



Development of e-SPM to Enhance Performance of Educational Service and Public Transparency in IAIN Syekh Nurjati Cirebon

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Abstract: In an effort to realize the objectives of IAIN Syekh Nurjati Cirebon, there is a need for a reference in the form of minimum service standards (SPM) that encompass general criteria in the implementation of education. These SPM aim to enhance the performance of educational services, promote public transparency and accountability. In line with the BLU legal mandate, government educational institutions are required to be efficient and effective in providing services, with a focus on the professionalism of human resources. The formulation of SPM at IAIN Syekh Nurjati Cirebon considers principles of simplicity, concreteness, measurability, openness, affordability, and accountability. The SPM covers services related to education, research, community service, administration, digital transformation, halal center, and business development. The development of the e-SPM have to improved performance in the management of SPM documents in IAIN Syekh Nurjati Cirebon.

Keywords: System Development; Waterfall Model; Minimum Services Standards.

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INTRODUCTION

To realize the goals of IAIN Syekh Nurjati Cirebon, it is necessary to have a reference that includes general criteria from various aspects related to the implementation of education in institution area. This reference serves as a standard aimed to improve performance in providing quality education services. Additionally, it is intended as a tool to promote transparency and public accountability in services administration. These references, criteria, or standards are formulated in the form of SPM (Minimum Services Standards) at IAIN Syekh Nurjati Cirebon.

Furthermore, government educational institutions, as mandated by the law regarding BLU (Public Service Agency), are non-profit institutions that provide efficient and effective services. This means that inefficient and ineffective management practices must be abandoned, focusing instead on the professionalism of human resources. Since the issuance of Government Law No. 23 of 2005, which governs BLU financial management, there has been an obsession with improving the management of educational institutions in accordance with regulations and requirements. Educational institutions which recognized as PK-BLU must meet the requirement of having SPM in place. IAIN Syekh Nurjati Cirebon is one of educational institutions that have been recognized as PK-BLU.

The implementation of SPM must ensure public access to basic services from service providers according to the standards set by the government. In this regard, community participation is needed to improve service quality so that institutions can meet SPM and enhance services in the future.

The preparation of SPM takes into account several important principles, namely simplicity, concreteness, measurability, openness, affordability, and accountability, as well as having a time frame for achievement. Additionally, SPM considers service principles as stipulated in the Regulation of the Minister of State Apparatus Utilization and Bureaucratic Reform No. 14 of 2017 on Guidelines for Preparing Public Service Provider Satisfaction Surveys, which have been developed into nine relevant, valid, and reliable elements as the minimum criteria for measuring the public satisfaction index.

The educational SPM is expected to serve as a guideline for managing the BLU at IAIN Syekh Nurjati Cirebon, both academically and administratively. The standard operating procedures, which are fundamental guidelines for daily activities, will be implemented by all staff at IAIN Syekh Nurjati Cirebon. Furthermore, the SPM will also be the basis of formulating the Strategic Business Plan of IAIN Syekh Nurjati Cirebon. Therefore, this SPM covers services related to education, research, community service, administrative services, digital transformation, the halal center, and business development.

Considering all the provisions related to the SPM of IAIN Syekh Nurjati Cirebon, it is necessary to improve performance in the preparation and management of SPM documents at IAIN Syekh Nurjati Cirebon by using e-SPM.

RELATED WORK

In recent years, there have been notable developments in web-based systems for Minimum Service Standards (SPM) reporting across various sectors, which are pertinent to the enhancement of educational services and public transparency, as explored in this study.

[1] presented a study on the quality of a web-based Minimum Service Standards reporting system in radiology installations, emphasizing its potential impact on healthcare management and service delivery. The development of emergency Minimum Service Standards reporting systems was explored by [2] highlighting the application of web-based platforms to improve emergency response services. [3] investigated a Geographic Information System (GIS) for monitoring Minimum Service Standards indicators in community health centers, demonstrating the integration of geographical data in service assessment. The analysis of Minimum Service Standards in outpatient care at RSUD Kota Semarang by [4] provides insights into early implementations and challenges faced in the healthcare sector.

The waterfall method, a linear and sequential approach to software development, has been widely adopted in various projects due to its structured nature. [5] implemented the waterfall method in designing a website-based information system for Cibadak Village, demonstrating its effectiveness in handling well-defined project requirements and ensuring systematic progress through distinct phases. [6] also employed the waterfall method in designing a web-based career system using the Laravel framework, highlighting the method's suitability for projects with clear objectives and stable requirements.

Laravel, a popular PHP framework known for its elegant syntax and powerful features, has been extensively used in developing robust web applications. [7] designed an information system for research permit applications using the Laravel framework, leveraging its built-in tools and libraries to enhance development efficiency and application performance. The study by [8] on developing web-based health information service systems further illustrates the versatility of the Laravel framework in

creating scalable and maintainable web applications. This work underscores the framework's capabilities in handling complex data management and user interactions.

These studies collectively underscore the evolution and diversification of research in Minimum Service Standards implementation in several areas, providing a comprehensive backdrop for the development and implementation of e-SPM at IAIN Syekh Nurjati Cirebon.

METHODS

The e-SPM system is being developed using Laravel as web application framework and follows waterfall model as system development method. The waterfall model contains several stages, start from requirement analysis, design, development or implementation, testing, operation and maintenance [9], [10], [11], [12], [13]. The waterfall method for developing the e-SPM system follows a sequential approach where each phase must be completed before moving on to the next phase. The development stages in waterfall model shown in Figure 1,

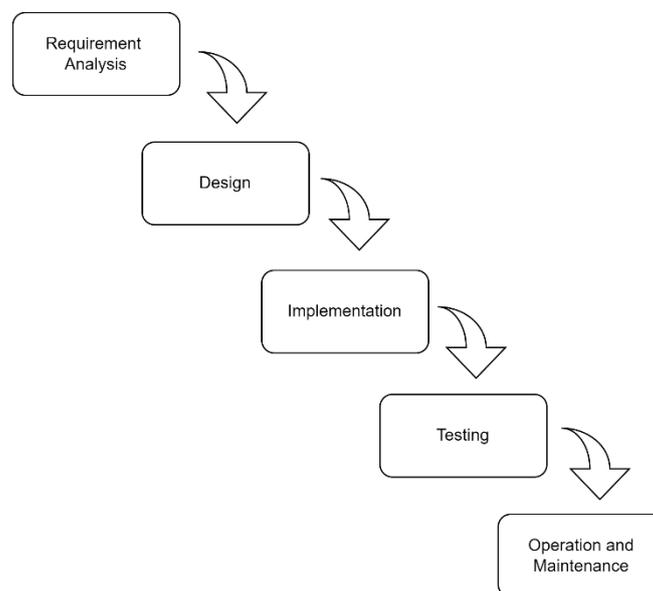


Figure 1. Waterfall Model

The waterfall method begins with requirements analysis, this stage aims to analyze user needs and system functionalities such as data management, reporting, and user interaction. Once requirements are defined, the system design phase started, where system architecture, database structure, and user interface layouts are planned. Following design approval, development begins, with each component of the e-SPM system constructed according to the specified requirements and design.

After development, testing is conducted to ensure all functionalities work as intended and meet users standards. Once testing is complete and the system meets acceptance criteria, it is implemented or deployed for operational use. Post-deployment, maintenance and support activities are undertaken to address user feedback, update features, and ensure system reliability and performance.

RESULT AND DISCUSSION

The E-SPM is developed through several stages. Here are the stages of developing the E-SPM: collecting system support data, analyzing system requirements, implementing the design, and testing the system.

These stages are carried out sequentially, starting from the first stage, which is the process of collecting system support data, to the final stage, which is system testing. Each stage has different processes and is continuous to be processed in the next stage.

1. Data Collection

In this stage, documents or supporting references that contain the elements for compiling the Minimum Service Standards at IAIN Syekh Nurjati Cirebon are collected. One of the key documents serving as a reference for the development of E-SPM is the law of Minister of Religious Affairs No. 771 of 2022 concerning Minimum Service Standards at IAIN Syekh Nurjati Cirebon.

2. System Requirements Analysis

After the data and references have been collected, the next stage is to perform a system requirements analysis. In this stage, an analysis is conducted to identify the important data to be included in the application. This includes the data listed in the SPM table and other data related to SPM management, such as system user data. For the SPM data table, several key data units were identified to be included in the E-SPM, including SPM services, parameters, indicators, operational definitions, units, baseline, and target values. The essential data related to SPM have been obtained through analysis.

3. System Design

After conducting the system requirements analysis, the next step is system design. This stage involves creating the design based on the results of the previous analysis. Four design processes are carried out in this stage: designing the application user roles, designing the system database, designing the application user interface, and designing the SPM table layout to be displayed in the e-SPM.

Firstly, the design of application user roles is established to define criteria and responsibilities for each user type. There are two primary user types: superadmin and administrators. Superadmin serve as the main managers of the E-SPM, responsible for configuring master data that forms the basis of the SPM table, such as unit data, service types, parameters, indicators, operational definitions, baseline values, and target values for SPM. Superadmins also validate the actual SPM values input by administrators and manage application users, including registration, password changes, and user data deletion. Secondly, system database design ensures efficient storage and quick access to all necessary data. A well-designed database supports the optimal operation of the e-SPM. Thirdly, user interface design focuses on creating an intuitive application interface, enabling users to efficiently perform tasks. Each of these design processes is crucial to ensure the E-SPM is functional, user-friendly, and meets the identified system requirements effectively. The details of users role and privileges will be explained in use case diagram shown at Figure 1.

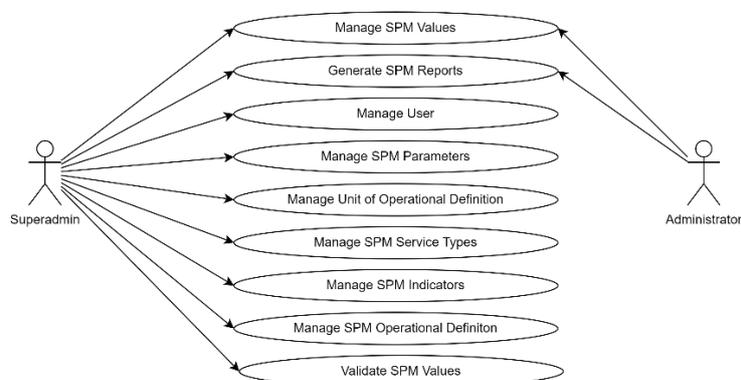


Figure 2: Use Case Diagram

After determining user roles and access rights, the next stage is database design. This process is to identify essential data that needs to be stored and managed by the e-SPM. Once the data elements are identified, relationships between them are established. Establishing these data relationships is crucial to ensure effective data management within the application. The relationships between data in the e-SPM can be visualized in the form of Entity Relationship Diagram shown in Figure 2.

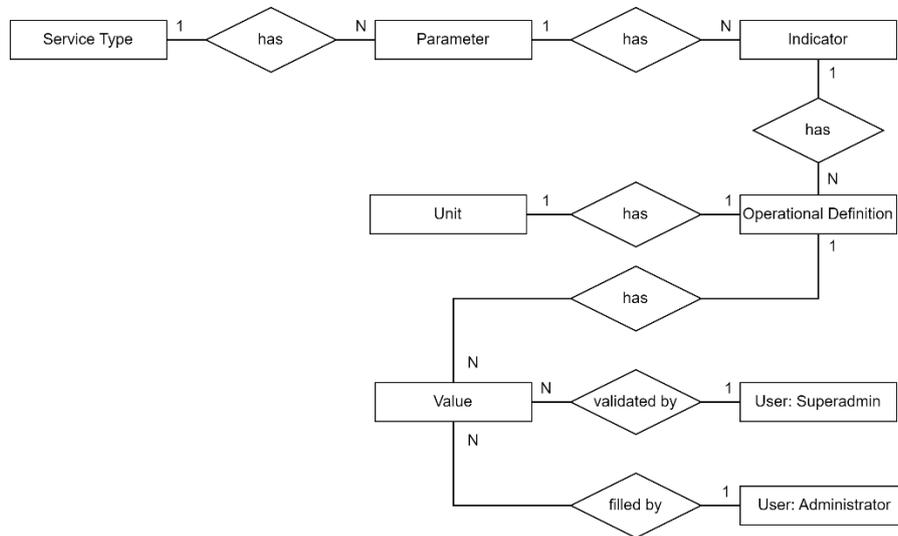


Figure 3: Entity Relationship Diagram

After designing the ERD for database relationships, the next step is designing the interface for the E-SPM. The interface design consists of three main interfaces: (1) Login page interface; (2) Main page interface; and (3) Master data management page interface.

4. Implementation

After completing the design phase, the next step is to implement the design into the e-SPM. The implementation phase begins with applying the database design. The database used for developing the e-SPM is MariaDB, and the conceptual database design previously developed is then applied to MariaDB. The implementation of the database design into MariaDB can be seen in Figure 3.

Name ^	Rows	Size	Created	Updated	Engine	Comment	Type
definisi_operas...	277	112.0 KiB	2022-03-23 11:05:...		InnoDB		Table
failed_jobs	0	16.0 KiB	2022-03-15 12:56:...		InnoDB		Table
fakultas	3	16.0 KiB	2022-03-16 10:28:...		InnoDB		Table
indikator	278	80.0 KiB	2022-03-24 11:59:...		InnoDB		Table
jenis_pelayanan	8	32.0 KiB	2022-03-16 11:04:...		InnoDB		Table
migrations	10	16.0 KiB	2022-03-15 12:56:...		InnoDB		Table
nilai	504	64.0 KiB	2022-03-31 15:31:...		InnoDB		Table
nilai2	1,788	208.0 KiB	2022-05-30 15:22:...		InnoDB		Table
npt	0	48.0 KiB	2022-03-16 10:28:...		InnoDB		Table
npt_data	2	16.0 KiB	2022-03-15 12:56:...		InnoDB		Table
parameter	46	32.0 KiB	2022-03-16 10:28:...		InnoDB		Table
program_studi	3	32.0 KiB	2022-03-17 08:48:...		InnoDB		Table
satuan	9	16.0 KiB	2022-03-16 11:14:...		InnoDB		Table
satuanv2	18	16.0 KiB	2022-03-21 08:31:...		InnoDB		Table
surat	0	16.0 KiB	2022-04-08 10:42:...		InnoDB		Table
users	2	48.0 KiB	2022-04-06 09:52:...		InnoDB		Table

Figure 4: Implementation of database design

After creating the database, the next step is to create routes. These routes serve to define endpoints on the server side with specific functionalities or purposes. Once the routes are implemented, the next step is to develop the user interface according to the application's interface design. The implementation includes three types: the login page, the main page, and the master data

management page. The interface design is implemented using the Bootstrap Framework SB Admin 2. For the implementation of the login page design, refer to Figure 4.

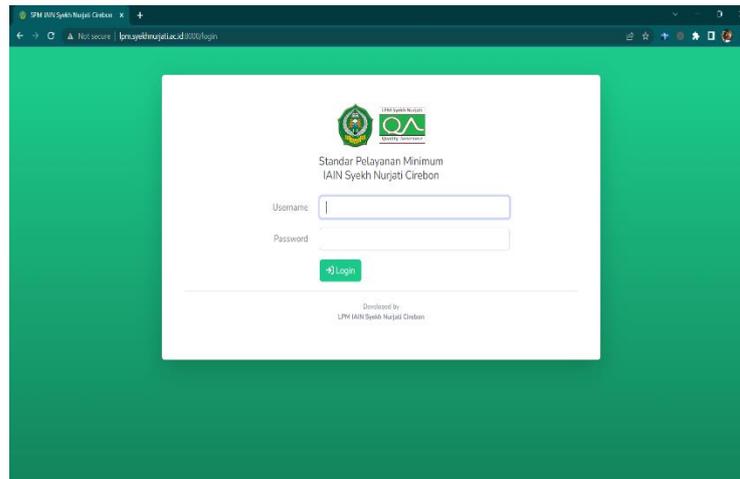


Figure 5: Login Page

Next is the implementation of the main page interface design. On this page, there is an SPM table used to view all SPM data for each year. Additionally, this page includes a button to print SPM data as a PDF report. You can view the appearance of the main page in Figure 5.

NO	INDIKATOR	DEFINISI OPERASIONAL	SATUAN	STANDAR	TARGET				REALISASI		
					2021	2022	2023	2024			
1	3	4	5	6	7	8	9	10	11	12	13
A. Pendidikan											
1	1. Standar Kompetensi lulusan	1. Indikator/Indikator Pelaksanaan yang ditargetkan	Program Studi (S1)	Rata-rata	3,1	3,1	4,1	4,1	5,1	5,1	4,1
			Program Studi (S2)	persentase Diakses	3,1	2,1	2,1	2,1	2,1	2,1	3,1
			Program Studi (S3)		2,1	2,1	2,1	2,1	2,1	2,1	2,1
2	2. Indikator/Indikator Baru	2. Indikator/Indikator Baru		Rata-rata	1.000	1.000	1.000	1.000	1.000	2.000	-
				Program Studi (S1)							
				Program Studi (S2)							
				Program Studi (S3)							
3	3. Indikator/Indikator Baru	3. Indikator/Indikator Baru		Rata-rata	30	30	30	30	30	30	-
				Program Studi (S1)							
				Program Studi (S2)							
				Program Studi (S3)							
4	4. Indikator/Indikator Baru	4. Indikator/Indikator Baru		Rata-rata	40	40	40	40	40	40	-
				Program Studi (S1)							
				Program Studi (S2)							
				Program Studi (S3)							
5	5. Indikator/Indikator Baru	5. Indikator/Indikator Baru		Rata-rata	30	30	30	30	30	30	-
				Program Studi (S1)							
				Program Studi (S2)							
				Program Studi (S3)							

Figure 6: Main Page

The main page interface design is not only implemented on the main page but also used for the SPM data management page and the SPM validation page because its layout still meets the needs of these pages. You can view the appearance of the data management page in Figure 6, and for the validation page, refer to Figure 7.

NO	JENIS PELAYANAN DAN KOMPOSISI	INDIKATOR	DEFINISI OPERASIONAL	SATUAN	STANDAR	BASELINE TAHUN 2021	TAHUN 2022	TAHUN 2023	TARGET TAHUN 2024	TAHUN 2025	TAHUN 2026	REALISASI TAHUN 2022
1	Pendidikan	a. Pembelajaran terhadap mahasiswa yang diterima	Program Studi S1 Program Studi S2 Program Studi S3	Terdapat Mahasiswa	9,1	9,1	4,1	4,5,1	5,1	5,1	5,1	4,1
		b. Monevoneering yang baru terhadap total mahasiswa	Pertandingan jumlah mahasiswa yang terdapat total jumlah mahasiswa	Salah satu Mahasiswa Baru	1.000	1.000	1.000	1.000	1.000	2.000	2.000	2,1
		c. Penertarikan mahasiswa baru	Penertarikan mahasiswa baru program sarjana S-1 melalui jalur SPN	Person	30	30	30	30	30	30	30	1,1
		d. Penertarikan mahasiswa baru	Penertarikan mahasiswa baru program sarjana S-1 melalui jalur UMPTKIN	Person	40	40	40	40	40	40	40	1,1
		e. Penertarikan mahasiswa baru	Penertarikan mahasiswa baru program sarjana S-1 melalui jalur MANEBER	Person	30	30	30	30	30	30	30	1,1
		f. Indeks prestasi rata-rata	Nilai rata-rata IPK bagi lulusan sarjana S-1	Skor	3,25	3,2	3,25	3,25	3,40	3,45	3,5	1,1
		g. Masa studi mahasiswa	Durasi waktu tempuh studi	Person	60	75	85	86	87	88	90	1,1

Figure 7: Data Management Page

Figure 8: Data Validation Page

On the Service Types Management page, the main table displays a list of service types registered in the E-SPM database. It includes columns for alphanumeric codes, service types, and a menu for managing unit data. The management options available on the Service Types Management page include buttons for adding new service types, editing existing ones, and deleting service types. The appearance of the Service Types Management page shown in Figure 8.

#	Kode Huruf	Jenis Pelayanan	Aksi
1	A	Pendidikan	[Add] [Edit] [Delete]
2	B	Penelitian	[Add] [Edit] [Delete]
3	C	Pengabdian Kepada Masyarakat (PKM)	[Add] [Edit] [Delete]
4	D	Layanan Administrasi	[Add] [Edit] [Delete]
5	E	Moderasi Beragama	[Add] [Edit] [Delete]
6	F	Transformasi Digital	[Add] [Edit] [Delete]
7	G	Hubat Center	[Add] [Edit] [Delete]
8	H	Pengembangan Bisnis	[Add] [Edit] [Delete]

Figure 9: Service Types Management Page

On the Parameter Data Management page, there are several sections for managing indicator data, operational definitions, and baseline values. The main table displays a collection of SPM parameter

data registered in the E-SPM database, including parameter data, service types, and a menu for managing parameter data.

Unlike other master data pages, the parameter data management menu includes a button for managing SPM indicators. This button opens a menu for managing indicator data, which includes a form for adding new indicator data and a table for managing indicator data. Within this table, there is also a menu for managing operational definition data, structured similarly to the indicator management. The appearance of the Parameters, Indicator, Operational Definition, and Baseline Value Management page shown in Figure 9.

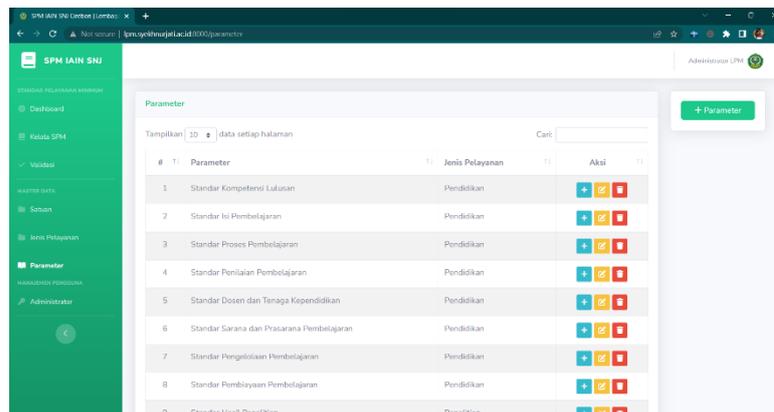


Figure 10: Parameters, Indicators, Operational Definitions, and Baseline Management Page

After implementing the master data management design, the next step is to generate SPM reports based on the data. The SPM reporting menu is accessible from the main page of e-SPM. The first step is to select the active year, then generate report by clicking the PDF button. The result of the SPM report can be viewed in Figure 10.

Figure 11: e-SPM Report

5. Testing

Testing phase is the final stage conducted after completing the e-SPM. This phase is aimed at verifying the accuracy and functionality of the e-SPM. The details of the e-SPM testing are as follows:

1. Annual SPM Reporting Function
2. Application User Management Function
3. Service Types Management Function
4. Parameter Management Function

5. Unit Management Function
6. SPM Value Validation Function
7. Indicator Management Function
8. Operational Definition Management Function

The testing points were internally tested by LPM by performing functional tests on the e-SPM. The test results indicated that all testing functions performed well. After completing all these stages, the e-SPM was uploaded to the LPM server and can be accessed through the LPM IAIN Syekh Nurjati Cirebon website under the LPM application menu, as shown in Figure 11.



Figure 12: e-SPM under LPM Application Menu

CONCLUSION

The development of the e-SPM at IAIN Syekh Nurjati Cirebon went through 5 (five) stages, start from data collection, system requirements analysis, system design, implementation, and application testing. All stages have been completed, resulting in an e-SPM system under LPM application menu.

This e-SPM includes management of various SPM data components such as units, service types, parameters, indicators, operational definitions, baseline values, target values, actual values, and user management functionalities.

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