

## Measurement Performance of Company using BSC-AHP Method

<sup>1</sup>Sriyono, <sup>1</sup>Sutoyo, <sup>2</sup>Chairul Saleh and <sup>2</sup>Maharani Lintang Putri

<sup>1</sup>Univesitas Pembangunan Nasional “Veteran” Yogyakarta, Yogyakarta, Indonesia

<sup>2</sup>Department of Industrial Engineering, Faculty of Industrial Technology,  
Universitas Islam Indonesia, Yogyakarta, Indonesia

---

**Abstract:** Measurement of a company’s performance is being obliged to organize a future strategy. When a company has good performance, it’s expected to fulfill consumer’s necessary. A company with good performance also can be competing with the competitor. So, every company is demanded to increase their performance. Balance Score Card (BSC) is one of the methods can be used to measure a company’s performance through four perspectives, those four perspectives are: financial perspective, customer performance, internal business process perspective also grows and learn perspective. But BSC only can measure company’s performance without knowing the quality of priority each perspective. So, in this research, Analytical Hierarchy Process (AHP) is used for quality of each perspective in BSC. Then, we will know which perspective have the highest and the lowest quality. A company can prepare a special strategy to increase the performance if they know the quality. Based on the result of performance measurement, the performance result is 94% so the performance of the company can be categorized very well. On the measurement of priority quality, consumer perspective has the lowest score that is 0.07. Then, financial perspective has the highest score that is 0.49. Both perspectives will be used as a reference by the company in increasing the performance.

**Key words:** Performance measurement, balanced scorecard, analytical hierarchy process, company, quality, financial perspective

---

### INTRODUCTION

Measurement of a company’s performance or an organization is obliged to arrange a future strategy of the company. When the performance of the company is good, it is expected to fulfill consumer’s necessary. In another side, a company with good performance also can be competing with the competitor. Generally, performance is measured based on financial performance. But this measurement is less complete cause there are other factors affect performance. Kaplan and Norton (1996) introduce a method used to measure the performance of a company or organization that is a Balanced Score Card (BSC). BSC is not only evaluating financial performance but BSC is also evaluating non-financial performance through four perspectives that is financial performance, customer performance, internal business performance also grows and learning performance.

Some performance measure with BSC research such as Ekmekci (2014), who evaluate and prepare a strategy to increase performance based on vision and mission they have through BSC method. Kadarova *et al.* (2014) explain that BSC method being a discussion in industry field because BSC can measure performance through four perspectives. And the feedback from BSC method is

improvisation process strategy, motivating and educating the company to increase performance. Turuduoglu *et al.* (2014) explains that the four perspectives in the BSC method and the relationship between the four perspectives so that can be improved the performance of a hotel in Turkey. Further, Ozpeynirci *et al.* (2015) conducted a study using the BSC method to measure educational accounting performance at the university. Thus, can be known weather accounting education process applied is effective or not and also can be used as a strategy to increase effectiveness. Bentes *et al.* (2012) held a research to integrate BSC and AHP method to measure performance in Telecommunication University in Brazil. That research is a recommendation for the next researcher to consolidate BSC-AHP method with the other measurement methods.

Thus, on the research held, appear some problems that need a solution. Build performance measurement with BSC which is consolidated with AHP that the function is giving quality on those four perspectives, the company can prepare a strategy to increase the performance. Based on the research before, application of BSC and AHP methods held on manufacture company, telecommunication service and other services. Thus, it gives us chance to apply BSC and AHP method in measurement of government office.

## Literature review

**Performance measure with balance scorecard:** The method of evaluating the performance of this research is BSC. The basic concept of BSC is to explain vision, mission and strategy of the company into the determination of scorecard purpose and measure (Kaplan and Norton, 1996). Balanced Score Card (BSC) is one of performance measure method introduced by Kaplan and Norton (1996). BSC is an approachment system used by the company to measure the performance through considerate four related perspectives.

### Perspectives on BSC

**Financial perspective:** Financial perspective related to shareholder in a company. Start from capital income, current, money supply, capital return and all other financial activities held by the company.

**Customer perspective:** Customer perspective related to customer's satisfaction. How the customer can understand the product and service of the customer.

**Internal business process perspective:** Internal business process perspective related to the main competence that company has.

**Growth and learn perspective:** Growth and learn perspective related to how the company can defend and develop the product. On this perspective, it is also very important for the company to understand the employee, start from the safety until the performance.

### Analytical Hierarchy Process (AHP)

**Definition of AHP:** AHP method is developed by Qingwei (2012). AHP method is one of the methods used to finish complex problem being simpler and more hierarchy.

**Decision making on AHP method:** To use AHP method rightly, there are some steps to through, the steps are:

- Define the problem and find the solution
- Make the hierarchy structure
- Make couple comparison matrix which is explained relative contribution on each purpose or criteria
- Normalize the data through divide value on each couple matrix with a total value of each column
- Count eigen vector value and the consistence
- Repeat step 3-5 for all hierarchy
- Count eigen vectors from each pairwise comparison matrix
- Test the hierarchy consistence. If the value is not  $CR < 0.1$  so the valuation should be repeated

Table 1: Pairwise comparison vote score

The intensity of interests	Description
1	Both elements are equally important
3	One element, slightly more important than another element
5	One element are more important than others
7	One element is clearly more important than the absolute other elements
9	One element is absolutely important than other elements
2, 4, 6, 8	The values between two values of considerations, nearby

**Preparation of priority in AHP:** The first step is arranged pairwise comparison. Numeric number used for 1-9 comparison like what Saaty said as presented in Table 1.

## MATERIALS AND METHODS

**Research object:** This research will be held in local tax service office Bantul, Yogyakarta. The object and focus on this research are measure company's performance based on perspectives in BSC which is consolidated with AHP to find the quality.

### Necessary data

**Plan and research (K-chart):** Based on the literature study on the chapter before can be arranged plan's research and equipment used (K-chart) also the position research by Chairul and Ridwan (2014) can be arranged as shown in Fig. 1.

**A conceptual model:** Based on the planning and research, it can be arranged the conceptual model of research aim to facilitate this research. A conceptual model can be seen in Fig. 2.

**Primary data:** Primary data are the data which taken and collected by researcher directly from object researched. Primary data can be established through:

- Interview, a method that used to get the data through direct interview
- Observe, a method that used to get research data through see and direct observe on the field
- Questioner result, a method that used to get the research data through question sheet give to the customer, employee and expert on the company

The primary data that will be used in this research are:

**Customer data:** Customer data which can support this research is customer satisfaction level (tangibility, reliability, responsiveness, assurance and empathy).

**Internal business process data:** Internal business process data which can be used in this research.

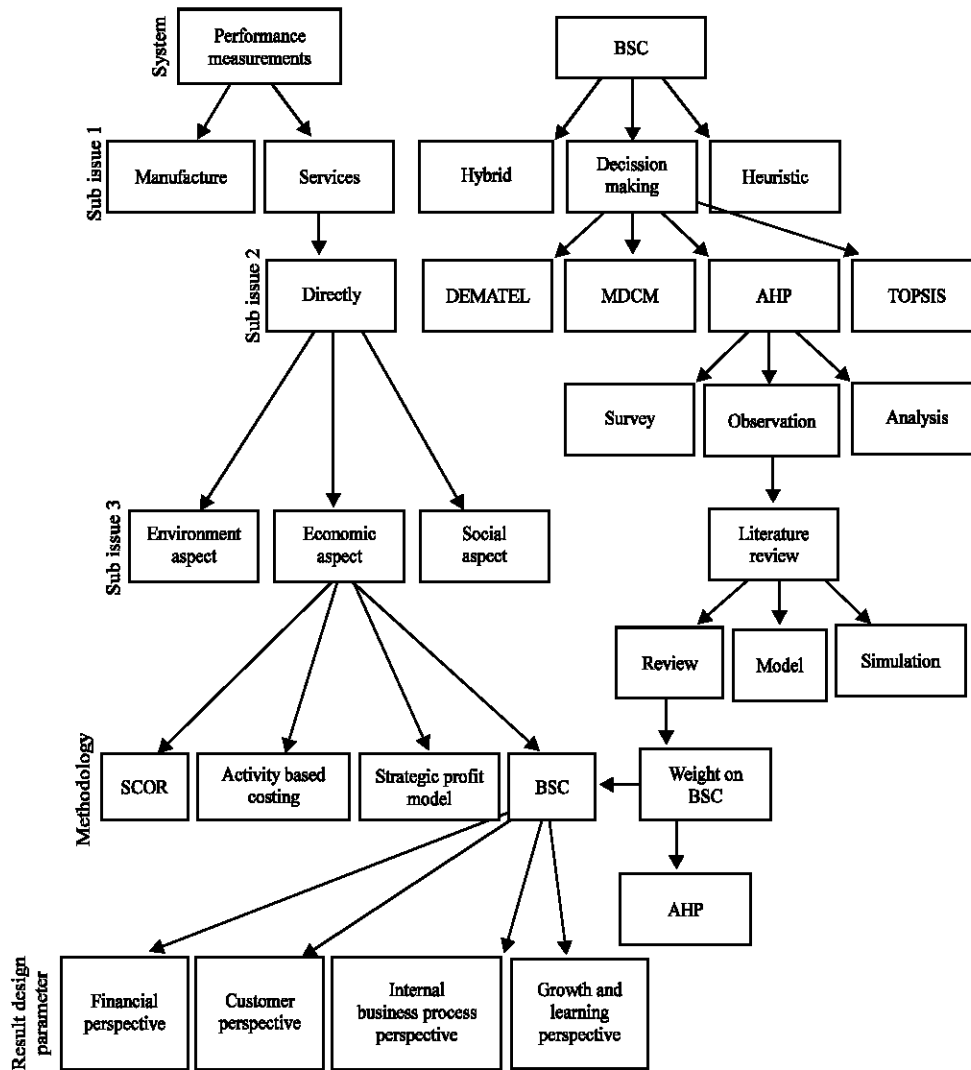


Fig. 1: K-chart research

- Morality employee level
- Productivity and innovation
- Effectivity and efficiency
- Strategic management
- Retention on technology

**Growth and learning data:** Growth and learn data which can be used in this research is:

- Employee skill level
- Productivity employee
- Satisfaction level
- Retention on technology
- Employee retention

**Secondary data:** Secondary data is data obtained or collected researchers from existing sources. Secondary data in this study such as the vision and mission of the company, financial data and other data required in this study. The financial data used in this study is the income in 2015.

**Data collection:** The data that collected in this study is done by.

**Literature study:** A literature study conducted in order that researchers can understand the basic concepts of research to be conducted. A literature study by reading the articles, journals, scientific papers, reports and other papers to support the research.

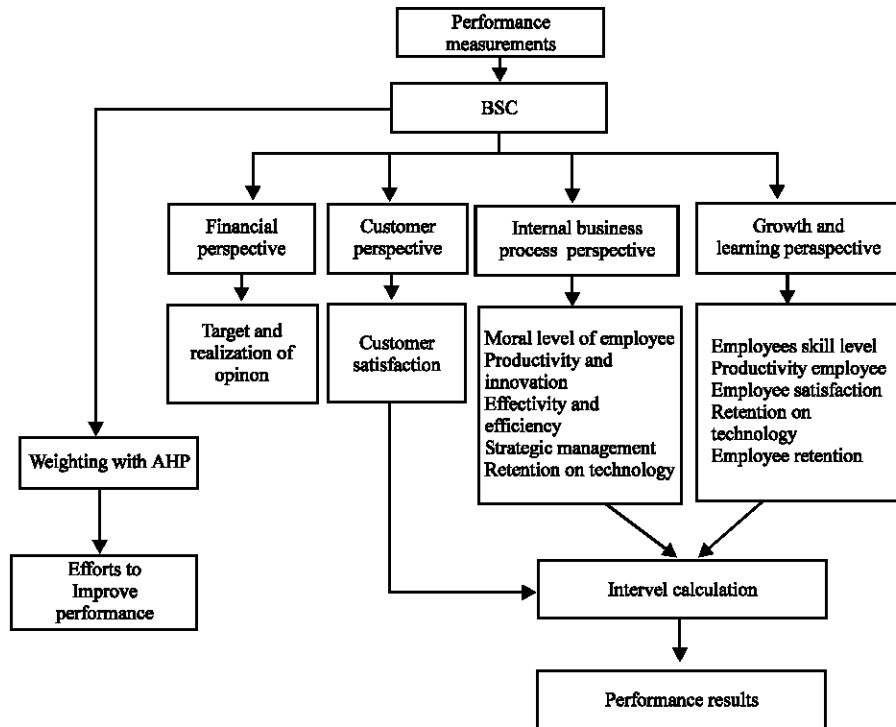


Fig. 2: Conceptual model

Table 2: Data target and actual revenue

Description	Target (Rp)	Actual (Rp)
PKB	116.500.000.000	124.198.537.800
BBNKB	89.000.000.0000	89.818.977.8000
Regional retribution	26.730.00000000	26.282.00000000

**Field research:** Field research was conducted to obtain information by direct observation in the field. The field research can be done in several ways among others.

**Observation:** Observations can be done by coming directly into the field and observe firsthand how the state of the field.

**Questionnaires:** Questionnaires can be done with a few questions through the sheets of questions and given directly to the authorities to be filled so as to obtain information in writing and more actual.

**Company data:** The company's data can be obtained through the data records on the company itself. As the company's history, vision and mission of financial data or other data that is needed in research. The data of target and actual performance measurement results are presented in Table 2 and 4, respectfully. Based on the calculation of the 18 benchmarks that

Table 2: AHP calculation results

Criteria weighting on each perspective			
Perspective weight	Variables	Values	Alt. weight
Financial (0.49)	PKB	0.63	0.49
	BBNKB	0.26	
	Regional retribution	0.11	
Customers (0.07)	Tangibility	0.05	0.07
	reliability	0.49	
	responsiveness	0.14	
	assurance	0.22	
	empathy	0.09	
Internal business processes (0.15)	Moral level on employees	0.48	0.15
	productivity and inn ovation	0.27	
	effectifity and efficiency	0.14	
	Strategic management	0.06	
Growth and learning (0.29)	Retention of technology	0.04	0.29
	Employee skill	0.47	
	Employee productivity	0.24	
	Employee satisfaction	0.08	
	Retention of technology	0.04	
	Employee retention	0.17	

have been done, it can be seen that there are 17 bench marks that meet the standards/targets. Meanwhile, there is one benchmark that does not meet the standards/targets. Thus the total percentage of KPPD Bantul performance is as follows:

Table 4: Performance measurement results

Perspective/Category	Standard	Realization
<b>Financial</b>		
PKB	Rp.116.500.000.000	Rp. 124.198.537.800
BBNKB	Rp. 89.000.000.000	Rp. 89.818.977.800
Regional retribution	Rp. 26.730.000	Rp. 26.282.0000
<b>Customers</b>		
Tangibility	Categorized either satisfied or if it is in the interval between 476-588	Realization index of 564 so it can be considered satisfied or good
Responsivness	Categorized either satisfied or if it is in the interval between 476-588	Realization index of 560 that can be categorized satisfied or good
Assurance	Categorized either satisfied or if it is in the interval between 476-588	Realization index of 534 so it can be considered satisfied or good
Empathy	Categorized either satisfied or if it is in the interval between 476-588	Realization index of 554 so it can be considered satisfied or good
The level of employee moral	Categorized either satisfied or if it is in the interval between 204-252.an	Realization index of 229 so it can be considered satisfied or good
Productivity and innovation	Categorized either satisfied or if it is in the interval between 204-252	Realization index of 251 so it can be considered satisfied or baik
Effectiveness and Efficiency	Categorized either satisfied or if it is in the interval between 204-252	Realization index at 254 so it can be categorized as very satisfied or very good
Strategic management	Categorized either satisfied or if it is in the interval between 204-252	Realization index of 253 so it can be categorized as very satisfied or very good
<b>Internal business processes</b>		
Retention of technology	Categorized either satisfied or if it is in the interval between 204-252	Realization index of 257 so it can be categorized as very satisfied or very good
Skill employees	Categorized either satisfied or if it is in the interval between 204-252	Realization index of 243 so it can be considered satisfied or good
<b>Growth and learning</b>		
Skill employees	Categorized either satisfied or if it is in the interval between 204-252	Realization index of 243 so it can be considered satisfied or good
Employee productivity	Categorized either satisfied or if it is in the interval between 204-252	Realization index of 247 so it can be considered satisfied or good
Employee satisfaction	Categorized either satisfied or if it is in the interval between 204-252	Realization index of 247 so it can be considered satisfied or good
Retention of satisfiedtechnology	Categorized either satisfied or if it is in the interval between 204-252	Realization index of 256 so it can be categorized as very or very good
Employee retention	Categorized either satisfied or if it is in the interval between 204-252	Realization index of 257 so it can be categorized as very satisfied or very good

$$\begin{aligned} \text{Total percentage performance} &= \\ &\frac{\text{The s tan dard amount is reached}}{\text{Number of s tan dards established}} \times \\ 100\% &= \frac{17}{18} \times 100\% = 94\% \end{aligned}$$

From the above calculation can be seen that the percentage calculation KPPD Bantul performance amounted to 94%. Thus, the shape of KPPD performance can be said is very good.

## RESULTS AND DISCUSSION

**Performance measurement:** Performance measurement in KPPD Bantul done with a few steps has been getting good results. The results obtained by measuring performance through four perspectives of the balanced scorecard and conduct weighting by AHP to the four perspectives that with the overall result is quite good. Giving the weight of is done conducted interviews and filling the questionnaire to the head of KPPD Bantul and

processed by AHP. For financial perspective got a weight of 0.49. For the perspective of the customer to obtain the weight of 0.07. In the perspective of internal business processes has a weight of 0.15. Meanwhile, learning and growth perspective has a weight of 0.29 was obtained.

Customer perspective had the lowest weight because based on the weighted conducted interviews to the head of KPPD Bantul on the criterion of tangibility, only obtain a weighting of 0.05 and 0.09 for empathy. Based on the results of interviews with leaders KPPD Bantul the place doesn't become a serious problem for KPPD Bantul. The most important are the performance of its employees. With good employee performance, customers will feel satisfied. However, a sense of empathy for employees in serving customer's problems is lacking. This is why the perspective of the customer weighs the lowest performance.

Financial perspective has the greatest weight because according to the results of main target interviews and questionnaires is the achieve of financial targets that have been set. The perspective of internal business processes, learning and growth perspective also has a

sizeable of the weight. This is because according to the head of KPPD Bantul, the employee performance, employee skills, employee morale and service innovation are essential in serving customers. If KPPD Bantul can maximize employee performance, it is certain that customers will be satisfied.

Based on the weighted with AHP and calculation of performance has been carried out, the performance was obtained by KPPD Bantul amounted to 94%. This value is significant, it is because of almost all benchmarks in accordance with predetermined targets. Where 17 of the 18 benchmarks have to meet targets and there is only one yardstick does not reach the target.

**Improving the performance:** Based on the research objectives first, then the proposed improvements in performance that must be carried out as follows:

- Fix the indoor facilities so that customers feel more comfortable when they have to queue
- Increase the empathy of employees to better understand and be happy to assist any customer complaints
- Do the training on employees to achieve better reliability in serving customers. Employee reliability in serving customers will also shorten the waiting time so that the queues can be minimized
- Continue to innovate services to attract people who are not yet aware of the importance of paying taxes. With the increasing number of people are aware of the importance of paying taxes, the main financial targets can be achieved with the maximum

The provision of the proposed improvement, conducted with due regard to the benchmarks that have low and high weights. By improving benchmarks that have a low weight and maintain or even increase the benchmarks that have a high weight can be assured that the performance of KPPD Bantul will increase.

## CONCLUSION

Overall performance on KPPD Bantul which is reviewed through four perspectives in the BSC, obtaining a percentage of 94%. Thus, it can be said KPPD Bantul performance is very good. Then the efforts should be made to improve performance include: improve indoor facilities so the customers feel comfortable when having to queue, increase empathy employees to be happy when

serving customers, conducted employee training to achieve better reliability in serving customers and continue to innovate the service, especially to attract people who are have not conscious of the importance of paying taxes.

## SUGGESTIONS

Suggestions are given for future research is on measuring performance with BSC-AHP can be combined again with other methods such as simulation methods. And the application of BSC-AHP method can be in other places such as SMEs, restaurants etc.

## REFERENCES

- Bentes, A.V., J. Carneiro, J.F. da Silva and H. Kimura, 2012. Multidimensional assessment of organizational performance: Integrating BSC and AHP. *J. Bus. Res.*, 65: 1790-1799.
- Chairul, S. and A. Ridwan, 2014. *Research Methodology: A Practical Guide*. Jaya Abadi Press, Yogyakarta, Indonesia.
- Ekmekci, Y.A.D., 2014. Implementing of balanced scorecard: Sample of Turkish Republic Ministry of youth and sport. *Procedia Soc. Behav. Sci.*, 150: 754-761.
- Kadarova, J., M. Durkacova and L. Kalafusova, 2014. Balanced scorecard as an issue taught in the field of industrial engineering. *Procedia Soc. Behav. Sci.*, 143: 174-179.
- Kaplan, R.S. and D.P. Norton, 1996. *The Balanced Scorecard: Translating Strategy into Action*. 1st Edn., Harvard Business Review Press, Boston, MA., USA., ISBN: 978-0875846514, Pages: 336.
- Ozpeynirci, R., M. Yucenursen, I. Apak and Y. Polat, 2015. A comparative analysis of accounting education's effectiveness with the balanced scorecard method: A case study of KMU. *Procedia Soc. Behav. Sci.*, 174: 1849-1858.
- Qingwei, F., 2012. Research on evaluation index system of management effectiveness on hospital human resource based on balanced scorecard. *Proc. Environ. Scie.*, 12: 1040-1044.
- Turuduoglu, F., N. Suner and G. Yildirim, 2014. Determination of goals under four perspectives of balanced scorecards and linkages between the perspectives: A survey on luxury summer hotels in Turkey. *Procedia Soc. Behav. Sci.*, 164: 372-377.