

# DESIGNING BUSINESS ARCHITECTURE OF THE SHARED SERVICE - MASS PAYMENT SYSTEM FOR THE INDONESIA PUBLIC FINANCE MANAGEMENT USING TOGAF FRAMEWORK

<sup>1</sup>SUDARTO, <sup>2</sup>NILO LEGOWO

Information Systems Management Department, BINUS Graduate Program-Master of Information Systems Management, Bina Nusantara University, Jakarta, Indonesia  
E-mail: <sup>1</sup>sudarto@binus.ac.id, <sup>2</sup>nlegowo@binus.edu

## ABSTRACT

Integrated Financial Management Information System (IFMIS) has become best practices for supporting the state financial management in every country. With the advancement of mass digital payment, IFMIS must also be able to include this practice to maintain the efficiency of state finance operation. In line with demands for efficiency and transparency, shared service centers are also increasingly becoming a common practice in government. Therefore, in an effort to get the full benefits of IFMIS investment in Indonesia, this paper designs one of business architectures for shared service-mass payment management of the Indonesia state finance based on the TOGAF-ADM framework. With this design, it is recommended that various mass payments such as payments for payrolls, government credit cards, official travel costs, common expenses and social assistances can be done more efficiently and transparently and consolidated in a shared service center. Hence, millions of mass payments which are previously carried out individually by thousands of working units across Indonesia could be simplified into smaller number of consolidated payments executed by a shared service center. It is also transforming millions of manual operation processes into much more efficient digital operation processes, maximizing the benefit of collaboration between state owned information systems with the availability of private information systems which are becoming very advanced. This proposed end-state business architectures obviously enhance the efficiency and transparency of state financial operation. This is the contribution of this paper, in addition to contributing to architectural enterprises of digital government in state financial sector which are very complex and still progress unevenly in many countries.

**Keywords:** *Enterprise Architecture, TOGAF, IFMIS, Shared Service, Mass Digital Payment*

## 1. INTRODUCTION

Modernization of state financial management has become a trend in all countries, especially in this Industry 4.0 era. One of them is by developing an Integrated Financial Management System (IFMIS) as a core system of various information systems supporting the management of state finances. Indonesia has also developed IFMIS, with the *Sistem Perbendaharaan dan Anggaran Negara (SPAN)* as the core of IFMIS. But there are still many systems needed to be developed, including mass payment management system in line with the massive development of digital payment systems and other latest information technology advancement [1]–[3].

Currently, various mass payments such as: (i) payments of salaries for more than 2.4 million

government employees, (ii) payments of utility bills such as water, electricity and telephone bills for more than 22 thousand government work units throughout Indonesia, (iii) payments of various social safety net (SSN) programs to more than 20 million families, and (iv) payments of government credit card (*Kartu Kredit Pemerintah or KKP*), are still carried out through various scattered payment systems making them less integrated and efficient. In many cases, those payment systems are in-house developed systems at each line ministry or agency, so that they are not only inefficient and created redundancies, but also fail to comply with the security requirements. Likewise, many government work units currently pay their utility and credit card bills manually through the banking system so that nationwide the number of transaction handlings is very large and expensive.

The lack of integration of IFMIS with mass payments still occurs in many countries. However, it has been realized by most of countries that to get the full benefits of IFMIS development, that integration is a priority which would also enhance the efficiency and transparency of the public service deliveries [4]–[13]. In the case of Indonesia state financial system, S. Lund, Ol. White, and J. Lamb [11] mentioned that in 2015 there was only about 26% of government payments used digital payments. Furthermore, the use of digital payments could save a budget of USD 6-10 billion, or about 1.1% of GDP. Of course, during the last five years there have been many improvements but there are still many things needed to be enhanced quickly.

Furthermore, the efforts to develop mass digital payments should also be accompanied by simplification of business processes and related organization structures. In this case, as it is widely practiced in private sectors or in many developed countries, it is also necessary to unify the "back office" of the management of mass digital payments in a form of shared service centers at the Ministry of Finance [14]–[21]. This concept will unite the same functions in almost all of work units into a shared service center, thereby eliminating duplication of functions and bringing also promising impacts on better resource allocations. The practices of state finances in Indonesia actually have implemented some shared service concepts. For example, currently the provision of information technology for managing state finances for 22 thousand work units throughout Indonesia are provided by the Ministry of Finance (*IT as a Service*). However, it still needs to be improved including for the management of these mass payments.

This paper designs the enterprise architecture (EA) of shared service - mass digital payment for the public financial management in Indonesia. This EA uses the TOGAF-ADM framework, which has been widely used in the Ministry of Finance. However, due to the complexity of EA and the space limitation in this paper, the focus will be on business architecture with the aims to simplify the business processes based on the shared service-mass digital payment concept and to assess the need of improvement from the existing data and application architecture as well as the existing technology architecture.

Therefore, this paper contributes to the development of an EA supporting digital government concept which is still unevenly evolving in many countries, along with the development of digital technology in financial sector [22], [23]. This paper also gives a real example of public-private partnership, collaborating to accelerate digital

transformation in the state financial sector. Likewise, the results of this paper can serve as a reference for other countries that are modernizing their state financial management.

## 2. RESEARCH PURPOSES

Based on the issues that have been described previously, the objectives of this study are:

- a) Conducting gap analysis as a basis for the development of EA shared service-mass digital payment using the TOGAF 9.2 ADM framework.
- b) Designing a business architecture shared service-mass digital payment using the TOGAF 9.2 ADM framework.
- c) Contributing to the acceleration of digital transformation in public sectors, through the public-private partnership and the creation of digital ecosystems in Indonesia.

## 3. PROBLEM STATEMENT

The problems which will be answered in this study are as follows:

- a) What are the current payment system gaps, especially if they are compared to those of best practice in mass digital payments?
- b) How to design a business architecture shared service-mass digital payment using the TOGAF 9.2 ADM framework?

## 4. LITERATURE REVIEW

### 4.1 The Indonesia IFMIS (SPAN) and Mass Payment

The best practices in managing state finances are always supported by an integrated financial management information system (IFMIS). SPAN is the core of the Indonesia IFMIS, which was developed based on the Oracle E-Business Suits for Public Sector. Though SPAN has been regarded as very success in integrating the information system for managing state finances in Indonesia, there is still needed to include mass payment systems to obtain the full benefit of SPAN investment [4], [5], [9], [13], [24], [25][3]. In regard to the very rapid development of digital payments in Indonesia, the integration between SPAN and digital payment ecosystem will really beneficial for both sectors and certainly increase the government's leverage on its IT investment [26]–[28].

Mass payments are commonly defined as simultaneous-online multiple payments to multiple recipients. In this case, ones can simply upload multiple payment-multiple recipient information into a mass payment platform or by using an application

resources information systems (HRIS) for payroll or other intended digital platforms [14].

Figure 1 is a general description of SPAN today. As shown in Figure I, SPAN is now interfaced and linked to many other institution information systems

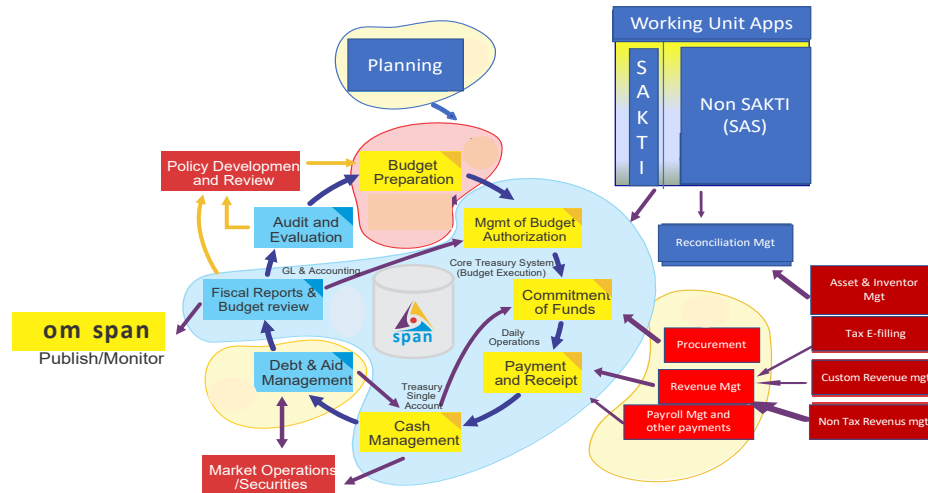


Figure 1: The Indonesia IFMIS [3]

programming interface (API) from their local payment systems. Thus, a mass payment platform can process multiple payments for millions of end recipients at once, so that they are very efficient. In practice, it is carried out digitally through various payment channels, and hence it must be interfaced with the available digital payment channels.

The current advancement of digital payment systems in Indonesia has opened up opportunities to mutually enhance the payment systems for the benefits of state finance, payment system industry and obviously the end beneficiaries. Most of mass utility bills for each work unit in Indonesia has been electronically provided by the service providers. Those thousands of bills can be electronically submitted at once to a Government Payment Platform (GPP) — it is later proposed in this paper — through API. Subsequently, the SPAN will verify and check the availability of fund for each working unit, and does mass payments through digital payment channels as instructed by each working unit. The same payment processes can be applied to payroll, accommodation bills, KKP bills or direct social assistance to millions of families. Obviously, the GPP must have an API that can be accessed by banking, financial technology, e-commerce, human

in Indonesia. SPAN, as the core of the Indonesia IFMIS, is now connected to all banking institutions in Indonesia. Other systems, such as Revenue Management, as an integrated revenue collection system in Indonesia, has also connected to all financial sectors including e-commerce. Therefore, enhancement of the Indonesia IFMIS by adding mass digital payment in a GPP is really possible and it will greatly increase the value of the Indonesia IFMIS.

#### 4.2 Shared Service Center (SSC)

As explained previously, many types of payments that actually can be paid digitally through mass payment systems are now individually carried out by each work unit. With the possibility to implement digitally mass payments through the GPP, it is very likely to further simplify the related business processes by centralized those payment activities into a government work unit functioning as a shared service center (SSC).

In general, the motivation of the formation of a shared service center is for efficiency and acceleration of service deliveries. This SSC is able to deliver the services with the same or better quality for all work units, and at the same time it is subsequently able to pooling scattered skill and knowledge from all work units into it [19]. Similar to the private sectors, SSC is increasingly becoming a trend in the public

sector especially because the government is also always required to be more efficient and transparent [15], [20], [21]. With the establishment of the SSC, most of the mass payments will be carried out by the SSC through the GPP. The employees in more than 22 thousand work units who previously handled these payments could be utilized for other needs, and so it is able to increase the public sector productivity.

#### 4.3 TOGAF-ADM

In general, with an EA, an organization tries to portray explicitly the relationships among organizational goals, role of management, business processes, and information technology in structured documentations. This structure documentations include "current architecture" and "target architecture", involving rules, standards, and life cycles of information systems in order to optimize the way an organization achieves its goals [29]. In this regard, there are several commonly used EA frameworks, and the TOGAF ADM (*The Open Group Architecture Forum - Architecture Development Method*) is one of the most popular [30].

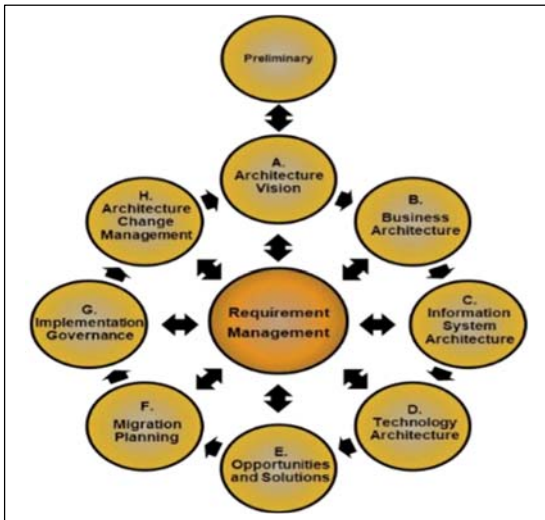


Figure 2: TOGAF-ADM Framework [30]

Figure 2 outlines the framework in the TOGAF ADM. As seen in Figure 2, the TOGAF ADM is a methodology consisting of several steps to develop and maintain the architecture of an organization. It forms an iterative cycle for the entire process, between and each phase so that at each iteration a new decision can be determined, to the extent of enterprise scope, level of detail, as well as the target time to be achieved. The TOGAF ADM also explains

the principles used as a measure to assess the success of the EA development.

As seen in Figure 2, the TOGAF-ADM Framework consists of a preliminary phase plus eight (8) architecture phases. This paper only focuses on designing business architecture because of the complexity of EA and the limited space available for the paper.

#### 4.4 Enterprise Architecture in Public Financial Management

The advancement of information technology has caused every sector to transform its operation. However, transformation is a very complex task, and EA has been regarded as a one of widely accepted tools to manage that complexity. It gives guidelines to align the common goals of the organization with the proposed end-state of business processes, data and applications as well as supporting technology infrastructures. It commonly also helps in managing the migration process from the old architectures to the new ones, including the complex change management processes. However, many implementations of enterprise architectures, including in public sector, are continuously facing huge amounts of problems so that many EA initiatives stop at the initial stages or fail to be completed as planned. Hence, continuous in-depth study in this area is still needed for better understanding of EA development and implementation [22], [23], [31]–[34].

This paper contributes to this study by designing the enterprise architecture in the area of public sector, especially in the state financial management. D. Dang and S. Pikola [34] mentioned various causes of the EA implementation failures. One of them is overemphasized on the IT perspectives so that they fail to capture the holistic view for the success of EA implementation. In addition, as it is still very limited integration of IFMIS with the current advancement of digital payment systems in many countries [4]–[13], there is also very limited study on EA in this area. Hence, this paper contributes to design the business process architectures in the areas of IFMIS and mass-digital payment system which so far haven't been studied intensively.

## 5. RESEARCH METHOD

### 5.1 Method of collecting data

#### 5.1.1. Observations and Literature Study

This paper did intensive observations and literature studies to define the business processes, applications and data and information technology

that is used today. It also studies the best practices of mass digital payments and shared service centers in private and government sectors, domestically and more specifically the various practices in developed countries. As well, the observations and literature studies are also carried out on laws and regulations that are currently in force or which must be replaced, improved or retained in the future.

### 5.1.2 Interview

Interviews were conducted with parties related to the government payment process, including the Directorate General of Treasury at the Ministry of Finance, banks, several e-commerce platforms and other policy-making officials. Those interviews were intended to deepen the analysis as well as to get their viewpoints on mass digital payments and shared service centers going forward, and their relation to technological developments as well as their impacts on the organization and HR management. There were series of discussions and overall all stakeholders agreed that it was very timely to radically change the current business processes by adopting the latest development in the mass-digital payment. Likewise, they had very high expectation that the EA will ensure the better successful of this state financial management transformation.

### 5.2 Framework of Analysis

The method of designing the shared service-mass digital payment business architecture for managing state finances uses the TOGAF-ADM framework. Therefore, the framework of analysis in this study also uses the stages in the TOGAF ADM, as in the Figure 3.

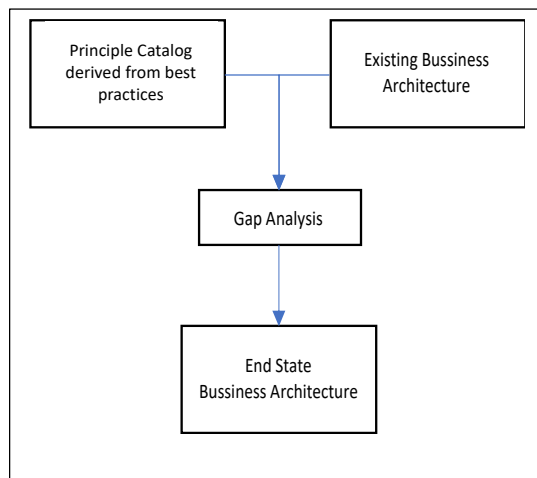


Figure 3: Framework of Analysis

In brief, as seen in the Figure 3, this paper will discuss various best practices related to IFMIS and mass payments, as well as the role of shared service centers in improving the efficiency of managing state finances. These good practices are included in the principle catalog as a reference for gap analysis with the existing business architecture. As seen in Figure 3, the results of the gap analysis become the reference for developing the end state business architecture.

## 6. DESIGNING THE ENTERPRISE ARCHITECTURE

Following the framework of analysis as outlined in Figure 3, this section will start by discussing the the principle catalog and continued by the existing business architectures (as-is) analysis. These two analyses become the basis for the gap analysis, comparing the as-is business architectures to the principle catalog. It results in the main prerequisites which must be adopted in the end-state business architectures. This section will end with the development of the proposed end-state business architecture of mass-digital payment in the Indonesia state financial management.

Moreover, following the EA process based on TOGAF-ADM, actually it was an iterative process among the business architectures, the IS architectures and the technology infrastructures. This process eventually derived the most optimum architectures for the mass-digital payments in the state financial management in Indonesia. It was actually a very intensive work, since it involved many stakeholders, to agree on the final business architectures, and finally to outline the business architectures in the Orbus Software.

### 6.1 Principle Catalog

At this stage, the principle catalog is created to provide guidelines for the design of the EA that will be developed. It is developed based on interview and literature review, gathering the best practices in the government and private payment systems, including their recent technological advancement. Table 1 is the architectural principles in a catalog form.

For example, as seen in Table 1, the EA must be based on the concept of a shared service center at the Ministry of Finance. This principle catalog is derived from the literature review—and was agreed by multiple stakeholders during the series of discussions—that there is a need to set up a shared service center, which integrates the similar business processes into one work unit serving to other work units. Obviously, it simplifies the payment system, and with the advancement of the information technology it is very possible to be implemented,

including for managing payment systems which require mass-digital payments.

Table 1: The Principle Catalog

1	Business Principles	Shared service for enhancing value for money
		Based on simplified business process
		Paper less
2	Data Principles	Encrypted data transfer
3	Application Principles	Security first
		Government Payment Platform
		Utilizing the existing Apps
4	Technology Principles	Utilizing the existing IT infrastructure & network
		API-Ministry of Finance Service Bus

card issuers and banking is now very common, ensuring paperless and contactless business processes architectures. However, the proposed information system must be guaranteed that the new business processes is secure. Hence, this principle catalog outlines that the data exchange must be encrypted with a certain standard, and all mass payments must be carried out through GPP digitally, with open APIs but secure to the designated institutions systems, both internal and external to the Ministry of Finance.

Furthermore, that the development of a shared service-mass digital payment employing the simplified business processes must put priority to utilize the existing IT infrastructures in order to enhance the benefit of the IFMIS investment. However, it opens the possibility to procure new technologies if the existing ones could not support the new EA. Hence, this EA is really expected to result in a better public financial management system architecture, ensuring more value for money of the government spending.

In addition, interoperability of data among government work units, shared service center, service providers, contractors, government purchase/credit

6.2 The Existing Business Architectures

Following the analysis during the development of this EA, the Microsoft Visio Software and the Orbus Software were intensively in use. Figure 4 is an

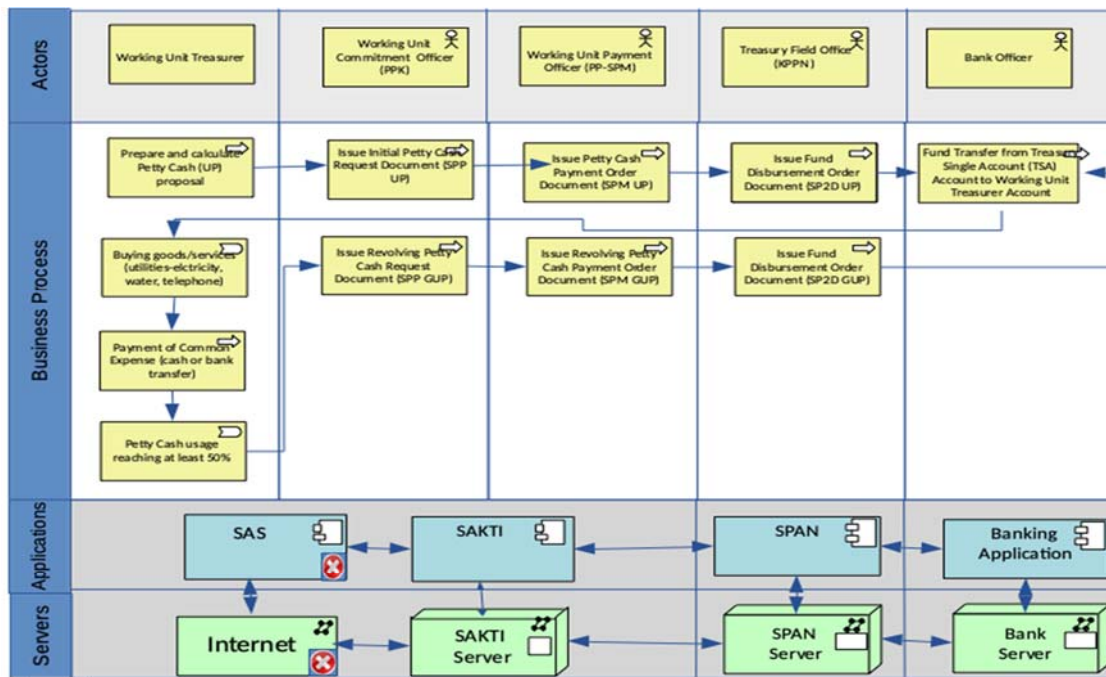


Figure 4: Mass Payment Using Petty Cash Fund (As-Is)

example of a simplified current business architecture of payment systems, which is developed using the Microsoft Visio Software and managed in the Orbus Software. More specifically, Figure 4 describes the high level of business process of paying bills that could be done on a mass payment basis, but currently is carried out individually by each work unit using their petty cash fund (*Uang Persediaan or UP*).

As seen in Figure 4, treasurers of work units can make payments directly for all electricity, telephone, water, or *KKP* bills using their *UP* mechanism. The treasurers pay bills individually every time, and if it is done through banking systems there is cost per transaction that must be paid by work unit treasurers.

Furthermore, if the funds in the work unit treasurer accounts are below the minimum balance limit (<50%), the work units can submit a request for additional funds to the State Treasury Offices (*Kantor Pelayanan Perbendaharaan Negara or KPPN*). In this case, the Commitment Officer (*Pejabat Pembuat Komitmen or PPK*) will make a Payment Request (*Surat Perintah Pembayaran or SPP*) to the Payment Officer (*Pejabat Pembuat-Surat Perintah Membayar or PP-SPM*), which will then be forwarded to the KPPN. For work units that have used *SAKTI* application, the delivery has been done electronically. For work units that have not used *SAKTI* application or older application called *SAS*, submissions of the database and *SPM* documents are carried out physically.

Furthermore, though it is not shown in Figure 4, currently millions of the *SSN* payments have been carried out through mass payments using the bank transfers or to the digital wallet specifically opened by the government on behalf of the end beneficiaries. These payments are based on manual orders from the work unit treasurers under a specific arrangement with the several state-owned banks. In addition, if there are application supporting the operations, those are distributed applications in each work unit so that they are less efficient, less standardized and no integration with other types of *SSN* operations. Moreover, those mass payments are made from a special intermediate account of the work units, which in term of fund revolving is similar to that of *UP* management as explained in Figure 4.

Furthermore, in accordance with the *TOGAF-ADM* framework, Figure 4 also describes the existing *IS* and supporting *IT* infrastructures for these business architectures. Although they are not in detail — because this paper only focuses on business architecture — Figure 4 provides an overview of linking the actors, the process businesses, the *IS* architectures and the technology architectures, including the *IS* and technology architectures that possibly will no longer be used in the future. This

becomes the basis for the next process which is the gap analysis.

### 6.3 The Gap Analysis

In accordance to the framework of analysis as explained in Figure 3 and in order to answer the first problem statement in this paper, the previous existing business architecture will be evaluated against the principle catalog. As outlined in Table 2, this is the gap analysis and it will result in various requirements that must be developed for the end-state business architecture of shared service-mass digital payment of the state financial management in Indonesia.

Table 2: The Gap Analysis

No	Principles	Prerequisites for the end state architecture	Gap Analysis
1	Business Principles	Shared service for enhancing value for money	Not exist currently
		Based on simplified business process	Require business process improvement for the end state business architecture
		Paper less	Require business process improvement for the end state business architecture
2	Data Principles	Encrypted data transfer	Require business process improvement for the end state data architecture
3	Application Principles	Security first	Require enhancement for the end state application architecture
		Government Payment Platform	Not exist currently
		Utilizing the existing Apps	Require enhancement for the end state application architecture
4	Technology Principles	Utilizing the existing IT infrastructure & network	Require enhancement for the end state business architecture
		API-Kemenkeu Service Bus	Kemenkeu Service Bus is not exist currently

As seen in Table 2, there are some gaps between the existing business architectures compared to the principle catalog. For example, the current business architecture executes the payments individually at each work unit, though they can be executed based on mass digital payment by the shared service center. As well, with the current advancement of information technology, there is possibility to implement paper less business process.

With this gap analysis, this paper formulate the minimum requirements that must be available at the end-state business architectures, including: (i) the development of shared service center, and (ii) the business process improvement in which this EA process is not only automating the current business process but it is also simplifying them to derive the full benefit of this EA process. In addition, as the end-state business architectures will mainly implement paperless process business, the adoption of the latest IT security management is unnegotiable.

Moreover, in line with the setting up of a shared service center, the business process and supporting IT which are similar in functions must be eliminated and integrated into the shared service center. Eventually, the GPP must be developed becoming the only interfaced tool to the external information systems. Table 2 shows some of those main prerequisites, which will become the basis of the end-state business architecture.

#### 6.4 The End-State Business Architecture

##### 6.4.1 The Solution Concept Diagram

In order to give a broader view of the EA process, Figure 5 shows a solution concept diagram illustrating high level relationships among business process, data, applications and information technology related to the architectures of proposed shared service-mass digital payment in Indonesia. In the business process group, there are four blocks, namely: (i) management of salary payments, (ii) management of common expense payments

(specifically for telephone, electricity and water bills), (iii) management of official travel payments; and (iv) management of SSN payments. These payment activities can be carried out by mass digital payments.

Furthermore, in the data group, there are blocks of data that are included in the shared service payment data. Those data includes data on SSN beneficiaries, human resources, finance, procurement, bill and invoice as well as purchase and credit card management. In this case, for example, the SSN beneficiary data contains detail information of more than 20 millions of families currently receiving the SSN from the government. They are the beneficiaries of various SSN, such as conditional cash transfer, unconditional cash transfer, non cash transfer, various subsidies, scholarship and other government assistances.

The human resources data stores the detail information of around 2.4 millions of government employees that are proposed to be paid centrally through the shared service center. The procurement data stores all information regarding the buying of all work unit across Indonesia in which the bills or invoices are assigned to the share service center to be paid collectively. It includes the procurement information of common services such as electricity, telephone and water. In addition, the goods and services information which are procured using purchase/credit card are also available which are also later collectively paid by the shared service center. Obviously, there are data on purchase/credit card

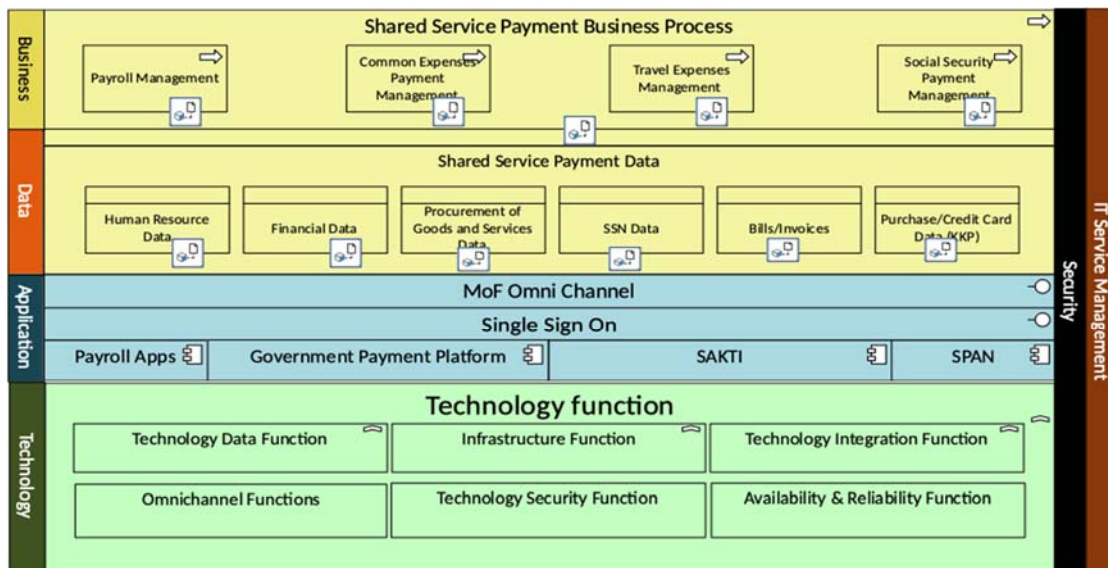


Figure 5: Solution Concept Diagram



owned all work units, bills and invoices as well as the finance information. All of these data are very essential for the shared service center to operate as expected.

Furthermore, in the application group there are at least four applications, including the payroll application, the GPP applications, SAKTI and SPAN. The cloud based payroll application will centrally process the salary payments, using the input from the human resources data and transferring the final payroll data to the GPP which is subsequently to be paid collectively by the shared service center, according to the proposed new business architectures.

This GPP applications functions very crucial in interfacing to information systems owned by external units, including the information systems of common service providers, e-commerce, bank and card issuers, and other contractors. For example, the consumption of electricity and their bills per electricity meters will be sent by the electricity companies to the shared service center through this GPP applications. The data will be stored in the shared service payment data, processed using the GPP applications and subsequently finalised by the shared service center through SAKTI and SPAN similar to other payment managements. Similar processes are implemented for SSN payments, purchase/credit card payments or other payments to contractors assigned to the shared service center.

As seen in Figure 5, there are many IT infrastructures supporting the functioning of business and IS architectures. Though Figure 5 does not explain them in detail, they are functioning to support the data management, various applications, integration tools, omni channel tools, security system and others, ensuring the availability and reliability of this mass-digital payment system. Hence, all of them collaborate to make this mass-digital payment function as planned.

#### 6.4.2 The End-State Business Process

Following the framework of analysis as mentioned in Figure 3, this sub-section discusses the end-state business process development. Figure 6 is a high-level example of an end-state business architecture for shared service-mass payments which are initially paid by work units using their KKP. The KKP payment processes start with the purchase of goods or services by the PPK work units after the KKP is active. In the current operation, the work units are allowed to have more than one KKP. With the proposed systems, all monthly KKP bills will be sent electronically from the card issuers to the work unit PPK through the GPP for each KKP bill. The work unit PPKs reconcile the purchase records with

the bills and subsequently they send the final bills to the shared service center electronically through the GPP.

Furthermore, as seen in Figure 6, the shared service center will finalize the payment collectively for all card bills from all work units across Indonesia. In this case, the shared service center PPK will issue payment request and--as part of check and balance--the shared service center PP-SPM will issue payment order to the KPPN after analyzing and approving the payment request from the shared service center PPK. Subsequently the KPPN will issues order of bank transfer from the treasury single account (TSA) to the end-beneficiary bank accounts.

Compare to the existing business architecture in Figure 4 in which the work unit treasurers pay individually by cash or bank transfer, the new business architectures are much simpler and efficient. It uses the KKP for purchasing goods or services. All bills and reconciliation processes are conducted electronically in the GPP. The payments are carryout through mass-digital payment by the shared service center, and by debiting only one bank account which is the treasury single account (TSA). As a result, millions of payment handlings which are previously done by each work unit per each bill are now become consolidated payments or mass-payments performed by the shared service center. It also shows that the new business architectures reduce the number of bank accounts and the floating fund in each treasurer bank account so that it is also very beneficial to the economic policy.

Furthermore, currently almost all procurements of goods and services admits credit cards or government purchase card including for travel costs, and hence those payment procedures can be consolidated into the shared service center. The common expenses still do not receive credit cards. However, as the data from the electricity, telephone and water providers could be sent to the GPP, the work unit PPKs could receive and reconcile the bills electronically through the GPP. They subsequently submit the final bills to the shared service center to be paid collectively.

The same procedures could be implemented for the salary payment in which the final payment data per employee is coming from the payroll database managed through the payroll application. In case of the SSN payments, the final payment data per end beneficiary is coming from the SSN database which is initially sent by the line ministries which are responsible for that types of SSNs. That final SSN payment data is received by the shared service center through the GPP.

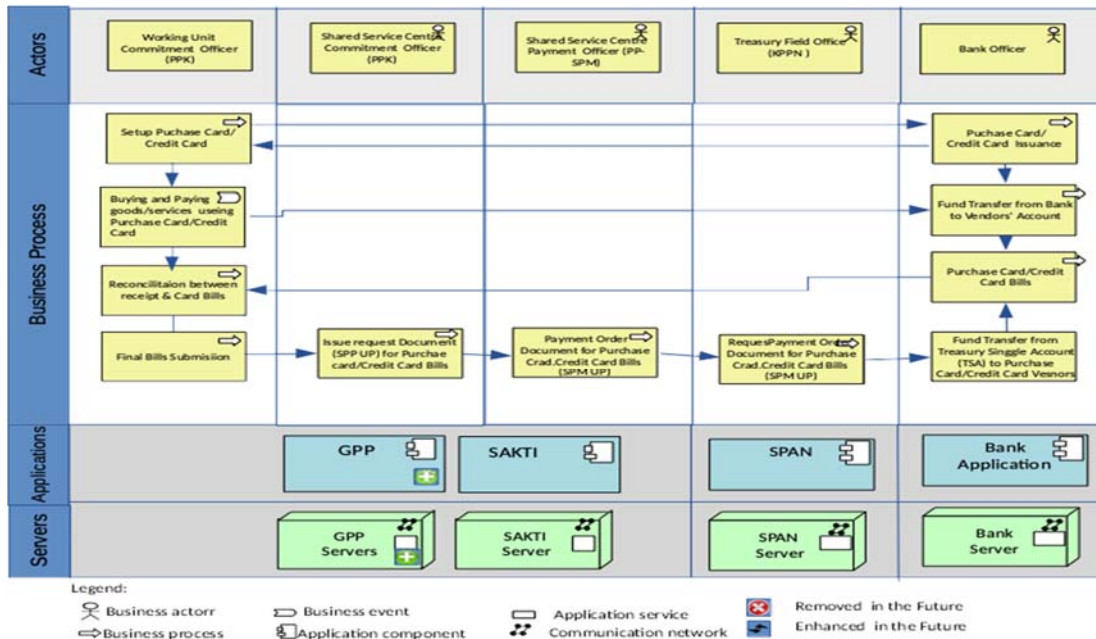


Figure 6: Mass Payment Using Government Purchased Card / Credit Card

Furthermore, the implementation of this new business architectures is in parallel to the currently roll-out of SAKTI applications to all work units. Hence, the SAS application is no longer available in Figure 6 and only the SAKTI as an integrated financial management application for all work units. Since the accounting processes of all those mass payment operations are still in each work unit, the final payment records will be posted to SAKTI by each work unit. Obviously, it is executed based on the designated accounting procedures, which is eventually reducing the budget allocation of each work unit.

Overall, the new business architectures are significantly simplifying the payment system in the state financial management. Following the TOGAF-ADM framework, these processes are done iteratively so that the IS architectures and the technology architectures are also developed simultaneously.

However, this paper still does not cover all phases from the framework of TOGAF-ADM. As mentioned in Figure 2, there are still remaining phases, including change management architecture as the last phase in the TOGAF-ADM. This usually becomes the hardest phase and so must be managed carefully in order to guaranty the smooth implementation of this new business architecture. However, since this paper only focuses on the

designing the business architecture, it does not cover all of the phases and could be important areas to be analysed in the near future.

## 7. CONCLUSION

This paper discusses the design of shared service-mass digital payments of state finances in Indonesia. The development of shared service-mass digital payment will increase the full benefits of the IFMIS investment. During the development of this end-state business process architectures, this paper conducts a gap analysis between the target business architectures--based on the principle catalog--with the existing business architectures. Some important principles catalog are the establishment of shared service center, the utilization of mass digital payments, the implementation of paper less business process and the enhancement of transaction security.

Furthermore, a solution concept diagram has also been prepared that illustrates the overall relationship among business architectures, data and application architectures and technology architectures. Some mass payments which are included in this paper are salary payments, KKP payments, official travel payments, common expenses payments and SSN payments.

This paper exemplifies one business architecture, which is the mass payments initially paid using KKP for procurements of goods and services including related to official travel costs. Billings from all work units are paid through shared service-mass digital payment, benefiting all work units which previously have to pay those bills individually to the card issuers. The selection of the KKP as an example also shows that the government can get the benefit of systems that have been provided by the private sector, and hence it could speed up the digital reform within the government.

Hence, this paper contributes to the initiatives of digital reforms within the government. It also adds to the on-going discussion on improving the efficiency and transparency of the government operation, especially by utilizing the commonly available technology advancement in the private and public sectors. This paper also adds the discussion on the EA development based on TOGAF-ADM which is still rare in the areas of state financial management.

Lastly, we have to acknowledge some limitations from this paper. One of those is this paper cannot describe thoroughly the architecture design processes according to the TOGAF-ADM. It is mostly caused by the complexity of enterprise architectures and the limited space of this paper. However, it is able to show that this enterprise architecture design could lead to multiple leverages of government information system investment and a better value for money. However, there are still ample of issues that must be researched in the future, especially within all the remaining phases of the TOGAF-ADM framework. This is very necessary to ensure that these new business architectures eventually can be implemented smoothly in the state financial management in Indonesia.

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