Analysis And Design
Interoperability Of Spm Monitoring Data (Minimum Service Standard) Health Sector Cilacap Regency

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INTRODUCTION

Every Indonesian citizen has the right to be served his basic needs by the state. One of them is the service in the health sector. At this time, the government has set standards for type and quality in realizing the minimum service provision for its citizens. This standard is known as Minimum Service Standards (SPM) (UU No. 23 of 2014). The SPM for Health (SPM-BK) covers provinces and regions, both of which have different service standards. Provincial SPM-BK includes health services aimed at residents affected by a health crisis caused by a disaster, potential disaster, or extraordinary event conditions. Regional SPM-BK consists of 12 types of basic services that must be implemented, such as health services for pregnant women, mothers giving birth, newborns, toddlers, to health services for people at risk of contracting HIV. In its realization, SPM-BK regulates technical standards, which include standards for the quantity and quality of goods and/or services, health personnel/human resources, as well as technical instructions or procedures for providing the standards. Ideally, the performance achievement of the realization of local government SPM-BK is 100%. There are sharp differences in achievement covering both in one district at different times and between different districts/cities. Based on the analysis of the main constraints, a system is needed that can integrate MSS data from all health care facilities. The target is that the management information system (SIM) in health facilities can directly connect its data with the Komdat SPM application (Data Communication).

ABSTRACT

The Minimum Service Standards for the Health Sector (SPM-BK) cover provinces and regions, both of which have different service standards. In regional SPM-BK, there are 12 types of basic services that must be implemented, such as health services for pregnant women, mothers giving birth, newborns, toddlers, to health services for people at risk of contracting HIV. In its realization, SPM-BK regulates technical standards, which include standards for the quantity and quality of goods and/or services, health personnel/human resources, as well as technical instructions or procedures for providing the standards. Ideally, the performance achievement of the realization of local government SPM-BK is 100%. There are sharp differences in achievement covering both in one district at different times and between different districts/cities. Based on the analysis of the main constraints, a system is needed that can integrate MSS data from all health care facilities. The target is that the management information system (SIM) in health facilities can directly connect its data with the Komdat SPM application (Data Communication).
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SPM is useful for providing guarantees for the implementation of quality health services as the output expected by all parties (Irenius Siriyei and Wulandari, 2013). The SPM concept is inseparable from the availability of equity-distributed health services. Equity is a form of fair health services to the community (Nisa and Sari, 2019). Aspects that affect health service equity are geographical, economic, and social access (Hendarwan, Rosita and Suriani, 2016). Each provincial Health Office (Dinkes) has a target achievement report from the city/regency Health Office, so that this data can be used to produce performance results. The performance achievements of the implementation of SPM-BK in Cilacap Regency in 2019 and 2020 showed that there were no types of basic services that reached the target (Central Java Provincial Health Office, 2019, 2020). This has experienced a decrease in dissolution in 2018 where there was one type of basic service that reached the target, namely health services at the age of primary education (Central Java Provincial Health Office, 2018).

SPM-BK performance targets that are not achieved can be caused by poor planning, as well as the quantity and quality of human resources that are not optimal. Other contributing factors are the breadth of regional demographics which influence the required facilities and infrastructure, culture and awareness as external factors of society, and the not uniform understanding of district/city Health Offices regarding the BE-MSS indicators. There are sharp differences in achievement covering both in one district at different times and between different districts/cities. Differences also occur at the operational level, including socialization, advocacy, monitoring and evaluation which are less than optimal (Siriyei & Wulandari, 2013); (Hendrawan, Purboputro, Saputro, & Setiyadi, 2018); (Zudi, Suryoputro, & Arso, 2021)

The success of a health program is influenced by the communication of accurate information and a commitment to maintaining the available resources in order to support program effectiveness (Frieden, 2014). One of the problems encountered is the lack of internal socialization carried out by the Health Office and policy makers in health facilities. This causes the understanding regarding SPM-BK to be uneven among officers. As a result, there can be differences in perceptions of the MSS assessment indicators which lead to confusion at the central level (Hendarwan, Rosita and Suriani, 2016). The SPM indicator is a benchmark for quantitative and qualitative achievement that describes the amount of targets to be met which include inputs, processes, results, and service benefits (Vermasari, Masrul, & Yetti, 2019).

Related to the problem of differences in understanding of indicators and the lack of optimal monitoring and evaluation in providing SPM-BK in districts/cities, in this case it is necessary to have uniformity in terms of data collection, data processing and reporting so that periodic monitoring and evaluation can be carried out and periodically. continuously (Budiman & Listyarini, 2022). The first step in meeting these needs is to establish data standardization and information system integration. Data integration between service units or Health Offices in regional areas must be properly managed and designed to enable stakeholders to obtain, integrate, analyze and
monitor data from different data sources. To facilitate management, it is necessary to make a data center (data bank) SPM-BK plan. This data bank includes data generating units up to district/city Health Offices that form an integrated system so that data can be synchronized from heterogeneous platforms (Budiman and Sudaryanto, 2015).

Interability is the ability to work together between two or more software in different programming languages, interfaces and operating system platforms. Interability is also defined as the ability of a system to use information and functions from other systems by following the same standards (Amin, Alazba, & Manzoor, 2014). The majority of the health systems currently being developed have been built partially and have not been able to communicate with other systems, so there is a double entry stage for certain data. Integration between these systems needs to be done with the concept of developing system interoperability (Vargas et al., 2016).

Several studies related to interoperability have been carried out. Among them by Santoso, Pramono, and Persada (2019) who developed web-based interoperability services in the form of an application programming interface (API) to synchronize data from the SIM of puskesmas and hospitals. (Ogutu & Mu, 2017) shows that system integration is very important because it allows ease of access, data portability, data confidentiality, integrity and security, data retrieval in different formats, file sharing, cost reduction, and creates a robust and scalable system.

A preliminary study conducted at the Cilacap District Health Office showed that in every puskesmas as one of the first level health facilities (FKTP) all of them used SIMPUS (PUSkesmas Management Information System). SIMPUS can support speed and smooth reporting in puskesmas. However, SPM-BK data collection has not been integrated with SIMPUS. The SPM-BK data collection currently still uses Google spreadsheet which will be processed by the Health Office staff by entering data into the Komdat SPM application (Data Communication). This is reinforced by the results of interviews conducted with the Head of the Health Insurance Section and Service Quality of the Cilacap District Health Office where currently there are still major obstacles in compiling reports on the work of health services from each health service facility. An example is the SPM report from the puskesmas that is being published at this time, which is the 2019 report data. Meanwhile, the 2020 health service results report cannot yet be published because the MSS data for all health service facilities has not been collected. This is due to the absence of an interoperability system that requires a separate process from the health facility information system. The data contained in the health facility information system cannot be directly managed as reporting on BE-MSS indicators. As a result, officials have to do double entry data needed to find out the achievement of the performance of the SPM-BK.

Based on the analysis of the main constraints, interoperability is very important to integrate MSS data from all health care facilities so that data can be accessed easily, quickly and accurately. As far as the literature search, interoperability has never been carried out between the SIMs owned by health facilities and the SPM-BK system. This study aims to design and design SIM data interoperability in health facilities that can be directly connected to the Komdat SPM application. It is hoped
that SPM data collection will become more effective so that it will facilitate monitoring and evaluation of SPM-BK in each region.

RESEARCH METHODS

Types of research

The type of research in the analysis and design of interoperability of Cilacap District MSS-BK monitoring data is operational research (operational research) using qualitative methods with the application of system design through the stages of the System Development Life Cycle which includes planning, analysis, design, and implementation (Roberta M. Roth, Barbara Haley Wixom, 2012). This research is an operational research because the researcher gives treatment to the system that is being used. The activities in this research are carried out by capturing data of information that is reasonable about a problem of life towards the object, so that it is included in the category of qualitative methods.

Data Collection Timing Approach

This study used a cross-sectional time approach.

Method of collecting data

Data and information mining was carried out using in-depth interviews and observations to find out user needs as an effort to get an interoperability system model that meets expectations.

The data sources used to design the Cilacap District SPM-BK monitoring data interoperability system consist of:

Basic Data

Primary data is data obtained directly from the source, in this case from observations of the Cilacap Regency MSS-BK data collection process and interviews with data collectors from health care facilities. The primary data information collected is an indicator of the required data, how to obtain the data, and the system constraints experienced at each stage of data collection.

Secondary Data

Secondary data is data collected indirectly by researchers. Data were obtained from documents from health care facilities and literature or books/written rubrics related to the research object.

Research subject

The subjects of this study were all officers related to the health facility information system which included the head of the SPM-BK Health Office, as well as the officer in charge of the SPM at the FKTP (hospital, health center, primary clinic, and doctor’s practice) area of Cilacap Regency.

Object of research

The research object used is an indicator of achievement of SPM-BK at each health facility collected at the Cilacap District Health Office which has been entered into a Google spreadsheet for the 2020-2021 period.

RESULTS AND DISCUSSION
Minimum Service Standards (SPM) is a provision related to the type of basic services. SPM is a mandatory matter for the government that can be obtained by every citizen at a minimum. Implementation of SPM goes through several stages, namely data collection, calculation of basic service needs, basic service provision plans, and implementation of basic service provision. This research was conducted by involving 4 respondents from the Cilacap District Health Office. The respondents were the Sub-Coordinator for Health Insurance and Quality Management for Health Services, Section for Health Insurance and Quality, Programmer PJ for the TB Program, and Sub-Coordinator for Life and Drugs.

1. Needs planning stage
A. identification of user needs

Cilacap Regency has several types of health facilities, including 9 general hospitals, 2 maternity hospitals, 38 health centers, and 79 auxiliary health centers (Central Statistics Agency (BPS), 2019). In addition, there were 27 family general practitioners and 6 family dentists who provide JKN services. Data collection is the initial stage carried out in the implementation of SPM.

SPM-BK reporting is carried out routinely by health facilities and related agencies. In terms of implementation, officers in the field have understood the SPM-BK hallucinations. This is in accordance with what was expressed by the following respondents:

“SPM-BK data collection is carried out every 5th of the following month. However, in reality several problems were encountered in the field, so that at least only 10% were on time. There are other health facilities that collect data every 3 months or every 6 months and there are even puskesmas that send it once a year. Currently at least once every 3 months..” (R1)

“Withdrawal of data/evaluation is carried out every 3 months. Achievements can also be seen from the SPM-BK dashboard. Having SITB makes things much easier, it's just a matter of discipline.” (R3)

"Data withdrawal is done every month, because there must be reporting in that month. If there are those who have not reported, there will be reporting every 3 months, or at the end of the year. So that at least every year there is a report on the capabilities that have been served.” (R4)

The Cilacap Regency SPM-BK reporting flow that is currently running is as follows:

“..for data from private health facilities, it is in charge of the area, namely the puskesmas. Data can be entered into the health office through a programmer.. ” (R1)

"Basic data on SPM-BK from the puskesmas. The health center then sends the data to the health office programmer. Data from fixed programmers goes to the admin and then inputs it into the application, so it can be captured immediately.
An example is the SPM-BK for health services for pregnant women.

The data requirements are the amount to be served and the amount served. From this data, it will automatically calculate itself. Data from the puskesmas is based on a separate format, while the format from the programmer to the admin is the export result of Ms. excel from the application.
The Puskesmas will calculate the target in each village. So that the plot is village-public health center-programmer-admin..." (R2)

"For the SPM-BK health service for people with severe mental disorders, we created a format that was derived from the province and then it was broken down to the puskesmas. Puskesmas as the spearhead of services will provide services to ODGJ. Before serving, they were equipped with an estimate of the number of PLWH in the area, and determined the targets/targets to be served so that they could calculate the SPM-BK for each health center. Currently, no application has been used, so manual reports are still being received. Not paper but Ms file. excel that was sent via whatsapp." (R4)

In the implementation of SPM several things become obstacles, especially at the data collection stage.

“The problem with collecting (data collection) reports is largely due to the limited time and number of human resources. In addition, the Covid-19 pandemic was also one of the obstacles. An example is the SPM-BK for health services for people with hypertension. The registration of hypertension sufferers is incomplete. This can be seen during the Covid-19 vaccination. Patients before the vaccine must have taken blood pressure measurements. However, not all data is complete. In addition, the existence of the BPJS back-referral program also results in incomplete data because patients do not only carry out examinations at primary health facilities but also at hospitals. Basically the data already exists but has not been collected yet.” (R1)

"For reporting SPM-BK health services for people with unexpected tuberculosis, TB programmer discipline is required at each primary and advanced health facility. Data collection from independent doctors' FKTPs and private clinics is still manual through puskesmas which will then input data to SITB. The SPM-BK for unexpected TB health services is calculated by the number of unexpected cases found and managed according to the standard estimates of unexpected cases in one year. Unforeseen estimates have been determined by the Ministry of Health. In SITB there have been 19,881 unexpected cases (denumerator) for Cilacap Regency in 2022. The quantifier is taken from the unexpected amount withdrawn from SITB at TB 06 (according to the year). The conversion technique is done by means of a programmer pulling data from SITB then recapitulating it himself and entering it into the Google Drive admin. Later the admin will enter the SPM-BK application belonging to the Ministry of Home Affairs.

” (R3) SPM-BK reporting constraints are not only encountered at the data collection stage. This was conveyed by respondents as follows:

“Data goes to admin every quarter. The problem is if it's past the deadline, for example it's already the third quarter, the admin can't access the first quarter. However, not all data has been filled in. It is not known for sure why the data cannot be filled in completely, one of the reasons could be because the puskesmas did not fill it in. Another obstacle was that the puskesmas staff held multiple programs, as well as the change of officers at the puskesmas. In addition, there is data that does not come directly from the health center, for example related to human resources, which must be coordinated with the SDK. Programmers also have to pursue across..."
data sectors. SPM-BK consists of 3 elements, namely goals, targets and achievements. Goals and targets are standard, but consist of elements of goods, services, and human resources whose data must be pursued." (R2)

"The difficulty is that it is difficult for the puskesmas to reach the village/kelurahan. The average working area of the puskesmas is around 17 villages at most. It must be that the village midwife who inputs it won't work either, dizzy.

Programmers with many applications are also burdened. For example, in a puskesmas, one officer does not only work on one program. As for the TB program alone, there are many applications that must be done, namely SITB, Sitras, TB drugs, etc."

(R3)
The application of SPM-BK reporting encountered several obstacles in the field. Some of the obstacles related to the flow that has been running that are felt by respondents, namely

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

".. Bridging that already exists is only used to help comb data. Comb the data so that there are no missing cases from various units. For example, in the hospital's internal network, is there a hospital SIM with SITB suddenly or cases that have not been entered into SITB later in the bridging module will appear. The TB programmer will input data that has not entered SITB by opening the status and checking the unexpected TB truth (verification). Data does not automatically enter SITB, it must be inputted by the programmer. Officers who enter from health facilities. The Health Service is tasked with reminding.

Data submission is currently facilitated with google spreadsheets. However, in the implementation in the field, discrepancies are still found. There are several possibilities, namely the SPM puskesmas staff who input the spreadsheet does not communicate with the programmer, or the programmer does not understand the SPM formula (for example TB SPM suddenly only has 17, even though the estimate is around 300). So, for now, the data from the programmer is used, because the data from the puskesmas is ambiguous. (R3)

The SPM-BK reporting that is carried out can show the level of achievement in the area. The current SPM-BK performance achievement according to the respondents, namely

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

"From the 12 SPM indicators:
1. The indicators that are easiest to fill in are TB and HIV so reporting is smooth because there are not many HIV targets.
2. The indicators that cannot be filled in in the first and second quarters are health services in basic education because the targets are taken at the time of the new school year so data in the field can only be collected in the third quarter
3. The most difficult indicator is health services in basic education." (R2)

Several solutions have been attempted to increase the achievement of data collection. The following are solutions that have been carried out according to respondents:

"Efforts to optimize the timeliness of data collection and data validity are carried out through routine evaluation activities via zoom/online/online at the end of each year. Apart from that, the SPM Whatsapp group was also formed, whose members ranged from health office programmers to health center SPM-BK administrators. With the Whatsapp group, it is hoped that it can become a medium for reminding each other of data collection. The response from the health center to the existence of the WA group was quite good.

Private clinics are the responsibility of the puskesmas. At the puskesmas there is a network structure and a puskesmas network. It is hoped that the puskesmas can embrace clinics in their area, especially related to SPM-BK data. The Puskesmas is responsible for the area of health services, including clinics, practicing doctors, practicing midwives. From the puskesmas, there have actually been efforts to collect data from the network, but the feedback is not optimal. The Puskesmas also has a monthly mini workshop (Lokmin) which can be a means of data collection. However, the implementation of lokmin also experienced budget constraints. The implementation of lokmin linsek (across sectors) is also not optimal."

"(R1)

"The solution for sending data that has been done is by using Google Sheets which will be filled in by the puskesmas every month so that the achievement of SPM-BK can be calculated immediately. Google Sheets constraints have not been filled, namely the presence of multiple jobs, and there is a change of staff without handing over work.

The condition in the field (puskesmas, hospital, clinic) is that they already have data with the system used in each place, but the problem is in terms of recapitulation. Data source from RS, not logged in admin. Because of its relationship with the target (community).

The clinic is a network of the puskesmas, which has the obligation to submit data to the puskesmas.

Most of the data under the puskesmas is from village midwives.” (R2)

Respondents hope there is a system that can facilitate SPM-BK reporting.

"Hopefully bridging the SITB application with SPM-BK data can help with reporting. Another option is to provide tools to centralize MSS data per village. With the help of tools, it is possible to run more smoothly because the format can adjust and process data independently. So if you already have SPM data as raw material, it's convenient to link to district or provincial data. Currently, when the district requests state data, it is given through the district format, then they are also asked to fill in other links (double-bought here and there)."

(R4)

**Interoperability system development**

Utilization of information systems, especially in the field of health is currently growing widely. One of the advantages of implementing an information system is
the existence of organized data management. A good information system is needed in order to obtain quality data and information products (Chotimah, 2022). The information system applied is influenced by the quality of human resources, the availability of standard operating procedures and infrastructure, ease of access to information, and the quality of health services (Wulur & Rupa, 2023). Chotimah (2022) emphasizes 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.

Most of the currently developed health systems are built partially and have not been able to communicate with other systems, so there is a double entry stage for certain data. Integration between these systems needs to be done with the concept of developing system interoperability (Vargas et al., 2016). Integrated information management is an important part of health facilities to assist service activities (Agarina, Sutedi, Karim, & Indera, 2022). Health information is very important in preparing health programs starting from the situation analysis stage, prioritizing, developing alternative solutions, programming, implementation, monitoring to the evaluation stage (Susanto, Christiano and Kurniawan, 2016).

Interoperability is a system's ability to exchange information and use information by following the provisions of a mutual agreement (Marier, 2018). Health facilities require an integrated system so that the sharing process can obtain real-time, precise and accurate information (Kristanti and Ain, 2021). Interoperability is not intended to equalize the use of certain system hardware or software, nor does the uniformity of the databases used, nor does it mean the uniformity of the programming language at the system development stage. Interoperability becomes a complex issue in efforts to exchange data between systems that use different platforms. It is not easy to standardize data formats and schemas throughout the system. Even though using different hardware or software, interoperability must be achieved for both operating systems, databases, and programming languages, especially for systems that have been used in various agencies. Interoperability can be achieved by standardizing data exchange formats. The quality information presented is an indicator of the quality of services provided at health facilities (Ratnaningtyas and Surendro, 2013). Interoperability between systems requires efforts to improve information technology facilities and infrastructure, develop health data standards, strengthen governance and regulations and utilize data as an effort to monitor, evaluate and maintain system continuity to support digitalization of services and routine reporting (Purwanto et al., 2021).

**Constraint system interoperability**

Obstacles that make system development interoperability difficult are the existence of regulatory restrictions and not all developers in health facilities open access for system integration. Ideally, different information system services can exchange data to obtain comprehensive and longitudinal patient data. Information systems that are developed partially and do not communicate with each other have the potential for double entry in certain data processing (Pal Varga et al., 2016). Development and strengthening of information systems is carried out to produce
health information services that are valid, fast, resource sharing, and integrated electronically based (Ministry of Health, Republic of Indonesia, 2022). One of the challenges in developing interoperability is being able to meet user needs. A system that is difficult to implement will not encourage users to run it. However, if the system created meets user expectations it can motivate use so that information exchange and processing can run well (Pradita, Heryawan and Sanjaya, 2023). Several countries that have had initiatives to develop interoperability systems have encountered obstacles in the absence of standards in the exchange of information, there is no sustainable business model for health information systems, and there is a fairly high investment risk (Fitriana, Hidana, & Parinduri, 2020).

Current conditions in the field indicate that there are several obstacles to obtaining good information from health facilities. Management of patient medical and administrative data which is very large has the potential to cause data duplication if the recording is done repeatedly, out of sync if the data storage is not filled, human error, and information delays (Hendarti, Anggita and Wina, 2008). This is partly because the Health Information System (SIK) in Indonesia has not been able to run optimally which in turn affects the decision-making process. For example, the application of information systems in health centers as implementers of health. Management of the puskesmas, if it is still done manually, can make the service process for patients take a long time (Fitriana et al., 2020). Obstacles in reporting, namely the existence of application specifications for making different reports makes work overlap so that it is not effective and efficient (Kairina, Nugroho and Lazuardi, 2016).

CONCLUSION
The development of interoperability in health facilities still has great potential to be implemented. The interoperability system is expected to be able to manage patient and administrative data so that information can be obtained in a valid, effective and efficient manner. Interoperability of the SPM-BK system can facilitate reporting. Data information can be easily viewed and found. In addition, data security can be guaranteed.

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