Development of Maintenance System Procedure
Governor Office Building South Sumatera Province

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Abstract. Building management strategically covers each of the existing organizational units and works together to achieve one goal. The issue of asset management is a problem that is often found in a company, education or government agency, to support every activity of a well-organized asset management building. The maintenance activities of the Governor's Office building run by the General Bureau and Building Sub-Maintenance Sub-Section are now quite good. But in running the maintenance activities to run smoothly of course must be supported by a system capable of supporting these activities. Problems that occur mechanism of maintenance system of South Sumatera Governor Office building is unstructured, executed manually and not well recorded so that if there is maintenance action takes a long time and sometimes not right target. The objective of the study is to develop the Governor's Office Building Maintenance Procedure. Evaluation of maintenance system from activity aspect that is organizational structure, procedure, form and evaluation of user satisfaction aspect with performance variable, information, economics, supervision, efficiency, service then develops Governor Office Building Maintenance Procedure. It is expected that the development of appropriate building maintenance system procedures, effective and efficient to assist the maintenance activities of South Sumatra Governor's office building.

Keywords: Building Maintenance System, Procedure Development, Office of the Governor

1. Introduction
Management of office building assets strategically covers every existing organizational unit and cooperates to achieve one goal. The issue of asset management is a problem that is often found in a company, education or government agency, to support every activity of managing a well-organized asset building. Organizing on building maintenance is one of the benchmarks of maintenance success.

In Indonesia, building maintenance guidelines as a reference standard are defined in the Minister of Public Works Regulation No.24 / PRT / M / 2008 on Guidelines for Maintenance and Maintenance of Buildings, but in reality these guidelines tend not to be applied so that the maintenance of buildings does not meet the established standards.

South Sumatra Governor Office Building is the headquarters of the government of the Capital of South Sumatra Province, inaugurated by President Soekarno in 1960. This building is classified as an old building so regular or periodic maintenance is needed to keep the building in order to always functional. The maintenance activities of the Governor's Office building run by the General Bureau and Building Sub-Maintenance Sub-Section are now quite good. However, in running the maintenance activities to run smoothly of course must be supported by a system capable of supporting these activities.
Problems that occur in the office building maintenance in the process often experience obstacles such as the planning, technical data of the building is not recorded and stored so that each planning must re-measurement, looking for data to the Office of Public Works Cipta Karya to look for people who have been involved in the maintenance activities the previous building. When the implementation is also sometimes not in accordance with the planning so that there is always an unexpected budget for the maintenance of the building and at the end of the data and information activities are not stored well, so that each year difficulty finding information and data when there is a change or change of employees in the building maintenance.

Based on this problem, it will develop the Building Maintenance System Procedure at the Governor's Office in order that the planning, implementation and reporting of activities can be performed more efficiently and effectively and hopefully will facilitate the monitoring and evaluation from time to time in a sustainable manner.

Based on previous research Sugianto J (2005) building maintenance unit there is no organizational structure and job description. Maintenance activities take a long time due to the separation of the system. There are overlapping jobs and poor job sequences. The above research concludes that there are still many shortcomings in system, procedure and form of building maintenance unit. So it is necessary to propose the development of information systems, procedures and forms. The above research analyzes system, procedure and form, whereas in this research system, procedure and form are analyzed based on activity, analyze user satisfaction of building maintenance system and proposed development of building maintenance system procedure.

The aim of this study:

a. Evaluate Building Maintenance System Office Governor viewed from the aspect of the activity of the organizational structure, procedures and forms.

b. Evaluating Office Building Maintenance System Governor viewed from the aspect of user satisfaction are performance variables, information, economy, supervision, efficiency and service.

c. Developing Office Maintenance System Procedure Governor Office.

2. Method

2.1 Research sites

The study was conducted at the Office of the Governor of South Sumatra Province with the focus on Building Maintenance System. Site selection because of the consideration of the building is classified as an old building and is the center of governance Capital of South Sumatra Province so that systematic maintenance is needed to keep the building to always functional.
2.2 Primary data

Primary data, is the main data used in research obtained through observation, interviews and surveys. Primary data used comes from officials and office maintenance staff. The steps of data collection are as follows:

a. Field observation
   Conducting interviews to get an overview of building maintenance information systems such as Organizational Structure, Job Descriptions, Procedures and Forms. In addition, data on the satisfaction of maintenance personnel as users of the maintenance system by providing a list of statements in the form of questionnaires.

b. Population and Sample
   • Population is a generalization area consisting of objects / subjects that have certain qualities and characteristics set by the researchers to be studied and then drawn conclusions (Sugiyono, 2007). The population in this study are officials and staff using building maintenance system consisting of 50 people.
   • The sample is part of the number and characteristics possessed by the population (Sugiyono, 2007). Isaac and Michael in Sugiyono (2007) developed a formula to calculate the sample size of the known population for the error rates of 1%, 5%, and 10% as follows:

   \[ s = \frac{\lambda^2 N P Q}{d^2(N-1)+\lambda^2 P Q} \]  

   \[ s = \frac{3.841^2 \times 0.5 \times 0.5}{0.05^2(50 - 1) + (3.841^2 \times 0.5 \times 0.5)} \]

   \[ s = 44,343 \approx 44 \]

   Based on the table of Isaac and Michael formula with error rate set at 5% obtained the number of samples for General Bureau and Office Building Maintenance Sub-Section of 44 respondents. The sample taken is purposive sampling.

c. Selection of variable
   The variable that is considered most influential on the level of user satisfaction system consists of 6 variables and contains some attributes to be evaluated, as in the following table:

   | No | Variable    | Code | Attribute                                                                 |
   |----|-------------|------|---------------------------------------------------------------------------|
   | A1 | Performance | A2   | The system can execute a number of commands within a specified time period without a hitch |
   | A2 | Performance | A2   | System capability in respond to commands quickly or slowly                 |
d. Instruments
Instruments in the study used to collect data, and will be used to perform measurements with the aim of producing accurate data, then each instrument must have a scale, Sugiyono (2012). The scale used in this study is Likert scale to measure the attitude, opinion and perception of a person or group of people about social phenomena. The choice of each answer for the responses of respondents on the dimensions of quality satisfaction scored as follows:

| Choice of answer                  | Code | Score |
|----------------------------------|------|-------|
| Strongly Agree                   | SA   | 5     |
| Agree                            | A    | 4     |
| Neither Agree or Disagree        | AD   | 3     |
| Disagree                         | DA   | 2     |
| Strongly Disagree                | SD   | 1     |

Table 2. Likert Scale

*Source: Sugiyono, 2012

2.3 Secondary data
Secondary data is obtained from related institutions in the form of maps, building plans, organizational structure, number of employees and other data required.

2.4 Evaluation of Building Maintenance System by Activity
To evaluate the system of building maintenance of the Office of the Governor of South Sumatra is assessed first from the current system running by looking at the Organizational Structure, job procedures, forms and job descriptions. From the evaluation of the building maintenance system can be known whether maintenance activities are running well or there are still many shortcomings and weaknesses in the system.

2.5 Evaluation of Building Maintenance System Based on User Satisfaction
From the evaluation of maintenance system based on known activity of existing condition of building maintenance system of Governor Office of South Sumatera. The next stage is to evaluate the maintenance system based on user satisfaction of the system through a questionnaire survey. Further data from the survey results in input and processed using the program Ms. Excel 2016. Results if the questionnaire data is further processed by using the formula to get the average level of satisfaction (Supriyatna, 2015):

\[ RK = \frac{JSK}{JK} \]

- RK = Average Satisfaction
- JSK = Number of Questionnaire Scores
- JK = Number of Questionnaire
Testing with this formula to get the average value of each attribute of the questionnaire. While to determine the level of satisfaction using a model defined by Kaplan and Norton with the following levels (Supriyatna, 2015):

| Code   | Level of Satisfaction                      |
|--------|--------------------------------------------|
| 1 – 1.79 | Very Dissatisfied                          |
| 1.8 – 2.59 | Not Satisfied                            |
| 2.6 – 3.39 | Neither Not Satisfied or Satisfied       |
| 3.4 – 4.91 | Satisfied                                |
| 4.2 – 5  | Very Satisfied                            |

*Source : Supriyatna, 2015

2.6 Study on Development of Building Maintenance System Procedure
Assessment that has been analyzed by Likert Scale method as stated in the next table is formulated to determine the level of user satisfaction, aiming to know the factors that exist in the system. These factors are formulated and calculated based on the ranks and weights that result in a particular assessment.

3. Result and Discussion
3.1 Evaluation of Activity Based Maintenance System
Maintenance and Maintenance System Building is an activity mechanism that should be developed by the manager in utilizing the building. The system is supported by several aspects as follows:

a. Patterns of Care and Maintenance
b. Implementing Organization Maintenance and Care
c. Scope of Maintenance and Care
d. Financing for Maintenance and Care

Theories relating to the system of building maintenance in general aims to function System becomes part of the maintenance and maintenance of the ideal building.

Through approach of system function for user is one of service product hence taken one assumption that can measure performance of maintenance system one of them based on activity.

Building Maintenance System based on the activity taken 3 variables of organizational structure of building maintenance, maintenance procedures and forms. These three variables can be considered to be one measure of the performance of Building Maintenance System. From each of these variables will be known activity of building maintenance.

To evaluate the Maintenance System of the Office Building Governor can be assessed from the aspect of its activities by comparing the organizational structure, procedures and forms that run against the standardization and regulations of Building Maintenance System.

3.1.1 Organizational Structure of Building Maintenance
The maintenance organization in a building is affected by the level of complexity of the building which includes the width and dimension of the building, the building system used, the applied technology, as well as the technical and non-technical aspects (Permen PU, 2008).

The organization of building maintenance is responsible for the smooth operation of the building, which is the operation of the operation in accordance with the procedures that have been determined efficiently and effectively.

Organizational Structure of Building Maintenance Office of Governor of South Sumatera Province is under General Bureau and Provision of Regional Secretariat of South Sumatera Province as in figure 2 below:
Sub Division of Building Maintenance and Office Equipment is fully responsible for maintenance and maintenance activities of South Sumatra Provincial Governor Office. For now the structure of Sub Building and Office Supplies Sub-section is not written or drawn, but from the interview result can be described the structure of the maintenance department based on the authority of the work.

Referring to Approach of Regulation of Minister of Public Works Number: 24 / PRT / M / 2008 About Organization Structure of Building Maintenance and Maintenance, where at least have four departments, the organizational structure in Building Maintenance Section and Office Equipment of South Sumatera Province is still very less.

### 3.1.2 Maintenance System Procedures

The maintenance of the building and office equipment shall be a unit performing all maintenance activities at the Governor's office, which consists of:

- Routine Maintenance System
- System Maintenance is Heavy

Based on existing forms for the maintenance of the building there are still some procedures not accompanied by the form, so some maintenance activities are not well recorded. Furthermore, for standardized form forms only on official and contract notes, but not document format and format, so it takes a long time to complete the file because the report and documentation must be reformat.

### 3.2 Evaluation of Building Maintenance System Based on User Satisfaction

Evaluation of this data is based on data of questionnaires distributed to the parties based on user satisfaction of building maintenance system of Governor Office of South Sumatera namely Head of Bureau, Head of Section, Sub Division Head and employees/staff competent.

#### 3.2.1 Data Processing Questionnaire

The number of questionnaires collected as described in the research methodology is 44 (forty four) questionnaires.
3.1.3 Maintenance System Forms

Current formats:

| No | Current Formats                      | Form Name          |
|----|-------------------------------------|--------------------|
| 1  | Routine Maintenance Procedures      | Official Memo      |
| 2  | Heavy Maintenance Procedures        | -                  |
| 3  | Procedure for Receipt of Service Note | -              |
| 4  | Field Survey Procedures             | -                  |
| 5  | Planning Procedures                 | -                  |
| 6  | Direct Appointment Procedures       | -                  |
| 7  | Auction Procedure                   | Official Memo      |
| 8  | Implementation Procedures           | Contract           |
| 9  | Supervision Procedures              | Daily, Weekly, Monthly, Photo Implementation Report |

3.2.2 Results of Questionnaire Data

By determining the level of satisfaction as above for the level of user satisfaction of the system obtained the average level of satisfaction based on the domains contained in PIECES are as follows:

- Performance

Table 5. Results of Domain System Performance Maintenance Questionnaire

| PERFORMANCE | RESP. | SA | A | AD | DA | SD |
|-------------|-------|----|---|----|----|----|
| SCORE       | 5     | 4  | 3 | 2  | 1  |    |
| 1           | 0     | 1  | 1 | 3  | 0  |    |
| 2           | 0     | 2  | 0 | 3  | 0  |    |
| 3           | 0     | 1  | 0 | 4  | 0  |    |
| 4           | 0     | 2  | 1 | 2  | 0  |    |
| 5           | 0     | 5  | 0 | 0  | 0  |    |
| 6           | 0     | 2  | 0 | 3  | 0  |    |
| 7           | 0     | 5  | 0 | 0  | 0  |    |
| 8           | 0     | 2  | 0 | 3  | 0  |    |
| 9           | 0     | 1  | 0 | 1  | 3  |    |
| 10          | 0     | 1  | 2 | 2  | 0  |    |
| 11          | 0     | 1  | 0 | 4  | 0  |    |
| 12          | 0     | 3  | 2 | 0  | 0  |    |
| 13          | 0     | 1  | 0 | 4  | 0  |    |
| 14          | 0     | 0  | 1 | 4  | 0  |    |
| 15          | 0     | 0  | 1 | 2  | 2  |    |
| 16          | 0     | 1  | 0 | 4  | 0  |    |
| 17          | 0     | 0  | 2 | 2  | 1  |    |
Based on the calculation of the average number of satisfaction levels obtained value of 2.47 on the domain of maintenance system performance and when combined with the level of satisfaction according to Kaplan and Norton, it can be concluded that the level of user satisfaction of system maintenance performance included in the category NOT SATISFIED. So this shows a negative indication that the user has not been satisfied with the performance of the governor's Office building maintenance system.

- Information

\[
RK = \frac{(5 \times 3) + (4 \times 58) + (3 \times 48) + (2 \times 83) + (1 \times 28)}{220} = \frac{585}{220} = 2.66
\]

Based on the calculation of the average number of satisfaction levels obtained value of 2.66 on the domain of system maintenance information and when combined with the level of satisfaction
according to Kaplan and Norton, it can be concluded that the level of user satisfaction of system maintenance information included in the category NEITHER NOT SATISFIED OR SATISFIED. So this shows a negative indication that the user is still doubting the quality of information from the Governor's Office building maintenance system.

- **Economic**

\[
RK = \frac{(5 \times 1) + (4 \times 20) + (3 \times 36) + (2 \times 123) + (1 \times 40)}{220} \\
RK = \frac{479}{220} = 2.18
\]

Based on the calculation of the average number of satisfaction levels obtained value of 2.18 on the economic domain of system maintenance and when combined with the level of satisfaction according to Kaplan and Norton, it can be concluded that the level of user satisfaction of system maintenance information included in the category NOT SATISFIED. So this shows a negative indication that the user is not satisfied with the budget system on the system maintenance of the Governor's Office building.

- **Control**

\[
RK = \frac{(5 \times 1) + (4 \times 16) + (3 \times 39) + (2 \times 125) + (1 \times 39)}{220} \\
RK = \frac{475}{220} = 2.16
\]

Based on the calculation of the average number of satisfaction levels obtained value of 2.16 on the maintenance system supervision domain and when combined with the level of satisfaction according to Kaplan and Norton, it can be concluded that the level of user satisfaction of supervision of maintenance activities included in the category NOT SATISFIED. So this shows a negative indication that users are not satisfied with the supervision system of the Governor's Office building maintenance activities.

- **Efficiency**

\[
RK = \frac{(5 \times 1) + (4 \times 12) + (3 \times 42) + (2 \times 124) + (1 \times 41)}{220} \\
RK = \frac{468}{220} = 2.13
\]

Based on the calculation of the average number of satisfaction levels obtained value of 2.13 on the system maintenance efficiency domain and when combined with the level of satisfaction according to Kaplan and Norton, it can be concluded that the level of user satisfaction on supervision of maintenance activities included in the category NOT SATISFIED. So this shows a negative indication that the user is not satisfied with the service on the system of maintenance activities of the Governor's Office building.

### 3.3 Development and Proposed Building Maintenance System

At this stage is the development and suggestion of Office Building Maintenance System Governor based on the results of activity evaluation and user satisfaction and also refers to the standardization and regulation.
3.3.1 Organizational Structure of Building Maintenance

Referring to Approach of Regulation of Minister of Public Works Number: 24 / PRT / M / 2008 About Organization Structure of Building Maintenance and Maintenance, which at least has four departments.

![Organizational Structure Diagram]

**Figure 4.** Development of Organizational Structure of Building Maintenance Section

3.3.2 Building Maintenance System Procedure

The development of building maintenance system procedures were initially separate system procedures and activities executed manually from scratch down to data storage. Development of a maintenance system into a maintenance information system where all activities are made into one and run no longer manual from start to storage data. Initially maintenance activities ranging from requests for improvement to implementation can take a maximum of 66 days or less 2 months 2 weeks working days. With the development of maintenance system procedures, maintenance activities from start to execution take up to 21 days or less 3 weeks working days.

![Flow Chart]

**Figure 5.** Flow Chart of Development of Building System Maintenance Procedure Office of South Sumatra Governor
4. Conclusion

From the results and discussion can be drawn the following conclusions:

a. Based on the evaluation result of building maintenance system based on the activity is assessed from the organizational structure aspect, current maintenance procedures and form. The results of the evaluation of the organizational structure of sub-sections of building maintenance is not formed, only the main organizational structure. From the interview result only has two sub-fields namely technical and administration. With reference to the Regulation of the Minister of Public Works No. 24 / PRT / M / 2008 on Organizational Structure of Maintenance and Maintenance of Building, the organizational structure on the maintenance of the Governor's Office building is not good. Furthermore, building maintenance procedures based on the results of data processing is still separated and run manually so it takes a long time from planning to implementation. And on the building maintenance system form there are many activities without
the form so that activities are not recorded and stored properly. It can then be concluded that the system of building maintenance based on activity at the Governor Office of South Sumatra Province is still not good.

b. The result of calculation of user satisfaction measurement at system maintenance of office building of Governor of South Sumatera Province by using PIECES method as variable and attribute of satisfaction rating, then result if data calculated with formula to get average satisfaction level, with value of satisfaction to performance equal to 2.47, satisfaction of information amounted to 2.66, satisfaction to the economy of 2.18, satisfaction of supervision of 2.16, satisfaction to the efficiency of 2.13 and satisfaction of the service of 2.38. So it can be concluded that the maintenance activities included in the category of not satisfied.

c. Development and suggestion of maintenance system of Governor Office building of South Sumatera Province based on result of evaluation and referring to standardization and regulation. The organizational structure was developed based on the Regulation of the Minister of Public Works No. 24 / PRT / M / 2008 on Organizational Structure of Maintenance and Maintenance of Buildings Building where at least 4 (four) departments. Then the maintenance system procedure is developed so that it is more effective and efficient. Initially maintenance activities ranging from requests for improvement to implementation can take a maximum of 66 days or less 2 months 2 weeks working days. With the development of a maintenance system, maintenance activities from start to execution spend a maximum of 21 days or 3 weeks working days. And the forms are developed in each maintenance activity and the maintenance system is in the form so that each activity can be well-documented, in a standardized format in order to avoid re-formatting each activity so that it can be time efficient.

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