Application Of SMMM Method for Maintenance Digital Signature in Government

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Abstract Digital signature is an application that really helps administrative activities in the government sector. Various benefits are felt now that the digital signature has been validated as a valid signature. This makes users use digital signatures more and more. Therefore, audiences need to do good documentation and training so that they can produce a digital signature application that is easy to understand, use and more efficient. In addition, with the many different needs in each service, there are also many integrated systems that are connected to the digital signature application. this needs to be done an audit for system maintenance so that the system can avoid bugs. Based on these problems, a digital signature system audit is needed to support a better application. In this study, a system audit will be carried out using the Software Maintenance Maturity Model method. Research with this method emphasizes the maintenance support system audit. This method is able to audit the digital signature system in system maintenance and support and produce conclusions if the most important thing to do is change, namely the Maintenance Process / Service Definition key process which has a capability level value of 1.67.

***Index Terms*—digital signature, Software Maintenance Maturity Model, Maintenance .**

Note: There should no nonstandard abbreviations, acknowledgments of support, references or footnotes in in the abstract.

I. INTRODUCTION

IN government the need for administration is very much needed. as evidenced by the large number of budget costs for paper in meeting administrative needs. To validate the administration requires an official signature. The problem that occurs is that officials are very busy, making the signing process often hampered. After implementing the TTE, these problems can be resolved. The budget for paper costs is minimized because the digital signature system uses digital documents and does not need physical documents. Another problem that can be overcome by digital signatures is that officials can sign anywhere and anytime. so that there are no more incidents of delay due to waiting for officials to sign documents.

Based on the benefits felt by officials, the signing process must be carried out. Digital signature users are currently increasing, but there are still many users who do not understand its use. The need for training and supporting tutorials to help these users understand the use of digital signatures.

Digital signature systems use a lot of integration, this should also be evaluated because the increase in the system will make the system more complex and there will be lots of unnatural data transactions, things such as having to do proper maintenance regularly. but the evaluation must be precise based on data and not just based on direct thinking
Based on this, it is necessary to improve maintenance services in digital signature applications using the Software Maintenance Maturity Model method. It is hoped that this method will be able to provide recommendations in assisting the maintenance of the digital signature system.

II. STUDY LITERATURE

A. Digital Signature

Digital signature is a method that can replace manual signature on physical paper. What is meant in this sense is not a scan using a scanner but by using a cryptographic algorithm and a digitally signed document will be issued with a certificate of origin. The digital signature document will be given information of the person in charge of signing what is written in the document, as well as to prevent one time the signer from denying what was written in the signed

document.

B. *Software Maintenance Maturity Model*

Software Maintenance Maturity Model (SMMM) is improvement of software maintenance functions by proposing improvements to software maintenance standards and introducing proposed maturity models for software maintenance activities per day. The software maintenance function includes a management model to facilitate evaluation, management, and continuous improvement. (April, Hayes, Abran, & Dumke, 2005)

III. RESEARCH AND METHODOLOGY

In conducting audit research on this digital signature system, it has several stages, which are described in Figure 1

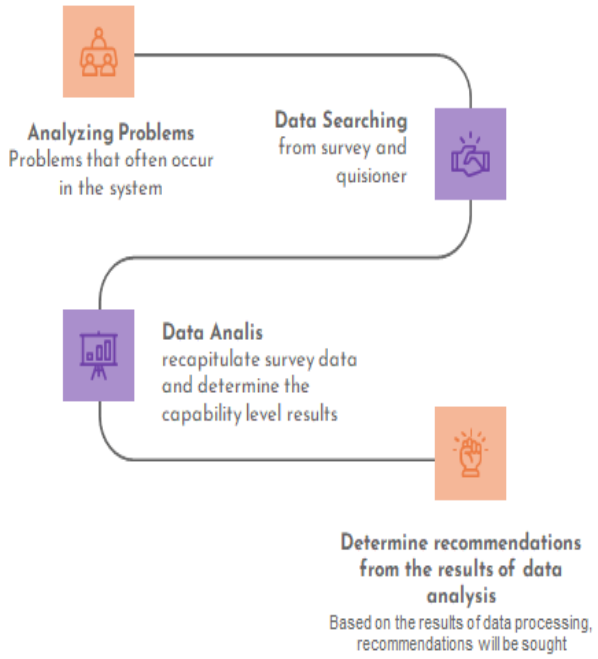

Fig. 1. flowchart analysis of SMMM in digital signature

From the picture one groove of this SMmm method is

A. *Analyzing problem*

That is the process of finding the main problems in the system that will be used as audit material. At this stage an audit will be carried out which refers more to the discussion of system maintenance and documentation because the digital signature is used by many users and there are users who do not understand the ux system. And with so many system integrations, it makes the system more complex so it needs to be recognized by an audit in the maintenance process

B. *Data Searching*

Data collection was carried out by using questionnaire methods, observation, and interview methods. At this stage, a survey was carried out to 4 people who use this system, namely

- Integration system developer
- Acknowledge
- Signer
- Organization admin

C. *Data Analysis*

At this stage the questionnaire data will be obtained using the SMmm framework. The results of this data set will be calculated to find the capability level value. From the capability level value, the right recommendation will be sought.

D. *Determine recommendations from the results of data analysis*

Based on the results of data processing, the capability level of processing using the SMmm framework is expected to be able to provide recommendations that can support the progress of the digital signature system

IV. RESULTSAND DISCUSSION

A. *The Process Of Looking For Capability Levels Using The Smmm Method*

In this calculation process using 4 domains, there are

1. Domain Software Maintenance Process Management

In this domain, more values are given for how to respond and plan for system maintenance

TABLE I
MAINTENANCE PROCESS FOCUS

	0	**1**	**2**	**3**	**4**	**5**	**L K**
Responsibility and Communications				1	3		3.75
Action plan					4		4
Average							3.875

Based on the results of the capability level, it has an average value of 3,875 which indicates that the maintenance process has been carried out correctly and in a controlled manner

In table 2 about the key process maintenance process / service definition maintenance process focus discusses how the value for documentation and storage

TABLE II
MAINTENANCE PROCESS / SERVICE DEFINITION MAINTENANCE PROCESS FOCUS

	0	**1**	**2**	**3**	**4**	**5**	**LK**

Documentation and standarization of process / services		3	1				1.25
Repository processes / service				4			3
Requirements, plans and resources		2	2				1.5
Average							1.67

Based on the results of the capability level, it has an average value of 1.67 which indicates that the service process has been implemented but needs further improvement

In the maintenance training key process, training on the use of the digital signature system for new or old users

TABLE III
MAINTENANCE TRAINING

	0	**1**	**2**	**3**	**4**	**5**	**LK**
Personal training				1	3		3.75
User training				2	2		3.5
Initial training of newcomers				1	3		3.75
Average							3.7

Based on the results, the capability level has an average value of 3,667 which indicates that the training process has been able to achieve the results in each process

in table 4 is about maintenance process performance, in this key process we can do for evaluation or audit of the system

TABLE IV
MAINTENANCE PROCESS PERFORMANCE

		1	**2**	**3**	**4**	**5**	LK
Definition of maintenance measures					4		4
Quantitative Management			3	1			2.25
Prediction Models				3	1		3.25
Average							3.168

Based on the results, the capability level has an average value of 3,167 which indicates that the process performance process has been able to achieve the correct results.

2. Software Maintenance Request (MR) Management

Table 5 shows the key process of maintenance planning and service requests. In this key process, there is more emphasis on auditing how to describe an event and what future plans are used to support the system.

TABLE V
EVENT AND SERVICE REQUEST MANAGEMENT MAINTENANCE PLANNING

	0	**1**	**2**	**3**	**4**	**5**	**LK**
Management of events and service requests			1	3			2.95
Project Transition Planning				4			3
Versions and Upgrade Planning		2	2				1.5
Average							1.85

Based on the results, the capability level has an average value of 1.67 which indicates that the service process has been carried out but needs further improvement

3. Software Evolution Engineering

Table 6 describes operational support in this key process, which emphasizes more on how the system rules are so that the system in terms of rules can support applications that are in accordance with the procedure and can produce more effective products.

TABLE VI
OPERATIONAL SUPPORT

	0	**1**	**2**	**3**	**4**	**5**	**LK**
Production Software Monitoring				1	3		3.75
Support Outside Normal Hours				2	2		3.5
Business Rules and Functionality Support				1	3		3.75
Average							3.666667

Based on the results, the capability level has an average value of 3,667 which indicates that the optional support process has been able to achieve the results in each process

Table 7 describes several lists of key process evolution and correction processes. This key process emphasizes auditing on system development and testing so that the system is protected from bugs

TABLE VII

SOFTWARE EVOLUTION AND CORRECTION

		1	2	3	4	5	LK
Detailed Design					4		4
Testing (Unit, Integration, Regression)			3	1			2.25
Construction (Programming)				3	1		3.25
Average							3.16667

Based on the results, the capability level has an average value of 3,167 which indicates the process performance process has been able to achieve the right results

4. Support to Software Evolution Engineering

Table 8 describes the key process evolution and correction of the Support to Software Evolution Engineering domain. This key process emphasizes how programmers solve problems when bugs occur

TABLE VIII
CAUSAL ANALYSIS AND PROBLEM RESOLUTION

	0	1	2	3	4	5	LK
Investigate Defects and Defaults				4			4
Identify Causes				4			4
Analyze Causes			1	3			3.5
Average							3.889

Based on the results, the capability level has an average value of 3.887 which indicates that the process of problem resolution analysis performance is stable

B. Provide Recommendations From The Results

5Based on the table 9 the value of gaps maintenance process / service definition has the lowest value because the Ministry of Communication and Information as an application manager rarely updates documentation after making changes

TABLE VIII
SOFTWARE EVOLUTION AND CORRECTION

Key Process Area	Capability Level	expected	gaps
Maintenance Process Focus	3.875	4	0.125
Maintenance Process / Service Definition	1.67	4	2.33
Maintenance Training	3.666667	4	0.33333
Maintenance Process Performance	3.166667	4	0.83333
Event and service request management maintenance planning	1.85	4	2.15
Operational support	3.666667	4	0.33333
Software evolution and correction	3.16667	4	0.8333
Causal analysis and problem resolution	3.889	4	0.111

Based on the results of the SMMM Framework analysis process, recommendations can be given as follows

1. Maintenance Process Focus
   should communicate more often to discuss problems that occur so as to avoid mistakes in the future
2. Maintenance process / service definition maintenance process focus
   Documentation should be updated as soon as changes are made
3. Maintenance training
   Post-change training should be quicker in informing users
4. Maintenance Process Performance
   It is necessary to build a system with a scientific method so as to produce a system that is more accurate in terms of security and is more practical in processing information
5. Event and service request management maintenance planning
   More emphasized in making decisions when requests should be handled or not. Because with the wrong time it can change the previous plan that has been set
6. Operational support
   In doing the job, it should be done according to the right working time. Because if the employee works more than the specified time, the job will not be completed as desired
7. Software evolution and correction
   when there is an error handle request from the user, it is better to do testing first to avoid other errors
8. Causal analysis and problem resolution
   In analyzing each problem, it should be further improved so that it is faster to handle bugs

V. CONCLUSION

From the results of the system audit using the Software Maintenance Maturity Model method, it can be concluded that the digital signature system is running well and stable because the average capability level value from the audit results is at level 3.But still the key process maintenance process / service definition has a value smallest process

key. Based on this, there is a need for improvement by means of more updating the tutorial document after making system changes

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