

Evaluation of Registration Staff Readiness In Handling “Si Wongso” System Downtime At Hospital X

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Abstract. *Downtime* of the Hospital Management Information System may disrupt service delivery, requiring registration staff to be adequately prepared to ensure continuity of services when system disruptions occur. This study aimed to evaluate the readiness of registration staff in managing *downtime* of the “Si Wongso” system at hospital X based on the aspects of **Man**, **Money**, **Material**, **Machine**, **Method**, and **Environment**. This study employed a descriptive qualitative method. Informants were selected according to predetermined criteria and consisted of registration staff from the TPPRJ, TPPRI, and TPPGD units, as well as one Head of SIMRS as a triangulation informant. Data were collected through in-depth interviews, *checklist* forms, and documentation. The results showed that the **Man**, **Material**, **Method**, and **Environment** aspects supported service delivery during *downtime* through staff knowledge and skills, the availability of manual forms, implementation of standard operating procedures, and a supportive work environment. The **Money** aspect supported equipment maintenance and operational facilities; however, budget planning for *downtime* mitigation remained general in nature. In the **Machine** aspect, system and network disruptions were still identified and affected service continuity. The overall interpretation of readiness was good because the main operational requirements for maintaining service continuity were present and consistently supported across data sources, although several areas still required improvement. The hospital is recommended to strengthen *downtime* mitigation budget planning, conduct regular training and simulation exercises, evaluate standard operating procedures, and improve system and network maintenance to ensure optimal service delivery during system disruptions.

Keywords: Registration Staff Readiness; System Downtime; Hospital Management Information System; Hospital Registration; Si Wongso

INTRODUCTION

The utilization of information systems in healthcare services has transformed hospital administrative processes from manual record-keeping into faster and more integrated services with improved documentation (1). Demonstrated that information systems for healthcare services and administration can reduce data duplication and help accelerate service processes. In the hospital context, the digitalization of patient registration is particularly important because the registration unit serves as the initial point in the patient care pathway and is directly associated with patient identity, medical record numbers, insurance information, and intended service destinations.

The success of an information system does not depend solely on hardware and applications, but also on user readiness (2). Found that readiness for the implementation of electronic medical records is influenced by human resources, organizational culture, leadership, and technological infrastructure. Therefore, registration staff need to understand system utilization, adapt to procedural changes, and possess the skills required to maintain service continuity when the system is unavailable.

One of the major risks associated with digitalization is downtime, which refers to a condition in which a system, server, or network becomes unavailable, causing electronic services to be disrupted (3). Reported that downtime in Hospital Information Systems can disrupt the continuity of healthcare processes, indicating that system unavailability can affect the continuity of healthcare services. Reported that downtime in registration applications can delay services, increase waiting times, and reduce service efficiency (4). Also found that downtime in outpatient registration may lead to long queues and may be caused by network disruptions or software-related problems. These impacts are particularly significant in hospitals because the registration system is interconnected with other service units; therefore, disruptions at the initial point of service may affect subsequent care processes (5).

Downtime management requires readiness that extends beyond technical preparedness (6). Emphasized the importance of training, identification of the causes of system disruptions, system maintenance, and clearly defined operational procedures to ensure a rapid response to downtime (7). showed that technical training and assistance can improve human resource capacity while also enhancing service reliability. Therefore, readiness to manage downtime should be viewed as a combination of staff competence, budgetary support, the availability of manual materials, equipment reliability, work procedures, and the service environment.

At hospital X uses the “Si Wongso” registration system, which is integrated with various service units. Based on the preliminary observations of this study, system disruptions occurred during the 2024–2026 period due to a server-room leak, server repairs, data migration, power outages, and network instability during the rainy season. Under these conditions, registration had to be shifted to manual recording, data retrieval and entry became slower, and service queues were likely to increase. This situation places registration staff in a critical position, as they are required to maintain service continuity when the primary system is unavailable.

Previous studies have primarily focused on the causes of downtime, technological evaluation, or optimization of system management, whereas studies specifically assessing the readiness of registration staff together with the operational support required during downtime remain limited. This study aimed to evaluate the readiness of registration staff in managing downtime of the “Si Wongso” system at hospital X using the Man, Money, Material, Machine, Method, and Environment aspects. This evaluation is expected to provide an overview of existing operational strengths and identify areas requiring improvement to ensure continuity of services during system disruptions.

METHODS

This study employed a qualitative method with a descriptive approach to obtain an in-depth understanding of the readiness of registration staff in handling downtime of the “Si Wongso” system. The study was conducted at RSD K.R.M.T. Wongsonegoro Semarang from January to May 2026. The evaluation was structured based on six aspects: Man, Money, Material, Machine, Method, and Environment. The first five aspects were derived from the 5M management framework and complemented by the Environment aspect in accordance with the theoretical framework of the study. The concept of 5M as a fundamental element of management has also been described by (8).

A total of nine informants participated in the study, consisting of eight registration staff from the Outpatient Registration Unit (TPPRJ), Inpatient Registration Unit (TPPRI), and Emergency

Registration Unit (TPPIGD), as well as one Head of the Hospital Management Information System (SIMRS) as a triangulation informant. The informants were selected based on their direct involvement in registration services and SIMRS management, representing the three registration units and the triangulation source. The inclusion criteria comprised staff who used the “Si Wongso” system in service delivery, had experience working with the system, and were willing to participate. Employees who were not involved in registration processes or system management, were inactive during the study period, or declined to participate were excluded.

Primary data were obtained through in-depth interviews. A checklist was used to assess the availability of facilities, documents, and readiness indicators because downtime did not occur during the data collection period. Documentation was conducted by reviewing registration standard operating procedures, downtime management standard operating procedures, and other relevant supporting documents. Data credibility was strengthened through source triangulation by comparing information obtained from registration staff with information provided by the Head of SIMRS, as well as method triangulation by comparing findings from interviews, checklists, and documentation.

Data analysis was conducted through data reduction, data presentation, and conclusion drawing or verification. The interview guide was developed based on the six readiness aspects, namely Man, Money, Material, Machine, Method, and Environment. Interview transcripts were reviewed and coded by identifying statements relevant to each aspect and its corresponding indicators. The codes were then grouped into categories and compared across informants to identify recurring findings and differences. The interview findings were subsequently compared with checklist and documentation results to strengthen interpretation. Readiness was interpreted qualitatively based on the consistency of findings across the six aspects and the convergence of interview, checklist, and documentation results. The study received ethical approval from the Health Research Ethics Committee of Hospital X under approval number 048/Kom.EtikRSWN/IV/2026. Informed consent was obtained from all informants prior to data collection.

RESULT

The study involved nine informants with approximately 9–13 years of work experience. Eight informants were registration staff with Diploma III qualifications in Medical Records, while one informant was the Head of the Hospital Management Information System (SIMRS) with a bachelor’s degree in Information Systems. The distribution of informants is presented in Table 1.

Table 1 Characteristics of Research Informants

Informant Group	n	Educational Background	Length of Service
Outpatient registration staff	4	Diploma III in Medical Records	9–10 years
Inpatient registration staff	2	Diploma III in Medical Records	9–13 years
Emergency department registration staff	2	Diploma III in Medical Records	9–11 years
Head of SIMRS	1	Bachelor’s Degree in Information Systems	10 years

Man

The registration staff understood the functions of the “Si Wongso” system for patient registration, retrieval of patient data, and computerized service delivery. They also understood the steps to be taken during downtime, including confirming the disruption with the Hospital Management Information System (SIMRS) unit, informing patients, preparing manual documentation, and re-entering the data once the system had been restored. Training on system use was primarily provided through socialization

sessions, direct practice, and orientation for newly recruited staff. Their work experience contributed to their confidence in managing downtime; however, the Head of SIMRS stated that a comprehensive downtime simulation had never been conducted. One informant stated, “if downtime occurs unexpectedly, we are already capable and prepared ... including providing information to patients and preparing manual forms” (Inf 2).

Money

The hospital had allocated funding for computer maintenance, service facilities, system development, and operational requirements for manual procedures. However, information from the Head of SIMRS indicated that the budget remained general in nature and that no specific mitigation fund had been allocated for backup server equipment. The triangulation informant emphasized that “a mitigation fund for backup server equipment is required” (Inf 9). These findings indicate that financial support was available, although financial preparedness for a primary server failure scenario still needs to be strengthened.

Material

Manual forms and recording media were available and considered sufficient to maintain service continuity during downtime. These materials included patient identity recording sheets and general consent forms. The recorded information included patient identity, insurance identification numbers, responsible person details, telephone numbers, and arrival times to facilitate data re-entry once the system had returned to normal. One informant stated that the available manual forms were “sufficient to support patient services” (Inf 7).

Machine

Computers in the registration units were generally in good condition and relatively new, while network infrastructure supported registration activities. However, system-related problems such as slow performance, errors, and downtime were still reported. One informant stated, “Downtime rarely occurs. However, system problems such as slow performance and errors occur relatively often, about once a month. Downtime can be detrimental to the hospital” (Inf 2). These findings indicate that although the available equipment supported registration activities, system and network disruptions remained potential obstacles to service continuity.

Method

Each registration unit had its own service SOP, and a specific SOP for downtime management was also available. This was confirmed by one informant: “There are SOPs for each registration service unit, and each unit also has its own service standards, including SOPs for outpatient, inpatient, and emergency services. There is also a separate SOP specifically for handling system downtime” (Inf 1). During downtime, staff recorded patient information manually and re-entered the data into “Si Wongso” after the system had recovered. However, periodic SOP evaluation and downtime simulation had not been conducted routinely. These findings indicate that alternative procedures were available and understood, while their periodic testing and updating remained areas for improvement.

Environment

The work environment supported continuity of registration services through the availability of facilities, network infrastructure, and coordination among relevant units. One informant stated, “Registration services are supported by adequate network connectivity and facilities” (Inf 3). Other informants similarly described the work environment and supporting facilities as helpful for maintaining registration services during system disruptions. Nevertheless, network and electricity instability under certain conditions could slow service delivery and increase staff workload.

Overall, findings across the six aspects indicate that operational readiness among registration staff has been established. However, gaps remain in strengthening backup systems, allocating dedicated

mitigation funding, and implementing structured training and simulation exercises, as summarized in Table 2.

Table 2. Summary of Downtime Management Readiness Based on Six Aspects

Aspect	Readiness Strengths	Remaining Gaps
Man	Knowledge of the system, work experience, coordination, and the ability to provide manual services	<i>Downtime</i> simulations have not been conducted routinely, and formal training remains limited
Money	Maintenance activities and operational facilities are supported	Specific <i>downtime</i> mitigation funding and dedicated backup server allocation remain insufficient
Material	Manual forms and general consent forms are available	Stock availability needs to be reviewed regularly to ensure adequacy during prolonged <i>downtime</i>
Machine	Computers and network infrastructure are generally adequate, and data backup is available	System errors, slow performance, and downtime still occur; server redundancy remains limited
Method	<i>Downtime</i> SOPs and manual recording procedures are available	SOP evaluation and downtime simulations have not been conducted periodically
Environment	Facilities and inter-unit coordination support service continuity	Network and electricity disruptions may slow service delivery

DISCUSSION

This study indicates that the operational readiness of registration staff in managing “Si Wongso” downtime has generally been satisfactory. The main strengths lie in the staff’s ability to switch to manual service procedures, the availability of manual forms, the presence of standard operating procedures (SOPs), adequate work facilities, and coordination with the Hospital Management Information System (SIMRS) unit. However, this readiness has not yet been fully supported by organizational system resilience because mitigation budgeting remains general, a dedicated backup server has not yet become a priority, network disruptions may still occur, and routine simulations and SOP evaluations have not been consistently implemented. These findings emphasize that staff readiness and system resilience represent two interrelated but distinct dimensions.

Regarding the Man aspect, staff knowledge of system functions and downtime management procedures constitutes a key resource for maintaining service continuity (9). Demonstrated that user knowledge is associated with the optimization of SIMRS implementation; limited understanding may prevent the system from being utilized effectively. The relationship between knowledge and skills was also reported by (10), who found a significant association between these two components in service implementation. In this study, staff skills extended beyond application operation and included the ability to assess situations, communicate with patients, conduct manual documentation, and coordinate with other service units.

Communication skills are particularly important because downtime occurs at a service point that directly interacts with patients (11). Found an association between effective communication by front-office staff and patient satisfaction, indicating that information regarding delays, estimated waiting times, and available service options should be communicated clearly. Although staff in this study were able to follow procedures based on their previous experience, excessive reliance on experience may lead to variations in responses among staff members (7). Demonstrated that structured training can

improve personnel competence and service reliability. Therefore, regular downtime simulation exercises are needed to standardize responses, role allocation, and inter-unit communication.

Regarding the Money aspect, the hospital had allocated funding for maintenance and operational facilities; however, no specific allocation had been established for downtime mitigation (12). Showed that training and technological infrastructure contribute to the optimization of SIMRS implementation. The findings of this study extend that evidence by indicating that the availability of a general operational budget does not necessarily ensure preparedness for critical system failures. Requirements such as backup servers, network strengthening, and replacement devices require more specific risk-based budgeting to prevent response mechanisms from depending solely on repairs to primary equipment after a failure has occurred.

Material readiness was identified as one of the study's strengths because manual forms were available when the system could not be accessed (13). Showed that the implementation of electronic systems continues to require adequate supporting facilities, policies, and procedures. In this study, manual forms functioned as a temporary continuity mechanism that enabled services to continue rather than stop completely. Nevertheless, material readiness should not be assessed solely based on whether forms are available, but also on stock adequacy, accessibility during every shift, secure storage, and mechanisms for reconciling manually recorded data after system restoration.

Regarding the Machine aspect, computers and network infrastructure generally supported service delivery, although system disruptions were still identified (14). Demonstrated that technological factors are associated with the implementation of SIMRS, whereas (15) emphasized that user experience is influenced by system integration and the suitability of the system for supporting work processes (16). Also found that network problems, system errors, and limited integration may hinder SIMRS implementation. The findings of the present study showed a similar pattern: relatively adequate hardware does not automatically eliminate the risk of downtime when potential points of failure remain in the network, server, electricity supply, or external system integration.

A key gap within the Machine aspect is the distinction between data backup and equipment redundancy. Data backup helps protect information from loss, but it does not necessarily ensure that services can resume immediately when the primary server fails (6). Emphasized the need for systematic maintenance, downtime procedures, and stronger technical capacity to accelerate system recovery. Therefore, technical preparedness should focus on functional continuity rather than data security alone, for example through server redundancy, system monitoring, incident logging, and clearly defined recovery time targets.

Regarding the Method aspect, the availability of SOPs and manual procedures represents an important protective factor (17). Found that SIMRS implementation may be hindered when operational guidance and system support are inadequate (18). Also demonstrated the importance of SOPs and hospital policies in the implementation of electronic medical records. In this study, staff understood the procedures for manual recording and subsequent data re-entry after system restoration; however, SOP evaluation and simulation exercises had not been conducted regularly. Existing SOPs should therefore be tested through real scenarios or simulations to determine whether they remain appropriate in light of changes in the system, patient volume, work patterns, and service integration.

The Environment aspect demonstrated that work facilities and inter-unit coordination helped maintain continuity of services (19). Showed that successful SIMRS implementation is determined not only by technology but also by organizational and environmental factors. The findings of this study are consistent with this concept because staff were able to continue their work through coordination with the SIMRS unit, service units, cashier services, laboratories, and other relevant departments. However, a supportive work environment may remain vulnerable when network connectivity and electricity

supply are unstable. Therefore, environmental readiness should include physical support, communication mechanisms, escalation procedures, and alternative workflows.

Conceptually, the findings indicate that downtime readiness can be understood as a combination of frontline operational readiness and organizational system resilience. Staff may be considered ready when they are able to maintain service flow through manual procedures, whereas stronger organizational resilience requires dedicated mitigation funding, infrastructure redundancy, tested SOPs, and documented recovery processes. This distinction is important because successfully managing a single downtime event through staff improvisation does not necessarily indicate systemic preparedness for longer or more extensive disruptions.

The practical implication of these findings is the need for regular downtime simulation programs involving registration units, SIMRS, medical records, cashier services, laboratories, pharmacies, and other integrated service units. The hospital should also establish specific mitigation allocations for backup servers and network strengthening, ensure the availability of manual forms during every shift, evaluate SOPs following system changes, and develop downtime logs documenting causes, duration, impacts, and recovery time. These measures would help transform readiness that currently relies heavily on staff experience into a more standardized and evaluable form of preparedness.

This study has several limitations. It was conducted at a single hospital using a qualitative approach and did not directly observe a downtime event during the data collection period. Some information regarding previous incidents relied on informants' experiences and recall; therefore, the duration and frequency of disruptions were not objectively measured using system logs. Future research may employ a mixed-methods approach to measure waiting time, downtime duration, workload, data reconciliation accuracy, and recovery time, while also expanding the scope of analysis to other service units integrated with the "Si Wongso" system.

CONCLUSION

Overall, the readiness of registration staff in managing downtime of the "Si Wongso" system was considered good. In the Man aspect, staff demonstrated an understanding of system use, manual procedures, communication, and coordination during system disruptions. The Money aspect supported system maintenance and operational needs; however, no specific downtime mitigation budget had been allocated for backup server equipment. The Material aspect was supported by the availability of manual forms and recording media. The Machine aspect indicated that computer equipment and network infrastructure were generally adequate, although system errors, slow performance, and downtime could still occur. The Method aspect was supported by the availability of standard operating procedures and procedures for re-entering data after system recovery, while the Environment aspect was supported by adequate facilities and inter-unit coordination. The main gaps identified were the lack of regular simulation exercises, periodic SOP evaluation, and strengthened infrastructure redundancy.

The management of hospital X, particularly through the SIMRS and Training and Education units, is recommended to conduct regular downtime simulation exercises, establish more specific information technology mitigation budgets, strengthen server and network redundancy, and ensure the availability of manual forms during every work shift. The local Health Office may also encourage the standardization of information technology risk management and facilitate coordination with external service providers integrated with hospital systems. Future researchers are recommended to quantitatively assess downtime duration, patient waiting time, data reconciliation security, and recovery time so that the effectiveness of downtime preparedness can be evaluated more objectively.

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REFERENCES

1. Maulidia MF, Besral, Prabawa A. Perancangan Sistem Informasi Pelayanan Dan Administrasi Klinik (Studi Kasus : Klinik X Di Kabupaten Malang). 2023;4(4):265–77.
2. Sulrieni IN, Susilo H, Abdillah N. Analysis Of The Readiness For The Implementation Of Electronic Medical Records (Emr) At Rumah Sakit Umum Aisyiyah Padang Using The Doq-It Method In 2024. *J Med Rec Inf Technol*. 2024;2(2):54–7.
3. Situmorang M, Mulyana, Safitri R. Analisis Penyebab Terjadinya Downtime Di Pendaftaran Pada Aplikasi EPUS UPT Puskesmas Lubuk Baja. 2025;87–94.
4. Jo I, Kim W, Lim Y, Kang E, Kim J, Chung H, Et Al. Strategy For Scheduled Downtime Of Hospital Information System Utilizing Third-Party Applications. 2024;0:2–8.
5. Wiwaha AD, Ulfah A. Tinjauan Penanganan Downtime Di Pendaftaran Rawat Jalan Guna Menunjang Akreditasi Versi STARKES. 2024;8:2951–7.
6. Muhammad K, Mahardika F, Trianto RB, Purwanto J. Pendampingan Optimalisasi Manajemen Downtime SIMRS Dan REM Di RSUD Purbalingga. 2025;7(2):171–82.
7. Simanullang MJ, Mikael SF, Setiawan AMA. Pelatihan Penanganan Dan Pencegahan Downtime Server SIMRS Dalam Meningkatkan Keandalan Layanan Rumah Sakit Di RSUD Mitra Medika. 2026;(November 2025):213–9.
8. Cahyadi N, Fachrurazi, Palupi FH, Mamengko RP, Nurcholifah I, Hartono S, Putra RS. Pengantar Manajemen [Internet]. CV Rey Media Grafika; 2022. Available From: <https://books.google.co.id/books?id=9qf-EAAAQBAJ>
9. Jusma SN, Niska R. Application Of Hospital Management Information Systems Viewed From Education And Knowledge. *Manaj Inf Kesehat*. 2021;34–41.
10. Aji ND, Maulidia SZ, Mei WL. Hubungan Pengetahuan Dengan Keterampilan Perawat Dalam Pelaksanaan Triase Di RSUD Kota Tangerang. *J Heal Sains*. 2021;2(1):44–55.
11. Chrisdayanti M, Nur D, Marchamah S, Arumsari W. Hubungan Komunikasi Efektif Pada Staff Front Office Di Bagian Pendaftaran Dengan Kepuasan Pasien Rawat Jalan Di X Hospitals Balikpapan. 2025;6(1):130–46.
12. Citra NC, Taufik Z, Taufan N. Pengaruh Pelatihan Dan Infrastruktur Teknologi Guna Menciptakan Optimalisasi Penerapan Sistem Informasi Manajemen Rumah Sakit Berimplikasi Terhadap Kepuasan Pengguna (Studi Pada Rumah Sakit X Kabupaten Bogor). 2025;6:4185–201.
13. Rosalinda R, Setiatin S, Susanto A. Evaluasi Penerapan Rekam Medis Elektronik Rawat Jalan Di Rumah Sakit Umum X Bandung Tahun 2021. *Cerdika J Ilm Indones*. 2021;1(8):1045–56.
14. Amelia IM, Tampubolon E, Ariescha Putri Ayu Yessy. Analisis Faktor Yang Berhubungan Dengan Implementasi Sistem Informasi Manajemen Rumah Sakit (Simrs) Di Rumah Sakit Nurul Hasanah Kutacane Tahun 2022. 2024;4(2):25–31.

15. Andriani R, Margianti RS, Wulandari DS. Implementasi Sistem Informasi Manajemen Rumah Sakit Untuk Digitali. *J Manaj Inf Dan Adminstrasi Kesehat*. 2022;05:131–41.
16. Melia ATI, Nur M, Liva M. Evaluasi Implementasi Sistem Informasi Manajemen Rumah Sakit (Simrs) Dengan Metode Task Technology Fit (Ttf) Di Rumah Sakit Ibu Dan Anak Annisa Pekanbaru Tahun 2021. *J Rekam Medis (Med Rec J)*. 2022;02:345–58.
17. Benge SSMA, Rayne K, Patut IA. Evaluasi Sistem Informasi Manajemen Rumah Sakit Dalam Penerapan Rekam Medis Elektronik Menggunakan Metode HOT- FIT Di Rumah Sakit Umum Daerah Wangaya Denpasar. *Semin Ilm Nas Teknol Sains, Dan Sos Hum*. 2024;7:269–76.
18. Ermasari MM, Rika S, Eka PW. Efektivitas Penggunaan Rekam Medis Elektronik Instalasi Rawat Jalan Di BLUD RSUD Kota Baubau. *J Promot Prev*. 2025;8(1):198–205.
19. Hardini RA, Ilmananda AS, Studi P, Informasi S, Informasi FT, Malang UM, Et Al. Evaluasi Implementasi SIMRS Di Rumah Sakit Bala Keselamatan " BOKOR " Turen Dengan Pendekatan HOT-Fit. 2025;3(2):127–34.