Analysis of the Use of Self-Registration Platforms (APM) on the Effectiveness of Outpatient Registration at Bandung Kiwari Hospital

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Abstract. One way to improve the quality and efficiency of hospital administration services is to carry out digital transformation. One of the innovations implemented is the Self-Registration Platform (APM), which aims to speed up the process of registering outpatients independently. This study aims to analyze the extent to which APM contributes to the effectiveness of the outpatient registration process at Bandung Kiwari Hospital. The method used in this study is qualitative descriptive with a case study type, through direct observation, in-depth interviews with key informants, and documentation analysis of registration data from October 2024 to March 2025. The results showed that APM users experienced a significant increase, showing early success in patient education and mentoring. However, the system still faces challenges such as limited integration with the Participant Eligibility Letter (SEP), biometric constraints, and uneven digital literacy among patients. Elderly patients and patients with special needs tend not to be able to access APM independently. Therefore, APM is considered quite effective in accelerating services for certain groups, but still requires technical development, socialization, and system integration in order to support comprehensive and sustainable services.

Keywords: *Self-Registration Platform, Effectiveness, Outpatient Registration, Analysis.*

Introduction

Hospitals as advanced health service facilities have a great responsibility in ensuring the implementation of quality health services that are responsive to the needs of the community (Mulyana et al., 2025). Hospitals are not only a place for the cure of diseases, but also serve as a referral, education, and research in the health field. In the midst of technological developments and increasing patient demands for fast,

precise, and efficient services, hospitals need to innovate not only in the aspect of clinical services but also in the administrative system (Rosmawati, 2024). One of the main challenges that hospitals often face is the length of the outpatient enrollment process, especially as patient visits increase (Nuryani & Ulfah, 2024). An inefficient registration process can lead to long queues and long wait times. These inefficiencies not only interfere with patient comfort, but also impact time management, staff workload, as well as reduce patient satisfaction with hospital services (Rosdiyah & Gunawan, 2024).

In the era of digitalization and the industrial revolution 4.0, the health sector is required to transform using information technology, in order to improve the quality and efficiency of services. The hospital registration system that was once done manually is now replaced by a digital system, one of which is through the implementation of the Self-Registration Platform (APM) (Nurazizzah & dkk., 2024). The APM machine is designed to make it easier for patients to register independently without having to queue at the registration counter (Chung & Park, 2024). The use of APM is also considered to increase the effectiveness and efficiency of patient service flows, reduce the workload of registrants, and assist hospitals in supporting the digitization of medical records and patient queue management in a more conducive and structured manner (Saputra & Gunawan, 2024). This technology is part of the development of Hospital Management Information Systems (SIMRS) and electronic medical records designed to facilitate real-time and accurate management of patient data.

One of the main indicators in the quality of hospital services is the patient registration system which is the initial stage of all medical service activities (Awanda et al., 2024). The speed and accuracy of this process is crucial, as it has a direct effect on the smooth running of the next clinical service. The effectiveness of the registration system is one of the benchmarks for the success of modern hospital management. Innovations such as the Self-Registration Platform (APM) are also closely related to service effectiveness variables, which include aspects of waiting time, convenience, and quality of administrative services (Adiffa & Masturoh, 2022). Based on *Technology Acceptance Model* (TAM) theory, it is explained that users will accept and use new technologies if they feel that the system is easy to use and provides benefits (Meysafera & Noor, 2024). The success of an APM machine is determined not only by the presence of its technology, but also by the readiness of the infrastructure, system integration, user perception and readiness of the support system in the hospital. Therefore, it is important to evaluate how APM actually contributes to the effectiveness of outpatient enrollment. (Andrania et al., 2023)

Bandung Kiwari Hospital will start operating an outpatient Self-Registration Pavilion (APM) system in mid-October 2024 as part of the transformation of digital-based registration services (Fitriyah et al., 2023). Based on the results of observation and direct confirmation with outpatient registration officers, it is known that this system is still in a transition period. Currently, most patients can use APM with the help of an officer (JKN Ambassador) (Jin et al., 2020). However, even though APM has been actively used, its implementation still encounters various obstacles, especially those

who are not familiar with the use of technology (Safarina & et al., 2023). In addition, the APM system has not been directly integrated with the creation *of the Participant Eligibility Letter* (SEP), so officers still have to carry out the process manually which has an impact on the double workload. Conditions in the field show that the use of APM has not reached all patient segments (Zhao & dkk., 2022). Some patients with special conditions, such as orthopedic patients with additional documentation requirements or psychiatric patients with drug or alcohol dependence, cannot be automatically screened through APM due to system limitations and certain administrative requirements from BPJS. This identifies the need for system adjustments and increased support for specific patient groups (Novianti & Gunawan, 2024).

The findings of this study indicate that digital transformation in the field of hospital services requires not only infrastructure readiness, but also user readiness, officer readiness, and a thoroughly integrated system (Sabrina & dkk., 2021). Therefore, it is necessary to conduct further studies on the effectiveness of APM in supporting outpatient registration in hospitals, both from the side of users (patients), implementers (officers), and system managers (IT teams) (Cahyani et al., 2024). The purpose of this study is to analyze the extent to which the use of APM can increase the effectiveness of the outpatient registration process at Bandung Kiwari Hospital. By understanding the supporting and inhibiting factors, hospitals can optimize the implementation strategy of the Self-Registration Platform (APM) in order to be able to provide better services to the community (Marliana & et al., 2023). With this, the researcher is interested in taking the title "Analysis of the Use of Self-Registration Platforms (APM) on the Effectiveness of Outpatient Registration at Bandung Kiwari Hospital".

Basic Theory

In research on the use of Self-Registration Platforms (APM) on the effectiveness of outpatient registration in hospitals, a theoretical basis is needed that explains the relationship between technology, service, and work effectiveness. Every hospital is required to provide fast, accurate, and efficient service to optimally meet patient needs. This is where the theory of effectiveness becomes a crucial foundation, because this theory emphasizes that a system or activity is considered successful if it is able to achieve the desired goals with satisfactory results. In the context of hospital services, effectiveness is seen in how the registration process runs smoothly, saves patient waiting time, and provides convenience and comfort throughout the process.

The implementation of technology in hospital service systems is also inextricably linked to user behavior. Therefore, technology acceptance theory is a crucial reference in understanding how patients and staff perceive the presence of APM. If a technology is perceived as providing tangible benefits and being easy to use, users will more readily accept and utilize it in their daily activities. In this regard, the success of APM depends not only on the system itself, but also on the extent to which patients and staff perceive the presence of the machine as helpful.

Furthermore, the use of APM is part of the development of a hospital management information system. Through this system, patient administration processes can be automated, accelerated, and integrated with other hospital data. This integrated system not only speeds up the registration process but also improves data accuracy and supports efforts to digitize healthcare services.

In terms of public services, the presence of APMs reflects innovation by local governments and hospitals in improving the quality of public services. Good public services must be able to meet community needs in a simpler, more transparent, and more efficient manner. APMs are a modern form of service that allows patients to register without having to wait long at the counter, resulting in faster and more orderly service.

Thus, the theories of effectiveness, technology acceptance, management information systems, and public services are interrelated in supporting the objectives of this study. These four theories explain that the effectiveness of outpatient registration is determined not only by the availability of new technology, but also by user readiness, system usability, and a supportive work environment capable of adapting to digital changes in hospitals.

Methodology

The study uses a descriptive qualitative case study approach to describe and analyze in depth the process and effectiveness of the use of the Self-Registration Platform (APM) at Bandung Kiwari Hospital. Data was collected through three main methods, observation carried out directly by observing the outpatient registration process, semi-structured interviews with key informants consisting of outpatient registration officers, patients, and IT officers, and documentation including data collection from hospital information systems, such as the number of registrations via APM and manual registration, as well as visual documentation in the form of photos of APM machines. Data analysis uses the Miles and Huberman model, which consists of three stages, namely data reduction, data presentation, and conclusion or verification. To increase the credibility of the data, it is strengthened through triangulation techniques, which are comparing information from various sources (patients, staff, IT) and various techniques (observations, interviews, documentation) to ensure the consistency and validity of the data obtained.(Miles et al., 2020).

Results and Discussion

Analyzing the effectiveness of the use of the Self-Registration Platform (APM) on the outpatient registration process at Bandung Kiwari Hospital. The research was carried out in a qualitative manner, a descriptive approach through direct observation at the location, in-depth interviews with various key informants (registration officers, IT, and patients), and secondary data analysis from the hospital information system section. All data collected are analyzed to comprehensively describe the actual conditions in the field, as well as identify obstacles and potential

for future development of APM systems, during the transition period of digitization of registration services.

Based on the results of observations made in the outpatient registration area and direct confirmation with officers, it is known that the APM system will begin to be implemented at the Bandung Kiwari Hospital in mid-October 2024 as one of the digital transformation efforts in the outpatient registration process. This system aims to reduce queues, speed up services, and improve hospital operational efficiency. However, in its implementation, the use of APM is still in a transition phase and has not completely replaced manual registration. Although APM machines are available and functioning, their use has not been fully optimized independently by patients. It was found that patients generally did not have difficulty using the Self-Registration Platform (APM). This is because there is still assistance from accompanying officers (JKN Ambassadors) who actively assist patients in the process of using APM. This officer has an important role in accompanying patients, especially in the early stages of use, so that patients do not find it difficult to operate the machine. This is because not all patients are familiar with technology or understand digital registration procedures independently.(Afifah & Prasastin, 2023)

In general, the registration flow at Bandung Kiwari Hospital directs all patients to be targeted to optimize online registration first, both through the *Mobile* JKN application and *the* hospital's official website. Online registration can be done from D-14 before the control date, as long as the quota is still available. However, if the online quota has been met, because currently at Bandung Kiwari Hospital is still in a transition period, patients are still given the alternative to take the registration quota directly (*offline*) at the hospital, even though the number is limited. Thus, patients who have successfully registered *online* only need to process the follow-up administration through APM upon arrival at the hospital. This condition generally helps to reduce congestion at the registration counter and speed up the initial service process. On the other hand, patients who cannot use APM generally experience problems when registering online, either through *the Mobile* JKN application or the Kiwari Hospital website. These obstacles can be in the form of technical problems in the *Mobile* JKN application, such as inability to access the application or obstacles related to BPJS membership data, doctor quotas that have been met, certain age restrictions, or administrative requirements such as internal referral letters. Patients who do not successfully register *online* are directed to use manual registration.

Facts on the ground show that not all patients can access or utilize APM easily. Some patient groups face obstacles, especially elderly patients who are not familiar with technology, patients who do not have devices such as *smartphones*, or patients whose devices are not compatible (*Old* School Cellphones) with the Mobile JKN application, or do not have an internet quota, finally cannot complete registration through APM. In fact, among patients who have digital devices (*mobile phones*), obstacles such as forgetting passwords or difficulty *logging* in are still common obstacles. In such cases, the role of the officer is essential to provide direct assistance on site. Patients who experience digital barriers tend to be more comfortable using manual registration

systems, as they have understood conventional flows and feel safer when assisted directly by an officer.

In observation, it was also found that there were several limitations in APM's ability to screen patients thoroughly, which caused some groups of patients to be unable to carry out the registration process independently in the machine. For example, patients with special needs such as patients who use NGT (*Nasogastric Tube*) or patients with mobility limitations such as those who use beds. In addition, orthopedic patients with a diagnosis of injuries due to traffic accidents, work accidents, or falls are required to attach a chronological letter of the event signed on a stamp that will be analyzed first by the officer to determine whether the BPJS claim can be processed. If the claim cannot be covered by BPJS, for example in the case of a double accident, the patient is required to attach a police report explaining that the patient is a double accident and then the one who covers is not BPJS Kesehatan but Jasa Raharja. And for mental patients with indications of drug or alcohol dependence also cannot be screened through APM because the limitations of the system have not supported in detecting and evaluating the patient's medical and administrative status, they must go to the registration counter first to fill out a statement that, if the patient is indicated to be drug or alcohol dependence, it cannot be covered by BPJS.

Interviews with outpatient enrollment officers reinforce the observational findings. The officer stated that the use of APM is situational and highly depends on the type of poly and service policy of the day. On certain days, some polys such as cardiac polys do not accept manual (*offline*) registration services and require the use of APM or *online systems*. However, technical constraints remain frequent, such as failure of biometric recording (face or fingerprint recorder), patients due to certain medical conditions (e.g. finger fractures, cuts, or patients who are unable to stand up straight for face recording). Another obstacle that often occurs is the incompatibility of the doctor's practice schedule with the system at APM where the schedule listed is different from the doctor's actual practice time, causing patients to not be able to take the queue number on time. System technical problems, such as BPJS network disruptions that make APM unusable. The officer also said that there are still many patients who are reluctant to use APM unaccompanied, even though information on instructions for use on the machine is available.

One of the main unresolved issues in the use of APM is related to integration with the *Participant Eligibility Letter* (SEP) system. APM has not been able to generate SEP automatically. Although patient data from APM can be used for SEP creation, the execution process is still carried out manually by officers at the registration counter. This condition causes a double workload, because officers have to serve manual registration while completing the administration of APM patients. The officer hopes that there will be the development of a system that allows full integration between the APM and the SEP system so that the entire registration process can be completed independently by the patient.

This was also confirmed by the Head of IT of Bandung Kiwari Hospital, stating that from a technical point of view, APM is relatively stable and does not experience significant disruptions. The disruption that had occurred was more related to operational use, not to the system or hardware. One of the examples mentioned is an incident when the registration slip did not come out of the machine, not because of a system malfunction, but because the clerk forgot to replace the paper that ran out in the machine. This shows that the reliability of the APM system is quite high, and disruptions are only incidental and can be minimized through increased supervision and internal SOPs. Regarding the integration of the APM system with the creation *of the Participant Eligibility Letter* (SEP), the resource person said that the APM system has been able to provide the data needed for the creation of SEP, but the finalization process is still carried out manually by the registration officer. The statement shows that the APM system has begun to lead to more integrative digitalization, but it is not yet fully automated. These limitations indicate that there are opportunities for future system improvements, especially in accelerating and simplifying patient service flows. Full integration between the APM system and the BPJS Kesehatan system will be an important step to increase the effectiveness and efficiency of registration services. When asked about the possibility of future development, the Head of IT said that the hospital has considered adding APM units in areas that currently do not have access to APM machines. The main focus is on the 3rd floor, where there are Medical Rehabilitation and Hemodialysis services. This plan illustrates the hospital management's commitment to continue to develop a self-service system to improve ease of access for outpatients from various service units.

Patient interviews show that they generally benefit from the use of APM, especially young patients or patients who are used to using the Mobile JKN application. They mentioned that the registration process became faster, there was no need for long queues, and it was more convenient in person. However, most patients still expressed criticism and hope that this system would continue to be improved, especially in terms of accessibility for elderly patients and technical assistance in the field. Patients also expect information about the use of APM to be explained in more detail when they first come to the hospital, so as not to confuse new users.

Most of the patients interviewed stated that the use of the Self-Registration Platform (APM) was quite helpful in speeding up the outpatient registration process. One patient said that by using APM, the queue atmosphere became more orderly and conducive. He stated, "The list is not queued to get the queue number, it is also more conducive if I think it is more conducive to using the APM machine." This statement shows that the APM system is able to increase efficiency and convenience in the administrative process. However, several obstacles were also revealed, especially in terms of technological affordability for the elderly group. One of the patients complained that many elderly patients had difficulty using APM and the Mobile JKN application. According to him, "The most obstacle in general who use machines or Mobile JKN is for patients who are indeed elderly, many complain, especially family members who are grandparents and so on, who cannot operate it." He also added that not all elderly

people come with companions, and officers such as security guards cannot always help individually. This reflects the digital literacy gap that still needs to be addressed.

Other respondents admitted that the APM system is very effective for young age groups who are used to using technology. "If it's easier for us young people to register, next month we can register tomorrow as well as the term I already have a queue, it's already young," he said with a laugh. Nevertheless, he still suggested that the registration system, both manual and digital, can continue to be improved so that it is more accessible to all groups. He added, "Actually, this is already good, it's not bad, it's just that if it can be even better, it will be eliminated again, if it can be faster, it will be accelerated again." One of the patients also explained that he felt quite helped because when he first used APM, he was guided directly by the JKN Ambassador officer. He said that the process became easier because he had previously registered through the Mobile JKN application. "I have registered first through Mobile JKN, so when I get to the hospital, I just need to enter the data into APM," he said. However, he admitted that if he was not helped, he could be confused because he was not used to it. Therefore, he suggested that information on how to use APM be conveyed more clearly, especially for patients who are less familiar with technology.

To support the results of observations and interviews, an analysis was carried out on data on the number of outpatient registration patients, both manual registration and through APM. Data obtained from the Information Technology section of Bandung Kiwari Hospital shows a significant trend in the use of APM over the past six months, starting from October 2024 to March 2025. The following is a recapitulation of the data :

Table 1.
Manual vs APM Registration Trends

No	Period	Manual	APM	Total Amount
1	October 2024	8125	4742	12867
2	November 2024	6705	5427	12132
3	December 2024	6007	6344	12351
4	January 2025	5883	6513	12396
5	February 2025	5518	6562	12080
6	March 2025	5013	6277	11290
	Total Amount	37251	35865	73116

Based on the table above, it shows that in the implementation of outpatients during the six-month period was 73,116 patients, with the use of registration almost balanced between manual users of 37,251 and APM registration of 35,865. However, the trend of using APM has increased significantly over time. In the first month of APM implementation, only 4,742 patients used APM machines. This is natural considering that APM is still relatively new, has not been widely socialized, and officers are still in the adaptation stage. The majority of patients still rely on manual systems because they are more familiar. There was a drastic increase in November 5,427 and December

6,344, indicating that more than half of the number of patients began to switch to using APM. This indicates the initial success in the process of patient education and assistance by officers (JKN Ambassadors), as well as the beginning of the formation of new habits in digital-based hospital services. In the following three months, the trend of APM usage continued to increase, reaching 6,277 in March 2025. These changes illustrate the success of progressive digital adaptation, although it is still in the development stage. With stronger infrastructure, socialization, and mentoring support, the APM system at Bandung Kiwari Hospital has great potential to become an effective and efficient self-registration solution in the long term.

Image 1. **Self-Registration Platforms (APM) Machine**

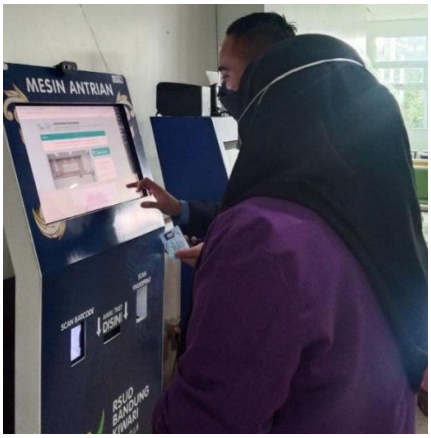

Image 2. **Patient Interaction with Officers (JKN Ambassadors)**

Conclusion

The implementation of the Self-Registration Platform (APM) at Bandung Kiwari Hospital is a form of health service innovation in an effort to improve the efficiency of outpatient registration. This study was conducted to examine the extent to which APM is able to speed up and simplify the administrative process in the early stages of health services, as well as identify various obstacles faced in its implementation. Based on the results of direct observations, interviews with outpatient registration officers,

patients, and IT, as well as documentation and analysis of data on the use of APM vs manual from October 2024 to March 2025, it can be concluded that **APM has succeeded in accelerating the registration process** for most patients, especially those who have registered through Mobile JKN or the *Bandung Kiwari Hospital* website.

APM allows patients to print their queue numbers quickly and directly to the poly room without having to queue at the registration counter. In a six-month time period, **APM usage has seen a consistent increase from month to month**. **In October 2024, APM users will only account for 4742** of the total outpatient registrations. **However, in March 2025, the number of APM users has exceeded 6277**, indicating a positive increase in acceptance among the public. However, **the effectiveness of APM has not been maximized,** because the system has not been fully integrated with the process of making SEP (*Participant Eligibility Letter*), which still has to be done manually by officers.

In addition, **APM has not been able to reach all types of patients**, especially those with physical limitations, special medical conditions, or digital unpreparedness. Many elderly patients or patients with limited access to technology still need assistance from a companion officer (JKN Ambassador), which means that the system is not yet fully independent. Registration officers stated that the existence of APM did ease the queue, but it had not significantly reduced their workload due to the additional manual process that was still ongoing. Thus, the **use of APM at Bandung Kiwari Hospital is in a positive development phase, but has not yet reached full effectiveness**. This system has succeeded in improving efficiency, but it still needs to be strengthened in the aspects of technology integration, patient education, and equitable access to digital services.

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