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Digital innovation for optimization of hospital administration

Immanuel Habeahan[1]*, Vip Paramarta[2], Kosasih[3], Fitriana[4]
[1]*Universitas Sangga Buana, Bandung, Indonesia, email: nuekhabeahan@gmail.com*
[2]*Universitas Sangga Buana, Bandung, Indonesia, email: vip@usbypkp.ac.id*
[3]*Universitas Sangga Buana, Bandung, Indonesia, email: kosasih@usbypkp.ac.id*
[4]*Universitas Sangga Buana, Bandung, Indonesia, email: fitrianadachlan64@gmail.com*
**Corresponding author*

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ABSTRACT

This community service program aims to improve hospital administrative efficiency through training and mentoring in service digitalization. The program began with an initial visit to obtain permission and understand the hospital's needs, followed by a three-day training session involving 16 participants from the social media, public relations, and administrative teams. The training covered the use of Electronic Medical Records (EMR), digital queue systems, online scheduling, and digital marketing strategies through SEO and SEA. Evaluation results showed a significant improvement in hospital staff's digital literacy, with the median pre-test score of 40 increasing to 80 in the post-test (p=0.000), demonstrating a substantial enhancement in digital literacy. This improvement positively impacted administrative processes, making them faster and more organized. Additionally, digital marketing optimization increased patient engagement with hospital services through online searches. To ensure the program's long-term benefits, an internal team was established to oversee continuous monitoring and evaluation. This program proves that digitalizing hospital administration can enhance operational effectiveness and provide a better service experience for patients.

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INTRODUCTION

Advances in information technology are driving changes in hospital administration systems to be more efficient and responsive to patient needs. Many hospitals still rely on manual systems that not only slow down the service process but also increase the risk of administrative errors. The inability of hospitals to manage data effectively can hamper operations and reduce service quality. Therefore, the implementation of digital systems is a solution that needs to be applied to improve the effectiveness and efficiency of hospital administration (Fauzi et al., 2024).

One of the primary solutions to address these challenges is the digitalization of hospital administration. The implementation of technology-

based systems, such as *Electronic Medical Records (EMR)*, digital queuing systems, and online scheduling, can significantly improve operational efficiency and reduce dependence on manual processes that are prone to errors. EMR allows for the structured and integrated recording and storage of patient data, making it easier for medical personnel to access information and enhancing diagnostic accuracy and treatment decisions. Meanwhile, digital queuing systems and online scheduling provide benefits in optimizing patient management, reducing waiting times, and improving patient experiences in accessing healthcare services (Ngelyaratan & Soediantono, 2022). Additionally, optimizing digital marketing strategies through *Search Engine Optimization (SEO)* and *Search Engine Advertising (SEA)* also plays a crucial role in increasing hospital visibility on online platforms, thereby expanding the reach of healthcare services to a wider community (Noor et al., 2023).

Despite its many benefits, the implementation of digital hospital administration does not come without challenges. One of the main obstacles is the lack of adequate technological infrastructure, particularly in hospitals located in areas with limited internet access or financial constraints preventing investments in advanced information technology systems. Moreover, low levels of digital literacy among administrative and medical staff also present a significant barrier (Nur et al., 2021). Many hospital staff members are not accustomed to digital systems and feel more comfortable using conventional methods, often leading to resistance to change. The lack of adequate training can also result in errors in operating newly implemented digital systems, ultimately hindering their effectiveness (Amal et al., 2021). Furthermore, the integration of digital administration systems with patient medical records remains a challenge, especially in ensuring that the inputted data remains accurate and can be accessed in real-time by authorized personnel without posing risks of data breaches (Rabiulyati & Nurwahyuni, 2023).

Beyond technical challenges, managerial and workplace culture aspects within hospitals also play a role in the successful implementation of digitalization. Some hospitals struggle to implement changes due to a lack of support from hospital leadership or insufficient understanding of the importance of digital transformation in healthcare. Research has shown that hospitals that have adopted digital administrative systems experience significant improvements in service efficiency, with faster and more organized administrative processes, as well as higher levels of patient satisfaction (Guriti et al., 2024). Therefore, implementation strategies must not only focus on technology but also include intensive training for administrative and medical staff, as well as the formation of internal teams responsible for monitoring and evaluating the sustainability of the implemented systems.

In response to these issues, this community service program is designed to provide practical solutions for improving hospital administrative efficiency through digitalization training and mentoring. The program begins with an initial visit to the hospital to assess specific needs and challenges related to digital system implementation. Subsequently, an intensive three-day training session is conducted involving 16 participants from various divisions, including social

media teams, public relations, and hospital administration. The training covers topics such as EMR usage, digital queuing systems, online scheduling, and digital marketing strategies aimed at enhancing patient interaction with hospital services.

This community service program aims to make a tangible contribution to accelerating digital transformation in the healthcare sector. Through a needs-based approach and comprehensive training, digital hospital administration is expected to not only improve operational efficiency but also strengthen public trust in healthcare services. This program is also expected to serve as a model for other hospitals looking to adopt technology-based administrative systems, ensuring that digital transformation in healthcare can progress more widely and sustainably.

METHOD

The implementation of Community Service related to improving hospital administration efficiency through digitalization of services at one of the regional general hospitals in Medan City is carried out through several stages, namely preparation of materials, socialization, training, mentoring, and monitoring and evaluation. These stages are carried out to ensure the effectiveness of digitalization in improving the quality of administrative services in hospitals. In detail, the stages are as follows.

Figure 1. Research methods

The material preparation phase aimed to provide a comprehensive understanding of hospital administration digitalization. The community service team developed content that highlighted the importance of digitalization in enhancing administrative efficiency. Topics covered included digital service systems such as online registration, electronic medical records, and the various implementation stages, including technical preparations, staff training, and performance monitoring.

Following this, socialization activities were conducted to introduce the concept of hospital administration digitalization to medical personnel, administrative staff, and the IT team. This session was designed to help participants grasp the benefits of digitalization in improving hospital service efficiency, while also offering an overview of the methods and implementation stages involved in the community service program.

Training sessions were provided for 5 administrative staff members, 4 IT team members, and 6 medical personnel, focusing on the management of medical records and patient services. The goal of this training was to equip the participants with the necessary skills to understand and operate the digital administration system, including online registration, electronic medical records,

and the digital monitoring of patient services. By the end of the training, participants were expected to confidently use the system in their roles.

To ensure smooth implementation, mentoring was provided to help partners effectively apply the digitalization system within hospital operations. The community service team offered technical guidance to administrative staff and the IT team on system operations and assisted with the integration of electronic medical records. Additionally, the team supported partners in resolving any technical issues that arose during the implementation of the digitalized patient service system.

Finally, monitoring and evaluation were carried out through interviews and observations to assess the success of the hospital administration digitalization. The evaluation focused on the effectiveness of digitalization in improving service efficiency, the staff's proficiency in operating the system, and patient feedback on changes to administrative services. The partners provided valuable insights on the outcomes achieved, and the results of the evaluation were used to formulate recommendations for further improvements, optimizing the digitalization of hospital administration

RESULT AND DISCUSSION

The preparation phase for the training and mentoring activities began with an initial visit to the hospital. During this visit, the objectives were presented, permissions were obtained, and the planned implementation of the community service program was discussed. This engagement was essential in securing the hospital administration's full support for the initiative and ensuring that its significance in enhancing operational efficiency was well understood.

Once approval was granted, the team conducted interviews with the hospital's Marketing and Public Relations Manager to gather insights into existing challenges in administrative digitalization. This step helped align the program's objectives with the hospital's actual needs, ensuring that the training would address key issues such as inefficiencies in manual record-keeping, slow appointment scheduling, and limited digital outreach to patients. The information gathered formed the foundation for developing a focused and effective training and mentoring program.

The training sessions took place over three days and involved 16 participants, including members of the social media team, public relations staff, and administrative personnel. Before the training began, a Pre-Test was administered to assess the participants' initial knowledge of digitalization in hospital administration. The sessions focused on introducing the concept of digital transformation in administrative services and the integration of digital systems to improve efficiency.

The training provided participants with an understanding of how digitalization could enhance service quality and streamline operational workflows. Key topics included the Electronic Medical Record (EMR) system, online appointment scheduling, and digital queue management. Additionally, the training covered important aspects such as data security and the enhancement of patient experience through the use of digital tools.

Participants were also trained in Search Engine Optimization (SEO) techniques to boost the hospital's online visibility and attract more patients through digital platforms. The training emphasized the importance of relevant keywords, content optimization, and website structuring to improve search engine rankings. Furthermore, Search Engine Advertising (SEA) strategies were introduced, teaching participants how to use paid advertising to increase the hospital's online presence.

Upon completing the training, a Post-Test was conducted, revealing a significant improvement in participants' knowledge compared to the Pre-Test results. This demonstrated that the training effectively enhanced the hospital staff's ability to leverage digital solutions, resulting in improved administrative efficiency

The results of the pre-test and post-test indicate a significant improvement in the digital literacy of hospital staff after participating in this training program. The median pre-test score was 40, while the post-test median score increased to 80, with bivariate analysis showing p=0.000, which confirms a statistically significant difference in participants' knowledge before and after the training. These findings highlight the success of the training program in equipping hospital staff with the necessary skills to operate and maintain digital administrative systems effectively and efficiently.

This success is not only reflected in the test score improvements but also in the participants' hands-on experience with digital technology during the training sessions. Throughout the training, participants were introduced to various aspects of hospital administrative systems, including electronic medical records (EMR) management, insurance claim processing, and patient information systems. This demonstrates that the adoption of digital technology is not solely dependent on system availability but also on the readiness and comprehension of human resources to utilize it. In other words, strong digital literacy is essential for the successful implementation of technology-based administrative systems.

Beyond enhancing technical skills, this program also aimed to address resistance to technological change, which often serves as a major obstacle to digital transformation in the healthcare sector. Resistance to technology may arise from a lack of confidence among staff in using new systems, fear of making operational mistakes, or the perception that technology adds to their workload. Thus, the training approach focused not only on technical mastery but also on psychological and organizational cultural adaptation.

To overcome such resistance, the training incorporated digital system usage simulations, group discussions, and case studies from hospitals that have successfully implemented digital transformation. These approaches allowed participants to understand the direct benefits of digital systems in simplifying their daily tasks. Additionally, mentorship by experienced instructors provided an opportunity for participants to ask questions and practice without pressure, gradually building their confidence in using digital systems.

Furthermore, the program aimed to foster a culture of continuous improvement within hospitals. The implementation of digital technology in

hospital administration is not merely a change in systems but also a transformation in work processes, mindsets, and habits in healthcare service management. Therefore, the training emphasized the importance of ongoing learning, whether through regular training sessions, internal workshops, or discussion forums among staff. With a culture of continuous improvement, hospitals can adapt to technological advancements and sustain operational efficiency over the long term.

This study aligns with previous research that highlights the impact of digital literacy training in improving hospital administration and service delivery. First, a study by Aurelia, et al. (2024) found that digital transformation in healthcare institutions significantly enhanced staff productivity and reduced administrative errors through the adoption of cloud-based EMR systems. Their research emphasized the need for structured training programs to ensure successful technology adoption. Second, Dainuri & Samsinar, (2023) examined the role of digital literacy among healthcare workers and concluded that continuous training positively correlated with improved hospital efficiency and patient satisfaction. Their study reinforced the idea that human resource readiness is a crucial factor in digital transformation success. Lastly, Kamarudin et al. (2024) explored digital technology adoption in hospitals across developing countries and found that hospitals with proactive digital training programs reported fewer system usability issues and higher staff confidence in handling digital records. These studies collectively support the findings of this research, further emphasizing the importance of structured digital literacy programs in hospital administration.

Despite the positive impact of the training, several challenges were encountered in implementing this program. One of the main challenges was the readiness of hospital digital infrastructure, including the availability of hardware, software, and stable network support. Without adequate infrastructure, the adoption of digital technology cannot be optimized. In some cases, hospitals with limited resources faced difficulties in providing sufficient computers, integrating legacy systems with new platforms, or resolving technical issues.

To address this challenge, one of the solutions applied was the adoption of cloud-based systems, which allows hospitals with limited infrastructure to access technology without requiring large investments in hardware. Additionally, hospitals were encouraged to collaborate with healthcare technology providers, whether in the form of technical support, system maintenance, or consultation on digital administrative system development.

Beyond technical challenges, the sustainability of the program is another critical aspect that must be considered. The success of the training is not only measured by the increase in post-test scores but also by how well the acquired skills are consistently applied in daily work practices. Therefore, long-term evaluation is crucial to ensuring that the training's impact remains sustainable. One strategy employed was the formation of an internal team responsible for monitoring the implementation of digital technology. This team acts as a bridge between hospital staff and system developers, ensuring that any issues encountered can be addressed promptly.

Another monitoring mechanism involved regular evaluations, such as user satisfaction surveys, staff interviews, and data analysis on system efficiency. Insights from these evaluations enable hospitals to identify areas that require further improvement and develop strategies to continuously enhance digital technology adoption over time. Overall, this training program has demonstrated a significant impact on improving hospital staff's digital literacy, ultimately contributing to greater administrative efficiency, reduced patient wait times, and improved coordination across departments. With proper implementation and continuous support, this initiative can serve as a model for other hospitals seeking digital transformation, leading to a more modern, efficient, and patient-centered healthcare system.

CONCLUSION

The implementation of the training and mentoring program on hospital administration digitalization has led to significant improvements in service efficiency, error reduction, and staff competency in utilizing digital tools. The most notable outcome was the enhancement of hospital staff's digital literacy, as evidenced by the increase in post-test scores, from a median of 40 in the pre-test to 80 in the post-test, with statistical analysis confirming a significant difference ($p=0.000$). This demonstrates the program's effectiveness in equipping hospital personnel with the skills necessary to operate and maintain digital administrative systems.

Beyond test score improvements, the program had a direct impact on hospital operations, particularly in reducing administrative errors and streamlining patient registration, appointment scheduling, and medical record management. The integration of Electronic Medical Records (EMR) improved data accessibility and accuracy, minimizing the risk of misplaced patient records and delays in medical services. Additionally, the implementation of online scheduling and queue management resulted in shorter patient wait times, thereby enhancing the overall patient experience.

The digital marketing training, particularly in SEO and SEA, also contributed to increased patient engagement. The hospital's digital presence improved, enabling better outreach to the community and providing patients with more accessible information about hospital services. This aspect highlights how administrative digitalization not only benefits internal hospital processes but also directly influences patient access to healthcare services.

However, the sustainability of these improvements remains a critical concern. To ensure that the positive impact of digitalization is maintained, the program facilitated the formation of an internal Digital Transformation Committee within the hospital. This team is responsible for monitoring the implementation of digital systems, conducting periodic evaluations, and organizing ongoing training sessions to keep staff updated on technological advancements. Additionally, the hospital was encouraged to collaborate with technology providers for system maintenance and updates, ensuring long-term usability and efficiency.

While this initiative has demonstrated positive outcomes, further measures are needed to solidify its long-term success. Future recommendations include structured follow-up training, continuous staff support, and periodic assessments to measure the sustained impact of digitalization on hospital operations. Additionally, direct patient feedback should be incorporated into evaluations to ensure that digital transformation efforts align with patient satisfaction and service quality improvements. With a well-maintained digital system and a culture of continuous learning, hospitals can sustain and expand the benefits of digital transformation, ultimately leading to a more modern, efficient, and patient-centered healthcare environment.

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