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Design of Performance Measurement Instrument at The Work Unit of Adisutjipto Institute of Aerospace Technology Yogyakarta

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ABSTRACT

The problem in this research is that there is no performance measurement in the work unit of the Adisutjipto Institute of Aerospace Technology (ITDA). This study aims to design a performance measurement instrument to measure performance in the ITDA work unit. The method used in designing the performance measurement instrument is the balanced scorecard and Objective Matrix (OMAX) method. The results obtained from this study, there are 7 Performance Indicators (IK), namely, the percentage increase in the budget, the percentage of budget absorption, the user/customer satisfaction index, the number of complaints,, the percentage of the implementation of the work program against the planned work program, percentage of conformity of work carried out with existing job description documents, and job satisfaction index. This research also produces worksheets/performance measurement instruments that can be used to measure the performance of work units in ITDA. Based on the worksheets/performance measurement instruments, it was obtained that IK 1 was good, IK 2 was very good, IK 3 was good, IK 4 was moderate, IK 5 was very good, IK 6 was very good, and IK 7 was good. Overall good performance score.

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INTRODUCTION

Adisutjipto Institute of Aerospace Technology (ITDA) has work units, namely academic bureau, financial and asset bureau, information technology service center, student bureau, collaboration and alumni bureau, general service center, housekeeping and security. Currently, the problem that arises is that there is no performance measurement in the ITDA work unit. This performance measurement can be used as a basis by ITDA to determine strengths and weaknesses so that it can be used as a reference in planning work programs to improve the performance of units. One of the important factors in influencing the progress and decline of an industry is the performance factor. To find out the company's performance, it is necessary to measure performance in order to evaluate and improve future performance. Research on performance measurement in companies was conducted by

Darmasto et al. (Darmasto et al., 2014) to determine the performance of PT Xl Axiata Tbk Jakarta, Khairani et al. (Khairani et al., 2019) to determine the performance at PT. Madukismo Yogyakarta, Septifani et al. (Septifani et al., 2020) to determine the performance of employees in the company, Wulandari et al. (Wulandari et al., 2017) to determine environmental performance in the gas industry, and Adana et al. (Adana et al., 2019) to find out the performance of village government companies (BUMDes).

Performance issues are not only important for companies, but also important for public organizations and educational institutions, so that performance measurement is needed by public organizations and educational institutions to determine organizational performance. Research on performance measurement in public organizations and educational institutions was conducted by Santhi et al. (Santhi et al., 2014) to determine the performance in the public sector (Bali Province Education Quality Assurance Institute), Hidayat et el. (Hidayat et el., 2017) to determine performance indicators and performance measurement in the public sector, Fakhrina et el. (Fakhrina et el., 2017) to determine the performance in the Management Department of IPB, Abbas et el. (Abbas et el., 2019) to determine the performance at the University of Muhammadiyah Luwuk, Aziza et el. (Aziza et el.2019) to find out performance in high school.

In order to measure performance, a performance measurement instrument must first be established. Therefore, the researchers tried to design a performance measurement instrument that includes performance criteria, strategic objectives, performance indicators, performance measurement worksheets by combining the balanced scorecard and Objective Matrix (OMAX) methods. Yuniawati et el. (Yuniawati et el., 2018) designed and measured performance with the balanced scorecard method at PT Cipta Paramula Sejati, Arifyanto, A. F. (Arifyanto, A. F., 2015) performed the design and performance measurement using the balanced scorecard method at PT. DPI, Ramadhani, Trisyulianti (Ramadhani, Trisyulianti, 2016) designed and measured performance using the balanced scorecard method, E. Mas'idah et el. (E. Mas'idah et el., 2018) designed and measured performance using the OMAX method. It is hoped that the combination of the balanced scorecard and OMAX methods used by researchers can produce performance measurement instruments that are precise, systematic and easy to use by ITDA work units.

RESEARCH METHOD

The research with the title of Design of Performance Measurement Instrument at The Work Unit of Adisutjipto Institute of Aerospace Technology was carried out in two stages of research, namely:

1) Determination of criteria, performance indicators and targets for each performance indicator.

Determination of performance criteria and indicators using the balanced scorecard method with financial, customer, internal business processes, learning and growing criteria. The four criteria affect the performance factor (Gunawan, K., 2009). The steps are as follows:

a. Determine criteria based on the balanced scorecard method
b. Determining the weight of the importance of each criteria using the AHP (Analytical Hierarchy Process) method (saaty, T.L., Vargas, L.G., 2012).
c. Determine the strategic objectives of each criteria based on discussions with the heads of work units at ITDA
d. Determine the relationship between strategic goals with one another by using a cause and effect relationship diagram.
e. Determine the performance indicators of each strategic goal and its formulation.
f. Determine the weight of importance of each performance indicator using the AHP method.
g. Set targets for each performance indicator based on an agreement between the heads of work units.

2) Creation of aworksheets/performance measurement instruments

Worksheets/performance measurement instruments are designed using the OMAX method (E. Mas'idah et el., 2018) with the reason:

a. The data used in the omax model is easy to obtain.
b. This model is relatively simple and easy to understand
c. The form of this model is flexible, can be adapted to the applied environment
d. The operation is fast and there is no need to have a special skill background for those who use it.

The steps for designing performance measurement worksheets/instruments using the OMAX method are as follows:

a. Determine the actual value of each performance indicator
   The actual value is the performance value achieved in the measurement period of each performance indicator.
b. Determine the final target value of each performance indicator
   The final target value for each performance indicator is the target performance value for each performance indicator set by ITDA. The final target value of each performance indicator will be placed on a performance score of 10 in the performance measurement worksheet/instrument.
c. Determine the initial value of each performance indicator
   The initial value of each performance indicator is the standard performance value of each performance indicator set by ITDA. The initial value of each performance indicator will be placed on a performance score of 3 in the performance measurement worksheet/instrument.
d. Determining the value on a score of 0
   The value on a score of 0 is the worst performance score set by ITDA. This value will be assigned to a performance score of 0 in the performance measurement worksheet/instrument.
e. Forming an OMAX matrix
   The actual value, the final goal value, the initial value, and the value at a predetermined score of 0 are entered into the performance measurement worksheet/instrument.
f. Determine the interval value of each performance indicator
g. Determine the actual score of each performance indicator
   The actual score of each performance indicator is determined by finding the value of the performance score that is close to the actual value of each performance indicator, the value is marked to determine the actual score.
h. Determining the weight of each performance indicator
   The weight of each performance indicator is determined using the AHP method.
i. Determine the performance value of each performance indicator
   The performance value of each performance indicator is obtained from the result of multiplying the actual score with the weight
j. Determining the overall performance score
   The overall performance value is the sum of the performance values of each performance indicator

RESULTS AND DISCUSSIONS

Performance criteria and indicators

a. Criteria

The criteria used in this study refers to the balanced scorecard method, namely there are four criteria (financial, customer, internal business processes, learning and growing).

b. Criteria importance weight

The first step is to determine the weight of the importance of the criteria using the AHP method. The weight of importance is determined by the experts at ITDA. Following are the results of the weighting of the importance of the criteria in table 1.

Table 1. Weight of Importance of Criteria

No	Criteria	Weight
1	Financial	0,24
2	Customer	0,20
3	Internal Business Process	0,39
4	Learn and Grow	0,17
	Total Weight	1,00

Based on table 1, it is found that the internal business process criteria have the highest importance weight. This shows that the performance of internal business process criteria is a priority to be achieved. While the lowest importance weight is the learning and growth criteria.

c. Strategic objectives

The next step is to determine the strategic objectives of each criterion by using a discussion method involving the head of the work unit at ITDA. Following are the results of the strategic objectives in table 2.

Table 2. Strategic objectives

No	Criteria	Strategic objectives
1	Financial	1. Budget increase 2. Good absorption of the budget according to the set plan
2	Customer	1. High level of user satisfaction
3	Internal Business Process	1. Improved systems and better work processes
4	Learn and Grow	1. Creating a good working climate

Based on table 2, it is obtained one strategic objective for each criteria. The financial criteria lead to an increase in the budget and budget absorption according to the established plan, the customer criteria lead to the achievement of user satisfaction, the internal business process criteria lead to improved systems and good work processes, while the learning and growth criteria lead to the realization of a good work climate.

d. Relationship between strategic objectives

The strategic objectives that are formed have a relationship between strategic objectives with one another (cause and effect relationship). The following is the result of the relationship between strategic objectives in Figure 1.

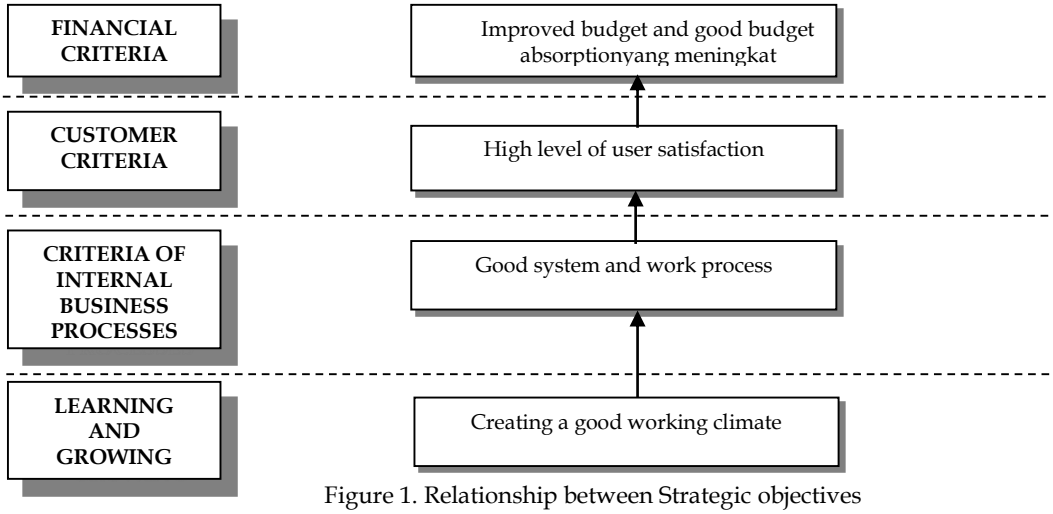

Figure 1. Relationship between Strategic objectives

Based on Figure 1, the creation of a good work climate will result in good work systems and processes. A good system and work process will provide good service so that users (students, lecturers, education staff) are satisfied. A high level of user satisfaction will have an impact on increasing the number of students and increasing income so that the quality, performance and educational services at ITDA can increase with an adequate budget.

e. Performance Indicator

After analyzing the interrelationships between strategic objectives, the next step is to determine the performance indicators and their formulas used to measure performance. The following shows the results of the performance indicators in table 3.

Table 3. Performance Indicators for Each Criteria

Performance Indicator	Formula
Financial Criteria	
1. Percentage increase in budget	$\frac{(\text{total budget period t}) - (\text{total budget period t-1})}{\text{total budget period t-1}} \text{ x } 100\%$
2. Percentage of budget absorption	$\frac{\text{amount of budget used}}{\text{planned budget amount}} \text{ X } 100\%$
Customer Criteria	
1. User/customer satisfaction index	User/customer satisfaction survey on a scale of 1 - 4
Internal Business Process Criteria	
1. Number of complaints	Number of complaints that occurred in the measurement period
2. Percentage of the implementation of the work program against the planned work program	$\frac{\text{number of work programs carried out}}{\text{number of work programs planned}} \text{ X } 100\%$
3. Percentage of conformity of work carried out with existing job description documents	$\frac{\text{number of types of work carried out}}{\text{the number of types of work in the job document}} \text{ X } 100\%$
Criteria for Growing and Learning	
1. Job satisfaction index	Employee Job Satisfaction Survey on a scale of 1 - 4

Based on table 3, there are 7 performance indicators with details of 2 performance indicators of financial criteria, 1 performance indicator of customer criteria, 3 performance indicators of internal business process criteria and 1 performance indicator of growth and learning criteria that will be used to measure the performance of work units in ITDA.

f. Weight of Importance of Performance Indicators

After the performance indicators have been formulated, the next step is to weight the performance indicators using the AHP method. The weight of importance is determined by the experts at ITDA. Following are the results of the weighting of the importance of performance indicators in table 4.

Table 4. Weight of Importance of Performance Indicators

No	Performance Indicator	Weight
1	Percentage increase in budget	0,12
2	Percentage of budget absorption	0,12
3	User/customer satisfaction index	0,20
4	Number of complaints	0,13
5	Percentage of the implementation of the work program against the planned work program	0,13
6	Percentage of conformity of work carried out with existing job description documents	0,13
7	Job satisfaction index	0,17
	Total Weight	1,00

aBased on table 4, the highest weight is the performance indicator of the user/customer satisfaction index, while the lowest weight is the performance indicator of the percentage increase in the budget and the percentage of budget absorption. This weight of importance will be used in worksheets/performance measurement instruments with the OMAX method.

Worksheets/performance measurement instruments

The next step after determining the criteria and performance indicators is to create a worksheet/performance measurement instrument using the OMAX method.

a. Actual value of each performance indicator

The actual value is the performance value achieved in the measurement period of each performance indicator. The following is a simulation of the actual value of each performance indicator in table 5.

Table 5. Actual Value

No	Performance Indicator	Actual Value
1	Percentage increase in budget	10%
2	Percentage of budget absorption	100%
3	User/customer satisfaction index	3,2
4	Number of complaints	2
5	Percentage of the implementation of the work program against the planned work program	100%
6	Percentage of conformity of work carried out with existing job description documents	100%
7	Job satisfaction index	3,5

b. Final target value of each performance indicator

The final target value of each performance indicator is the target performance value of each specified performance indicator. The following is a simulation of the final target value of each performance indicator in table 6.

Table 6. Target Value

No	Performance Indicator	Target Value
1	Percentage increase in budget	15%
2	Percentage of budget absorption	100%
3	User/customer satisfaction index	4
4	Number of complaints	0
5	Percentage of the implementation of the work program against the planned work program	100%
6	Percentage of conformity of work carried out with existing job description documents	100%
7	Job satisfaction index	4

The final target value of each performance indicator will be placed on a performance score of 10 in the performance measurement worksheet/instrument.

c. Initial value of each performance indicator

The initial value of each performance indicator is the standard performance value of each specified performance indicator. The following is a simulation of the initial value of each performance indicator in table 7.

Table 7. Initial Value

No	Performance Indicator	Initial Value
1	Percentage increase in budget	5%
2	Percentage of budget absorption	90%
3	User/customer satisfaction index	2,5
4	Number of complaints	2

No	Performance Indicator	Initial Value
5	Percentage of the implementation of the work program against the planned work program	80%
6	Percentage of conformity of work carried out with existing job description documents	90%
7	Job satisfaction index	3

The initial value of each performance indicator will be placed on a performance score of 3 in the performance measurement worksheet/instrument.

d. Value on a score of 0

The value on a score of 0 in the performance measurement worksheet/instrument is the worst performance score assigned. The following is a simulation of the value on a score of 0 for each performance indicator in table 8.

Table 8. Value on a score of 0

No	Performance Indicator	Value on a score of 0
1	Percentage increase in budget	3%
2	Percentage of budget absorption	75%
3	User/customer satisfaction index	2
4	Number of complaints	5
5	Percentage of the implementation of the work program against the planned work program	70%
6	Percentage of conformity of work carried out with existing job description documents	80%
7	Job satisfaction index	2,7

Tabel 9. Worksheets/Performance Measurement Instruments

Performance Indicator (PI)	PI 1	PI 2	PI 3	PI 4	PI 5	PI 6	PI 7	PI TOTAL	SCORE	DESCRIPTION
Actual	10,00%	100%	3,2	2	100%	100%	3,50	7,25		
Target	15,00%	100%	4,0	0	100%	100%	4,00	10,00	10	Very good
SCORING	13,57%	99%	3,8	0	97%	99%	3,86	9,00	9	Good
	12,14%	97%	3,6	1	94%	97%	3,71	8,00	8	
	10,71%	96%	3,4	1	91%	96%	3,57	7,00	7	
	9,29%	94%	3,1	1	89%	94%	3,43	6,00	6	
	7,86%	93%	2,9	1	86%	93%	3,29	5,00	5	Moderate
	6,43%	91%	2,7	2	83%	91%	3,14	4,00	4	
	5,00%	90%	2,5	2	80%	90%	3,00	3,00	3	
	4,33%	85%	2,3	3	77%	87%	2,90	2,00	2	Bad
	3,67%	80%	2,2	4	73%	83%	2,80	1,00	1	
	3,00%	75%	2,0	5	70%	80%	2,70	0,00	0	Very bad
Description of Performance Indicators	Higher is Better	Higher is Better	Higher is Better	Higher is Worse	Higher is Better	Higher is Better	Higher is Better	Higher is Better		
Score	7	10	6	3	10	10	6	7		
Weight	0,12	0,12	0,20	0,13	0,13	0,13	0,17	1,000		
Achievement Value	0,84	1,20	1,20	0,39	1,30	1,30	1,02	7,25		

Target Value	1,20	1,20	2,00	1,30	1,30	1,30	1,70	10,00
Target Achievement Percentage	70%	100%	60%	30%	100%	100%	60%	73%
Performace Status	Good	Very Good	Good	Moderate	Very Good	Very Good	Good	GOOD

Based on table 9, it proves that the worksheet/performance measurement instrument with the OMAX method can be used to measure the performance of work units in ITDA. The results obtained are that the IK 1 (percentage of budget increase) is good, the IK 2 value (percentage of budget absorption) is very good, the IK 3 value (user/customer satisfaction index) is good, the IK 4 value (number of complaints) is moderate, the IK value is 5 (the percentage of the implementation of the work program against the planned work program) is very good, the IK value of 6 (percentage of conformity of work carried out with existing job description documents) is very good, and the IK value of 7 (job satisfaction index) is good. Overall the performance value is good.

CONCLUSION

This research produces a worksheet/performance measurement instrument with 4 criteria (financial criteria, customers, internal business processes, learning and growth) and 7 performance indicators/IK (percentage of budget increase, percentage of budget absorption, user/customer satisfaction index, number of complaints, the percentage of the implementation of the work program against the planned work program, the percentage of conformity of the work carried out with existing job description documents, and the job satisfaction index). Worksheets/performance measurement instruments can be used to measure the performance of work units in ITDA. The results obtained that the IK 1 (percentage of budget increase) is good, the IK 2 value (percentage of budget absorption) is very good, the IK 3 value (user/customer satisfaction index) is good, the IK 4 value (number of complaints) is moderate, the IK value is 5 (the percentage of the implementation of the work program against the planned work program) is very good, the IK value of 6 (percentage of conformity of work carried out with existing job description documents) is very good, and the IK value of 7 (job satisfaction index) is good. Overall the performance value is good.

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