Rancangan API Interoperabilitas Monitoring dan Pelaporan Standar Pelayanan Minimal Bidang Kesehatan Kabupaten Cilacap

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Abstract

The Minimum Service Standards for the Health Sector (SPM-BK) at Cilacap District in 2019 and 2020 showed that no type of basic service has reached the target. This has decreased compared to 2018 where health services at the age of basic education can meet standards. Interoperability is important to integrate SPM data from all health facilities so that data can be accessed easily, quickly and accurately. This study aims to analyze and design the interoperability of information system data in health facilities for reporting SPM-BK. This type of research is operational research using qualitative methods. Data collection was carried out by interviewing and observing user needs (planning and analysis stages), making system architectural designs (design stages), as well as system trials. The results of the in-depth interviews were analyzed using the content analysis method. Evaluation of the system used is carried out descriptive analysis as a basis for analysis of interoperability systems for monitoring SPM-BK data. This research produces an interoperability system that facilitates the process of transferring data so that information can be obtained quickly and accurately. The development of interoperability to help manage data and information still has the potential to be carried out. Development of SPM-BK system interoperability can facilitate reporting. Data information can be easily seen and found and data security can be guaranteed.

Keywords*: Minimum service standards, Interoperability, Management information system.*

Abstrak

Penelitian ini bertujuan untuk menganalisis dan merancang interoperabilitas data sistem informasi di fasilitas kesehatan untuk pelaporan SPM-BK. Jenis penelitian ini yaitu *operational research* menggunakan metode kualitatif. Pengambilan data dilakukan dengan wawancara dan observasi kebutuhan pengguna (tahap perencanaan dan analisis), pembuatan rancangan arsitektur sistem (tahap desain), serta uji coba sistem. Hasil wawancara mendalam dianalisis dengan menggunakan metode analisis isi *(content analysis)*. Evaluasi sistem yang digunakan dilakukan analisis deskriptif sebagai dasar analisis sistem interoperabiltas pemonitoran data SPM-BK. Penelitian ini menghasilkan sistem interoperabilitas yang memfasilitasi proses transfer data sehingga informasi dapat diperoleh secara cepat dan akurat. Pengembangan interoperabilitas untuk memantu pengelolaan data dan informasi masih berpotensi untuk dilakukan. Pengembangan interoperabilitas sistem SPM-BK dapat mempermudah pelaporan. Informasi data dapat mudah dilihat dan ditemukan serta keamanan data dapat terjamin.

Kata Kunci: Standar pelayanan minimal, Interoperabilitas, Sistem informasi manajemen.

INTRODUCTION

The Government has set standards for the type and quality of services it provides to its citizens. These standards are known as Minimum Service Standards (Standard Pelayanan Minimal/SPM) [1][2]. The SPM for Health (SPM-BK) covers both provinces and regions, both of which have different service standards [3]. Ideally, the performance result of local government implementation of SPM-BK is 100% [4]. SPM is established to guarantee and support the implementation of mandatory authority by the regions as well as regional accountability to the government. The availability of equitably distributed health services is inseparable from the SPM concept. Equity is a form of health service that is fair to the community [5]. Each provincial health department has a target achievement report from the city/district health departments. This data can be used to assess performance results. The performance achievement of the SPM-BK implementation in Cilacap district in 2019 and 2020 showed that no basic service types achieved the targets. This is a decrease from 2018 when one basic service type achieved the target, namely health services at primary school age[6].

Poor planning and inadequate quality and quantity of human resources have contributed to the failure to meet SPM-BK performance targets. Various problems in the implementation of SPM-BK, including inconsistencies between indicator titles, operational definitions, and formulas used, and there are sharp differences in coverage attainment [7]. Other contributing factors are the size of the demographic region, which affects the need for facilities and infrastructure; community culture and awareness as external factors; and lack of uniform understanding of SPM-BK indicators by the district health office [8]–[10]. To establish successful interoperability, a set of multidimensional, complementary, and dynamic capabilities are specified to defined networks of organizations[11]. SPM indicators serve as a measure of quantitative and qualitative achievement. They describe the scope of objectives to be achieved, including inputs, processes, outcomes, and benefits of services[12].

Establishing data standardization and information system integration is the first step in meeting the need for uniformity in data collection, processing, and reporting. Several studies have been carried out about interoperability. Among them are Santoso, Pramono, and Persada (2019), who developed a web service-based interoperability in the form of an application programming interface (API) for the synchronization of data from SIM Puskesmas and hospitals[13].

Preliminary studies in Cilacap District Health Office show that each Puskesmas as a first-level health facility (FKTP) fully uses SIMPUS (Puskesmas Management Information System). The speed and accuracy of reporting in Puskesmas can be supported by SIMPUS. However, SPM-BK data collection is not yet integrated with SIMPUS. SPM-BK data collection is currently done through Google spreadsheets, which are processed by DHO staff through data entry into the Komdat SPM application (data communication).

Based on this analysis of key constraints, interoperability is essential for the integration of SPM data from all health facilities so that data can be accessed easily, quickly, and accurately. According to the literature search, interoperability between SIMs owned by health facilities and the SPM-BK system has not been conducted. This study aims to analyze and design interoperability of SIM data in health facilities that can be directly linked to the Komdat SPM application. It is expected that SPM data collection will become more effective, which will facilitate the monitoring and evaluation of SPM-BK in each region.

METHODS

The type of research in designing the interoperability of SPM-BK monitoring data in Cilacap Regency is operational research using qualitative methods by applying system design through the stages of the system development life cycle including planning, analysis, design, and implementation. This research is operational because the researchers provide treatment for the system that is used. The activities in this research are carried out by collecting information data that is natural about a life problem on the object, so it falls into the category of qualitative methods.

Data was collected through interviews and observations of user needs (planning and analysis phase), system architecture design (design phase), and system trials. The results of the in-depth interviews were analyzed using the method of content analysis, which is a systematic, objective, and quantitative communication analysis of visible messages[14]. The relevant data were selected and presented in a narrative form. The purpose of this was the identification of the causes of errors and failures in specific conditions/aspects. The system evaluation used descriptive analysis as a basis for analyzing the interoperability of the SPM-BK data monitoring system.

RESULTS

Four respondents from the Cilacap District Health Office were involved in the planning and needs assessment phase. These respondents were the sub-coordinator for health insurance and quality management of health services, the section for health insurance and quality, the PJ programmer for the TB program, and the sub-coordinator for mental health and substance abuse. Health facilities and related agencies routinely report on the SPM-BK. In terms of implementation, field staff understand the routine of SPM-BK reporting. This is consistent with the following respondents:

"SPM-BK data collection is done every 5th of the following month. In reality, however, there are some problems in the field. Therefore, only 10% at most are on time. Other health facilities collect data every 3 months or 6 months. Some health centers

even submit data once a year. At the moment, the minimum is at least every 3 months...". (R1)

"Data collection/evaluation takes place every 3 months. Results can also be seen on the SPM-BK dashboard. With the existence of SITB, it's very easy, it's just a matter of discipline..". (R3)

"The data is taken every month because there has to be a report in that month. If someone has not reported, there is a 3-month report or at the end of the year. So that at least every year there is a report on the services provided.."(R4)

The current reporting flow of SPM-BK Cilacap District is:

"...for data from private health facilities, it is done in the area concerned, namely the Puskesmas. The data can be entered into the health office using the programmer..." (R1)

"The basic data for SPM-BK come from the Puskesmas. The Puskesmas then sends the data to the DHO programmer. The fixed data from the programmer goes to the administrator and is then entered into the application so that it can be recorded immediately.

For example, SPM-BK for health services for pregnant women.

The data required is the number to be served and the number served. From this data, the system automatically calculates itself. The data from Puskesmas is based on its format, while the format from the programmer to the administrator is the result of MS Excel export from the application.

The Puskesmas will calculate the targets in each village. So the flow is village-Puskesmas-programmer-admin..". (R2)

"For the SPM-BK for health services for people with severe mental disorders, we created a format that is derived from the province and then broken down to the Puskesmas. The Puskesmas, as the spearhead of the service, will provide services to the ODGJ. Before the service, they are provided with an estimate of the number of ODGJ in the area and determine the target(s) to be served so that they can calculate the SPM-BK per each Puskesmas. Currently, there is no application in use, so manual reports are still received. Not on paper, but Ms. Excel files sent via Whatsapp..." (R4)

The implementation of SPM faced several obstacles, especially during the data collection stage.

"The limited time and number of human resources are the main obstacles in collecting data (data collection reports). In addition, the Covid-19 pandemic has also been one of the obstacles. For example, the SPM-BK for health services for people with hypertension. Recording those suffering from hypertension is incomplete. This can be seen during the Covid-19 vaccination. Patients are required to have blood pressure measured before vaccination. However, not all data are complete. In addition, because patients are examined not only in primary healthcare facilities but also in hospitals, the BPJS referral program also leads to incomplete data. The data is there, but it has not been collected. (R1)

"Reporting on SPM-BK for health services for people suspected of having tuberculosis requires the discipline of TB programmers in every primary and secondary health facility. Data from independent GPs and private clinics are still collected manually by Puskesmas, which is responsible for entering the data into the SITB.

The SPM-BK for health services for TB suspects is calculated as the number of suspects found and treated according to standards divided by the estimated number of suspects in one year. The estimated number of suspects was determined by the Ministry of Health. In SITB, 19,881 suspects were identified for Cilacap district in 2022 (numerator). Numerators were taken from the number of suspects drawn from SITB in TB 06 (by year).

The conversion technique was carried out by programmers pulling data from SITB, then recapitulating it themselves and entering it into the admin's Google Drive. Later, the admin will enter it into the Home Office's SPM-BK application." (R3)

SPM-BK reporting constraints were not only encountered at the data collection stage. This was conveyed by respondents as follows:

"The data goes to the administrator every quarter. The problem is that when the period is over, for example, the third quarter, the admin does not have access to the first quarter. However, not all of the data has been filled in. It is not known exactly why the data cannot be filled in completely. One of the reasons could be that the Puskesmas did not fill it in. Other obstacles include the Puskesmas officer

working on several programs simultaneously, as well as the Puskesmas officer having been replaced. In addition, some data does not come directly from the Puskesmas, such as that related to human resources, which has to be coordinated with the SDK. Programmers also have to track data across sectors. The SPM-BK consists of three elements: goals, objectives, and results. Targets and objectives are standardized but consist of goods, services, and human resources elements for which data must be tracked..." (R2)

"The difficulty is that it is difficult for the Puskesmas to reach their villages. The average working area of a Puskesmas is about 17 villages at the most. Even if the village midwife does the input, it will not work.

Programmers with many applications are also overburdened. In the Puskesmas, for example, an official does not work on just one program. As for the TB program alone, many applications need to be done, namely SITB, SItras, TB drugs, etc". (R3)

The implementation of SPM-BK reporting encountered several obstacles in the field. Some of the obstacles related to the existing flow that were felt by respondents were:

"...The weakness encountered is the possibility of differences between the data submitted to the Puskesmas and the programmer. Efforts that can be made are adjustments to the data in the programmer..." (R1)

"...The existing bridging is only used as an aid to the combing of the data. The data are combed in such a way that there are no missing cases from different units. For example, in the hospital internhospital'srk, SIM RS with SITB, some suspects or cases have not been entered in SITB, and the bridging module will appear. The TB programmer will enter data not entered in SITB by opening the status and verifying the truth of the TB suspect. Data is not automatically entered into SITB, it must be entered by the programmer. The data entry officer will be from the health facility. The health department is responsible for reminders.

Data entry is currently facilitated by Google spreadsheets. However, there are still differences in implementation in the field. There are several possibilities, such as the SPM officer from the Puskesmas who entered the spreadsheet did not communicate with the programmer, or the programmer did not understand the SPM formula (for example, the TB SPM was estimated to be only 17, whereas the estimate was around 300). So, for now, the programmer's data is still being used because the Puskesmas' data is ambiguous... (R3).

SPM-BK reporting can indicate the level of achievement in these areas. Current SPM-BK performance achievements according to respondents are:

"The highest performance of the 12 indicators is TB, followed by hypertension and then DM. The achievement of TB is considered to have a high validity because there is a directive from the center, so the data and achievements are in line with the conditions..." (R1)

"Out of the 12 SPM indicators:
The easiest indicators to fill in are TB and HIV, so reporting is easy because there are not many HIV targets. The indicators that could not be completed in the first and second quarters were health services in primary education because the targets were set during the new school year, so data could not be collected on the ground until the third quarter. Health services in primary education is the most difficult indicator..." (R2).

Several solutions have been sought to improve data collection achievements. The following are the solutions that have been implemented according to respondents:

"Routine evaluation activities via Zoom/online/ online at the end of each year are used to optimize the timeliness of data collection and data validity. In addition, the SPM Whatsapp group has been established, with members ranging from programmers at the health department to SPM-BK managers at community health centers. The expectation is that the Whatsapp group will be a medium for mutual reminders about data collection. The response from the community health centers to the group is quite good.

Private clinics are the responsibility of the Puskesmas. There is a network structure at the health center and a network of health centers. It is hoped that Puskesmas will be able to include clinics in their area, especially SPM-BK data. Puskesmas

are responsible for the health including clinics, practicing doctorspractising midwives. There have been efforts by the Puskesmas to collect data from the network, but the feedback has not been optimal.

Puskesmas also has a monthly mini-workshop (Lokmin), which can be a means of collecting data. However, the implementation of Lokmin also faces budgetary constraints. The implementation of the cross-sectoral Lokmin is also not optimal. (R1)

"The data submission solution that has been implemented is to use a Google spreadsheet that is filled in by Puskesmas every month so that SPM-BK achievements can be calculated immediately. The obstacles to not filling in the Google spreadsheet are duplication of work and changes of staff without handing over the work.

Conditions in the field (Puskesmas, hospitals, clinics) are that they already have data with the system used in each place, but there are obstacles in terms of recapitulation.

Source data from hospitals, not entered in the administration. Because it is related to the target (community).

The clinic is the network of Puskesmas, which is obliged to deposit data to the Puskesmas.

The village midwives are the source of most of the data in the Puskesmas..."(R2).

Respondents hoped that there would be a system that could facilitate SPM-BK reporting:

"It is expected that reporting will be facilitated by bridging the SITB application with SPM-BK data. Another option would be the provision of tools for the centralization of SPM data by village. With a tool, it is possible to be more flexible because the format can be adapted and the data processing is independent. So if you already have raw material for SPM data, you can link it to district or provincial data. The current situation is that when the district asks for data, it is given in the district format and then they are also asked to fill in other links (bought here and there)" (R4)

The recommended system architecture design to be developed to overcome technological problems that have been implemented by the Cilacap Regency Health Office is shown in Figure 1.

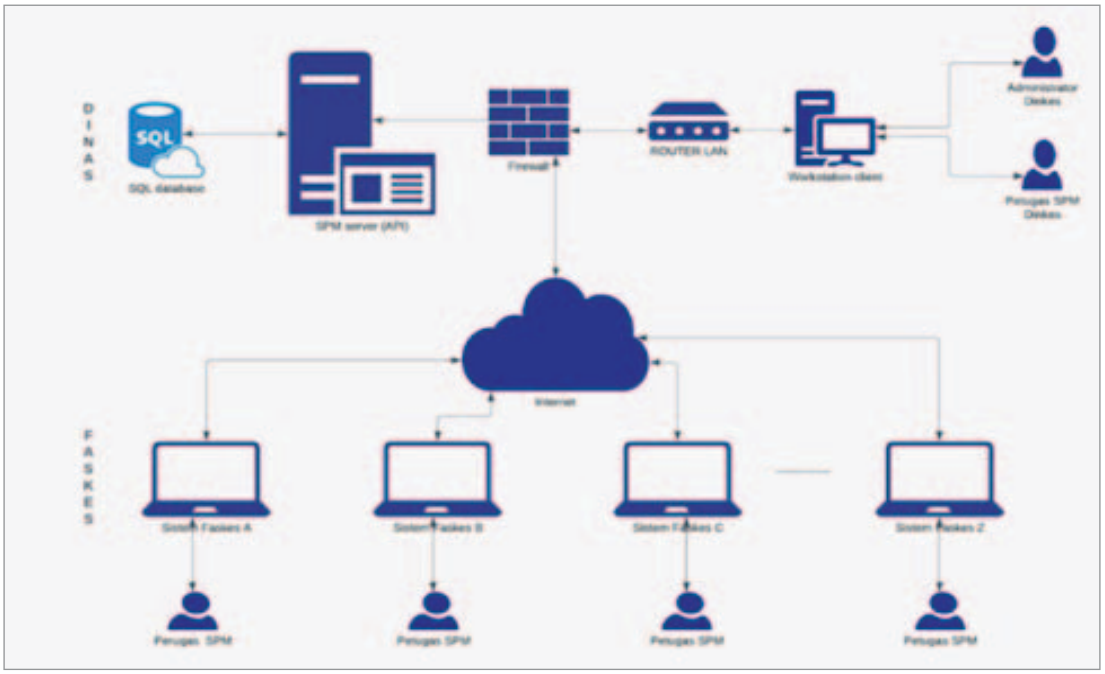

Figure 1. Developed Architecture System

The results of the SPM-BK reporting system development process through analysis and future needs, a graphical user interface (GUI) or interface is produced as shown in Figures 2 - 3. The system functionality test was carried out using the black box method. The test results show that the system can run well.

Figure 2. Server API Display

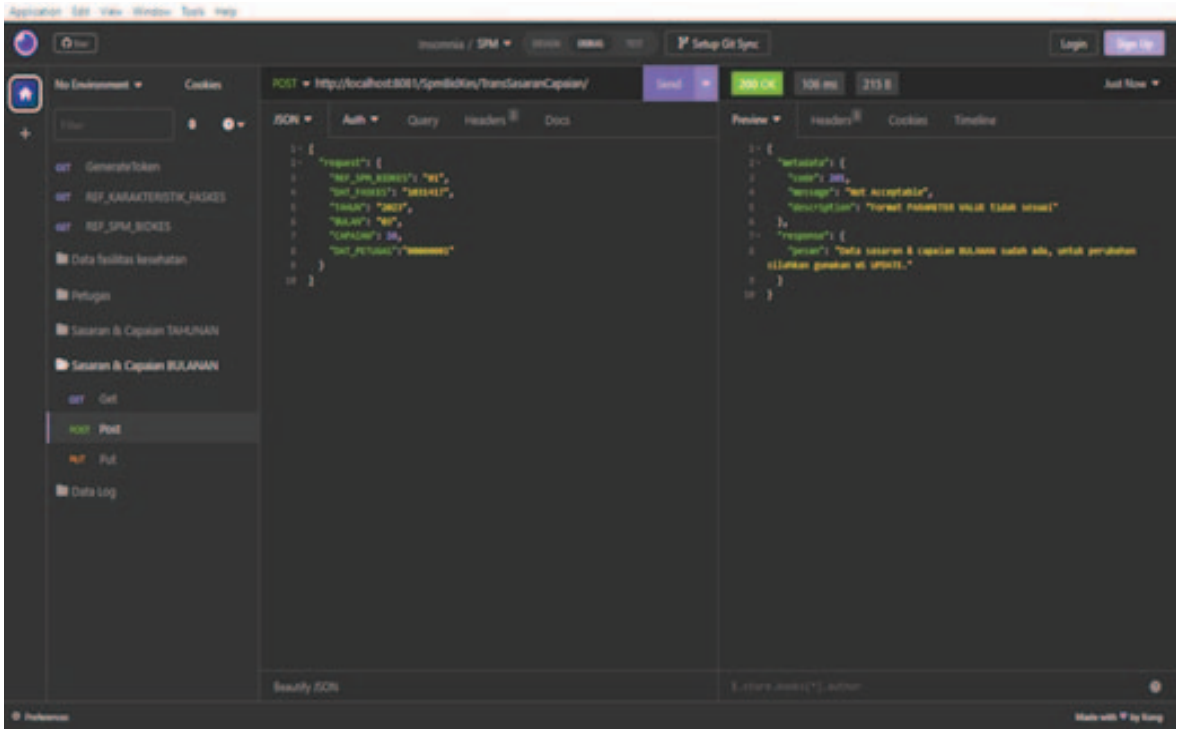

Figure 3. Environment Testing API

DISCUSSION

Minimum Service Standards (MSS) are provisions that relate to the nature and quality of the basic services provided. SPMs are mandatory government obligations that every citizen has a right to receive as a minimum. The implementation of SPM goes through several stages, namely data collection, calculation of basic service needs, preparation of basic service fulfillment plans, and implementation of basic service fulfillment. Cilacap district has several types of health facilities, including 9 general hospitals, 2 maternity hospitals, 38 community health centers, and 79 auxiliary health centers [15]. There are also 27 family doctors and 6 family dentists providing JKN services. Data collection is the first step in SPM implementation. The Cilacap district health office previously had tools to collect SPM-BK data from primary healthcare facilities, namely Puskesmas, through Microsoft Excel, which had been designed with templates by the requirements of the SPM-BK variables and indicators from the central government. However, due to the limited capacity of Microsoft Excel to collect and analyze data, an information technology (application) is needed to replace the current tools. The application is expected to be more flexible and interoperable with other systems, which is needed in the current and future era.

Based on the results of the interviews regarding the details of what information is needed for the SPM-BK reporting, the following points of emphasis in the development of system interoperability systems are: (1) Provide information on when the collection deadline is, (2) Make it easy for the system to interact automatically using the Application Programming Interface (API). (3) Facilitate further development in line with national standards currently set by the Department of Health through the Digital Transformation Officer (DTO), namely the use of Fast Healthcare Interoperability Resources (FHIR) and the Systematised Nomenclature of Medicine Clinical Terms (Snomed-CT).

Health information services that are valid, fast, and based on shared resources and integrated electronics can be achieved by developing and stabilizing information systems[16]. The information system implemented is highly dependent on the quality of human resources, the availability of standard operating procedures and infrastructure, the quality of health services, and easy access to information[17]. Chotimah (2022) confirms that the quantity and quality of human resources and the availability of supporting facilities and infrastructure affect the implementation of information systems in health services[18]. Health information is very important for program design.

Interoperability is the ability of systems to exchange and use information according to agreed rules[19], [20]. For this kind of data exchange to be successful at scale, there are a variety of interoperability problems that must be resolved. These challenges include technology, governance, security, and privacy [21]. An integrated system can make the information exchange process real-time, valid, and accurate [22], [23]. Exchangeability is necessary for the variety of datasets produced by data from wearable technology, telehealth, and digital therapeutics, not just for the data themselves but also for the information they contain [24]. The improvement of information technology facilities and infrastructure, the strengthening of governance and regulatory frameworks to support the digitization of services, and routine reporting are necessary to develop interoperability between systems[25] .

One of the barriers to reporting is the existence of different applications to produce a specific report, which leads to duplication of effort [26]. The development of system interoperability must also take into account the needs of users. The process of using a difficult system will make users reluctant to use it [27]. Interoperability development has been carried out by several parties. The results show that the obstacles are the lack of standards for information exchange and sustainable businessmodels, and that investment risks are still quite high [28]–[30]. Interoperability and standardization of data are essential for the digitization of the healthcare industry, and building a secure interoperable infrastructure for e-Health demands a more dynamic strategy with cybersecurity safeguards to ensure various domains. There is a need for greater cooperation and trust among the key participants, with a focus on their inclusivity in working toward interoperability [21]. However, developing interoperability between information systems that deal with sensitive information requires a substantial interdisciplinary expert team and takes a significant amount of time [31].

CONCLUSION

The development of interoperability in healthcare facilities still has great potential. The interoperability of systems is expected to have an impact on the management of patient and administrative data, so that information can be obtained validly, effectivel, and efficiently. SPM-BK system interoperability can facilitate reporting. Data information can be easily viewed and found, and data security can be ensured.

Health facilities can further motivate relevant staff for routine and timely SPM-BK reporting. In addition, health facilities could conduc socialization on sessions for health workers and administrative staff on SPM-BK reporting. This will raise awareness of the importance of completeness and timeliness of data for SPM-BK reporting.

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