Electronic Design of Indramayu Surveillance System (e-SIPENYU) Website-Based SMART Method

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Abstract. The Inspectorate is an internal government supervisory element led by the Inspector, responsible for fostering and supervising the implementation of government affairs which fall under regional authority. The evaluation is carried out by reviewing the assessment of the Integrity Zone Evaluation Worksheet and Bureaucratic Reform inputted by the Regional Work Unit or Work Unit in Indramayu Regency, which consists of 28 Regional Apparatus. The Inspectorate of Indramayu Regency has an important role in conducting examinations, supervision and control of the implementation of local government duties and functions, and ensuring that their implementation is in accordance with applicable laws and regulations. So an electronic-based system is needed that can assist the Indramayu Regency Inspectorate in supervising the Regional Work Unit and conducting independent assessments or evaluations effectively and efficiently. Website-Based E-SIPENYU with the SMART Method is a website-based electronic system that makes it easier for the Indramayu Regency Inspectorate to access information and recap the Integrity Zone Evaluation Worksheet and Bureaucratic Reform online. This research produces an electronic system design that assists the Indramayu Inspectorate in carrying out its self-evaluation supervisory function in the implementation of Bureaucratic Reform and the Integrity Zone Towards WBK within the Indramayu Regency Government.

1 Introduction

The Inspectorate is an element of internal government supervision led by the Inspector, the Inspectorate is responsible to the Regent through the Regional Secretary in fostering and supervising the implementation of government affairs that become regional authorities [1–3]. The work program of Indramayu Inspectorate consists of Performance Audit, Compliance Audit, Specific Purpose Audit, Village Audit, Review and Verification, Monitoring and Evaluation, Supervision Clinic, Saber Pungli [2] (Satuan Pemberantasan Pungutan Liar) dan Jum’at Berbagi (https://inspektorat.indramayukab.go.id/). In one of these work programs, the Inspectorate becomes an Internal Assessment Team at the Regional Government in the implementation of supervision to evaluate the implementation of Bureaucratic Reform (RB)

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and the evaluation of the Integrity Zone (ZI) towards a Free from Corruption Area (WBK) [4]. The evaluation is carried out by reviewing the assessment of the Integrity Zone Evaluation Worksheet (LKE) and the Bureaucratic Reform LKE inputted by the Regional Apparatus Work Units or Work Units in Indramayu Regency [5].

Based on the Regent Circular Number 060/09/Org of 2022 concerning the Shortening of the Nomenclature of Regional Devices within the Indramayu Regency Government consisting of 28 Regional Devices. And based on the Circular Letter of the Minister of State Apparatus Empowerment and Bureaucratic Reform Number 04 of 2023 concerning the proposal and evaluation of the 2023 Integrity Zone [6].

In terms of supervision, the Indramayu Inspectorate has an important role to inspect, supervise, and control the implementation of local government duties and functions, as well as ensure that the implementation of local government duties and functions is in accordance with applicable laws and standards. In this case, the Regional Apparatus Work Unit (SKPD) is tasked with conducting an independent assessment to the Indramayu Inspectorate [7]. However, in carrying out its duties, the Indramayu Inspectorate still experiences obstacles such as not optimal and efficient in recapping the Evaluation Worksheet (LKE) of the Integrity Zone (ZI) and the Evaluation Worksheet (LKE) of Bureaucratic Reform (RB) on regional devices because it still uses the Microsoft Excel application. To overcome this, a touch of technology is needed to be able to bridge related parties to speed up the evaluation process [8]. One of them is an electronic-based system that can assist the Indramayu Inspectorate in supervising the Regional Apparatus Work Unit (SKPD) and assist SKPD in conducting independent assessments or evaluations effectively and efficiently. Website-Based E-SIPENYU with SMART Method is a website-based electronic system that makes it easier for the Indramayu Inspectorate to access information and recap the Evaluation Worksheet (LKE) of the Integrity Zone (ZI) and the Evaluation Worksheet (LKE) of Bureaucratic Reform (RB) online.

2 Literature Review

2.1 Electronic System

Based on PP Number 71 of 2019, Electronic Systems are a series of electronic devices and procedures that function, prepare, collect, process, analyze, store, display, announce, transmit, and/or disseminate Electronic Information [9]. In addition, there is also the term Electronic System Operator of the Public Sphere, namely the implementation of Electronic Systems by State Organizing Agencies or institutions appointed by State Organizing Agencies [10]. In this case, the local government agency that implements the electronic system is the Indramayu Regency Inspectorate.

2.2 Information System

The system according to Ludwig von Bartalanfy is a set of elements that are intertwined in a relationship between these elements and the environment. While according to Anatol Raport, a system is a collection of unity and a device of relationships with each other and According to L. Ackof, a system is any conceptual or physical unity consisting of parts in a state of interdependence on each other. The system consists of three elements: input, process and output. The input is the driving or powering component on which the system is operated, while the output is the result of operation. In a simple sense, output means the goal, goal, or target operation of a system, while process is an activity that can transform inputs into outputs [11]. While information in other opinions is data that has been processed into a form that is
meaningful to users, which is useful in making current decisions or supporting information sources [12]. Information systems according to Laudon are components that are interconnected and work together to collect, process, store and disseminate information to support decision making, coordination, control and to provide an overview of activities within the company [13]. While information systems according to others are a series of formal procedures where data is collected, processed into information and distributed to users [14].

Laith and Bavis information system is a system within an organization that meets the needs of daily transaction processing, supports the operational, managerial and strategic activities of an organization and provides certain external parties with the necessary reports [12]. Furthermore, according to Cushing, the information generated comes from structured data processing, namely data that fulfills the functions of (a) Formal validity, which is that it has gone through the correct data creation and collection procedures, meaning that it is clearly authorized and juridically valid, and (b) Material validity in the sense that the data has represented a financial transaction that occurred and is correct [13].

Meanwhile, according to sources from information systems within the company sourced from data processing / processing tools are: [13]

1. Brain, human brain has two kinds of memory namely long-term memory and short-term memory,
2. Manual, manual processing tools are characterized by the use of pen and ink,
3. Mechanical, mechanical provides faster, neater and the same / standard processing results,
4. Electrical, and
5. Electronics, electronics provide speed and efficiency of processing

**2.3 Zone of Integrity (ZI)**

According to the Regulation of the Minister of State Apparatus Empowerment and Bureaucratic Reform Number 52 of 2014, the Integrity Zone (ZI) is a title given to government agencies where leaders and staff have a commitment to realize WBK/WBBM through bureaucratic reform, especially in terms of corruption prevention and improving the quality of public services [15]. Based on that the Integrity Zone hereinafter abbreviated as ZI is a government agency whose leaders and staff have committed to realizing a Free Area from Corruption/Clean and Serving Bureaucratic Area through bureaucratic reform, especially in terms of realizing clean and accountable government and excellent public services [16].

Free from Corruption Area, hereinafter abbreviated as WBK, is a title given to a work unit / work unit that has succeeded in implementing Bureaucratic Reform well, which has met most of the criteria for the improvement process in the levers component and realizing clean and accountable government and excellent public services [17]. Clean and Serving Bureaucratic Area, hereinafter abbreviated as WBBM, is a predicate given to a work unit / work unit that has succeeded in implementing Bureaucratic Reform very well, by fulfilling most of the criteria for the improvement process in the lever component to realize clean and accountable government and excellent public services. The guidelines for the development and evaluation of ZI development towards WBK and WBBM as intended have the following objectives: [18]

1. As a reference for government agencies and other stakeholders in building ZI Towards WBK and WBBM; and
2. as a reference for TPI to evaluate the development of ZI in work units / work units / areas;
3. as a reference for TPN to evaluate the work units/work units/areas proposed to obtain WBK and WBBM predicates;
4. ensure that TPI and TPN have the same understanding of the development process and evaluation of Zi development; and
5. ensure the quality of work units/work units/areas that will get the title Towards WBK and WBBM.

The construction of the Integrity Zone includes two components, namely levers and results. The leverage component is an aspect of internal governance of the work unit and the result component is how stakeholders feel the impact / result of changes that have been made in the leverage area. [19]

2.4 Bureaucratic Reform (RB)

According to him, Bureaucratic Reform is an effort to ensure the achievement of good governance through structuring, acceleration, and innovation in various areas [20]. Bureaucratic reform is defined as the process of transformation from certain conditions to desired conditions. Bureaucratic reform is an effort to improve the quality of the current bureaucratic conditions in order to demand improvements in public service performance. Bureaucratic reform is expected to solve the nation's problems, such as KKN cases, abuse of office and other cases that harm certain communities. The implementation of Bureaucratic Reform has been regulated in Presidential Regulation Number 81 of 2010 concerning the Grand Design of Bureaucratic Reform 2010-2025 [21].

3 Method

3.1 Research Stages

Research on the electronic design of a Website-Based Indramayu Surveillance System (e-SIPENYU) using the SMART method using Figma was carried out through several stages of the process which can be seen in Figure 1. Based on Figure 1 there are 3 important stages in the process of designing a website-based system which can be described as follows:
1. Problem Analysis: This stage is carried out through interview techniques to direct partners to explore information ranging from input, process to output.
2. Study of Literature: This process seeks several related journal references in support of research activities. Especially references to Bureaucratic Reform (RB) and Integrity Zones (ZI).
3. System Planning: Conducted to design Website-Based Electronic software Indramayu Surveillance System (e-SIPENYU) with 5 design processes, namely: (1) Flowchart; (2) Use Case Diagram; (3) Class Diagram; (4) Figma Interface Design.

![Flowchart
Use Case Diagram
Class Diagram
Figma Interface Design

Fig. 1. Stages of the research process
3.2 Simple Multi Attribute Rating Technique (SMART)

The research was conducted using quantitative methods, which is a study in which many numbers are used. Starting from the process of collecting data in a web-based system to its interpretation in the form of the best ranking of SKPD Indramayu Regency.

The ranking method uses a scientific algorithm, namely Simple Multi Attribute Rating Technique (SMART). This model is a multi-criteria decision-making method developed by Edward in 1977. SMART is a multi-criteria decision-making technique based on the theory that each alternative consists of a number of criteria that have values and each criterion has a weight that describes how important it is compared to other criteria [22]. This weighting is used to assess each alternative in order to obtain the best alternative [23].

SMART uses a linear additive model to predict the value of each alternative. SMART is a flexible decision-making method. SMART is more widely used because of the simplicity in responding to the needs of decision makers and the way they analyze responses. The analysis involved is transparent so that this method provides a high understanding of the problem and is acceptable to decision makers. The steps in the calculation of the SMART method are as follows: [24]

1. Define criteria and weighting. This stage is weighted for the criteria of integrity zones (ZI) and Bureaucratic Reform (RB) as follows:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEVERS</td>
<td>60,00</td>
</tr>
<tr>
<td>C1</td>
<td>8,00</td>
</tr>
<tr>
<td>C2</td>
<td>7,00</td>
</tr>
<tr>
<td>C3</td>
<td>10,00</td>
</tr>
<tr>
<td>C4</td>
<td>10,00</td>
</tr>
<tr>
<td>C5</td>
<td>15,00</td>
</tr>
<tr>
<td>C6</td>
<td>10,00</td>
</tr>
<tr>
<td>RESULT</td>
<td>40,00</td>
</tr>
<tr>
<td>C7</td>
<td>22,50</td>
</tr>
<tr>
<td>C8</td>
<td>17,50</td>
</tr>
</tbody>
</table>

Table 1. ZI Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEVERS</td>
<td>36,30</td>
</tr>
<tr>
<td>C1</td>
<td>5,00</td>
</tr>
<tr>
<td>C2</td>
<td>3,00</td>
</tr>
<tr>
<td>C3</td>
<td>3,50</td>
</tr>
<tr>
<td>C4</td>
<td>4,75</td>
</tr>
<tr>
<td>C5</td>
<td>3,40</td>
</tr>
<tr>
<td>C6</td>
<td>6,25</td>
</tr>
<tr>
<td>C7</td>
<td>4,15</td>
</tr>
<tr>
<td>C8</td>
<td>6,25</td>
</tr>
</tbody>
</table>

Table 2. RB Criteria

2. Normalize, with formulas [25]:

\[ N_j = \frac{W_j}{\sum W_j} \]  

Information:

\[ W_j = \text{Weight of a criterion} \]
\[ \sum W_j = \text{Number of Criteria Weights} \]

3. Provide criteria values for each alternative.
4. Calculate the value of each utility, with the formula:
   \[
   u_i(a_i) = \frac{(C_{out}-C_{min})}{(C_{max}-C_{min})}
   \] (2)
   \[ u_i(a_i) = \text{Utility value of the i-th criterion for C-I criteria} \]
   \[ C_{max} = \text{Maximum criteria value} \]
   \[ C_{min} = \text{Minimum criteria value} \]
   \[ C_{out} = \text{I-th criterion value} \]
5. Calculate the final grade. Final value calculation formula used with the formula [25,26]:
   \[ NA = u_i(a_i)w_j, i=1,2,\ldots,m \] (3)

Information:
\[ w_j = \text{Criterion weighting value to-j} \]
\[ u_i(a_i) = \text{the utility value of the i-th criterion for the i-th criterion} \]

The Regional Apparatus Work Unit (SKPD) inputs evaluation data, then the system will process the data according to the stages of the SMART method calculation process so as to obtain the output of the Integrity Zone (ZI) and Bureaucratic Reform (RB) ranking.

3.3 Requirements Analysis

At this stage, it is an effort to achieve direct resolution of problems that occur as an accurate fulfillment of needs by utilizing technology. For the Indramayu Inspectorate and the Regional Apparatus Work Unit (SKPD), this website will help improve effectiveness and efficiency in implementing Integrity Zone (ZI) Evaluation Worksheets (LKE) and Bureaucratic Reform (RB) Evaluation Worksheets (LKE). The hardware requirements include Processor Core 13 7Th Gen, RAM 12GB, Storage (SSD) 512 GB, Keyboard Compatible with Windows, and Mouse Compatible with Windows. The software requirements include OS Windows 10 (64bit), Programming language PHP, Software Processing used VSCode, XAMPP, Google Chrome, FireFox, Edge, Framework Laavel, and Database MySQL.

4 Results

4.1 Flowchart

The Admin Flowchart can be seen in Figure 2.
4.2 Use Case Diagram

Therefore, in planning e-SIPENYU, the use case diagram can be seen in Figure 3.
An overview or representation of the interaction that occurs between the system and the user of the e-SIPENYU. Provide information on software needs in accordance with parties involved in using an e-SIPENYU website. The first actor, of course, is the admin, in this case the agency is the Indramayu district Inspectorate has a core role with tasks ranging from managing master data, evaluation worksheets (LKE), be it ZI or RB, then managing audit schedules to the results of the SKPD evaluation process. The next actor is SKPD, which in this case is the agencies/agencies throughout Indramayu district. This SKPD is an audite that will be carried out an evaluation process until assessment by PPUPD. The last actor is the Supervisor of Local Government Affairs, hereinafter abbreviated as PPUPD, is a civil servant who is given full duties, responsibilities, authorities, and rights by officials authorized to carry out supervisory activities over the implementation of concurrent government affairs, in this case the LKE process in e-SIPENYU.

### 4.3 Class Diagram

Class diagram is a type of static structure diagram in UML that illustrates the structure of e-SIPENYU by connecting the class system, its attributes, methods, and relationships between objects. The e-SIPENYU class itself describes a group of objects that all have similar roles in the system as shown in Figure 4.

![Class Diagram](image)

**Fig. 4. Class Diagram**

### 4.4 Figma Interface Design

The tool used by e-SIPENYU in designing UI/UX designers that function to design the appearance of a website or application. Through Figma allows designers to create prototypes, an interactive mockup to evaluate the design of the product to be developed. By using Figma we can simulate websites ranging from the appearance to the data storage process that is interrelated with each other with the aim of reducing the error rate of the coding programming process in the future.

1. **Login Page Design**

The sign-in page is the part of the system or application used to authenticate users before they can access restricted features or content. On the login page, there are two options to log in, namely using E-mail or username along with password.
The "Forgot Password" page is a feature provided on a system or application to help users who forget or want to reset their password. On this page, there is a form that asks users to enter the E-mail address associated with their account.

2. Dashboard Page Design
The dashboard page is the main page in an application or website that presents conclusions and recaps from various menus or features in it. On the dashboard page, users can see concise and centralized information about status, performance, or other important data related to the application or website.

3. PPUPD TEAM Management Page Design
This page contains the management settings of the PPUPD team or supervisory team where there are two tabs available, namely, the regional tab which is to determine the name of the Irban area (Auxiliary Inspector), and to add which SKPD can be accessed by the region, the second tab is the PPUPD team tab which is to manage the team containing the name, email, NIP, rank/class, position, position in the team and related areas that have been added earlier.

4. Management Page of Regional Apparatus Work Unit (SKPD)
On this page, there is a menu to manage work units to be able to grant access rights to the SKPD to be able to conduct LKE self-assessments. In this case it consists of, email, username, image and available edit and delete features.
5. Lever Component Management Page

On this page there is component management, which consists of Lever and Result components, which in this feature only consists of 2 definite components and cannot be added, deleted, or change the component name, the edit feature is only available to change the description of the component.

6. Lever Component Area Aspect Page

On this page there is a feature to be able to add aspects of areas that are sustainable from the series of components, meaning that aspects of this area will be connected to the leverage component contained in the component menu.

7. Lever Component Area Page

This page has two tabbed areas with like type integrity zone (ZI) and Bureaucratic Reform (RB) which have the area name, aspect area of the leverage component and description.

Figure 13 provides the function of filling in data for sub-areas of the area that has been registered.
8. **Lever Component Questions Page**
On this page there are various questions from the sub-area that we added earlier. The question table has columns of sub area name, answer choice, question, answer/question type columns.

![Fig. 14. Lever Component Questions Page](image1)

![Fig. 15. Results Component Area Aspect Page](image2)

In Figure 15. There is an aspect area for the result component with columns similar to the aspect area of the leverage component.

9. **Result Component Question Page**
On this page there is a table of result component questions. For the column presented the same as in the lever component.

![Fig. 16. Result Component Question Page](image3)

10. **Fulfillment Area Aspect Page**
On this page there is an area of the aspect area of the leverage component along with the values obtained from the filling results.

![Fig. 17. Fulfillment Area Aspect Page](image4)

11. **Sub Area Page**
On this page, there is a sub area page of the pre-selected area to display what sub areas are presented from the area and leverage components.

![Fig. 18. Sub Area Page](image5)
5 Conclusion

The design of e-SIPENYU has 3 important stages, namely the first problem analysis, namely interviews with the Indramayu Regency Inspectorate to explore information ranging from the business process of auditing ZI and RB. The second study of literature is that researchers are looking for several regulatory references and related journals that support research activities, especially on Bureaucratic Reform (RB) and Integrity Zones (ZI). The three planning systems are the core of research to design website-based electronic software Indramayu surveillance system (e-SIPENYU) with 4 design processes, namely: (1) Flowchart; (2) Use Case Diagram; (3) Class Diagram; (4) Figma Interface Design. Through this design, a database administrator and programmer is able to understand what must be done for the development process. Design can also reduce the level of errors made by developers with the aim of none other than increasing project profits generated by the company.

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