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Development of a Surveillance System as a Means for Collection and Report of Infectious Diseases in Puskodono Health Center, Sragen

Kiki Puspita Sari[1], Kusworo Adi[2], and Farid Agushybana[1]
[1] Faculty of Public Health, University of Diponegoro, Semarang, Central Java, Indonesia
[2] Faculty of Mathematical Sciences, University of Diponegoro, Semarang, Central Java, Indonesia

Corresponding author: Farid Agushybana (e-mail: agushybana@lecturer.undip.ac.id).

ABSTRACT Communicable disease notification is an essential source of data collection for an effective surveillance system. However, the existing information system in low- and middle-income countries is still limited due to printed-based and lack of quality, accuracy, and timeliness. This study developed an information system for surveillance of infectious diseases for data collection and reporting. It was a qualitative and quantitative study through developing a prototype model. The subjects of this study were one head of the health center, one head of the infectious disease program, and four holders of the infectious disease program. Data analysis in this study was carried out by means of content analysis for qualitative and descriptive analysis methods for quantitative. The acquisition of the evaluation results from the total average percentage was accurate at 62.19%, completeness at 83.89%, timeliness at 84.44%, and relevance at 95.20%. Meanwhile, in terms of data accuracy (accuracy) and completeness of content or data availability (content), information system users are very satisfied, as indicated by the results of the total average percentage of both 80.36 and 99.36% indicating that the user is very confident in the completeness and correctness of the examination data that has been inputted into the information system by paramedics. The results of the evaluation of the information system as a whole are 81.43%, meaning that the Information System for Surveillance of Communicable Diseases can be received and used by users of the information system very well.

INDEX TERMS Collection and Reporting System, Infectious Diseases, Surveillance System.

I. INTRODUCTION

Surveillance is crucial in the context of disease data collection. Surveillance contributes to helping countries monitor and evaluate emerging patterns and trends of disease. Through the data collected, better prevention and management of both infectious and noninfectious diseases are provided [1]. Infectious disease surveillance is an essential epidemiological tool to monitor populations' health [2]. Infectious disease surveillance can have different approaches based on the goals of surveillance. In Indonesia, Community Health Centers (in Bahasa: Puskesmas) is the central position as the closest health facility in the community, hence the data collected by the Puskesmas is very crucial as a basis for health policymaking. However, in practice, data collection and reporting on infectious diseases has been lacking in some factors. In this case, puskesmas still have various limitations related to the existing or used health information system. These problems, for instance, data collection or reporting of infectious diseases are printed-based, resulting in a slow process of recording examination results, the data collected is not centralized, allowing files to be scattered and even lost [3], [4]. In this study, The Sukodono Health Center as the target study location has not fully utilized SIKDA, an electronic application designed to be able to bridge data communication between components in the national health system, and information system in Puskesmas for data collection and reporting purposes, especially regarding infectious diseases. The manual collection and reporting of infectious diseases is considered impractical for the officers concerned in carrying out their duties. Therefore, a better health information system is needed in accordance with existing needs, by developing an information system for data collection and reporting of infectious diseases [2].

It is hoped that an adequate health information system in the health center will help the implementation of health development for the community, especially in tackling infectious diseases [5]–[7]. This needs to get attention because infectious diseases require fast and appropriate treatment so as to prevent wider transmission. In the Regulation of the Minister of Health of the Republic of Indonesia Number 82 of 2014 concerning Management of Communicable Diseases Article 1, it is stated that what is meant by Contagious Diseases are diseases that can be transmitted to humans caused by biological agents, including viruses, bacteria, fungi, and parasites [8]. Health information is needed to conduct effective and efficient health efforts. Information can be shared across the systems for the purpose of integrated prevention. Lack of integration of these systems leads to inadequate data flow between them, thus, information or reports should be relevant, timely, and efficient for those who need them as a basis for decision-making. However, most of the community health centers (puskesmas) in Indonesia have used a manual system [9], [10]. This system has acknowledged a risk of truth and data accuracy [11]. There is a possibility of intentional or unintentional errors, thereby reducing the accuracy of the information [12]. Addressing these issues will be essential for the effective reduction of information barriers.

Considering the importance of recording and reporting infectious diseases, a developed information system to record and report infectious diseases including the incidence and mortality of diseases, trends, and identification is in urge [13]. Several studies have explored the issue regarding the health information system in general. The following is the originality of this study compared to previous studies that have been published in various journals (Table 1).

TABLE 1

Study's Authenticity

No.	Research Title	Description	Results
1.	Albertus Dimas Pratomo. M, Ridha Sefina Samosir, Erwin Syah Rani (2019) A Desktop-based Health Information System at GKI Raya Hankam Clinic [14]	Desktop applications are capable applications that operate offline but must be installed first by the user. This information system is a combination of computer hardware and software, procedures, documentation, forms, and people who are Responsible for collecting, processing, and distributing data and information.	The Desktop-Based GKI Raya Hankam Clinic Information System helped store patient data, and drug data, record transactions, and print receipts or transactions. This system can also help search patient data and drugs if the user wants to find the data needed.
2.	Ida Bagus Surya Paramarta Made Sudarma, Ida Bagus Alit Swamardika. (2015) Medical Information System Application Design Using Desktop-Based Barcodes And Android [15]	An application that aims to simplify patient data collection and resource management available at a provider's clinic health services. This development will be in desktop form for personal computer users' immobile nature and mobile application for Android smartphones. This app later equipped with a usage barcode on the patient's identity to assist with data collection and sourcing faster and more precise information.	The work of Medical Information System application uses desktop-based and Android-based barcodes, namely being able to display patient data information to doctors via barcode scans displayed on desktop and Android applications and can update patient and doctor data information at Karya Prima Clinic.
3.	Asri Samsiar Ilmananda, Muhammad Noor Rizkianto, Ronald David Marcus. 2020 Desktop-Based Medical Record Information System for KH Mansyur Kintap Regional General Hospital with VB.NET [16]	Medical record information system designed using a desktop-based application. This is expected to avoid errors in data processing. So if an error occurs, it can be corrected quickly, especially in making reports and medical records.	The system built is considered to be able to facilitate employee performance in terms of managing patient medical record data and making reports effectively and efficiently.
4.	Komang Ananta Wijaya, Luh Yulia Adiningsih, Ida Bagus Wikrantha Punarbawa (2022) Development of Patient Data Management Information Systems in Desktop-Based General Practitioner Practices [17]	Services to their patients' computers based on the time of data collection and patient registration and numbering queuing and storage of inspection history or patient history using desktop and database applications.	Using the Visual Studio 2017 application and Microsoft SQL Management Studio 18. Users will interact with the system through a Graphical User Interface interface on desktop devices. SIDU can help General Practitioner doctor Komang Rendy Krisnadi to manage patient data record patient examinations and report patient examination history.
5.	Aprilia Ningsi, Kristina Sara, Anastasia Mude (2021) Desktop-Based Kotaratu Health Center Medical Record Information System [18]	Developing a system using the waterfall method, as the server Apache 2.4.34, programming language PHP 5.6.38, and MySQL as the database with the goal facilitate the puskesmas to process patient data and patient medical records so that be a report.	The results of black box testing show that all components in this system are running well, and all medical record data has been stored in the database, easy to manage patient data, search for medical records, manage medical record records, and make regular reports.

Based on the description above, it is understood that effective data collection and reporting on communicable diseases due to their rapid transmission is critical. Accurate and reliable information could determine the speed in handling potential outbreaks of infectious diseases in an area as well as reduce the risk of a wider impact. Addressing this issue, therefore, this

development attempts to improve the existing information system in Puskesmas. We identified some significant contributions of this study in developing a more effective and better information system than the existing method.

1. Developed a desktop-based infectious disease surveillance information system to make it easier for officers to collect data and report on infectious;
2. Improved the quality of existing infectious disease surveillance information systems: accuracy, completeness, timeliness, and relevance;
3. Simplified the manual recording and reporting system to become paperless and better maintain data backup

II. MATERIALS AND METHODS

A. STUDY DESIGN

This study uses descriptive analysis with double methods, qualitative and quantitative. Qualitative methods to explore information, and problems and analyze system requirements by conducting interviews and observations of related subjects. Quantitative methods are used to evaluate the quality of information systems that have been developed by assessing the quality of information.

B. POPULATION AND SAMPLE SIZE

The population in this study were all parties involved in the development of the Communicable Disease Management Information System at the Sukodono Health Center, Sragen. The selected subjects of this study were system users: the Head of the Puskesmas, the Head of the Infectious Diseases Program, and 4 holders of the Infectious Diseases Program.

C. INSTRUMENTS

The research instrument used was an interview guide used to gather information on problems, analyze the needs of the information system to be developed, and determine the type of data used. The questionnaire sheet is a form of user assessment of the information system being tested for use as material for evaluating the quality of information systems. The questionnaire is used to evaluate the quality of the information system that has been developed which refers to 4 main indicators, namely accuracy, relevance, timeliness, and completeness.

D. DATA COLLECTION

The prototype model stage starts with needs analysis by conducting in-depth interviews to obtain current problem data and identify needs from the input, process, and output sides. Next, a general and simple quick design is carried out which will give a brief description of the system you want to make (FIGURE 1). Fast modeling and design as a basis for making prototypes (modeling quick design).

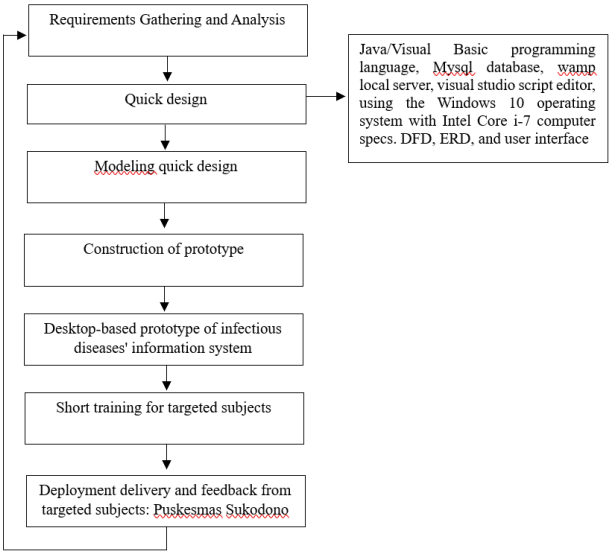

FIGURE 1. The flowchart of study collection

The design is quickly translated into a programming language and system testing (construction of the prototype) is carried out. Furthermore, the prototype of the desktop-based infectious disease information system was submitted to the Sukodono Health Center to evaluate the prototype so that feedback was obtained to improve requirements specifications (deployment delivery and feedback). Prior to submission, a brief training was conducted on operating the information system. If a discrepancy is found, it will be repeated from the initial stage.

E. VALIDATION

Design validation is carried out by asking several experts in their respective fields to conduct a design assessment designed to find out how effective the information system is. Design validation is carried out by system experts and material experts involving system users.

F. DATA ANALYSIS

Data from the interviews were collected, grouped, and sorted based on variables and then analyzed using descriptive analysis methods. Data analysis in this study was carried out by means of content analysis to analyze qualitative data derived from the results of in-depth interviews and observations. Data are selected according to their relevance and presented in narrative form.

Quantitative data was collected by scoring the questionnaires. Data collection is based on variables. After the data was collected, data entry was carried out in Excel and then data analysis was carried out using descriptive analysis methods.

G. QUALITY ASSESSMENT

The quality assessment of the developed desktop-based system is assessed from 4 indicators: accuracy, completeness, timeliness, and relevance to the users of the

evaluating system. System evaluation in this study used a Likert scale consisting of 5 levels of answers: Strongly Agree, Agree, Doubtful, Disagree, and Strongly Disagree. The calculation of the number of each item per indicator is then divided by the maximum score for each indicator. From the results of this calculation can be seen immediately the percentage of each indicator.

TABLE 2
Interpretation result of the quality assessment

Score	Category	Recommendation Need
81% - 100%	Very satisfied	No
61% - 80%	Satisfied	No
41% - 60%	Enough	Yes
21% - 40%	Dissatisfied	Yes
0% - 20%	Very dissatisfied	Yes

III. RESULT

A. PROBLEM IDENTIFICATION

1. THE DEMAND FOR RECORDING, DATA COLLECTION, AND REPORTING

Recording, data collection, and reporting on infectious diseases have so far been carried out manually, namely staff writing or recording data related to infectious diseases using stationery and paper, so they are considered less effective.

" In my opinion, the use of technology related to health information, especially infectious diseases, is very important because it will have a positive impact on the user or users or anyone in charge, especially those related to data collection, recording or reporting of infectious diseases. So far, the recording of infectious diseases is still done manually. This means that there is no system. Officers must write it using a ballpoint pen and then copy it to the computer." (Key Informant 1)

"Yes, here I think we need, among other things, a system that will make it easier to carry out tasks regarding recording data collection and reporting of infectious diseases. With the existence of the system, it is expected that officers will more easily carry out their duties." (Key Informant 2)

2. DATA COLLECTION CONSTRAINTS

Obstacles to data collection on infectious diseases at the Sukodono Health Center are manual-based and caused suboptimal to be implemented. Furthermore, several challenges appeared, such as data not being collected centrally, allowing files to be scattered and even lost, and the difficulty of searching, tracking, processing, recapitulation data, and analyzing the results of data collection.

In the process, the officer must first look for data in the lab or get information from the new village midwife, then record it manually, and then transfer it to the computer. Therefore, it requires support from technology. Information regarding the constraints in data collection on infectious diseases carried out by the main informants can be seen below.

"The obstacle is that officers still have to look for it in the lab, have to check which data is needed. In addition, officers also came to the village midwife to ask questions about infectious diseases. This of course takes a long time and is not effective either." (Key Informant 1)

"Because of the manual system, the officers ask other officers, for example in the lab about infectious diseases. I think this is an obstacle when viewed from the point of view of how to make a system practical." (Key Informant 2)

3. PROBLEM-SOLVING OF DATA COLLECTION

The way officers deal with existing obstacles related to data collection on infectious diseases at the Sukodono Health Center is by making special forms and notes that are tailored to the needs of the data to be inputted. The form has been pre-processed using a computer according to the type of disease and then printed out. This aims to shorten the time and is far neater than the officers doing it using a pencil or pen. So, the officer only needs to fill in the data as needed into the existing form.

"To overcome existing problems related to the recording of infectious diseases, officers first make a form using a computer and then print it. This is to make recording easier. So, officers just write what is needed." (Key Informant 1)

"Yes, in order to speed up the work at the same time so that it is neat, a form is made beforehand so that the officers only have to fill it in according to the existing data." (Key Informant 2).

4. DATA RECAP

The recapitulation of infectious disease data is still done manually so accuracy is required in calculating. The manual calculation has the potential to experience errors which can result in repetition in the calculation. This is important because it involves reporting and making decisions related to infectious diseases.

5. REPORTING

After the officers collect data on infectious diseases and recapitulation, the next stage is reporting to the Sragen District Health Office. This report is reporting data on infectious diseases provided to the district health office. In compiling the report, officers still do it manually, namely by checking the existing data one by one and counting it manually as well regarding the number and type of infectious diseases.

6. PROBLEM-SOLVING OF REPORTING

Officers overcome problems related to reporting infectious diseases by trying to be faster in preparing the data needed for reporting, namely conducting a recap of infectious diseases before D-day of reporting. This is to respond so that reporting can be done more quickly considering the possibility of work piling up. In addition, reporting can also be done more quickly than what has been scheduled so that officers are not in a hurry when they come to the health office.

B. SYSTEM DESIGN

1. DATA FLOW DIAGRAM

The following data flow diagram shows the way information flows through the present system. SIMPELAR entities or users consist of data collection officers and

reporting of infectious diseases. Officers can access several menus such as patient data, disease data recap, infection area, and patient disease. Officers can input patient data in the infectious disease management information system (SIMPELAR) such as name, age, family card number, region, etc., then officers can also input patient disease data in the infectious disease management information system (SIMPELAR) such as covid 19, measles, malaria, etc. After the officer gets patient data information, the data is input into the infectious disease management information system (SIMPELAR) where the officer gets info on disease data recap, area of infection, and patient disease data (FIGURE 2).

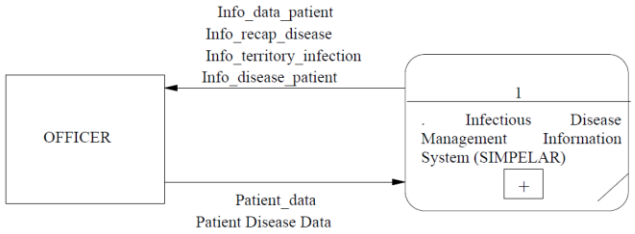

FIGURE 2. Context diagram of the developed communicable disease management information system

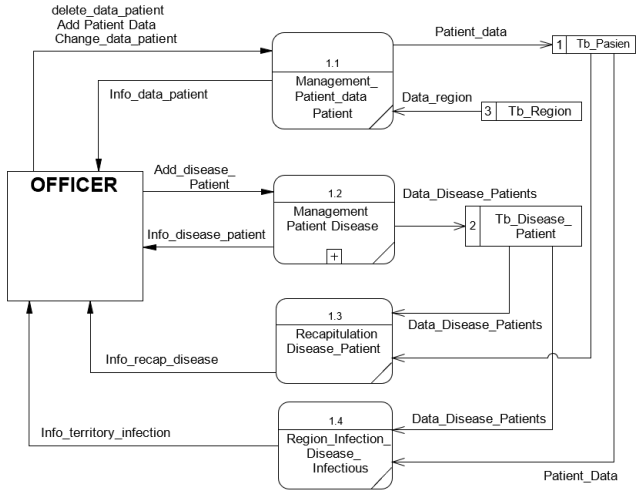

FIGURE 3. Data Flow Diagram Level 1 SIMPELAR

2. USER INTERFACE

The first user interface is the login page on the front page to enter the Infectious Disease Management Information System (SIMPELAR) (FIGURE 3). There was a text box with a username and password that should be filled in and a login button for system users to enter the system.

a. User Interface Dashboard

The user interface dashboard was the first page for system users who have successfully entered the Infectious Disease Management Information System (SIMPELAR). On this page, a graph of disease transmission is presented, hence users can see the distribution of cases of infectious diseases. In total, 9 regions and 11 infectious diseases are provided according to the working area of the puskesmas. Meanwhile, on the dashboard menu, there are two menus, including patient and form. The Patient Menu is a menu for adding patients and registering patients, and a form menu that consists of 3 sub-chapters including disease data input, disease data recap, and disease infection areas.

b. User Interface of Patient Management

The flow of the patient's management started by filling out the identity form as can be seen below. This page provides an add button to add patient data and patient lists. The patient form design shown has several patient data items that must be filled in starting from filling in the name, NIK, KK NO, contact NO, occupation, date of birth and region, and the save button to save. After the data is saved, it will automatically enter the patient list form. On the patient list form there is a search button on the menu to search for patient data that has been stored, then to change patient data that has been stored can be done by double-clicking on the number in the patient list so that the data that has been saved can be changed again.

c. User Interface of Disease Data Input

On the patient form, it also mandatory the information regarding the data of the diseases. Several sub-menus including Measles, DHF, Covid, Diarrhea, Malaria, and TB have appeared on this page. Triple E, DHF, ARI, Polio, Leprosy, and Leptospirosis, on the menu, are selected according to user needs.

d. User Interface of Disease Data Input

On the infectious disease input form, the user may search for patient data if it has been registered via the check button, then there are components of the sick start date, hospital admission date, treatment, measles diagnosis, clinical, drug administration, medical administration, therapy, and counseling. After the data is filled in, all of the counseling records are stored and the data is stored and will be automatically stored in the disease recap data menu.

e. User Interface of Disease Recap

This page displays the results of the disease recap from disease data input in the previous disease data input menu. Users can press the disease button as needed in the search section and then search for the date, month, and year of disease data input. The user selects the preview button to see the desired disease data summary and selects the export button to copy to Excel for printing as reporting material to the Health Office.

f. Regional User Interface

The regional user interface is a recap of the diseases based on the area. This may be beneficial to map the health status of the Puskesmas work area. On this page, users can see the distribution of infection areas by pressing the button on the menu from and to. Then search for the date, month, and year the disease data input was carried out which can be seen on the menu and until then the user selects the preview button to see the desired disease data summary.

B. IMPLEMENTATION SYSTEM

TABLE 3
Quality Assessment

Variable	Indicator	Total	Maximum score	Total Score (%)	Average Score (%)
Accuracy	The information generated is accurate as needed	24	40	60.00	62.19
	Needs development and improvement	22	40	55.00	
	Facilities and features available according to user needs	24	40	60.00	
	Easy to use	24	40	60.00	
	Satisfied with the system interface	29	40	72.50	
	Satisfied with the information obtained	26	40	65.00	
	Helpful in handling the work	24	40	60.00	
	Improve work quality	26	40	65.00	
Completeness	Complete and detailed information	29	30	96.67	83.89
	A simple interface for users	25	30	83.33	
	Easy to access	28	30	93.33	
	Errors rarely occur	24	30	80.00	
	Flexible	24	30	80.00	
	Reliable system	21	30	70.00	
Timeliness	The resulting information on time	24	30	80.00	84.44
	The resulting information is according to the data entered	24	30	80.00	
	Easy to read	23	30	76.67	
	Easy to understand	27	30	90.00	
	The resulting information is according to the data input	27	30	90.00	
	The resulting information can be accounted for	27	30	90.00	
Relevancy	The information produced is relevant to the work	24	25	96.00	95.20
	All the features and functions have been running as needed	25	25	100.00	
	The Simpelar system has met my expectations	25	25	100.00	
	The information that Simpelar produces can be accounted for	23	25	92.00	
	Data confidentiality is guaranteed	22	25	88.00	

The development of Infectious Disease Management Information System is developed by programmers and researchers, also monitored by the person in charge of the infectious disease program. Programmers in developing information systems use developer items which can be seen in the Table 3. After the development of the information system was completed, the information system was implemented at the Sukodono Health Center, Sragen.

TABLE 4
Study's Developer Items

Developer Items	Specification
Programming language	Java/visual basic
Database	Mysql
Local server	Wamp
Published server	Regency Health Office of Sragen
Script Editor	Visual Studio
Sistem Operation	Windows 10
Computer specification	Intel Core i-7

C. QUALITY ASSESSMENT BY USERS

The following table provides an overview of the quality assessment by users regarding the innovated present application. In general, the evaluation results of the developed system by user assessment fall into good categories in terms of accuracy, completeness, timeliness, and relevance (Table 4).

IV. DISCUSSION

A. SYSTEM QUALITY ASSESSMENT

System quality is the desirable characteristic of an information system. For instance, ease of use, system flexibility, system reliability, ease of learning, intuitiveness, sophistication, and response time [19], [20]. In this study, the developed system was assessed by evaluating 4 main indicators: accuracy, completeness, timeliness, and relevance.

The results of the presently developed health information system were considered accurate with an average score of 62.19% which indicates that system users assess the system as having the truth or accuracy in presenting data, which is in the good category. The results of the accuracy variable are supported by an assessment of the correctness of the data presented as is, detailed, in accordance with what is input by the system user so that the accuracy of the data can be trusted. An information system can be considered high quality due to the accuracy of the data in its performance [21].

The accuracy of this data is also related to management considerations in making decisions related to infectious diseases [22]. In the developed system, there is a graphic of the transmission of infectious diseases, which shows the distribution of cases of infectious diseases. Through the graph of the spread of the disease, management can make

decisions to carry out related programs, such as holding counseling, tackling the disease as soon as possible to prevent wider spread, and so on. Information accuracy comes from data or results of measurement and recording of facts. Therefore, accuracy in measuring and recording facts will determine the accuracy of the data and the value of the information produced.

The information system is considered to be accurate in accordance with the data or information presented by the Infectious Disease Management Information System (Simpelar) both in terms of data from examination results and recapitulation check-up results. Common weaknesses were reporting only one measure of accuracy among 14 studies for determining the gold standard for the purpose of the study or the computer-based patient record data [23]. Additionally, a previous study reported that inaccurate records in health information might prove liabilities and lead to mistakes in decision-making regarding the prevention of infectious diseases in the area [24]. Therefore, the accuracy obtained from this developed system might be seen as a positive signal of well-developed work for the improvement of the existing infectious diseases recording and reporting.

Also, the data presented must be complete, as well as accurate. Data completeness is defined as a structured and documented process performed to ensure that any database is complete for its intended use [25]. A previous reference measured completeness as the information includes all necessary values [21]. If the system fails to record an infectious disease case, then the pattern of the disease transmission is not complete. In the worst scenario, the local public health center (Puskesmas) could not end or at least minimize how big the rapidness of the disease [24], [26], [27].

Evaluation results on the completeness variable with 6 indicator items obtained an average percentage of 83.89%. Thus, the information system is considered complete in providing a presentation regarding the recording of infectious disease data. The completeness and breadth of information will be of higher value if it is presented in full in a broad scope. Piecemeal information, let alone not systematically arranged, will not mean much. Likewise, if the information only covers a narrow area of a problem. This finding is not surprising since previous researchers have identified problems and complaints about the existing system so the features provided in this system can answer or fill these deficiencies. Further, the completeness of data varies according to the types of data used [28]. This previous literature found that the percentage of completeness varies based on the types of data included. Meanwhile, this study defined completeness as above 60% satisfaction of the users. Hence, with a total score of 83.89%, the system presented in this study is considered complete and does not need additional recommendations.

In addition, information should be on time for the purpose for which it is required. Data must be available for the intended use within a reasonable time period [25]. The results of the studied information system evaluation based on the timeliness variable get an average percentage of 84.44%. The user considers that the use of the Communicable Disease Management Information System is related to presenting data, recording, and reporting in a timely manner.

Timeliness results are influenced by several factors, namely the speed of system response to users, the presentation of data or information according to the needs of system users, and the data presented as the latest information. Thus, it can be said that system users judge that the information generated by the information system can be relied upon if data is needed at any time. Timely information is timely if it is provided at the right time to enable the government and stakeholders to use it in making decisions [29].

In addition, information should be relevant and suitable to the targeted work. In this case, relevance is determined by asking 5 questions to users where the results obtained an average percentage of 95.20%. This proved the developed system highly relevant to the users' work at the public health center, appropriate, and applicable to their work.

Information is said to be relevant if the information can reduce uncertainty, increase the ability of decision-makers to make predictions, or confirm or correct their expectations in the past. Relevant information is information that needs to be known to provide new understanding. Reports that are only temporary and subsequently irrelevant must be discontinued [30].

Overall, with the Infectious Disease Management Information System developed in this study, users as a whole feel very satisfied, both in terms of the completeness of the data that is presented correctly and accurately, the user interface that is implemented, is timely and relevant in presenting information related to infectious diseases. Using this system is also considered easy and simple so that officers feel no difficulty carrying out their duties and operating the system.

B. FUTURE IMPLICATIONS AND LIMITATIONS

The development and improvement of the information systems are always constructed if there are certain changes, the required output data, and user interface refreshments following the wishes and needs of information system users based on the results of previous information system quality evaluations. Recognizing that not all regions in Indonesia have a good internet network, one of the advantages of a desktop-based system is that it does not require an internet network, only for data collection reporting of infectious diseases at the Puskesmas. The Infectious Diseases Management Information System or SIMPELAR has already been evaluated for its use, but it was only carried out after system introduction training so it has not been able to provide an overview of the level of satisfaction or acceptance of the system for the actual operation of the system by officers in carrying out their work.

Last but not least, we acknowledge that the Communicable Disease Management Information System (SIMPELAR) has several limitations. First, the designed system is still desktop-based, thus it can only be accessed by internal health

centers or institutions related to the health office. This also causes the program to be difficult to access remotely if at any time it is necessary to monitor or retrieve the database from the program. However, this can be controlled by using remote desktop software as long as there is an internet connection on both computers. Second, it is difficult to distribute the software because it uses the concept of installation in advance with adjustments and settings from the database if it is not connected automatically. Third, the information system is only designed for recording and reporting infectious diseases in the limited working area of the Sukodono Health Center. Considering all the weaknesses mentioned above, therefore, future studies to improve similar infectious disease systems for better recording and reporting are needed.

V. CONCLUSION

In conclusion, users are satisfied with the display format which is quite attractive despite its simplicity, the menu arrangement is precise and easy to use. Furthermore, the presentation of data was considered fast as indicated by the acquisition of the evaluation results from the total average percentage: accuracy 62.19%, completeness 83.89%, accuracy time 84.44%, and relevance 95.20%. Therefore, all the findings indicated that the user really believes in the completeness and correctness of the examination data that has been inputted into the information system by the paramedics.

To summarize, this developed SIMPELAR needs further study to improve its performance and efficiency. The present study is a desktop-based software that still needs installation of software in a laptop or PC. Therefore, web-based software may be more beneficial and efficient due to its being accessible from anywhere, as long as people have a connection to the internet and easier to access using various mobile devices.

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BIOGRAPHY

KIKI PUSPITA SARI S.KM was born in Sragen, Central Java, October 25, 1993. Completed Bachelor of Public Health Education with a concentration (KLKK) in Environmental Health and Occupational Safety at Muhammadiyah University Surakarta in 2015. Currently pursuing Masters's Degree at Diponegoro University Semarang with a major in Health Management Information Systems (SIMKES).

KUSWORO ADI was born in Temanggung, March 17, 1972 who completed his Bachelor of Physics education at FSM Undip and completed his Masters and Doctoral degrees in image processing at the Bandung Institute of Technology (ITB). In addition, he serves as Deputy Dean of Business Resources and Communications FSM Undip. He was inaugurated as a Professor of Instrumentation Physics at the Department of Physics, FSM UNDIP. Thanks to his persistence in image technology, he was able to create technology to check the quality of beef using an android mobile phone. The findings can later be used by the public in determining the quality of meat based on the SNI (Indonesian National Standard) set by the government.

FARID AGUSHYBANA was born in Jember in 1970. Bachelor of Public Health education at FKM UNAIR in 1994. Furthermore, he completed his master's degree in Health System Methods at Toulouse III University, France in 2002. While the Ph.D degree was completed in 2016 at the Institute for Population and Social Science (IPSR), Mahidol University, Thailand. He has been teaching at the Faculty of Public Health since 1995 in the specialization of Biostatistics and Population. The main courses taught include Biostatistics, Advanced Biostatistics, Basic Population, Social Demography, Rapid Survey, Computer Applications, Health Information Systems and Geographic Information Systems. The main focus of research and community service activities that have been carried out so far is on the themes of maternal and child health, maternal health information systems, early warning systems for elderly health problems, development of monitoring and evaluation tools for health systems.