess the success of achieving company's strategic goals from its consumer index, that collected from 152 respondent questionnaire. Customer index seen in Table 9.

**Table 9** Consumer Perspective

Numb.	Indicator	Score	Percentage	Category
1	Complaint Response Time	3.07	61.45	Satisfied
2	Quality of Service and Product	2.91	58.29	Enough
3	Delivery and Access	3.24	64.87	Satisfied
4	Reputation and Variety of Product	2.95	58.95	Enough
5	Price	3.08	61.58	Satisfied
6	Level Consumer	3.50	70.00	Satisfied
7	Benefit Consumer	3.07	61.32	Satisfied
8	Consumer Relation	2.99	59.74	Enough
<b>Average</b>		3.10	62.02	Satisfied

Internal Business Process Perspective: Internal assess the success of achieving company's strategic goals from its company index, to know the level of efficiency and effectiveness. Company index seen in Table 10.

**Table 10** Internal Business Process Perspective

Numb.	Indicator	Score	Percentage	Category
1	Effectiveness and Efficiency	3,59	71.71	Good
2	Technologies Utilization	3,68	73.68	Good
3	Resources Utilization	3,61	72.11	Good
4	Time and Cost Reduction	2,67	53.42	Enough
5	Productivities and Innovation Products	3,65	73.03	Good
<b>Average</b>		3,44	68.79	Good

Learning and Growth Perspective: Learning growth assess the success of achieving company's strategic goals from its employee and learning index that can see in Table 11.

**Table 11** Learning and Growth Perspective

Numb.	Indicator	Score	%	Category	Indicator	Score	%	Category
1	Job Performance Realization	4,10	82	Very Satisfied	Recruitment Process	3,60	72	Good
2	Financial and Income Info	4,89	96	Very Satisfied	Job's Tutorial	3,40	68	Good
3	Training Utilization	3,30	66	Satisfied	Training Realization	3,10	62	Good
4	Research Utilization	2,70	54	Enough	Work System	3,40	68	Good
5	Management effectiveness	3,20	64	Satisfied	Management System	3,30	66	Good
6	Management Concept	3,40	68	Satisfied	Work Motivation	4,20	84	Best
7	Support and Initiative Realization	4,40	88	Very Satisfied	Worker Feedback Ability	3,20	64	Good
8	Worker Ability and Productivity	3,20	64	Satisfied	Work Completion Time	2,90	58	Enough
9	Information System Application	2,60	52	Enough				
10	Management Feedback Ability	2,80	56	Enough				
11	Worker Feedback Ability	3,30	66	Satisfied				
12	Consistency	3,90	78	Satisfied				
<b>Average</b>		3,48	69,5	Satisfied				

**Table 12** All Perspective

Numb.	Perspective	Indicator	Average Percentage (%)
1	Financial	Profit Rate	7.40
2		Cost Rate	7.45
3		Return on Equity	7.25
4	Consumer	Consumer Satisfaction Index	62.02
5	Internal Business Process	Company Index	68.79
6	Learning and Growth	Employee Index	69.50
7		Learning Index	67.75

Based on Table 9, there are 8 indicators to indicate customer satisfaction index with satisfied result (62%). This consumer perspective concludes that even though the depot has low price offer and many advantages, but they also have lack of reputation and variety of product also their quality of service and product and there is no follow-up feedback from consumer surveys. Based on Table 10, there are 5 indicators to indicate internal business index with good result (68%). This perspective concludes that even though the depot was good by the structured process, using good technology and resources, also the depot has accommodated phone calls and text messages to collect consumer's



voice, but also the depot still indicates a long processes time and a lot of costs. Based on Table 11, there are 12 indicators of employee index with satisfied result (69%) and 8 indicators of learning index with good result (67%).

Employee index was satisfied because the depot has given encouragement to work actively and use initiatives for workers, well application of work performance, and transparently salary and income details. The depot has implemented a non-optimal information system so the consumer cannot gather information accurately. Learning index was good because workers have a strong reason and motivation to survive in doing their work, of course to meet their needs and also good in how they learn something new, worker recruitment process is in accordance with the needs of the depot, workers give each other feedback appreciation. The depot has implemented a bad work completion time so workers complete the work not according to the specified time limit. Result's data conclusion at Table 12.

Based on Table, four balanced scorecard perspectives using total seven indicators with financial rate at 7.36% and index rate at 67.04%. One financial measure that does not exceed the target is cost reduction when low cost reduction impact inefficiency performance and one internal business process that does not exceed the target is innovation services because it has not been realized.. In addition, an ordering application or integrated information system has not been implemented. It is necessary to plan risk mitigation with emergency funds to prevent cost over and realize the application in 2024. Performance's score achieved by the depot is 5 indicators achieved standard divided by 7 indicators used and the result is 71.43%. It can be conclude that the performance score of Panca Drinking Water Depot through the Balanced Scorecard approach is 71.43%. It is indicate that depot have a systemic approach to measurement and achieve a good enough balance, but still have something to improve in slow response time or service, bad scoring system, and also bad integrated information system, so the decision-making in order to improve organizational performance is not optimal to achieve 90%.

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#### 4. Conclusion

The conclusion answered the purpose of the research. From financial perspective, the depot has not been able to achieve its strategic goal (efficiently financial) caused by an unexpected disaster happened around 2020 and there is no risk mitigation system, so the depot will plan mitigation. From consumer perspective, the depot has been able to achieve its strategic goal (consumer satisfaction) even though it has not been carried out optimal due to bad service and product quality, lack available information, even though the depot offering cheaper prices and many benefits, so the depot will increase investment in efficiently equipment and transportation and also expand the operational area with best promos. From internal business process perspective, the depot has not been able to achieve its strategic goal (good company competence) caused by innovation services have not been realized (creating and implementing ordering applications) and also caused by long processes time and high costs, so the depot should implementing ordering application and fixing integrated information system. From growth and learning perspective, the depot has been able to achieve its strategic goal (worker satisfaction and learning) even though workers are satisfied and motivated to work, but workers have not been able to complete the work deadline time, so the depot will implement stricter regulation planning to discipline workers. From all of the suggestion, maybe it can make the depot's performance score raise up from 71% to 90%.

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#### Compliance with ethical standards

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No conflict of interest to be disclosed.

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