

## **The Evaluation of “APROMED” Application Based on Organizational Assessment**

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### **Article history**

Posted, Jul 26<sup>th</sup>, 2023

Reviewed, Aug 14<sup>th</sup>, 2023

Received, Sept 29<sup>th</sup>, 2023

### **ABSTRACT**

Developing an outpatient reservation application is one of the efforts to fulfil the requirements of PMK RI Number 21 of 2020. Kaliwates General Hospital has an outpatient reservation application called APROMED. However, 7.3 more times patients made reservations manually than using APROMED, and the decrement in APROMED users is 3.2–5.6% monthly. Personally, the informant wanted an APROMED usage level above 50%, but it was only 13.6%. Based on these data, the problem is the low usage level of APROMED. This research aimed to evaluate the APROMED application based on an organizational assessment at Kaliwates General Hospital because a thorough evaluation had never been done. The method used was descriptive research with the cross-sectional study by measuring based on the success components of the DeLone and McLean systems using the ISO/IEC 15504 measurement scale. The results obtained were 76.9% 'L' largely achieved for system quality value, 52% 'L' largely achieved for information quality, 73.9% 'L' largely achieved for service quality, 32% 'P' partially completed for user satisfaction, and 51.8% 'L' largely achieved for net benefits. Kaliwates General Hospital must support APROMED application development based on evaluation, research, development, trial, and implementation activities.

**Keywords:** System evaluation; organizational assessment; approved application.

### **ABSTRAK**

Pengembangan aplikasi reservasi rawat jalan merupakan salah satu upaya untuk memenuhi persyaratan PMK RI Nomor 21 Tahun 2020. RSUD Kaliwates memiliki aplikasi reservasi rawat jalan yang diberi nama APROMED. Namun, 7,3 kali lebih banyak pasien melakukan reservasi secara manual dibandingkan menggunakan APROMED, dan penurunan pengguna APROMED adalah 3,2–5,6% per bulan. Secara pribadi informan menginginkan tingkat penggunaan APROMED di atas 50%, namun hanya 13,6%. Berdasarkan data tersebut, permasalahannya adalah rendahnya tingkat penggunaan APROMED. Penelitian ini bertujuan untuk mengevaluasi penerapan APROMED berdasarkan penilaian organisasi di RSUD Kaliwates karena belum pernah dilakukan evaluasi menyeluruh. Metode yang digunakan

adalah penelitian deskriptif dengan studi cross-sectional dengan melakukan pengukuran berdasarkan komponen keberhasilan sistem DeLone dan McLean menggunakan skala pengukuran ISO/IEC 15504. Hasil yang diperoleh adalah 76,9% 'L' sebagian besar tercapai untuk nilai kualitas sistem, 52% 'L' sebagian besar tercapai untuk kualitas informasi, 73,9% 'L' sebagian besar tercapai untuk kualitas layanan, 32% 'P' selesai sebagian untuk kepuasan pengguna, dan 51,8% 'L' sebagian besar dicapai untuk manfaat bersih. RSUD Kaliwates harus mendukung pengembangan aplikasi APROMED berdasarkan kegiatan evaluasi, penelitian, pengembangan, uji coba, dan implementasi.

Kata Kunci: Evaluasi sistem; penilaian organisasi; persetujuan aplikasi

## INTRODUCTION

Regulation of the Minister of Health of the Republic of Indonesia Number 21 of 2020 concerning the Strategic Plan of the Ministry of Health for 2020-2024 stated that hospitals required an effort to change health development governance, which includes integration of information systems, research and health development (PMK RI, 2020). One of the developments in information systems for health services is online outpatient reservations. Online reservations are helpful in helping patients obtain clinic information, doctors's operational hours, doctor's schedules, access to queue numbers, duration of procedures or examinations, and waiting time or queue information (Rizqi, 2018).

Kaliwates General Hospital in Jember is one of the hospitals that has implemented an online reservation system by launching the Rolas Medika or APROMED Application. There is a problem, namely the low-level usage of the APROMED application. The number of outpatients

from November 2021 to November 2022 was 128,275 patients. However, only 17,409 patients (13.6%) made reservations using APROMED, and 110,866 patients (86.4%) made reservations manually. This means 7.3 times more patients made reservations manually than using APROMED, and APROMED users decreased by 3.2 – 5.6% monthly from November 2021 to November 2022.

Based on the explanation of the Head of the IT Sub-division, the APROMED user does not achieve the target, so it cannot be evaluated based on terms of usage. Nagameka and Anshori Research (2018) stated that the absence of achievement targets for a system impacts the implementation and use of the system, which cannot be effective. The informant wanted APROMED usage to be more than 50%, but it was only 13.6%. Various aspects can cause low-level usage of an application. The APROMED application can be downloaded via Google Playstore so users can provide assessments and comments regarding the application. Most comments

stated that the application often experienced system errors, such as inability to open the application, forced-closed, or taking a long time to load.

One effort to respond to the problems is to hold a system evaluation. The informant stated that the organization had never carried out evaluations based on assessment or measurement of the system. System evaluation is important because it offers excellent opportunities to achieve organizational goals (Alhendawi & Baharudin, 2017). Evaluation helps improve system or application performance and determine the success of implementing information technology in the health sector (Purba, 2022). The system evaluation results will provide information on obstacles to online outpatient reservation services that may occur in the future (Nabyla & Sigitta, 2019). Potential problems faced by users and organizations can be identified by carrying out evaluations so that the development of the online patient reservation or registration system is better refined (Martiana, 2020). This research aimed to evaluate the APROMED application based on organizational assessments at Kaliwates General Hospital Jember.

## **METHOD**

This research was descriptive research, which had been done ethical clearance number 1973/UN.25.8/KEPK/DL/2023. The research was conducted in Kaliwates General Hospital. The research started from December 2022 to May 2023. The unit of analysis in this research was the Head of the IT Sub-Section (chief of networking and infrastructure). At the same time, informants were selected based on competency, scope and knowledge related to the research area.

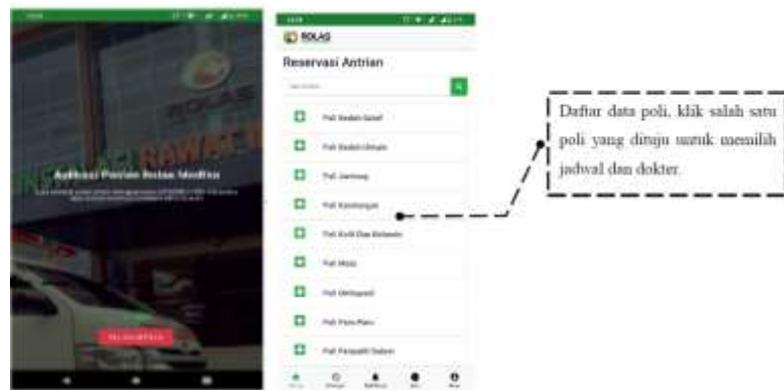
Data collection was carried out by interview, documentation study and measurement. The interview was conducted with the Head of the IT Sub Division because he is the only developer, holder, and manager of the APROMED application. An interview was conducted to obtain data about system quality components, information quality, service quality, user satisfaction survey results, and the usefulness of APROMED. In this research, the documentation object is supporting evidence for each research instrument. Study documentation included Meeting Minutes, Quotations, Cooperation Agreement (PKS) documents, Statement Letters (SK), Procurement, Proposals, Guidebooks, Invoices, Charts, and Excel files. Measurements were carried out by assessing the system components based on the Information System Success Theory by

McLean and DeLone's. These components included system quality (easy of use, flexibility, reliability, security, and response time), information quality (completeness, relevance, accuracy, format), service quality (completeness, relevance, accuracy, format), and user satisfaction (repeat purchases, repeat visits and user surveys) which were adjusted to ISO/IEC FDIS 9126-1, ISO 9241-10, ISO Guide 37, ISO 10004 and COBIT standards 5. The net benefits component (benefits to top management and IT management) was based on research by Gupta et al. (2007).

The measurement scale used the ISO/IEC 15504 standard.

## RESULTS AND DISCUSSION

The Rolas Medika Patient Application, abbreviated as Kaliwates General Hospital, launched the APROMED application on February 2, 2022. This application aims to improve the quality of services in hospitals. APROMED has three main functions: outpatient service reservations, a drug queue tracking system, and ambulance reservations.



### Evaluation of the quality of the APROMED application system

Evaluation of the quality system of the APROMED application was assessed through five indicators: ease of use,

flexibility, reliability, security and response time.

**Table 1.** System quality measurement results

Indicator	Total aspects	Number of aspects fulfilled
Easy of use	14	11
Flexibility	14	9
Reliability	10	9
Security	8	5
Response time	6	6
<b>Total</b>	<b>52</b>	<b>40</b>
<b>Value = (number of aspects fulfilled/total aspects x 100%)</b>		<b>76.9%</b>

The system quality of the APROMED application was 76.9%, including the Largely Achieved (L) category. The system quality of the APROMED application cannot reach the Fully Achieved (F) category because some aspects of the indicators have not been completely fulfilled. Sodik and Nugraheni's research (2022) assessed the health clinic information system in the Central Java region. The results obtained were 70% included in the Largely Achieved (L) category. This value showed that, systematically, no significant weaknesses were found in the system's quality (Sodik et al., 2022). Another research conducted by Putra (2021) related to the evaluation of the Juwita Hospital information system also received an 'L' category. Researchers mention the need to improve aspects that have not been met and regular evaluations to see changes in the value of system quality improvements (Putra, 2021). Based on the interview result, the plan for APROMED developing features and menus has been discussed for future improvements. However, it has not yet been implemented because a Policy Letter stated that application development was prohibited. In the system quality component, ease of use aspects have not been fulfilled. Based on research by Cahyani *et al.* (2022), who evaluated online outpatient registration in

hospitals, a good system must fulfil convenience aspects, including ease of understanding, ease of learning and ease of use or operation. APROMED had no how-to-use information as an introduction. The introduction shows the main menu before the system runs, providing the user with initial knowledge (Baharuddin *et al.*, 2021). Other research on the Online Dentist Reservation System at RSGM, Padjadjaran University, stated that the application needs an initial display to direct users to access the system correctly (Suryani *et al.* 2021). APROMED users also cannot reuse data that had been input because APROMED reservation data was disconnected. The system needs to implement features so users can use data without re-entering the same data again (Adikara *et al.*, 2020). Kaliwates General Hospital has also considered this aspect important to make APROMED easier for users. Based on evidence from meeting minutes regarding the evaluation of the user-friendliness of APROMED at Kaliwates General Hospital, it was stated that the APROMED menu was not user-friendly and needed an improvement for displaying doctor's schedule information.

Flexibility is another aspect not fulfilled in the system quality component. The first aspect was that APROMED had no confirmation feature. Online registration or

reservation applications should have a feature that can be confirmed automatically. This is intended to make it easier to convey information to each application user. (Hasanuddin & Andie, 2020). The second aspect was APROMED, only available in Android. Applications have higher software value and quality if they can be installed and uninstalled on various types of OS or devices (Rozi et al., 2020). Another aspect of APROMED was not integrated with other systems such as SatuSehat or BPJS-Kesehatan. Based on the interview results, APROMED is still a stand-alone system that can't synchronise with patient manual reservations. Research by Pradiatiningtyas and Kusnadi (2020) regarding the Design of an Outpatient Registration Information System for Patients at RSU PKU Muhammadiyah Bantul Yogyakarta stated that the outpatient registration or reservation system needs to implement a computerized system to increase the efficiency and effectiveness of the system.

### **Evaluation of the quality of APROMED application information**

Evaluation of the information quality of the APROMED application is assessed through four indicators, namely completeness (availability of complete information),

Another aspect that has not been fulfilled is related to the system. The development of APROMED was based on a prototype, according to the developer, so it may not use standard guidelines as a reference. Applications should be prepared with at least one guideline and developed based on applicable standards as a reference (Setyawan et al., 2021). Kaliwates General Hospital did not train other IT officers, so only one person could operate and manage the APROMED. The next aspect of system quality is related to security. APROMED had a policy regarding Information Security Management Systems (ISMS) but cannot provide the documentation because security-related data can only be accessed by APROMED founders. Rules, regulations, and procedures must be available in a business, whether in a soft file or complex file, to support the system's running optimally (Windhyastitia dkk., 2019). The founder stated that the documentation is confidential and cannot be shared publicly.

relevance (relevance according to needs), accuracy (accuracy of information), and format (presentation of information).

**Table 2.** Information system measurement results

Indicator	Total aspects	Number of aspects fulfilled
<i>Completeness</i>	5	5
<i>Relevance</i>	4	3
<i>Accurate</i>	6	2
<i>Format</i>	10	3
<b>Total</b>	<b>25</b>	<b>13</b>
<b>Value = (number of aspects fulfilled/total aspects x 100%)</b>		<b>52%</b>

The score obtained from measuring the information quality of the APROMED application was 52%, which included the Largely Achieved (L) category. Muttaqin et al.'s research (2020), who carried out measurements on the Center View application of the East Java Provincial Health Service, were 80.6% and included in Largely Achieved (L). This value showed that most of the information quality components in the application had been fulfilled. However, re-measurements still need to be made after improvements to achieve the Fully Achieved (F) category (Muttaqin et al., 2020). In contrast to research conducted by Krisnawati et al. (2019) Regarding evaluating the hospital management information system at Lawang Hospital, the value scored was 30%, including Partially Achieved (P). The quality of information is still not perfect because the implementation of SIM-RS at Lawang Hospital is only a basic application. However, the design of activities had not been adequately monitored and evaluated, and the work products have not been implemented,

controlled and maintained as they should be (Krisnawati et al., 2019). On the other hand, APROMED provided up-to-date and complete information according to needs and had an APROMED usage module, namely a Guidebook for Using the APROMED Application for Patients. A video tutorial about how to use APROMED had been shared on the Kaliwates General Hospital YouTube channel.

In the information quality component, the relevance aspect had not been fulfilled. APROMED did not provide the same information as manual reservations because it was not yet computerized. Adjustments were only made on a technical basis but not a system one. Based on research by Nabylla and Sigitta (2019), The design of the online hospital registration application for reservations or registration at a hospital must be made per the conditions for manual registration or reservation. This implementation was carried out by creating a flowchart describing the system's flow to be developed. This flowchart adapted the online patient reservation or registration system prototype to the conventional

patient registration system (Nabyla & Sigitta, 2019). Based on the interview results, this happened because there were eventually mismatches between the patient identity on APROMED and the registration system.

Another aspect that had not been fulfilled was related to accuracy. APROMED did not use standards to ensure the accuracy of the application, and there was no evaluation for accuracy. Following the previous discussion, APROMED development did not use any standards. Based on the interview results, APROMED had been evaluated only for system improvements and ease of use. System accuracy evaluation must be carried out to maintain the system's consistency (Rahmad, 2020). The next aspect is the aspect related to format (presentation). APROMED does not have design guidelines, and APROMED development does not refer to guidelines or standards. The design of an application

should consider other people's perceptions, so standards are needed as a reference for fulfilling these perceptions (Firantoko et al., 2019).

The next aspect that has not been fulfilled is because APROMED does not have a proper display. Registration or reservation information flow as an image reduces patient complaints about service because it is easier to understand (Fitriyah, 2021). APROMED is also unavailable in multiple languages. The number of application users can increase if the application has multilingual features (Mulyaningtyas & Setyawan, 2021). Other aspects were not fulfilled because APROMED design evaluation was never done. Design is one of the main attractions of an application, so evaluation regarding design is important to carry out (Urbanantika & Salim, 2021). Because the developer focused on improving the system but did not consider the APROMED design.

### Evaluation of the quality of APROMED application services

Evaluation of the service quality of the APROMED application is assessed through

three indicators, namely responsiveness, assurance, and empathy.

**Table 3.** Service quality measurement results

Indicator	Total aspects	Number of aspects fulfilled
<i>Responsiveness</i>	11	8
<i>Assurance</i>	4	2

<i>Empathy</i>	8	7
<b>Total</b>	<b>23</b>	<b>17</b>
<b>Value = (number of aspects fulfilled/total aspects x 100%)</b>		<b>73,9%</b>

The score obtained from measuring the quality of the APROMED application service was 73.9 and included in the Largely Achieved (L) category. This value showed evidence of a systematic approach and significant achievement of the aspects that must be fulfilled in the assessment process. This category also explains that when measuring the APROMED application, several weaknesses emerged in the assessment process. Evaluation of user satisfaction with the APROMED application.

Research by Septriadi et al. (2019), who evaluated health information technology at the Bina Husada College of Health Sciences in Palembang, received a score of 51%, which was included in the 'L' category largely achieved. Researchers explain that good information technology processing guarantees efficiency values and good service quality to the company's business goals (Septriadi et al., 2019). Another study conducted by Huda et al. (2020) related to assessing the population administration information system (SIAK) in the Kediri area received a similar score, namely 'L' primarily achieved with a percentage of 54%. This value shows that service requests and incidents have not been fully met, so there is still a need for a systematic

approach and gradual improvement to meet the service quality value, especially in the COBIT DSS02 subdomain (Huda *et al.*, 2020). In general, the quality of APROMED application services meets the requirements, where the trend of services provided can be known through the service request and incident schemes of the APROMED system. However, several problems result in APROMED services being less than optimal, such as the APROMED application often closing itself (force close).

Aspects of service quality that have not been met are in the responsiveness indicator because APROMED has been unable to respond to incidents automatically and confirm related incidents. Likewise, the empathy aspect does not have proof of acceptance of service improvements because there is no confirmation. This feature requires user confirmation, which is not yet available on APROMED. Based on the results of the interview, the reason this aspect cannot be fulfilled is to add features or confirmation menus. A separate user confirmation is required, which is still not implemented in the APROMED application. User confirmation requires complicated specifications and skilled human resources in this field. In contrast,

based on the results of interviews, it was stated that human resources conditions are insufficient to develop a more complex system. There are no regulations regarding incidents and service improvements, but improvements are still made after conducting an evaluation.

Research by Oriastu et al. (2022) stated that a confirmation menu in the patient reservation and registration application needs to be added to ensure that the patient does not immediately receive the results. These results can then be confirmed first, and then the patient will receive notification

via the application to minimise errors in the online reservation application (Oriastu et al., 2022). The next aspect concerns assurance with no APROMED user connectivity security policy. The privacy of application users is still vulnerable to attack by hackers, so development and policies in connectivity security are needed (Windhyastiti et al., 2019). APROMED has not yet reached the application stage with a user connectivity security policy. To fulfil this, more detailed features, while the hospital is still trying to add a confirmation feature first.

### Evaluation of APROMED application user satisfaction

Evaluation of user satisfaction is not carried out directly on users but rather on confirmation by the hospital whether or not they have carried out an evaluation such as a community satisfaction index (IKM) survey. Evaluation of user satisfaction (user

satisfaction) of the APROMED Kaliwates General Hospital application is assessed through three indicators, namely repeat purchases (reuse), repeat visits (viewing or re-visiting) and user surveys.

Table 4. Results of user satisfaction measurements

Indicator	Total aspects	Number of aspects fulfilled
<i>Repeat purchase</i>	9	0
<i>Repeat visit</i>	8	8
<i>User survey</i>	8	0
<b>Total</b>	<b>25</b>	<b>8</b>
<b>Value = (number of aspects fulfilled/total aspects x 100%)</b>		<b>32%</b>

The score obtained from measuring user satisfaction with the APROMED application is 32%, while 68% of aspects of user satisfaction have not been met. The user satisfaction value is included in the 'P'

partially achieved assessment category because it is in the range >15-50%. This value shows evidence of the approach and some achievement of the aspects that must be met in the assessment process. In this category, several aspects of user

satisfaction and achievement are unpredictable.

Research conducted by Ramadhan and Tolle (2022) related to evaluating the online mobile registration application for outpatient RSUP Dr Kriadi with a percentage of 57.94% is included in the 'L' category primarily achieved. Researchers stated that the results obtained were quite good. Only improvements and re-evaluation were needed to achieve the best score for the user satisfaction component (Ramadhan & Tolle, 2022). This is similar to research conducted by Muslimah et al. (2023), who obtained an 'L' score primarily achieved with a percentage of 66% in evaluating the online registration system at RSUD Singaparna Medika Citrautama. The score was almost achieved because user satisfaction was evaluated with the system being considered user-friendliness. However, regulation must still be carried out (Muslimah *et al.*, 2023).

Many of these aspects have not been fulfilled because all aspects related to user

satisfaction surveys have not been carried out by the hospital, which causes the user satisfaction survey scores low. User satisfaction surveys help determine the application's needs (Ani Yoraeni, 2021). Applications that meet aspects according to their needs can reduce obstacles, where patient satisfaction using online reservations or registration will increase if the application does not frequently experience problems (Rohman et al., 2022). User satisfaction can measure an application's success (Anggraini et al., 2020). Application user satisfaction surveys must be carried out to increase application users and obtain information regarding developments that must be implemented. This has never been done directly with patients because many things need to be prepared, such as making questionnaires and others. Patient satisfaction surveys should be able to be carried out online in the APROMED application itself by displaying it at the end of the application after the patient uses the application.

### **Evaluate the net benefits of the APROMED application**

The net benefits of the APROMED Kaliwates General Hospital application are assessed through two indicators, namely top management and IT management. Interviews were conducted using a guide in

the form of a questionnaire containing components of top management and IT management indicators. These were conducted with the chief networking and infrastructure officer, who is also the

representative of the hospital director because he has a position directly under the director.

**Table 5.** Net benefits measurement results

Indicator	Total aspects	Number of aspects fulfilled
<i>Top management</i>	19	10
<i>IT management</i>	8	4
<b>Total</b>	<b>27</b>	<b>14</b>
<b>Value = (number of aspects fulfilled/total aspects x 100%)</b>		<b>51,8%</b>

The score obtained from measuring the net benefits of the APROMED application was 51.8%, while 48.2% of aspects of information quality could not be met. The net benefits value is included in the 'L' assessment category as largely achieved (almost achieved) because the value is in the range >50-85%. This value shows evidence of a systematic approach and significant achievement of the aspects that must be fulfilled in the assessment process. This category also explains that several weaknesses emerged when measuring the APROMED application in aspects of the net benefits component assessment process.

Khairani et al. (2022) conducted research that evaluated the SI-EKA application with a percentage of 72.73% included in the 'L' category primarily achieved. This research shows that the level of capability in running the application has met almost all the requirements. However, system managers on the part of top management and IT management must carry out evaluations to

achieve the total value (Khairani *et al.*, 2022). Another research conducted by Prandana et al. (2019) evaluated the governance of the Ganesha Hospital information system audit with measurement results in the 'L' category primarily achieved. Researchers stated that top management needs to conduct system operation training so that the service received by patients is better, and IT management needs to immediately address aspects that have not been met (Prandana et al., 2019).

Aspects not fulfilled in the net benefits component related to top management include that training has never been carried out regarding the system to increase the quality of APROMED. Increasing skills needs to be done by conducting training. Training functions to meet hospital needs to ensure that every business process within the hospital can run more orderly and according to expectations. (Suawah, 2021). Training can increase knowledge and skills, which will later have an impact on

developing a more professional system because top management has never conducted a survey to determine APROMED that top management has never conducted a survey to determine APROMED's competitive level ability to provide information on users' decisions to reuse a system, weaknesses and strengths of the system that influence system use (Sunarya et al. Awaluddin, 2022). The next aspect is IT management, where there is no documentation related to APROMED, which can reduce or improve IT performance. The IT sector has never been rewarded for establishing, developing or improving the APROMED application. Providing rewards can improve the quality of human resources who can work optimally and implicitly produce better system quality (Kustiani et al., 2021). The existence of rewards in the field of information technology can foster enthusiasm and motivation in carrying out tasks and responsibilities for the progress of system implementation (Putra & Vadriasmu, 2020).

Overall, the results of measuring the effectiveness of the APROMED application showed an effectiveness value of 82.07%. This value shows that the APROMED application is 'less effective' because it is in the value range of 65-84% (Mahmudi, 2015, p. 111). Aspects that have not been

fulfilled (not yet complete) in each component of system quality, information quality, service quality and user satisfaction have caused APROMED not to reach the maximum value. Requirements that have not been fulfilled completely, developing technology, context of use, rapidly changing requirements, and imperfect or inflexible management determine the results of assessing or measuring the effectiveness of a system (Barraood dkk., 2021), in line with research by Widiantari et al. (2021), where the components of system quality, information quality, service quality have low values resulting in the effectiveness value being included in the less effective category.

This research has limitations in that evaluations should also be carried out at the registration or front office and at superiors (leaders) of hospital management at Kaliwates General Hospital Jember. Apart from that, the assessment is only seen from an organizational perspective and is not asked directly by APROMED application users or patients. In contrast, system quality indicators related to ease of use should be asked of users (patients) directly.

## CONCLUSION

The overall evaluation of the APROMED application is less effective due to several obstacles, such as being in the development

stage so that several components cannot be fulfilled. To achieve a reasonably practical value, the value that must be achieved is in the range of 85-99%, and to achieve a practical system value, the value that must be achieved is more than equal to 100%.

Suggestions for Kaliwates General Hospital are to improve the system's quality by adding an introduction and carrying out developments so that APROMED can be installed on iOS and PC. APROMED needs to be synchronised by the system with manual reservations. Regarding the quality of information, it is necessary to add a visualisation of images or flows in the APROMED application, display posters of the flow of how to use APROMED in the outpatient waiting room and carry out evaluations regarding the system's accuracy. Improve the quality of APROMED services by adding a confirmation feature. The next suggestion is that Kaliwates General Hospital needs to support the development of the APROMED application through evaluation, research, development, testing and implementation activities. Suggestions for further researchers are to conduct research related to user satisfaction with the APROMED application through direct surveys with application users to determine the evaluation of application use for users,

namely patients, as well as conducting quantitative research based on the indicators described in this research to determine the relationship and the influence of each variable on the effectiveness of using APROMED.

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