

## Implementation of Online Registration Information Technology in Health Service Delivery at Matur Primary Health Center in 2025

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### ABSTRAK

Pemanfaatan teknologi informasi dalam pelayanan kesehatan, seperti sistem pendaftaran online di puskesmas, menjadi alternatif untuk meningkatkan efisiensi layanan dan mengurangi antrean panjang. Sistem ini diharapkan mampu meningkatkan aksesibilitas dan kualitas pelayanan kesehatan di fasilitas kesehatan tingkat pertama. Penelitian ini bertujuan untuk mengkaji aspek *man* (sumber daya manusia/perilaku), *material* (sarana dan prasarana), dan *method* (prosedur dan alur kerja) dalam implementasi pendaftaran online di Puskesmas Matur. Penelitian dilaksanakan pada 22 April–06 Mei 2025 dengan metode kualitatif deskriptif, melibatkan lima informan yang terdiri dari petugas dan pasien. Hasil penelitian menunjukkan adanya perubahan signifikan dalam alur pelayanan dan interaksi antara pasien dan petugas. Sebagian besar pasien menyatakan puas terhadap kemudahan pendaftaran online, meskipun kendala masih dialami oleh pasien lansia dan pengguna yang kurang memahami teknologi. Petugas menyatakan sosialisasi telah dilakukan, namun masih perlu ditingkatkan. Secara umum, implementasi pendaftaran online diterima dengan baik, meskipun memerlukan penguatan sosialisasi dan pendampingan teknis.

**Kata kunci:** Implementasi; teknologi informasi; registrasi online

### ABSTRACT

The utilization of information technology in health services, such as online registration systems at primary health centers, serves as an alternative approach to improve service efficiency and reduce long waiting times. This system is expected to enhance accessibility and the quality of healthcare services at the primary care level. This study aimed to examine the aspects of *man* (human resources and behavior), *material* (facilities and infrastructure), and *method* (procedures and workflow) in the implementation of online registration at Matur Primary Health Center. The study was conducted from April 22 to May 06, 2025, using a descriptive qualitative approach involving five informants consisting of healthcare staff and patients. The results indicated significant changes in service flow and interactions between patients and staff. Most patients expressed satisfaction with the convenience of online registration; however, challenges were still experienced by elderly patients and those with limited technological literacy. Registration officers reported that socialization efforts had been implemented, but further outreach is required. Overall, the implementation of the online registration system was positively received, although enhanced socialization and technical assistance remain necessary.

**Keywords:** Implementation; information technology; online registration

## BACKGROUND

The current era is characterized by rapid digital transformation, in which information technology plays a crucial role in improving organizational performance and service efficiency across various sectors, including healthcare. According to the World Health Organization, health information technology refers to the use of digital, mobile, and wireless technologies to support the achievement of health system objectives. Prior to the adoption of digital health technologies, many communities faced significant barriers in accessing healthcare services, particularly those living in remote areas with limited health facilities. In response to these challenges, digital health transformation has become a strategic initiative promoted by the Indonesian government to enhance accessibility, efficiency, and quality of healthcare services.

In Indonesia, the legal foundation for health information systems is clearly regulated. The Regulation of the Minister of Health of the Republic of Indonesia No. 46 of 2014 defines health information systems as integrated structures consisting of data, information, indicators, procedures, technology, and human resources that function collectively to support decision-making in health development. Furthermore, the Regulation of the Minister of Health No. 31 of 2013 mandates that every primary health center (*Puskesmas*) implements an integrated health information system to ensure the availability of accurate, continuous, and accessible health data. One form of service reform arising from these regulations is the implementation of electronic-based services, including online patient registration systems.

Online registration systems are intended to simplify administrative procedures, reduce long waiting times, and improve patient convenience by allowing registration and appointment scheduling without the need for physical visits. Through these systems, patients can estimate waiting times and manage their healthcare visits more efficiently. Despite these potential benefits, the implementation of online registration systems in healthcare facilities has not been fully optimized. Several technical challenges persist, including unstable internet connectivity and system integration issues, particularly with national health insurance platforms. These issues may disrupt service continuity and reduce user trust in digital systems.

In practice, the utilization of online registration applications remains limited. Many patients continue to rely on manual registration due to low digital literacy, lack of familiarity with technology, and resistance to change, especially among elderly populations. Insufficient socialization and user education further contribute to low adoption rates, resulting in persistent queues at registration counters and inefficiencies in service delivery.

This study is grounded in the system implementation framework proposed by Robbins et al., which emphasizes five interrelated components influencing system success: *man* (human resources and user behavior), *material* (facilities and infrastructure), *method* (procedures and workflow), *money* (financial support), and *machine* (technology and equipment). Previous studies conducted in various primary healthcare settings in Indonesia have similarly reported suboptimal utilization of online registration systems due to limited community participation and technological barriers. Therefore, a comprehensive examination of these components is essential to understand the challenges and opportunities in implementing online registration systems in primary healthcare services.

## METHOD

This study employed a qualitative research design using a descriptive approach. The research was conducted at Matur Primary Health Center from April 22 to May 06, 2025. Informants were selected using purposive sampling to ensure the inclusion of individuals who met specific criteria relevant to the research objectives. The informants consisted of healthcare staff involved in the implementation of the online registration system and patients who utilized the online registration application at Matur Primary Health Center. Data collection was carried out through direct observation, in-depth interviews, and document review to obtain comprehensive and contextual information regarding the implementation process.

## RESULTS

### 1. Man Aspect (Human Resources and Behavior)

Although registration is conducted online, patients may still require assistance or additional information from healthcare staff. Therefore, effective communication between staff responsible for online registration and other units within the primary health center is essential to ensure smooth service delivery and minimize errors. Staff managing and supporting the online registration system are required to possess adequate technological skills, basic troubleshooting abilities, and the capacity to assist patients, particularly because applications with multiple features often generate questions from users.

Based on interviews with five informants, the *man* aspect at Matur Primary Health Center involved registration staff responsible for outpatient and emergency services. No major difficulties were reported by staff in operating the online registration system. However, patients experienced several obstacles, including not having the Mobile JKN application, unstable internet connectivity, frequent application loading delays, and

system errors. Although online registration has been implemented nationwide since 2023, including at Matur Primary Health Center, many community members have not utilized the system due to limited smartphone ownership, insufficient device storage, lack of internet data, and inadequate understanding of how to use the application. To address these issues, healthcare staff have conducted educational activities through counseling sessions and leaflet distribution, with the expectation that patients will gradually shift to online registration in accordance with established procedures.

## **2. Material Aspect (Facilities and Infrastructure)**

Facilities and infrastructure are critical components in supporting online registration systems. These include digital platforms that allow patients to input personal data, select services and schedules, and confirm registration, as well as stable internet connectivity supported by LAN infrastructure and internet service providers. Technical personnel are also required to maintain and update the system.

Interview findings indicated that Matur Primary Health Center provides computers, tablets, and internet access (WiFi) to support online registration. Infrastructure inspections are conducted at least once a year. Patients with personal devices may access online registration independently, while those without such facilities may use the equipment provided by the health center. Although infrastructure was considered adequate, patients reported difficulties accessing the application during periods of slow internet connectivity. No recent infrastructure upgrades have been implemented.

## **3. Method Aspect (Procedures and Workflow)**

The online registration workflow should be designed in a simple and user-friendly manner, as not all patients are familiar with digital systems. The process should follow a logical sequence, including patient identification, service selection, scheduling, and registration confirmation, and be integrated with other health information systems. At Matur Primary Health Center, online registration is conducted through the Mobile JKN application and the e-Puskesmas cluster (e-Klinisia). However, as most patients are BPJS beneficiaries, only the Mobile JKN application has been actively used since 2023. This method was selected due to its integration with referral health facilities and its compatibility with national health insurance services.

## **DISCUSSION**

The *man* aspect of online registration implementation at Matur Primary Health Center has not yet been fully optimized. While healthcare staff demonstrated adequate competence and encountered minimal technical difficulties, significant challenges were

identified among patients. These challenges were primarily related to limited digital literacy, inadequate access to technology, and resistance to transitioning from manual to online registration. Although educational and socialization efforts have been implemented, their effectiveness has not yet reached all target users.

According to Robbins et al. (2007), human factors play a critical role in system implementation success. Healthcare staff serve as frontline facilitators who guide patients in understanding and utilizing online registration systems. Consistent with previous studies, elderly patients and those unfamiliar with digital technology remain the most vulnerable groups.

In contrast, the *material* aspect was found to be largely optimal. Adequate hardware and internet infrastructure were available to support the system, with occasional connectivity issues being the primary limitation. These findings align with Robbins et al. (2007), who emphasize that sufficient infrastructure is essential for system functionality. The *method* aspect was also assessed as optimal. Clear procedures, defined workflows, and the use of a nationally integrated application (Mobile JKN) have supported effective implementation. Educational guidance provided by staff further strengthened user understanding, indicating that from a procedural standpoint, the system is well established. Overall, while infrastructure and procedures are adequately implemented, the primary challenge remains user adaptation and acceptance. Optimizing the *man* aspect requires not only staff competency but also sustained community engagement, digital literacy improvement, and targeted support for vulnerable patient groups.

The study concludes that the use of online registration provides significant positive benefits as a strategy to improve healthcare services. The availability of online registration applications can reduce patient waiting times and meet patient expectations by enabling easier registration via mobile phones without the need to visit primary health centers or hospitals in person. Based on the results and discussion, the implementation of online registration at Matur Primary Health Center can be considered optimal across several aspects. However, one aspect remains suboptimal, as a considerable proportion of the community continues to experience difficulties in using the online registration system.

#### AUTHOR CONTRIBUTION

Novelita Harlin contributed to the conceptualization and design of the study, data collection, data analysis, and interpretation of the results. Silvia Adi Putri contributed to the literature review, data collection, and manuscript drafting. Legabina Adzkia contributed to data analysis, manuscript revision, and final editing. All authors reviewed and approved the final manuscript.

### CONFLICT OF INTEREST

There is no conflict of interest in this research.

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