

DESIGNING DATA AND INFORMATION ARCHITECTURE FOR ELECTRONIC-BASED GOVERNMENT SYSTEMS

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Abstract

The study is part of an issue of women's empowerment and child protection. It handles cases of violence against women and children. The objective is to develop data and information architecture and the domain of a government work unit (SKPD) for women's empowerment and child protection. This paper studies the implementation of a model of object-oriented design and analysis based on the business process. The structured thinking method has a great revelation and helps create the data and information architecture and domain.

Keywords: violence, women's empowerment, children protection, object-oriented design

I. INTRODUCTION

The development of Information Technology (IT) and Information Systems (IS) has overgrown in various fields of life. One of the areas affected by these changes is the application of smart cities in governance management in Indonesia to move towards a government system called the Electronic-Based Government System (SPBE). [1] It means that governments seek to enable the public, employers, and their government programs to better take advantage of the wealth of state data that can be fed into applications and services by ensuring that data is accessible and readable by systems automatically. Governance of the government system is included in one of the aspects of a smart city, namely smart government or E-government. [2] Today, various city administrations around the world are experimenting with emerging technologies, such as the Internet of Things (IoT), cloud computing, sensor networks, and artificial intelligence (AI) [3]. According to the government, the appropriate use of information and communication technology, especially the Internet, can increase citizens' satisfaction with the government. Similarly, better and more convenient services, more accessible and complete information, and

new and better communication channels can reduce information gaps and increase citizens' trust in the government. To implement an electronic-based government, the Indonesian government has challenges integrating planning, budgeting, procurement, and performance management services. SPBE evaluation is an effort the Indonesian government must achieve to improve the implementation of smart governance in Indonesia. [1] The index of evaluation is shown in Table I.

Table I. Evaluation index

NO	SCORE	PREDICATE
1	4,2 – 5,0	Excellent
2	3,5 – < 4,2	Very good
3	2,6 – < 3,5	Good
4	1,8 – < 2,6	Acceptable
5	< 1,8	Poor

Through presidential decree number 5 of 2018 concerning guidelines for evaluating electronic-based government systems, the government aims to increase the achievement index of the

national ranking of each region in Indonesia. This assessment instrument is used to measure the progress of implementing the Electronic-Based Government System in Central Agencies and Local Governments. Therefore, it is necessary to pay attention to Table 1 regarding the SPBE predicate index.

1.1. Electronic-Based Government System Development

In developing SPBE, including thinking about the business processes of each government work unit (SKPD).

Each government work unit must have gone through different processes to achieve business goals. It is the core of the entire business operation. For more details, let us understand what is meant by a business process. [4]

1. Main Process (Primary)

This process becomes the core of the company's operations related to the primary value stream in the business. There are three phases in this process including:

- Production
- Marketing
- Service to customers

By carrying out these three stages, a company has added value to the final offer and successfully delivered it to the customer. This means that business operations have been running according to plans and objectives.

2. Support Process (Secondary)

This process does not add value directly to the final product. However, this process focuses on preparing an environment that can support the primary functions effectively and efficiently. This support process ensures that the company's operations continue to run. It means that this process focuses on serving the internal company.

3. Process Management

In its implementation, the management process requires the involvement of supervision, planning, and monitoring.

This process will regulate all activities, management, and strategic management of the organization or company.

The Guidance for the integration of business processes, data, and public services is prepared for 5 years. Business process based on Permenpan RB no 11 of 2015. [6] Structuring business processes

1. Clean and accountable bureaucracy
2. Effective and efficient bureaucracy
3. Bureaucracy that has quality public services.

The effectiveness of regional apparatus organizations depends on the components of business processes. Vision, mission and objectives, business processes, organizational design, organizational structure, job analysis, job descriptions, job specifications. An OPD must have these business processes to be aligned and consistent. Development of Business Process

1. Development Stage
2. Implementation Stage

Development stage: input, probes, output. The process with BPMN business process model and notation. It is an international standard of open management. How to create a business process

1. Determine the initial and final conditions
2. Define steps and stages to achieve the final condition.
3. Identify needs and requirements
4. The first step starts from the first input condition

1.2. Data and Information Architecture

The database is an architecture that considers the following design principles. It facilitates the emergence of new services developed by Smart Cities governments, organizations, or citizens.

The Presidential Regulation No. 95 of 2018 concerning electronic-based government systems states that the data architecture domain requires data management, which is carried out through a series of processes for managing data architecture, master data, reference data, databases, and data quality. Designing data and information architecture reference and domain uses object-oriented analysis design.

Object-Oriented Analysis and Design.

Object-Oriented Design (OOD): An analysis model created using object-oriented analysis is transformed by object-oriented design into a design model that works as a plan for software creation [5]. OOD results in a design having several

different levels of modularity. The primary system components are partitioned into subsystems (a system-level “modular”), and data manipulation operations are encapsulated into objects (a modular form that is the building block of an OO system.). In addition, OOD must specify some data organization of attributes and a procedural description of each operation. Figure 1 shows a design pyramid for object-oriented systems. It has the following four layers. We focus on the Class and Object Design Layer

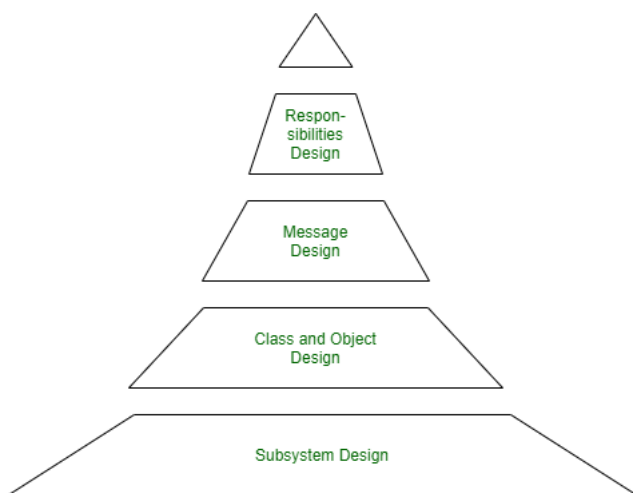


Figure 1. Layers of Object-Oriented systems

II. METHOD

The object of this research is part of an issue of women’s empowerment and child protection. The focus of the study is handling cases

of violence against women and children. First of all, we have to look at the business processes that exist in this case. Next, we determine the class, object, and attributes with OOD. The next step is creating the reference of data architecture based on a standard worksheet form.

III. DISCUSSION

3.1 Business Process

The business processes in this case are:
 Perform analysis or assessment
 Preparation of follow-up plans
 Carry out outreach and case handling
 Assist victims of violence
 Evaluate the results of handling
 Violence cases enter the legal process
 Legal process assistance
 Reporting the results of case assistance
 Report results
 Reconciliation of the parties
 Problem solved
 Report handling results.

3.2 Object-Oriented Design

Based on the business process above, the system can be defined. In the object-oriented diagram, it can be seen that there is one class, namely Case Handling, with its derivative objects, namely Victim, Type of violence, Complaints of violence, Violence Handling, and Counseling.

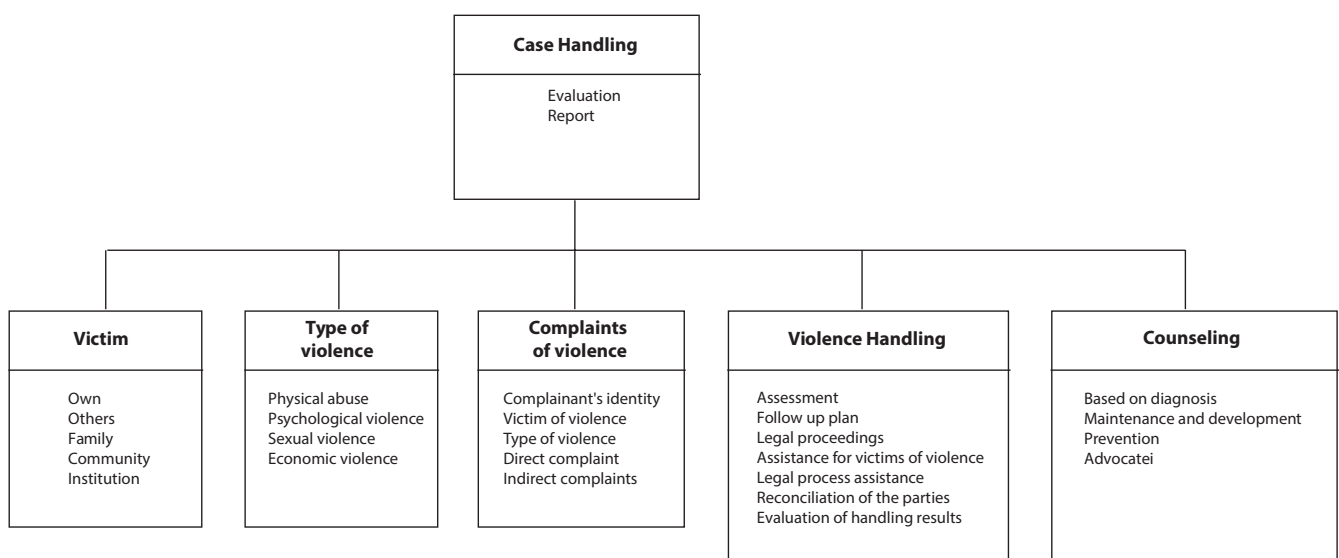


Figure 2 Object -Oriented Diagram

ID Data	Name of data	→ RAD Level 1 National (Dependency)	↑ RAD Level 2 (Dependency)	Suggestion RAD Level 3	Suggestion RAD Level 4
4					
5	BJMD-16.06	Case handling	RAD.04 Information on Social Protection and	RAD.04.03 Data on women's empowerment	RAD.04.03.06 Case handling
6	BJMD-16.06.01	Legal proceedings			RAD.04.03.06.01 Legal proceedings
7	BJMD-16.06.02	Accompaniment			RAD.04.03.06.02 Accompaniment
8	BJMD-16.06.05	Reconciliation of the parties			RAD.04.03.06.03 Reconciliation of the
9	BJMD-16.06.04	Evaluation of treatment results			RAD.04.03.06.04 Evaluation of treatment
10	BJMD-16.07	Counseling			RAD.04.03.07 Counseling
11	BJMD-16.07.01	Based on diagnosis			RAD.04.03.07.01 Based on diagnosis
12	BJMD-16.07.02	Maintenance and development			RAD.04.03.07.02 Maintenance and
13	BJMD-16.07.03	Prevention			RAD.04.03.07.03 Prevention
14	BJMD-16.07.04	Advocacy			RAD.04.03.07.04 Advocacy

Figure 2 Data reference architecture

The important object is Violence Handling with several attributes of data and information, i.e. Assessment, Follow up plan, Legal proceedings, Assistance for victims of violence, Legal process assistance, Reconciliation of the parties, and Evaluation of handling results. The object-oriented design is used to create architecture and domain, as shown in Figure 3.

IV. CONCLUSION

It made a data reference architecture using a form tool by creating an object-oriented two grams. With this diagram, avoid duplication of data. Making diagrams is done manually because it requires thinking and analyzing the data and its relationship to other data. In OOD theory, a process can be an object with several attributes.

REFERENCES

- [1] KemenpanRB, "Sistem Pemerintahan Berbasis Elektronik (SPBE)," KemenpanRB, 2020. <https://www.menpan.go.id/site/kelembagaan/sistem-pemerintahan-berbasis-elektronik-spbe-2%0A>.
- [2] I. Kunttu, "Developing smart city services by mobile application," Int. Soc. Prof. Innov. Manag., no. April 2019, pp. 1–8, 2019.
- [3] K. Harsha, P. Suchitra, and D. Reynolds, "IoT BASED POWER CONSUMPTION MONITORING AND CONTROLLING SYSTEM," Int. Res. J. Eng. Technol., vol. 5, no. 7, pp. 2211–2218, 2018.
- [4] R. J. McLeod, Management Information Systems. Englewood Cliffs: Prentice Hall, 2004.
- [5] J. Rumbaugh, Object-Oriented Modeling and Design. Englewood Cliffs: Prentice Hall, 1991.