

Blueprint for Implementation of Intelligent System at Government Agencies

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Abstrak

Perkembangan teknologi informasi semakin canggih. Sistem cerdas adalah sistem komputer masa depan, terutama untuk instansi pemerintah dalam pengambilan keputusan. Persiapan yang mengarah ke sistem cerdas harus dilakukan mulai hari ini. Mulai dari Visi, Misi, tujuan dan kesiapan sumber daya yang disusun dalam sebuah cetak biru. Berbagai metodologi dapat digunakan untuk membuat cetak biru. Penelitian ini akan menggunakan Enterprise Architecture Planning (EAP). EAP dalam Enterprise Architecture adalah proses perencanaan mendefinisikan arsitektur untuk penggunaan informasi dalam mendukung bisnis dan rencana penerapannya. EAP memiliki pandangan bahwa misi dalam bisnis adalah pendorong utama. Yang didukung oleh data yang dibutuhkan untuk memenuhi misi, didukung oleh aplikasi yang dibangun menggunakan data, dan akhirnya tersedianya teknologi untuk mengimplementasikan aplikasi tersebut.

Kata kunci : teknologi informasi, sistem cerdas, EAP, cetakbiru

Abstract

The development of Information technology increasingly sophisticated. Intelligent System is the future of computer systems, especially for government agencies in decision-making. Preparation leading to the intelligent system must be done starting today. Starting from the vision, mission, goals and readiness of resources arranged in a blueprint. Various methodologies can be used to create a blueprint. The research will use Enterprise Architecture Planning (EAP). EAP in [Enterprise Architecture](#) is the [planning](#) process of defining [architectures](#) for the use of information in support of the business and the plan for implementing those architecture. EAP had a viewpoint that the business mission is the primary driver. That is followed by the data required to satisfy the mission, followed by the applications that are built using that data, and finally by the technology to implement the applications.

Keywords : information technology, intelligent system, EAP, blueprint

1. Introduction

The government agencies is staregis organization in determining the nation's development planning. Strategic policy of government agencies either the central government or the regions must be in harmony with the laws and regulations that exist.

Strategic policy-making of government agencies is often judged by the people as a step in the wrong, even considered to be insensitive to the needs and conditions of the people in general.

It is time for government agencies to consider the source of knowledge from the knowledge base of past for determine future policy. Information technology now makes it possible to build a knowledge base which is part of the Intelligent System

Government agencies can implement intelligent systems such as the field of budget management, economics, the field of transportation, communications, defense and others.

The initial step in applying intelligent systems are made the blueprint that could describe the needs of the data, applications and technologies that will be directed to the creation of Intelligent Systems.

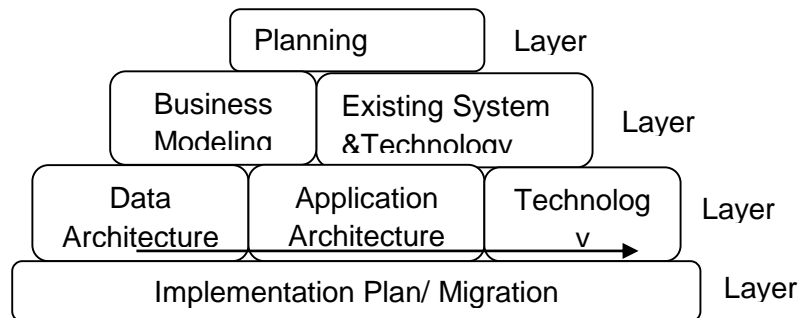
The title of this research is the "Blueprint for implementation of Intelligent Systems at Government Agencies" conducted through the stages of Enterprise Architecture Planning methodology.

Basically, the various approaches or frameworks can be used in making a blueprint, as will be discussed in this paper. This study describes the preparation of anything when the intelligent system will be built on an institutional government.

2. Research Method

2.1. Enterprise Architecture Planning

Enterprise Architecture Planning is a method of approach to planning-oriented data quality on business needs and how the implementation of the architecture. Components of the EAP methodology according Spewak using 2 lines on the basis of John Zachman framework, which is about the scope (planner) and business model (owner) [6].



Steven Spewak's Enterprise Architecture Planning (EAP) is a set of methods for planning the development of information, applications, and technology architectures, and for aligning the three types of architecture with respect to each other. Explanation of each layer EAP is the layer 1 (start), layer 2 (where / existing sys. & tech.), layer 3 (vision of where we want in the future), layer 4 (how we plan to achieve it).

2.2. Value Chains

To see the function of primary activities and functions supporting activities from organizations /institutions through a tool called value chains, as shown below :

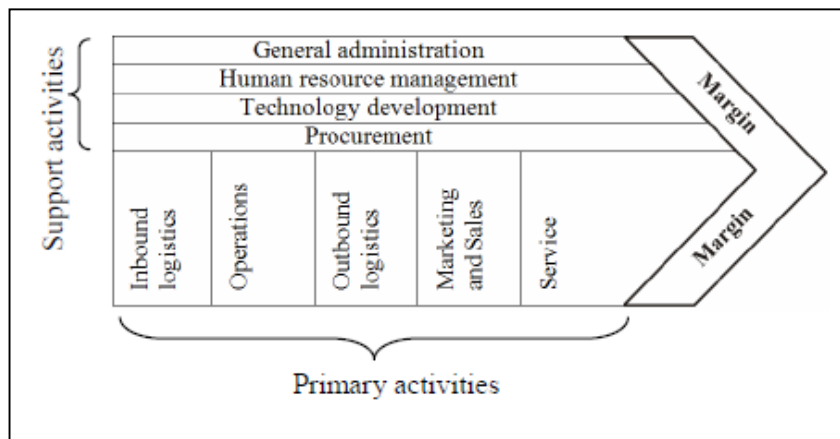


Figure 2.2 : Value Chains [5]

The goal of these activities is to offer the customer a level of value that exceeds the cost of the activities, thereby resulting in a profit margin. The primary value chain activities are:

- Inbound Logistics: the receiving and warehousing of raw materials, and their distribution to manufacturing as they are required.
- Operations: the processes of transforming inputs into finished products and services.
- Outbound Logistics: the warehousing and distribution of finished goods.
- Marketing & Sales: the identification of customer needs and the generation of sales.
- Service: the support of customers after the products and services are sold to them.

These primary activities are supported by:

- The infrastructure of the firm: organizational structure, control systems, company culture, etc.
- Human resource management: employee recruiting, hiring, training, development, and compensation.
- Technology development: technologies to support value-creating activities.
- Procurement: purchasing inputs such as materials, supplies, and equipment.

2.3. Business System Planning

Organization's business functions above will be described in more detail using the Four Stage Life Cycles (Business System Planning), which consists of requirements, acquisition, stewardship, and retirement [4].

2.4. Work System Framework

A work system is a system in which human participants and/or machines perform work using information, technology, and other resources to produce products and/or services for internal or external customers [3].

Work System Framework describes who the users of the system (customer), product and service system, business processes are carried out, parties involved (participant), information, technology.

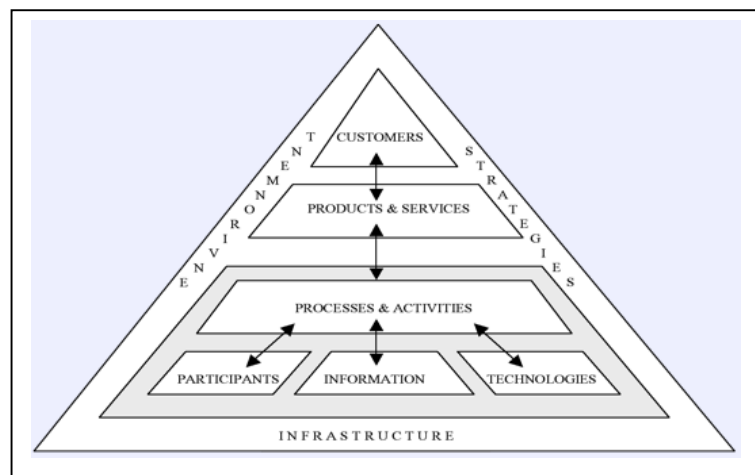


Figure 2.3 : Work System Framework [3]

An explanation of the Work System Framework:

1. Customers : are people who receive direct benefit from products and services the work system produces.
2. Product & Service : are the combination of physical things, information, and services that the work system produces.
3. Processes and activities : include everything that happens within the work system.
4. Participants : are people who perform the work.
5. Information : includes codified and non-codified information used and created as participants perform their work. Information may or may not be computerized.
6. Technologies : include tools (such as cell phones, projectors, spreadsheet software, and automobiles) and techniques (such as management by objectives, optimization, and remote tracking) that work system participants use while doing their work.
7. Infrastructure : includes human, informational, and technical resources that the work system relies on even though these resources exist and are managed outside of it and are shared with other work systems.
8. Environment : includes the organizational, cultural, competitive, technical, and regulatory environment within which the work system operates.

2.5. Business Process Modelling Notation

Based on the Work System Framework, then the next to describe the business process, using the Business Process Modeling Notation (BPMN). BPMN has a Business Process Diagram, where its application as well as the use of the flowchart that serves to create a graphical model of a business process. BPMN is a depiction of business processes swimlanes shaped, with the model construction pool and lane. Pool has a participant in the process, while the lane is a decomposition or sub-partition of the pool [8].

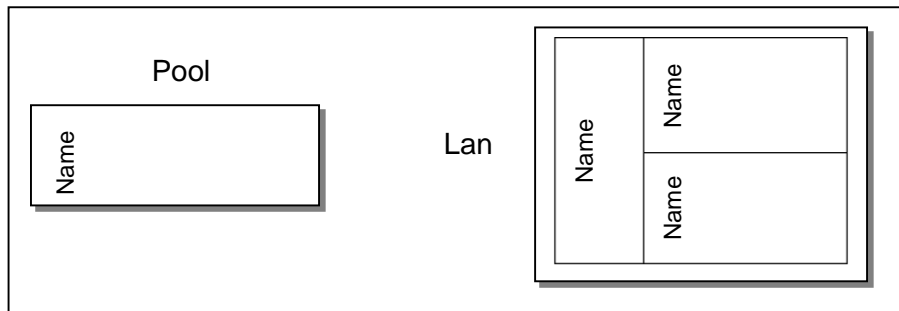


Figure 2.4 : Business Process Diagram Swimlanes Object [8]

2.6. Enterprise Architecture

Portfolio analysis application is used for clustering applications in the development of applications on the institution / organization [7].

3. Results and Analysis

3.1. Planning Initiation

Initiation of planning to do the elaboration of the definition of the organization, about the vision of the organization / government agency, then determine the scope of the EAP work should focus on function of primary activities and functions supporting activities of the application of intelligent systems. Next is to determine the target of the application of intelligent systems in which the related information technology and information systems that will be built as part of the organization's strategic business plan [6].

3.2. Business Modeling

When planning the implementation of Intelligent Systems assumed a chain, then after understanding the definition of the organization, then look in more detail than the function of primary activities and functions supporting activities through a tool called value chains, as shown below:

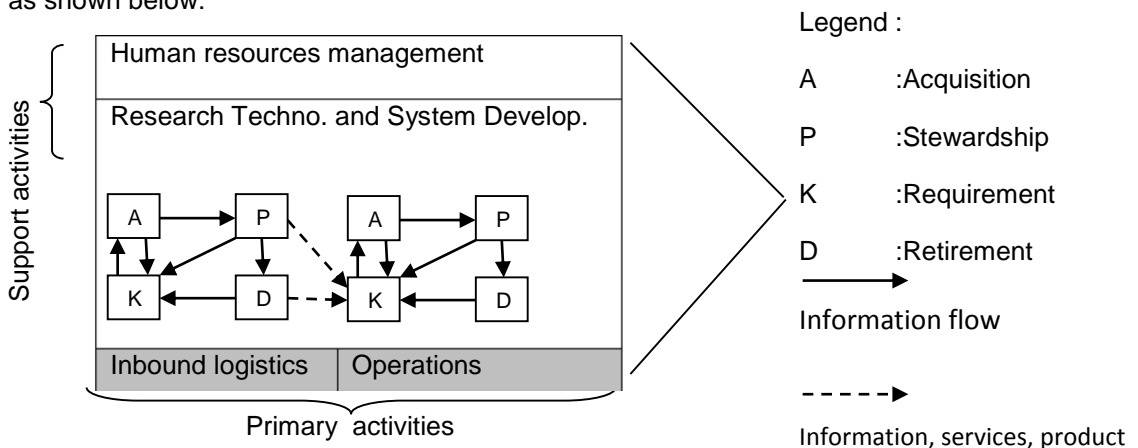


Figure 3.1 : Value Chains with Life Cycle Analysis at Government Agencies [1]

Based on the organization's business functions hereinafter described in more detail using the Four Stage Life Cycles (Business System Planning).

Table 3.1 : Four Stage Life Cycle for Primary Activities Function

Stage / Function	Requirement	Acquisition	Stewardship	Retirement
Data warehouse	Data warehouse strategic planning	<ul style="list-style-type: none"> Preparation of data (within and outside the organization) Preparation of Human Resources Preparation of procedure/ document 	<ul style="list-style-type: none"> Capture and data collection Prepare the data (transforming) Data storage (loading) Analysis of data 	Query & Reporting
Data mining	Data mining strategic planning	<ul style="list-style-type: none"> Preparation Human Resources Preparation of procedure/ document 	<ul style="list-style-type: none"> Predictive and classification modeling Link Analysis Database Segmentation Deviation Detection 	Table/file contains data analysis, can be accessed by query & reporting tools

Similarly, to support activities outlined in the Four Stage Life Cycle in detail as in the function of primary activities. Next connect between business functions (primary and support) with the organizational unit in the form of a matrix that looks who is fully responsible and act as decision makers, who are fully engaged in the function, and who was involved in the process

3.3. Current Systems & Technology

3.3.1. Data Architecture

a. Data Entity and Relationship Diagram Between Entities

Identify the entity is a fundamental step when going to build applications in a enterprise/organization. Each data entity is described through its relationship database modeling (ERD / Relational Model).

b. Matrix Process Associated with the Data Entity

Defining relations in the matrix of data entities represented by the symbol C (create), U (update), R (reference) [7]. The relationship in order to creation, processing, and use of data to meet the goals of business functions. Connectivity matrix is as shown as follows:

Entity	Ent1	Ent2	Ent3	Ent4	Ent5	Ent6	Ent7	Ent8	Ent9	Entn
Business Process										
Business Process 1										
Business Process 2										
Business Process 3										
Business Process 4										
Business Pro										

C(create),
U(update),
R(reference)

Figure 3.2 : Matrix of Business Processes to the data entities [9]

3.3.2. Application Architecture

a. List of Candidate Applications and Selection Applications

Candidate applications are prepared by running applications plus other proposals from the internal needs of the institution / organization and saw the development

of current technology. The existence of an application with the picture of the relationship between data entities first. This can be done using a matrix of entities from the previous step.

b. Impact Analysis

Analyzing the impact of the determination of new applications to legacy systems, the result is the establishment, use, modification, and even legacy systems replacement.

c. Application portfolio

To view the strategic alignment of business and business functions can be described through the application portfolio. Application portfolio planning a short-term, medium term, long term, as follows :

Strategic	High Potential
Critical applications for the future sustainability of the business strategy	Applications that may be important for future
The application is currently being used enterprise	Applications are valuable but not critical
Key Operational	Support

- Short-term and medium
Thinking about the needs of short-term investments (6-12 months), through an understanding of business strategy, determine the critical factors determining success, identification of critical business processes and activities, focusing on short term / medium term. Support systems and current technology to the business is to what extent, success criteria, value chain analysis, organizational relationships, the contribution of business from the current system.
- Long-term
Perform identification of potential future investments (1-3 years) include the potential impact of systems and technologies, potential risks and implementation of technology systems to changes in the structure and performance of the value chain. Evaluation of systems and technology choices as well as determine the most profitable.

3.3.3. Technology Architecture

At this stage of preparation to data, systems and infrastructure to do so that the effectiveness of an organization's business functions better. Storage and distribution of data / information into the main thing as a foothold in the preparation, grouping of data / information from a knowledge base that becomes an ingredient in the development of Intelligent Systems.

The next stage is to understand the system architecture and technology environment that is running in the organization of government through the tool Information Resources Catalog (IRC). IRC is a form of a table that contains descriptions of existing application programs, tables, user applications in an organizational unit. Similarly, the use of hardware and what software is used is also made in the form of tables. Preparation of tables of data collection will be used in describing the relationship applications with business functions, applications with the use of technology

From IRC mentioned above will be generated findings and observation, that whatever the factors associated with the use of information technology. These factors include technological obsolescence, redundancy utilization, redundancy provision of data and applications as well as frequency of use.

Further describing application support to business functions, applications of what already exists and what has not been any applications associated with the system being built. Applications that are described in the application schema (work system framework) steven alters. In this scheme there is a business process applications are illustrated with BPMN.

The design model describes the architecture of the system carried out by the data (candidate entities, the delineation of relationships between entities / ERD, validity testing), application architecture, technology architecture.

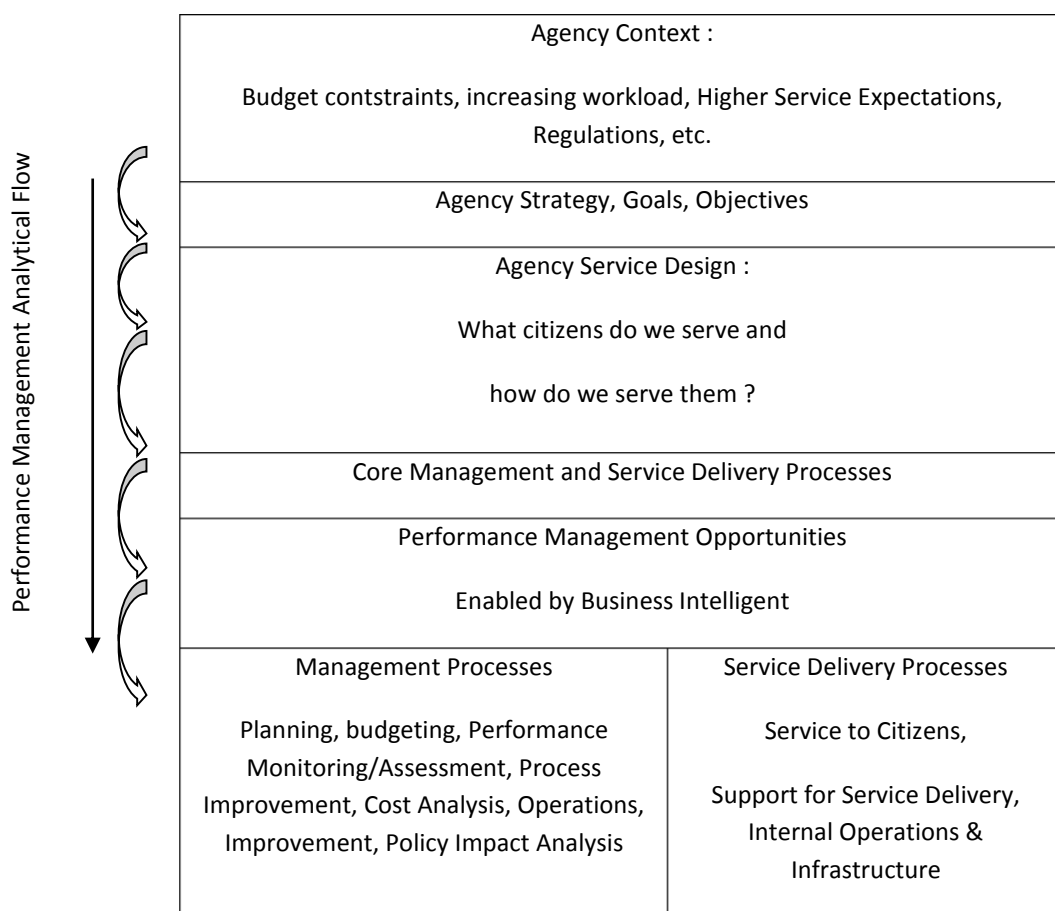


Figure 3.4: Performance-Centric Business Intelligence Implementation[10]

From the picture above can be explained that in developing Business Intelligence at a government institution should be based on the context of the organization concerned (condition, expectations), objectives, strategies will be used, and how to shape the services to be given to the public.. The existence of Business Intelligence will assist the organization in achieving the desired conditions, in the form of improved process management and service delivery process.

3.3.5. Implementation Plan

Implementation plan is a concrete step in the development of a series of steps. EAP methodology provides direction that the order be implemented by way of illustrating the application of a matrix. Through this matrix between applications and data that had been prepared much easier to understand. Matrix that describes the relationship between applications and data is simplified into a road map (roadmap) application development.

4. Conclusion

This study applied the EAP framework which produce proposals for the development of the application when the government agency will implement Intelligent System. In making this blueprint also involve other tools outside the EAP according to their respective functions, with the end result of Intelligent System application development roadmap.

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