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Design Information Technology Assets Management System Platform Based on Service Oriented Architecture (SOA) Case Study: Statistics Indonesia

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Abstract— *Today, the asset of Information Technology (IT) is the most strategic resource in organizations including Statistics Indonesia which is a Non-departmental government agency that serves as a statistical data provider. To get the most value from IT assets, IT assets must be managed properly. IT Aset Management (ITAM) system is required to manage IT assets properly and in accordance with standards. For current conditions, Statistics Indonesia's ITAM system is not optimal. The classic problem is data silos. Each type of IT asset is managed in a different system, making it difficult to conduct a comprehensive analysis of IT assets. Better ITAM systems are needed to conduct better IT services. Today's technology is growing. So that has an impact on the expansion of features, technology and resources used in the ITAM system. For that we need a system that can integrate all IT asset data. The platform is the answer to this problem. The purpose of this research is to design a service computing system platform for IT aset management system in order to realize integrated data and IT asset management processes. The design of this platform is based on Service Oriented Architecture (SOA) to create an integrated IT asset management system. This research uses Service Computing System Engineering (SCSE) as a framework for designing. ITAM System platform model validated using SOA approach has coupling factor value of 0.0048 (loosely coupled), cohesion factor value of 0.2444 (high cohesion), complexity factor of 0.0198 (not complex), and the value of reusability factor of 1.4000 (reusable)..*

Keywords— *Platform, information technology assets management, service oriented architecture, service computing system engineering.*

I. INTRODUCTION

Information technology (IT) has become a critical component of business services organization [1]. IT is an essential driving force of business innovation and differentiation initiatives [2]. The development of IT into business enabler, encouraging increased investment in this field. so many IT tools are purchased to build a reliable IT infrastructure. The entire IT infrastructure, including hardware and software is an organization asset that is used jointly. Along with the increasing role of IT in an organization, there are also more IT assets that must be managed. This of course raises new problems and challenges for the organization.

IT assets are all components that have economic value that contribute to producing IT services. IT assets include hardware, software, data, networks, cloud services, and client devices [3]. Each IT asset has its own characteristics and ways of being managed. IT asset management is a very important part of an organization's strategy to maximize the quality of IT services provided [4]. IT asset management is the activity of planning, managing, using, and controlling IT assets so that an IT asset must be recorded throughout the entire process in its life cycle, from procurement, storage, use, maintenance, and disposal of assets [3]. In the Process Reference Model at COBIT 2019, ITAM is a process that is measured to determine the maturity level of an organization's IT governance [5].

Electronic government is commonly known as e-government. It is an effort of the local and central government to develop the electronic-based government [6]. Statistics Indonesia is a non-departmental government agency in carrying out its duties to produce statistical data. To realize e-government, Statistics Indonesia continues to improve its IT services. One way to create excellent IT services is by innovating ITAM.

Based on observations, ITAM in BPS-Statistics Indonesia is not optimal. The classic problem is data silos. Each type of IT asset is managed in a different system, making it difficult to conduct a comprehensive analysis of IT assets. The ITAM system that has not been integrated has resulted in various problems. First, the life cycle of IT assets is not well recorded, making it very difficult to carry out an audit of IT assets. Second, the difficulty of tracking and monitoring an IT asset. For example: by whom is it being used, what is the condition, what treatments have been done, and whether it has been abolished or not. Third, it is difficult to carry out investigations and provide solutions when an IT asset is having problems because ITAM has not been integrated with the help desk so that the type and specifications of the problematic IT assets are not known. Fourth, it is difficult to make a decision because the IT asset data is not yet fully integrated with the data in SIMAK BMN which is in the inventory section.

The ITAM systems are needed to conduct better IT services. Today's technology is growing. So that has an impact on the expansion of features, technology and resources used in the ITAM system. For that we need a system that can integrate all IT asset data. The platform is the answer to this problem. This is because the platform can divide such a complex system into multiple levels, ultimately finding a middle ground between standard and personalization [7]. Platform can be interpreted as software that provides services for other

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software through the use of Application Programming Interfaces (APIs) [8], While other meanings state the platform as a software system that can be expanded, which provides core functions to be shared, through applications that interact with it or through the interface where they interact [9]. So that by implementing service computing on the platform, the platform in this study is intended as a software base that provides key services in order to support the ITAM process. The platform also makes it possible to develop other services based on the services that have been provided. This certainly makes the ITAM system development process easier if there are other features or services development without having to build the system from scratch. In addition, the platform is also expected to have good portability and interoperability, but still have a high level of performance.

This research use service computing system engineering (SCSE) methodology. SCSE methodology focuses on the development of IT services systems that include IT and business services [10], The SCSE methodology presents the interaction between participants which is a necessity in designing a platform. SCSE accommodates architectural designs ranging from business, data, application and infrastructure that answer platform design needs.

This paper is the initial stage of research on designing an ITAM system platform based on SOA. The remainder of this paper is arranged as follows. Section II presents the related work for this research. Section III explains the methodology. Section IV discusses the results of the objectives and requirements stage and modeling stage. Finally, Section V gives the conclusion of this paper

II. Related Work

A. *Information Aset Management System*

Research on project ITAM system has begun. Until now, many researchers have tried to solve ITAM's problems by building an ITAM system. Maryono analyzed and designed the Information and Communication Technology Asset Management Information System (SIMATIK). This information system has been designed successfully and provides ICT asset information management functionality which includes asset registration, asset placement, asset transfer, depreciation calculation, asset valuation, asset maintenance recording, asset write-off, asset tracking, and reporting [11]. SIMATIK design is done on a web-based (intranet) and using an object-oriented approach (OOA). In research using OOA in a single organizational unit, namely Asmi Santa Maria Yogyakarta so that the perspective is only limited to the objects in the organization.

Nursikuwagus designed the ITAM system using the Unified Modeling Language (UML) and spiral methodology in developing the system. The spiral methodology emphasizes agility or speed in building systems so that in this study the scope of this study is very small in managing only one type of IT asset, namely hardware. So it creates new problems in terms of integrating it with the management of other types of IT assets [12].

Dewi's research, entitled Analysis and Design of Fixed Asset Management Information Systems at PT. Metis Teknologi Corporindo uses Unified Modeling Language (UML), prototype model methodology, PHP programming, and Mysql database in system development. The use of prototypes will make it easier to communicate the system to be built to business process owners so that it is easier to align business needs with IT needs. However, this system is still built with an object-oriented paradigm so that it will be difficult to develop into a larger system that can communicate with other systems in the organization [13].

Service computing as a science that includes computers, information technology, information management, and consulting services with the aim of eliminating the gap between business services and IT services through the implementation of service computing technology [14]. Another definition of service computing as a discipline of new computing with web service and SOA as the main approach in developing software and based on service-oriented software design and analysis principles [7]. Platform is one of the technologies in service computing.

Several research platforms related to SI case studies have been developed. Priantari designs a data processing platform based on service oriented architecture (SOA) [15]. The data processing platform in its research is software that provides the foundation for services or related functions in the data processing process. Furthermore, rahim designs an SOA based meta data platform [16]. Yunofri Designing Service Computing Platform for Statistical Project Management Based on SOA [17]. And this research will design a service computing platform for ITAM.

B. *Service Oriented Architecture* (SOA)

SOA is a congruent approach between business and Information Technology where applications rely on available services to facilitate business processes. Services are standalone reusable software components provided by service providers and consumed by service requesters. SOA creates a vision of IT flexibility that enables business agility [18]. SOA is a fundamental architectural model that supports the entire service computing paradigm. SOA is a service-based architecture that allows the design and design of application services (software services) in a loosely-coupled manner to meet the needs of business processes and service users. Through SOA, every application built is treated as a service to support service business processes. SOA creates IT service flexibility, such as service reuse (reusability) and interoperability, which can support service business process automation [19]. SOA implementation primarily involves building service-based applications and making applications as services available to other applications that need them.

Research on SOA which forms the basis of service computing technology has been conducted since 2002. The focus of research in this period is process models and process-based application integration in implementing SOA in the world. service industries. Furthermore, Keen conducted SOA research by focusing on the integration of business service components, integration services, enterprise service buses, and infrastructure services. A practical SOA methodology

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proposed by Arsanjani under the name Service Oriented Modeling and Architecture (SOMA). This methodology provides a comprehensive guide to designing and building SOA-based services. Furthermore, SOA becomes the main foundation in engineering research in the field of service engineering and service systems.

C. Service Evaluation

Service design evaluation is crucial to validate and make sure that the design of service-oriented platform is designed with and in line with SOA principles. Loose and high cohesion are the characteristics of SOA. The value of coupling, cohesion, complexity, and reusability of the service design is measured in this study [20]-[21]. The evaluation is based on interactions between services as well as interactions between operations within one service and with other services.

1) Coupling Factor

Coupling factor is used to measure the interdependence between services based on the interaction between services and their elements in a service-oriented design. The formula for calculating the coupling factor value is as follows:

$$CopF(p) = \frac{IC(p)}{f^2 - f} \quad (1)$$

$$f = NS(SOS) + NO(SOS) \quad (2)$$

with CopF(p) representing the service system's coupling factor, IC(p) representing indirect coupling, representing the number of services and operations in the service system, NS(SOS) representing the number of services, and NO(SOS) representing the number of operations in the service system.

2) Cohesion Factor

Cohesion factor is used to measure the level of strength of the relationship between operations and services of a service oriented system used together in each service and composite service. The resulting value is between 0 and 1 with a high value if it is close to one. The formula for calculating the cohesion factor value is as follows:

$$CohF(s) = \sum_{s \in SOS} \frac{CM(s) * (l^2 - l)}{f^2 - f} \quad (3)$$

$$l = NS(s) + NO(s) \quad (4)$$

with $CohF(s)$ is the cohesion factor of service system, $CM(s)$ is the cohesion metric value of services that act as service providers and consumers, l is the number of services and operations within services, $NS(s)$ is the number of services in service, and $NO(s)$ is the number of operations in service. This measurement is carried out by measuring the value of the cohesion factor in each service and composite service. Initial identification by calculating the cohesion metric on each composite service and service and then calculating the number of services and operations on the composite service and service.

3) Complexity Factor

Complexity factor is used to measure the level of complexity of a service by using the value of the coupling factor and cohesion factor. The resulting value between 0 and 1 with a value that is getting smaller or closer to zero, then the value of the complexity of the service is getting better. The formula for calculating the complexity factor value is as follows:

$$ComF(s) = \frac{Cop(s)}{CopF(s)} \quad (5)$$

4) Reusability Factor

Reusability factor is used to measure the value of reuse of an operation and service in the service system. This measurement is done by comparing the value of the cohesion metric in the service system with direct coupling in the service system. So that a service has less direct interaction and a high cohesion value between operations will be more reusable. The formula for calculating the reusability value is as follows:

$$ResF(s) = \frac{CM(SOS)}{DC(SOS)} \quad (5)$$

with $ResF(s)$ is reusability factor in service system, $CM(SOS)$ is value of cohesion metric in service system, $DC(SOS)$ is value of direct coupling in service system.

III. Research Methodology

The research methodology used in this research is Service Computing System Engineering (SCSE) Framework. This framework consists of five stages produced in accordance with its lifecycle. This framework provides guidance to the designer to understand the overall stages required to build a Service Computing System. Figure 1 shows the SCSE framework consisting of five stages, namely (1) Objectives and Requirements, (2) Modeling, (3) Development, (4) Deployment, and (5) Evaluation [10].

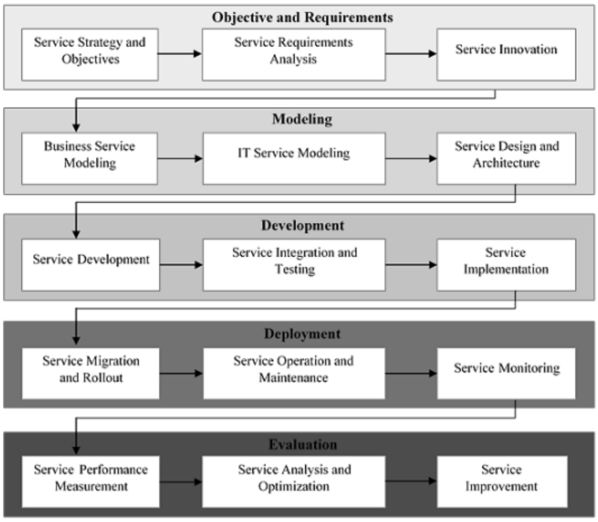

Fig. 1. SCSE Framework [10]

IV. Research Result

In this section, the results of the objectives and requirements stage will be presented. This stage displays the results of the service strategy and objective phases, service requirements analysis, and service innovation. Each phase will display several artifacts as the output of the research results.

A. Service Strategy and Objective

The results of research in this phase include business strategy and objectives, IT strategy and objectives, business service models, and business service context in ITAM activities in IS. This phase uses the method of document

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analysis and interviews with related parties. The Directorate of Statistical Information Systems (SIS) was the party being interviewed because it was responsible for the development and provision of the ITAM system.

1) Business Strategy and Goal

Business strategy and goals must be in line with the vision and mission of an organization. The vision and mission of the organization serve as a guide to formulate various things such as goals, strategic objectives, strategies, and work programs. Therefore, the discussion regarding the strategy and business objectives of SI is proceded by discussing the vision and mission. Based on the 2020-2024 SI Strategic Plan, SI has a vision, namely "Provider of Qualified Statistical Data for Advanced Indonesia", Meanwhile, in an effort to realize its vision, SI has the following missions:

1. Providing quality statistics with national and international standards.
2. Fostering K / L / D / I through a sustainable National Statistics System.
3. Realizing excellent service in the field of statistics for the realization of the National Statistical System.
4. Building superior and adaptive human resources based on the values of professionalism, integrity and trust.

With reference to the mission that has been mentioned, the role of the SIS Directorate in the ITAM aspect is contained in the 3rd mission, which can be described in table I as following.

TABLE I. Goals, Strategies and Policies

Vision	**Provider of Qualified Statistical Data for Advanced Indonesia**		
3rd mission	Realizing excellent service in the field of statistics for the realization of the National Statistical System (SSN)		
Goals	Target	Strategies	Policy Direction
Increased Service excellence in SSN administrati-on	Increased facilities and infrastructure, including those based on information and communication technology in statistical activities	Increase the use of information and communicate-on technology based facilities and infrastructure in statistical activities at BPS service units and in statistical activities	Meet the needs of facilities and infrastructure that support excellent service and employee performance improvement

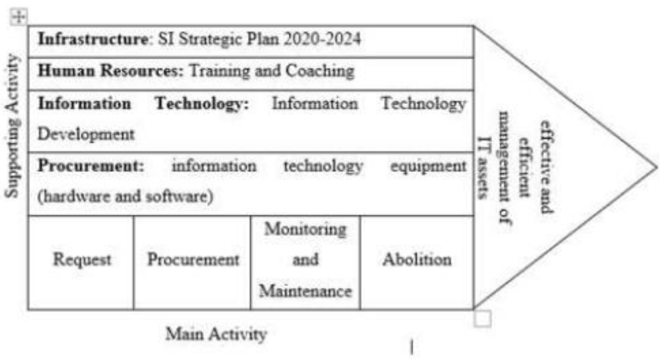

Fig. 2. Value chain

Every activity carried out in the organization should produce added value for the organization in achieving its goals. Value chain can describe a series of activities and added value. The added value that SI wants in ITAM is the effective and efficient management of IT assets. Figure 2 shows a series of activities both main and supporting activities in order to achieve the expected value.

2) Information Technology Strategy

Some of the uses of technology that have supported ITAM-related business activities are as follows:

1. Application SIMPATI (IT Device Management Information System)
   SIMPATI is a web-based application that is used to perform data entry for procurement, requests, allocations, borrowing, and maintenance of IT devices, both hardware and software.
2. Application SMDM (Data and Metadata Management Systems)
   SMDM is a web-based application used to manage census / survey data and metadata.

3) Business Service Model (As-Is)

This section analyzes the ongoing business service models related to ITAM at SI. The tool used to describe this business service model is the Business Model Canvas (BMC). BMC describes the relationship between nine elements of a business model, so it is hoped that an organization's business model will be easier to understand and understand. The ITAM business service model at SI is shown in Figure 3 below.

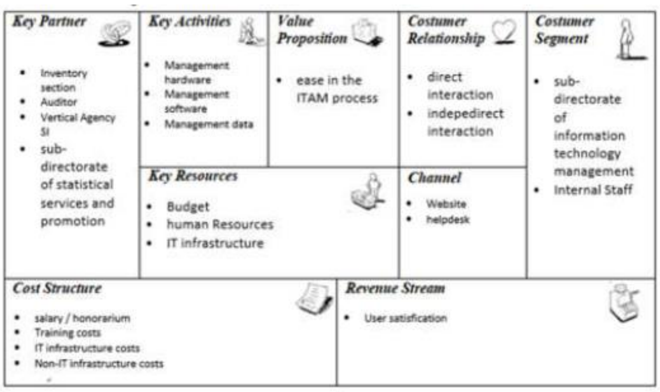

Fig. 3. Business Model Canvas As-Is

4) Service Business Context

The service business context describes every business process that occurs between each stakeholder with an ongoing system. Context diagram shows this well. Figure 4 below is a context diagram that illustrates the implementation of ITAM platform.

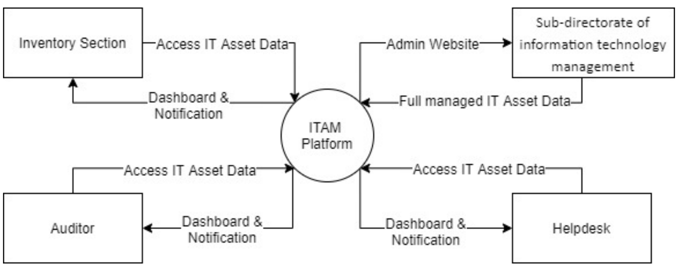

Fig. 4. Context Diagram

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B. *Service Requirements Analysis*

Business processes of ITAM cover four business processes. Request, procurement, monitoring & maintenance, and abolition of IT Asset. In each business process the workflow is described with the business process model. Then analysis is done to get business needs and IT needs. Table II shows the business and IT needs on ITAM system platform.

TABLE II. Business and It Requirement

No.	Business Requirement	IT Requirement
1	Request of IT Asset	Able to accommodate request of IT Asset from All SI Staff.
2	Procurement of IT Asset	Able to facilitate planning and scheduling Procurement of IT Asset
3	Monitoring & Maintenance of IT Asset	Able to automatic tracking of IT Asset location and give the information about history of maintenance an IT asset
4	Abolition of IT Asset	Able to facilitate planning and scheduling Abolition of IT Asset

C. *Service Innovation*

Service innovation is the last stage in the objective and requirement phase. Based on the analysis of service requirements that we get from the analysis of the previous stages then we can identify new business processes proposed in the design of a service computing platform. The existing business process is innovated in the form of an automation process. The proposed Business Service Innovation is a Service Computing Platform for ITAM. One new service raised in this innovation is evaluation services. Finally, various automation processes in the existing process IT Asset Monitoring to validate and speed up the process.

The next show in table III is Goal Service Model (GSM) which describes the purpose service computing platform for ITAM.

TABLE III. GSM ITAM Service

No.	Goal/Sub-Goal	KPI	Metric
1	IT Aset automatization tracking	Time saving	Speed of getting information about IT Asset
2	Service manage IT Aset Life Cycle	Human resources	Access manage of IT Asset
3	IT Aset recapitulation report	Time saving and Human Resources	Time and human Resources required recapitulation process
4	Evaluation of IT Asset	Increase next procurement	Information for Next procurement

The next step is to make improvements based on the existing service gap. This is done by innovating the services that are currently being carried out. Service innovation can be described as in Table IV. Service innovation covers business service innovation and IT service innovation that in line between organizational needs and business processes identified in the service gaps. Therefore, service innovation is expected to improve service gaps that exist in each business process. The innovation in question can be in the form of improvement of existing services or new services needed to complement the organization needs.

TABLE IV. Service Innovation

Service Innovation	Status	Description
SI1. IT Asset Request	***Update***	There needs to be a business service that can automatically add a list of requests for IT assets when there is a request for IT assets through haloSIS.
SI2. Procurement of IT Assets	***Update***	There needs to be a business service capable of managing the IT asset procurement process. This service can store all documents needed to procure IT assets, and can also be used to assess the performance of vendors and principals.
SI3. IT Asset Monitoring	***Update***	There needs to be a business service that is able to manage information related to the condition and location of IT assets so that usage can be monitored.
SI4. IT Asset Maintenance	***Update***	There needs to be a business service that is able to automatically perform clustering and categorization of problems in IT assets.
SI5. IT Asset Abolition	***Update***	There needs to be a business service that is able to track IT assets that need to be written off and also calculate the depreciation of IT assets.
SI6. IT Asset Dictionary	***New***	This service will be used to manage IT asset master data such as the type, brand, and type of IT assets.
SI7. Data analysis	***New***	This service will be used for data analysis regarding usage, history of maintenance and repair of IT assets.
SI8. Mapping	***New***	This service is used to map IT asset data into thematic maps using GIS.
SI9. API User Management	***New***	This service is used to manage API users provided by the system

D. *Business Service Modeling*

At this time, service innovation has been obtained to improve the previous service. The results of these innovations are then incorporated into business service modeling and new business process. This new business process description can be made using Business Process Modeling and Notation (BPMN) to-be as shown in Fig. 5 below. The business processes are IT Assets Request, Procurement, Monitoring, Maintenance, and Abolition.

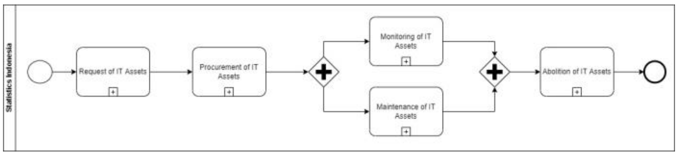

Fig. 5. BPMN To-Be of ITAM System Platform

Furter artifact can take advantage of the Business Model Canvas (BMC), which is the complete description of business model on one sheet/canvas so that it is easy to understand and can be analyzed quickly. An overview of BMC in the Statistics Indonesia organization by looking at its main activities and focusing on activities related to data management for more details. Based on the main

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organizational change from Statistics Indonesia, it affected several processes and stakeholders. Therefore, there are updates and improvements from the previous BMC. The renewal and improvement focus on revenue streams, namely standardization of applications and data formats, optimization of the integrated ground station management and operation system, improved ITAM.

E. IT Service Modeling

The next stage is to model IT services to support the service model that has been implemented previously. This is needed to align business service needs that are juxtaposed with the needs of IT services as a support. This artifact is obtained by decomposing business services into operations on each required IT service. Furthermore, based on the activities mentioned, the IT service catalog is obtained as in Table V.

TABLE V. IT Service Catalog

No.	IT Service	Operation
1	IT Asset Request	addPermintaanAsetTI, displayPermintaanAsetTI, listAvailableAsetTI, updateStatusPermintaanAsetTI, displayListPermintaanAsetTI
2	Procurement of IT Assets	uploadKAK, downloadKAK, uploadKontrak, addPengadaan, downloadKontrak
3	IT Asset Monitoring	addAsetTI, displayDetailAsetTI, displayConditionAsetTI, displayLocationAsetTI, updateDataAsetTI, getDataAsetTI, updateDataBMN
4	IT Asset Maintenance	addPermasalahanAsetTI, displayPermasalahanAsetTI, updateDeskripsiPermasalahanAsetTI, updateDeskripsiPerbaikanAsetTI, updateStatusPermasalahanAsetTI
5	IT Asset Abolition	createListPenghapusanAsetTI, addPenghapusanAsetTI
6	IT Asset Dictionary	addKamusDataAsetTI, modificationKamusDataAsetTI, deleteKamusDataAsetTI, getKamusDataAsetTI
7	Data analysis	getCluster
8	Mapping	displayMap
9	API User Management	createUser, readUser, sendToken, readToken, signIn, displayPegawai, sendNotification

F. Service Design and Architecture

After modeling business services and IT services, validation is carried out on the model based on SOA principles. By measuring the value of the coupling factor, cohesion factor, complexity, and reusability of the resulting service design, validation is accomplished. Evaluation is based on interaction services and operations within a service interact with other services.

This measurement is carried out by measuring the value of the cohesion factor in each service and composite service. Initial identification by calculating the cohesion metric on each composite service and service and then calculating the number of services and operations on the composite service and/or service. This calculation can be seen in Table VI based on the service interaction diagram of the ITAM System platform that has been made previously. The calculation of the cohesion factor is as follows.

TABLE VI. Measurement of Cohesion Factor

Service	CM(s)	l	f	CohF(s)
IT Asset Request	1	6	46	0,014492754
Procurement of IT Assets	2	6	46	0,028985507
IT Asset Monitoring	2	8	46	0,05410628
IT Asset Maintenance	3	6	46	0,043478261
IT Asset Abolition	1	3	46	0,002898551
IT Asset Dictionary	2	5	46	0,019323671
Data analysis	0	2	46	0
Mapping	0	2	46	0
API User Management	3	8	46	0,08115942
Total CohF(s)				**0,24444444**

TABLE VII. Evaluation Value Measurement

No	Factor	Best	Nilai	Category
1	*Coupling Factor* (CouF(s))	*toward 0 is better*	0,004831	Good
2	*Cohesion Factor* (CohF(s))	*away from 0 is better*	0,244444	Good
3	*Complexity Factor* (ComF(s): CoupF(s)/CohF(s))	*toward 0 is better*	0,019763	Good
4	*Reusability Factor* (ResF: CM(SOS)/DC(SOS))	*higher than 1 is better*	1,40	Good

Based on the calculation results in Table VII, the coupling factor value of 0,004831 indicates a low level of dependence between services (loosely coupled), the total value of the coupling factor is 0,244444, indicating the level of strength of the relationship between operations and services in the platform is high (high cohesion), the total complexity factor value of 0,019763 indicates the level of complexity of ITAM System platform is low because the value is close to zero (not complex), and the total coupling factor value is 1.40, indicating the reusable level of ITAM System platform is reusable

V. CONCLUSION

This study has identified the problems and needs of the service computing platform for ITAM. This identification has illustrated some of the problems and needs of service management that also affect the achievement of the value proposition of the SI. The management of business services and IT services has also been identified. Based on the findings, it is proposed service computing platform for ITAM innovation design that allows users to use the management service, then modeling the business services and IT services proposed by implementing SOA architecture and SCSE framework. This paper show the results of the objectives and requirements stage and modeling stage. Then an evaluation of the design or design has been proposed. ITAM System platform model validated using SOA approach has coupling factor value of 0.0048 (loosely coupled), cohesion factor value of 0.2444 (high cohesion), complexity factor of 0.0198 (not complex), and the value of reusability factor of 1.4000 (reusable). Suggestions for further research have to develop into the next stage development, deployment and evaluation.

REFERENCES

[1] P. Yustianto, Suhardi, and R. Doss, "Consolidating service enginering perspectives," 2015 Int. Conf. Inf.Technol. Syst. Innov. ICITSI 2015 - Proc., 2016.
[2] M. Carcary, E. Doherty, and C. Thornley, "Business innovation and differentiation: Maturing the IT capability," IT Prof., vol. 17, no. 2, pp. 46–53, 2015.
[3] ITIL ver.4, ITIL® Foundation ITIL 4 Edition. United Kingdom: Axelos, 2019.
[4] J. Ajdari, A. Abdullai, X. Zenuni, B. Raufi, and F. Ismaili, "Definition and implementation of procedures for IT assets managing," Pressacademia, vol. 4, no. 2, pp. 221–226, 2017.
[5] ISACA, COBIT® 2019 Framework: Introduction & Methodology. Schaumburg, 2019.
[6] M. Huda and N. S. Yunas, The Development of EGovernment System In Indonesia, vol. 8, no. 735. 2016.
[7] Z. Wu, S. Deng, and J. Wu, Service Computing: Concept, Method and Technology. 2015.
[8] D. S. Evans, A. Hagiu, and R. Schmalensee, Invisible Engines. London: Massachusetts Institute of Technology Press, 2006.
[9] A. Tiwana, B. Konsynski, and A. A. Bush, "Platform evolution: Coevolution of platform architecture, governance, and environmental dynamics," Inf. Syst. Res., vol. 21, no. 4, pp. 675–687, 2010.
[10] N. B. Kurniawan, Suhardi, Y. Bandung, and P. Yustianto, "Services Computing Systems Engineering Framework: A Proposition and Evaluation Through SOA Principles and Analysis Model," IEEE Syst. J., vol. PP, pp. 1–12, 2019.
[11] Y. Maryono, S. Suyoto, and P. Mudjihartono, "Analisis Dan Perancangan Sistem Informasi Manajemen Aset TIK Studi Kasus: Asmi Santa Maria Yogyakarta," J. Buana Inform., vol. 1, no. 2, pp. 81–90, 2010.
[12] A. Nursikuwagus and T. Juliana, "Perangkat Lunak Sistem Manajemen Aset Dalam Penanganan Aset It," Simetris J. Tek. Mesin, Elektro dan Ilmu Komput., vol. 7, no. 1, p. 111, 2016.
[13] S. Dewi, L. M. Jannah, and Y. Jumaryadi, "Analisis Dan Perancangan Sistem Informasi Manajemen Aset Tetap Pada Pt. Metis Teknologi Corporindo," J. Sist. Informasi, Teknol. Inf. dan Komput., vol. 9, no. 1, pp. 81-91 p-ISSN 2089-0265, e-ISSN 2598-3016, 2018.
[14] J. L. Zhao, M. Tanniru, and L. J. Zhang, "Services computing as the foundation of enterprise agility: Overview of recent advances and introduction to the special issue," Inf. Syst. Front., vol. 9, no. 1, pp. 1–8, 2007.
[15] R. Priantari, Suhardi, and N. B. Kurniawan, "Designing statistical data processing system platform based on SOA," 2018 Int. Conf. Inf. Technol. Syst. Innov. ICITSI 2018 - Proc., pp. 93–98, 2018.
[16] R. Rahim, Suhardi, and N. B. Kurniawan, "Designing statistical metadata service computing system based on service oriented architecture (SOA)," 2017 Int. Conf. Inf. Technol. Syst. Innov. ICITSI 2017 - Proc., vol. 2018- Janua, pp. 120–127, 2017.
[17] Yunofri, Suhardi, and N. B. Kurniawan, "Designing Service Computing Platform for Statistical Project Management Based on SOA," 2018 Int. Conf. Inf. Technol. Syst. Innov. ICITSI 2018 - Proc., vol. 8, pp. 99–104, 2018.
[18] Wu, Z., S., Yin, J., dan Deng, S., Modern Service Industry and Crossover Services : Development and Trends in China," 2016. IEEE Transactions on Services Computing, 9(5), 664–671
[19] T. Erl, "Service-Oriented Architecture: Analysis and Design for Services and Microservices (Second Edi) (G. Wiegand, Ed.)," 2017. Prentice Hall, United States of America
[20] A. A. Mohammed Elhag and R. Mohamad, "Metrics for evaluating the quality of service-oriented design," in *2014 8th. Malaysian Software Engineering Conference (MySEC)*, 2014, pp. 154–159.
[21] A. A. M. Elhag, R. Mohamad, M. W. Aziz, and F. Zeshan, "A Systematic Composite Service Design Modeling Method Using Graph-Based Theory," *PLoS One*, vol. 10, no. 4, p. e0123086, Apr. 2015.

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