

The Effect Of Hospital Information Management System Implementation, Digital Competence, And Administrative Burden On Work Efficiency

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ABSTRACT

The work efficiency of hospital administrative staff still faces challenges in the form of suboptimal implementation of the Hospital Information Management System (HIMS), low digital competency, and high administrative burden, which impacts the smooth operation of healthcare services. This study aims to analyze the influence of HIMS, digital competency, and administrative burden on the work efficiency of administrative staff at Madani General Hospital, Medan, based on scientific management and digital innovation theories. This is a quantitative study using an associative approach, using a cross-sectional study. The study was conducted at Madani General Hospital, Medan. The population was all 135 employees, and a sample size of 112 was obtained. Sampling was conducted using purposive sampling. The data were analyzed univariate bivariate (Chi-Square test), and multivariate analysis using multiple logistic regression. The results showed that the work efficiency of administrative staff at Madani General Hospital, Medan, was significantly influenced by the implementation of HIMS ($p=0.003$), information and data literacy ($p=0.013$), digital communication and collaboration ($p=0.013$), time burden ($p=0.003$), and compliance burden ($p=0.001$). While digital content creation ($p=0.073$), digital security ($p=0.311$), digital problem-solving ($p=0.111$), and psychological burden ($p=0.203$) did not significantly influence work efficiency. HIMS implementation had the largest contribution to work efficiency with an OR of 10.632, and a simultaneous multiple logistic regression model showed significant variables explaining 72.11% of the variation in work efficiency, while 27.89% was influenced by other factors outside this study. Future research is recommended to include variables such as leadership, motivation, organizational culture, technological facilities, and work stress. A mixed methods or qualitative approach can also be used to explore employee experiences in using HIMS and strategies to improve work efficiency.

Keywords: *HIMS, Digital Competence, Administrative Burden, Employee Work Efficiency.*

INTRODUCTION

Hospitals, as healthcare institutions, have complex work structures, encompassing not only the medical aspects but also their administrative management systems (Marselinus et al., 2024). Employee efficiency, particularly in the administrative department, is the foundation that supports the smooth running of the entire healthcare process, from patient registration and medical record management, to claims processing, and even unit reporting (Priansa, 2023). When administrative processes are slow or uncoordinated, the impact can be widespread, leading to delays in medical services, misinformation, and even risks to patient safety (Lepangkari et al., 2024).

Globally, administrative burdens contribute significantly to healthcare system expenditures. In the United States, approximately 25–35% of total healthcare costs are absorbed by inefficient administrative processes, primarily due to unintegrated systems and duplicated data (League & Shi, 2025). This reflects the fact that work efficiency is not just about speed, but also about the effectiveness of data and information management that supports overall operational decisions.

Conditions in Indonesia are not much different. Uneven information technology infrastructure, low employee digital competency, and resistance to change are major challenges in hospital administration. Manao (2024) noted that only 50% of hospitals have adequate internet connections, and only 42% have fully implemented HIMS (Maulana, 2024). Of that number, only 20% of hospitals are considered digitally mature (Hughes, 2024), meaning most still rely on manual or *hybrid systems* that lead to repetitive, slow, and inefficient processes. Financial issues and operational cost control are also among the causes of low employee work efficiency. Research *on digital hospital efficiency* reduces administrative costs, but in Indonesia administrative costs increase by 23% due to inefficiency and duplication of claims (Damanik et al., 2025).

Hospital staff work efficiency has declined due to resistance to change, low system interoperability, and high administrative burdens. Approximately 44% of staff, particularly seniors, have shown resistance to digitalization, with 90% of medical staff still unfamiliar with digital interfaces despite increased service speed (Laurenxius et al., 2025). Implementation of a Hospital Management Information System (MISRS) without effective change management has proven less successful (Binsar et al., 2024), compounded by the fact that 35–40% of data input remains duplicated because systems across units are not yet integrated, increasing the risk of errors and delays in decision-making (Santosa et al., 2023).

One of the root causes of low employee work efficiency is limited digital competency. According to Redecker (2017), digital competency encompasses five important aspects: information and data literacy, digital communication, digital content creation, digital security, and digital problem-solving. Unfortunately, many administrative staff lack the skills to operate a HIMS optimally. Cita et al. (2025) found that the majority of employees in regional hospitals had not received digital training in the past two years. This hampers system adoption, creates resistance, and lowers productivity.

The implementation of HIMS, digital competence, and administrative burden are the main independent variables that facilitate or hinder the efficiency components, according to Taylor's principles, where time, cost, and work quality must be measured and optimized (Taylor, 2022). In addition to using Taylor's theory, regarding the main issue of employee work efficiency, the digital innovation theory based on the thinking of Kohli & Melville (2019) is used, which includes the driving factors (*antecedents*) and results (*outcomes*) of digital innovation, as well as the unique characteristics of digital technology itself that enable it.

According to Laudon and Laudon (2021) , the implementation of Management Information Systems, including HIMS, aims to support organizational efficiency through work process automation, reduced data duplication, accurate data-based decision-making, and improved coordination between service units. According to Redecker (2017), digital competence within the DigComp framework encompasses five aspects: information and data literacy, communication and collaboration, digital content creation, digital security, and digital problem-solving, which support individuals' ability to use technology effectively and safely. According to Herd and Moynihan (2021) , administrative burdens include time, psychological, and compliance burdens. All three can hinder employee work efficiency by consuming time, causing stress, and complicating administrative work processes. Improving the work efficiency of administrative staff through technology such as *Electronic Medical Records* (EMR) systems not only reduces workload but also accelerates service response, improves data accuracy, and ultimately supports better patient *outcomes* (Chaerunnisa & Yuniar, 2023) . Based on the background described above, the researcher is interested in conducting research with the title: Analysis of the Influence of the Implementation of the Hospital Management Information System (HIMS), Digital Competence, and Administrative Burden on the Work Efficiency of Administrative Employees at Madani General Hospital, Medan

METHODS

This type of research is quantitative research with an associative approach. The research design used is *a cross-sectional study* . This research was conducted at Madani General Hospital Medan located at Jl. Arief Rahman Hakim No. 168, Sukaramai I Village, Medan Area District, Medan City. This research began with an initial survey until a research results seminar starting from April 2025 until it was completed in September 2025. Data collection was carried out in mid-July 2025 - August 2025. The population in this study were all employees at Madani General Hospital Medan as many as 135 people. The sample size calculation used $G * Power$, the minimum number of samples needed in this study was 112 people. The data analysis method consisted of 3 steps, namely univariate analysis, bivariate analysis and multivariate analysis using multiple logistic regression tests.

RESULTS

Table 1.
Respondent Frequency Distribution

No	Characteristics	Amount	
		f	%
1.	Age :		
	a. ≤ 30 years	51	45.6
	b. 31 – 40 years old	38	33.9
	c. > 40 years	23	20.5
	Amount	112	100.0
2.	Gender :		
	a. Man	30	26.8
	b. Woman	82	73.2
	Amount	112	100.0
3.	Education :		
	a. D3	26	23.2
	b. S1	61	54.5
	c. S2	25	22.3
	Amount	112	100.0
4.	Length of work :		
	a. ≤ 5 years	42	37.5
	b. 6 – 10 years	29	25.9
	c. > 10 years	41	36.6
	Amount	112	100.0

The information presented in the table indicates that the majority of respondents were aged ≤ 30 years with a total of 51 people (45.4%), while the group with the fewest number of respondents was respondents aged > 40 years with a total of 23 people (20.5%). In terms of gender, female respondents dominated with a total of 82 people (73.2%), while male respondents numbered 30 people (26.8%).

Based on education level, the majority of respondents were bachelor's degree graduates (60 people) (54.5%), while the fewest were master's degree graduates (25 people) (22.3%) . In terms of length of service, the largest number of respondents had worked for ≤ 5 years (42 people) (37.5%), while the fewest respondents had worked for 6–10 years (29 people) (25.9%).

Table 2
Cross-tabulation of Variables on Administrative Employee Work Efficiency

No	Variable s	Administrative Staff Work Efficiency				Amount	p- value
		Not efficient		Efficient			
		f	%	f	%		
Implementation of HIMS							

1.	Not enough	16	61.5	10	38.5	26	100.0	0,000
2.	Good	15	17.4	71	82.6	86	100.0	
Information and Data Literacy								
1.	Not enough	18	46.2	21	53.8	39	100.0	0.001
2.	Good	13	17.8	60	82.2	73	100.0	
Digital Communication and Collaboration								
1.	Not enough	16	53.3	14	46.7	30	100.0	0,000
2.	Good	15	18.3	67	81.7	82	100.0	
Digital Content Creation								
1.	Not enough	19	43.2	25	56.8	44	100.0	0.003
2.	Good	12	17.6	56	82.4	68	100.0	
Digital Problem Solving								
1.	Not enough	19	40.4	28	59.6	47	100.0	0.010
2.	Good	12	18.5	53	81.5	65	100.0	
Digital Security (Safety)								
1.	Not enough	19	41.3	27	58.7	46	100.0	0.007
2.	Good	12	18.2	54	81.8	66	100.0	
Time Burden								
1.	Low	8	11.8	60	88.2	68	100.0	0,000
2.	Tall	23	52.3	21	47.7	44	100.0	
Psychological Burden								
1.	Low	8	11.8	60	88.2	68	100.0	0,000
2.	Tall	23	52.3	21	47.7	44	100.0	
Compliance Burden								
1.	Low	7	10.4	60	89.6	67	100.0	0,000
2.	Tall	24	53.3	21	46.7	45	100.0	

The results showed a significant relationship between the implementation of HIMS and the work efficiency of administrative staff at Madani Medan General Hospital ($p = 0.000$), where the majority of respondents who rated HIMS as good had high work efficiency. In addition, information and data literacy also significantly influenced work efficiency ($p = 0.001$); respondents with good literacy tended to be more efficient. Similarly, digital communication and collaboration had a significant relationship with work efficiency ($p = 0.000$), with most respondents in the good category showing higher efficiency. Digital content creation also had a significant relationship ($p = 0.003$), where respondents with good skills showed higher work efficiency. Furthermore, digital safety significantly influenced work

efficiency ($p = 0.007$), as did digital problem-solving skills ($p = 0.003$). In addition to digital literacy, time burden significantly influenced work efficiency ($p = 0.000$); employees with low time burden were more efficient than those with high workload. Psychological burden also had a significant effect ($p = 0.001$), with employees with low psychological burden being more efficient. Finally, compliance burden showed a significant effect on work efficiency ($p = 0.000$); employees with low compliance burden tended to be more efficient than those with high compliance burden.

Table 3
Fifth Stage Multiple Logistic Regression Test

Variables	B	Sig.	Exp(B)	95%CI for Exp(B)
Implementation of HIMS	2,364	0.002	10,632	2,412 - 46,861
Information and Data Literacy	1,851	0.013	6,366	1,487 - 27,261
Digital Communication and Collaboration	1,954	0.013	7,057	1,505 - 33,094
Time Burden	-2,088	0.002	0.124	0.034 - 0.451
Compliance Burden	-2,198	0.001	0.111	0.030 - 0.417
Constant	-0.933	0,0	0.393	
		41		

Based on the equation model, it shows that administrative employees who implement HIMS well, have good digital communication and *collaboration*, good information and data literacy, have a low time burden, and have a low *compliance burden*, have the opportunity to have administrative employee work efficiency of 72.11%. This means that the variables of HIMS implementation, digital communication and *collaboration*, information and data literacy, time burden, and compliance burden, together influence the work efficiency of administrative employees by 72.11%, the remaining 27.89% is influenced by other variables not analyzed in this study.

DISCUSSION

Implementation of HIMS

Based on the results of the study, it shows that the implementation of HIMS has a significant effect on the work efficiency of administrative employees at Madani General Hospital Medan, $p = 0.003 < 0.05$. The variable of HIMS implementation with the value of $\text{Exp}(B) = 10.632$ ($95\%CI = 2.412-46.861$) means that respondents who assess the level of HIMS implementation in the good category have the opportunity to have work efficiency 10.6 times better than respondents who assess the level of HIMS implementation in the less category.

An exploratory study by Hossain et al. (2025) in Indonesian hospitals found that the implementation of *Electronic Medical Records* (EMR) influenced the culture of electronic record-keeping and the readiness of hospitals to adopt digital systems, explaining that when infrastructure and staff skills are adequate, EMR implementation improves data regularity and speeds up administrative processes, thereby reducing the time required by administrative staff for recording and reporting. An analytical study by Sukhwil et al. (2025) A study on the impact of *Hospital Information Systems* (HIS) on operational efficiency revealed that HIS/HIMS implementation can reduce administrative burden through process

automation, reduced duplication of work, and increased data accessibility. The report also highlighted initial challenges such as implementation costs, staff adoption, and the need for workflow improvements. However, the empirical evidence in this study supports that HIS can significantly improve administrative efficiency when accompanied by appropriate management policies and training.

According to the researchers, the results of this study indicate that the implementation of HIMS (Management Information System) at Madani General Hospital, Medan, impacts the efficiency of administrative staff. With HIMS, many previously time-consuming administrative processes can be completed more quickly and in a more structured manner, from patient data recording and schedule management to reporting. This system helps employees reduce repetitive manual work, allowing them to focus on more important and strategic tasks. Consequently, the workload feels lighter and the results are neater and more accurate.

Information and Data Literacy

Based on the results of the study, it shows that information and *data literacy* has a significant effect on the work efficiency of administrative employees at Madani General Hospital Medan, $p = 0.013 < 0.05$. The variable of information and *data literacy* with a value of $\text{Exp (B)} = 6.366$ ($95\% \text{CI} = 1.487-27.261$) means that respondents who assess information and *data literacy* in the good category have the opportunity to have work efficiency 6.4 times better than respondents who assess information and *data literacy* in the less category.

Research by Noeryosan et al. (2025) evaluating *e-Health literacy* among healthcare workers reported that the ability to access and use digital information increases the acceptance of technologies such as EMR/HIMS, resulting in faster and more accurate administrative processes; the implication being increased work efficiency. On the other hand, several studies have shown that the effects of information and *data literacy* on work efficiency are context-dependent and not automatic. Researchers have found that employees with high levels of information and data literacy are also more adaptable to the use of technologies such as the Hospital Management Information System (HIMS). They can find solutions when they encounter obstacles, understand data-based work procedures, and share relevant information with colleagues more effectively. This facilitates smoother coordination between departments, saves time, and supports smooth hospital operations. In other words, the better employees' ability to manage information and data, the higher the level of work efficiency they can achieve.

Digital Communication and Collaboration

Based on the results of the study, it shows that digital communication and collaboration have a significant effect on the work efficiency of administrative employees at Madani General Hospital Medan, $p = 0.013 < 0.05$. The variable of digital communication and collaboration with the value of $\text{Exp (B)} = 7.057$ ($95\% \text{CI} = 1.505-33.094$) means that respondents who assess digital communication and collaboration in the good category have the opportunity to have work efficiency 7 times better than respondents who assess digital communication and collaboration in the less category.

Several studies have found a positive relationship between digital communication and collaboration and the work efficiency of administrative staff in healthcare facilities. Research by Wosny et al. (2023) shows that digital collaboration tools facilitate information sharing,

accelerate task coordination between departments, and reduce wait times for administrative decisions, resulting in faster and more organized work. Empirical evidence from hospitals also reports improved staff performance and reduced administrative burden after adopting integrated digital tools, provided adequate training and IT support are provided. On the other hand, some studies report conflicting results: adopting digital communication and collaboration *does* not automatically increase efficiency if the infrastructure, training, and organizational processes are not ready. A qualitative study by Nascimento et al. (2023) encountering technical barriers, lack of training support, and differing managerial perceptions that lead to digital tools adding to the workload or creating workflow confusion.

According to the researchers, the results of this study indicate that the work efficiency of administrative staff is closely related to their digital communication and *collaboration* at Madani General Hospital, Medan. Through smooth communication and effective collaboration using digital media, employees can exchange information quickly, coordinate tasks clearly, and minimize misunderstandings. This process helps accelerate work completion, reduce delays, and ensure that each task is completed within the specified timeframe.

Digital Content Creation

The research results show that digital content creation *does* not affect the work efficiency of administrative staff at Madani General Hospital, Medan, with $p=0.073 > 0.05$. This is because most administrative staff's tasks focus more on data management, recording, and reporting through the Hospital Management Information System (SIMS) than on digital content creation activities. Furthermore, digital content creation skills are not yet a primary requirement for supporting administrative work efficiency, so they do not have a significant impact.

Research and reviews by Naqbi et al. (2024) state that digital *content* creation capabilities, especially when combined with automation tools and generative AI, can improve administrative work efficiency by accelerating the creation of documents, summaries, and communication materials, thereby reducing the time employees spend on routine tasks. Empirical evidence suggests that automated content generation technologies can reduce manual work and allow administrative staff to focus on more valuable decision-making tasks. According to the researchers, the results of this study indicate that the work efficiency of administrative staff is not affected by digital content creation *at* Madani General Hospital, Medan. This occurs because the majority of administrative tasks at the hospital focus on data management, record-keeping, and administrative coordination, so digital content creation skills are not a primary factor influencing work efficiency. While digital content creation can be beneficial under certain conditions, most administrative work can be performed well without these skills.

Digital Security (Safety)

The research results show that digital security (*safety*) does not affect the work efficiency of administrative staff at Madani General Hospital, Medan, with $p = 0.311 > 0.05$. This occurs because digital security aspects are mostly handled by the hospital's information technology unit, so they do not directly impact daily administrative tasks. Furthermore, administrative staff tend to focus more on system usage and completing workloads than on the technical aspects of digital security.

Previous research by Ewoh & Vartianinen (2024) stated that the implementation of good digital security (*safety*) actually supports the smooth running of administrative work because it reduces the incidence of system disruptions and data loss that require long recovery times, and suggests socio-technical solutions to strengthen cybersecurity while maintaining system usability, so that data access becomes more reliable and administrative processes run more smoothly.

According to the researchers, the results of this study indicate that the work efficiency of administrative staff is not affected by digital security (*safety*) at Madani General Hospital Medan due to the main focus of administrative work which is more related to recording, data management, and administrative coordination, so that the digital security aspect is not a major determining factor in the smoothness of their tasks. Although the implementation of digital security is still carried out, its influence on the acceleration and accuracy of administrative work is relatively low compared to other factors.

Digital Problem Solving

study by Hashish & Alnajjar (2024) examining digital skills found that problem-solving is a key competency related to digital readiness and increased employee productivity; employees who are more confident in solving technical problems tend to use digital systems more smoothly and reduce manual work, digital problem-solving skills *improve* the work efficiency of administrative staff by accelerating the resolution of technical problems, reducing system downtime, and enabling employees to complete work without constantly waiting for IT support. A literature review by Mauro et al. (2024) highlighted that the lack of specific training and organizational support makes it difficult for employees to apply these technical skills effectively, resulting in limited or inconsistent benefits to administrative efficiency, and the impact of digital problem *-solving* on work efficiency is context-dependent: without adequate infrastructure, clear work routines, and training programs, problem-solving skills do not automatically translate into increased efficiency.

Digital Problem Solving *is* a critical competency that encompasses the ability to identify and resolve digital technical issues, utilize digital work tools to improve efficiency, and adapt to new technologies independently. This skill directly impacts work efficiency, as employees who can resolve technical issues quickly can reduce downtime *and* be more adaptable in implementing digital solutions to support productivity.

According to the researchers, the results of this study indicate that the work efficiency of administrative staff at Madani General Hospital Medan is not affected by digital problem solving. Administrative work at this hospital emphasizes operational routines that already have standard procedures, so the need to perform digital problem solving independently rarely arises. As a result, this skill is not a major factor affecting the speed or accuracy of employees' work in carrying out daily tasks.

Time Burden

Based on the results of the study, it shows that there is an influence of time burden *on* the work efficiency of administrative employees at Madani General Hospital Medan, $p = 0.003 < 0.05$. The time burden *variable* with the value of $\text{Exp}(B) = 0.128$ (95%CI = 0.033 -0.492) means that respondents who have a low time *burden* have the opportunity to have work efficiency 0.12 times better than respondents who have a high time *burden*.

Previous research by Lu et al. (2025) found that time burden *negatively* impacts the work efficiency of administrative staff in healthcare. When tasks and deadlines pile up without a clear division of tasks, employees spend more time completing routine work and correcting errors, freeing up time for value-added tasks and making administrative processes less efficient. Interventions that reorganize workflows and reduce repetitive administrative tasks have been shown to help speed up processes and improve administrative staff productivity. According to the researchers, the results of this study indicate that the work efficiency of administrative staff is significantly influenced by time burden *at* Madani General Hospital, Medan . Employees faced with high time pressure tend to experience decreased focus and accuracy in completing tasks. This condition can result in suboptimal work, as employees must divide their attention across multiple tasks within a limited time. The heavier the time burden, the more difficult it is for employees to maintain consistent and high-quality performance.

Psychological Burden

The research results show that there is no effect of psychological burden *on* the work efficiency of administrative staff at Madani General Hospital, Medan , with $p = 0.203 > 0.05$. This occurs because administrative staff are accustomed to routine workloads, so psychological stress does not directly hinder their productivity. Furthermore, a supportive work environment and a clear division of tasks can help reduce the impact of psychological burden on work efficiency.

Research and literature review by Oliveira et al. (2023) show that psychological burden *reduces* the work efficiency of administrative staff due to stress, fatigue, and decreased concentration, which reduce the speed and accuracy of completing daily tasks. A summary of evidence by Mohr et al. (2025) found a clear link between mental health issues (such as depression or anxiety) and decreased work productivity through both absenteeism and presenteeism, resulting in significant operational disruptions in hospital administration.

According to the researchers, the results of this study indicate that the work efficiency of administrative staff at Madani General Hospital, Medan , is not affected by psychological burden . Although each job carries its own unique pressures and challenges, the administrative staff at this hospital are still able to maintain their performance well. This indicates that they have quite good adaptation and stress management skills, so psychological stress does not become a major obstacle in completing daily tasks.

Compliance Burden

Based on the results of the study, it shows that there is an influence of compliance burden *on* the work efficiency of administrative employees at Madani General Hospital Medan , $p = 0.001 < 0.05$. The compliance burden *variable* with the value of $\text{Exp (B)} = 0.111$ (95 % CI = 0.030-0.417) means that respondents who have a low *compliance burden* have the opportunity to have work efficiency 0.11 times better than respondents who have a high *compliance burden* .

Several studies have shown that compliance burden *can* reduce the work efficiency of administrative staff because strict regulatory procedures consume time and resources. A study by Heuer (2021) in Denmark found that reporting systems with high administrative burdens, including compliance, directly impact work performance and lead to delays in task

completion. Navigating formalities and administrative responsibilities takes extra time, making administrative staff less efficient in completing their daily work.

Researchers also found that the high compliance burden is often caused by the large amount of documentation required, multi-layered verification processes, and rapid regulatory changes. This requires employees to continuously adapt and ensure all documents and procedures comply with applicable regulations. If not managed properly, the compliance burden can slow down workflow and increase the risk of delays in task completion. However, with an efficient management system and the right technology support, this compliance burden can be managed, ensuring employee efficiency.

CONCLUSION

The results showed that the implementation of the Hospital Management Information System (HIMS) had a significant effect on the work efficiency of administrative staff at Madani Medan General Hospital ($p = 0.003$), with a 10.6 times higher chance of efficiency in employees who rated the HIMS as good. Information and data literacy ($p = 0.013$) and digital communication and collaboration ($p = 0.013$) also had a significant effect on work efficiency, while digital content creation, digital security, and digital problem solving did not show a significant effect. Time burden ($p = 0.003$) and compliance burden ($p = 0.001$) had a significant effect, where low burden increased efficiency, while psychological burden had no effect ($p = 0.203$). The HIMS variable was the most dominant factor with an OR value of 10.632. The regression model showed that the combination of HIMS implementation, digital literacy, communication, and low workload contributed to efficiency by 72.11%.

It is recommended that hospital leaders improve the optimization of HIMS through employee training, providing supporting facilities such as adequate devices and networks, and managing the workload proportionally to maintain the efficiency and quality of administrative services.

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