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EVALUATION OF TELEMEDICINE SERVICES IN OUTPATIENT SERVICES AT HOSPITAL X, JEMBER DISTRICT USING THE HUMAN ORGANIZATION TECHNOLOGY METHOD (HOT-FIT MODEL)

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ABSTRACT
The use of telemedicine as an information technology innovation in health services is one of the important strategies in improving quality services, especially in the era of digitalization of the health system. This study aims to capture patient perceptions and satisfaction with the use of telemedicine services at the X Hospital using the HOT-Fit Model approach. This study uses a quantitative method with a cross-sectional design and SmartPLS-based Structural Equation Modeling (SEM) analysis, involving 380 randomly selected respondents. Data was collected by filling out a questionnaire via Google Form. The results of the study indicate that there is a significant relationship between human, organizational, and technological variables on the net benefits or utilization of telemedicine. The technological factor has the most dominant influence both directly on utilization and indirectly through improving the quality of human resources and organizational support. These findings emphasize the importance of investing in technological infrastructure, increasing digital human resource literacy, and the role of organizations in supporting the successful implementation of telemedicine services.

Keywords: evaluation system; health services; HOT-Fit; telemedicine

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INTRODUCTION

The use of information technology in health care facilities, one of which is the use of telemedicine (Franki & Sari, 2022). Telemedicine is understood as the delivery of health services remotely, which can be done through consultation using teleconferencing or telecommunications systems, allowing medical personnel to distribute, diagnose, and provide treatment to patients (Permenkes RI, 2019). According to the Decree of the Minister of Health of the Republic of Indonesia Number HK.01.07/Menkes/4829/2021, it is necessary to make efforts to overcome this through innovation in the use of information and communication technology in the form of telemedicine in providing health services. One of the health care facilities that provides health services is a hospital (Kemenkes RI, 2021). It is highly hoped that this application can be implemented for users in every health service, both primary and secondary health facilities. Hospital X is a type C hospital which is the first referral from a first-level health facility with a complete predicate. The complete predicate has an impact on the high number of outpatient visits compared to other hospitals in Jember Regency. This causes the hospital to continue to make continuous improvements by following the development of digital technology as an effort to provide the best service for all levels of society, one of which is by implementing telemedicine services.

Outpatient services at Hospital X, Jember Regency have 2 types, namely conventional (meeting face to face) and via telemedicine (virtual meetings). Telemedicine users at Hospital X, Jember Regency have been running but have not been utilized properly by health workers (general practitioners, dentists, specialist doctors, nurses) or outpatient patients at Hospital X, Jember Regency. Based on the results of preliminary research, the comparison of the number of outpatients using telemedicine services in 2023 was only 4.3% (IHC, 2023). The low utilization of telemedicine for patients who come directly with post-hospitalization is also an indicator of the low utilization of telemedicine at Hospital X, Jember Regency. This is indicated by the percentage of post-hospitalization patients who use telemedicine services of 0.15% (IHC, 2023).

During the implementation of this telemedicine, an evaluation of telemedicine services has not been carried out, so that in its implementation there are still many obstacles and shortcomings that interfere with patient services. The obstacles and shortcomings encountered in a system require an evaluation system. Evaluation is a benchmark for organizations to determine whether the system is running well (Franki & Sari, 2022). Therefore, it is necessary to conduct a system evaluation of the implementation of telemedicine at Hospital X, Jember Regency. One of the system evaluation methods is the HOT-Fit method. The HOT-Fit Model is a measurement model that is comprehensive compared to previous theories. The HOT-Fit method is comprehensive because it considers technology (IT), people (Roles and Skills), and organizational problems (Strategy, Structure and Management Process) (Tawar et al., 2022). HOT-Fit is a method that comprehensively assesses the implementation of the system by considering four main components in the information system, namely humans, organization, technology, and net Benefit, as well as the suitability of the relationship between these components as determining factors for the success of the implementation of the information system (Wirajaya & Nugraha, 2022). Another advantage of the evaluation using the HOT-Fit model method is that this method is a combination of the ISSM (Information System Success Model) and IT Organization Fit models so that it can measure the success of the system from various aspects (Monalizabeth et al., 2015). The purpose of this study was to display patient perceptions and satisfaction with the use of telemedicine in outpatient services at Hospital X, Jember Regency using the Human Organization Technology (HOT-Fit model) method medications while simultaneously having excess.

METHOD

The type of research conducted is analytical research. This study adopts a quantitative approach with a cross-sectional research design, which aims to study the relationship between risk factors and their impacts. The population referred to in this study were patients who used telemedicine services for outpatient services at Hospital X, Jember Regency. The determination of the sample in this study used the simple random sampling technique and the sample size was calculated using the Slovin formula, so that 380 samples were obtained. The data collection technique used a research questionnaire instrument. The validity and reliability of the questionnaire were conducted by testing on 30 respondents in hospitals that had the same characteristics as Hospital X, Jember Regency. The data analysis used in this study was the Structural Equation Modeling (SEM) method using the SMARTPLS application. The ethical test was carried out at the Health Research Ethics Committee of dentistry faculty Jember University No. 2934/UN25.8/KEPK/DL/2025.

RESULT

Identification of Waste in the Drug Inventory Management Process of Hospital X

Based on the research results, it can be seen that most respondents are in the early adulthood age range (26-35 years), which is 41.3%, and most respondents are female (60.3%). Most respondents have a final education of high school (SMA), which is 65.73% with a job status

as a private employee (53.4%). The majority of telemedicine patients use gadgets with the Android operating system (81.8%), the Android system is considered more economical to use and capable of accessing telemedicine services (8). This can be seen in table 1 bellow:

Table 1.
Respondent Characteristics

No.	Respondent Characteristic	f	%
1.	Age		
	Adolescents (17-25)	52	13,7
	Early adulthood (26-35)	157	41,3
	Late adulthood (36-45)	102	26,8
	Early elderly (46-55)	50	13,2
	Late elderly (56-65)	12	3,2
	Elderly (>65)	7	1,8
2.	Education Level		
	Not Finished Elementary School	1	0,2
	Elementary Education	4	1,1
	Secondary Education	203	53,3
	Higher Education	173	45,4
3.	Employment		
	Not Working	46	12,1
	Students/college students	27	7,2
	Civil Servants (PNS)	26	6,8
	Self-Employed	45	11,8
	Private Employees	203	53,4
	Others	33	8,7
4.	Gender		
	Male	151	39,7
	Female	229	60,3
5.	Operating System of Gedget		
	Android	311	81,8
	IOS	69	18,2

Based on the results of the inferential analysis of Structural Equation Modeling (SEM), the following results were obtained:

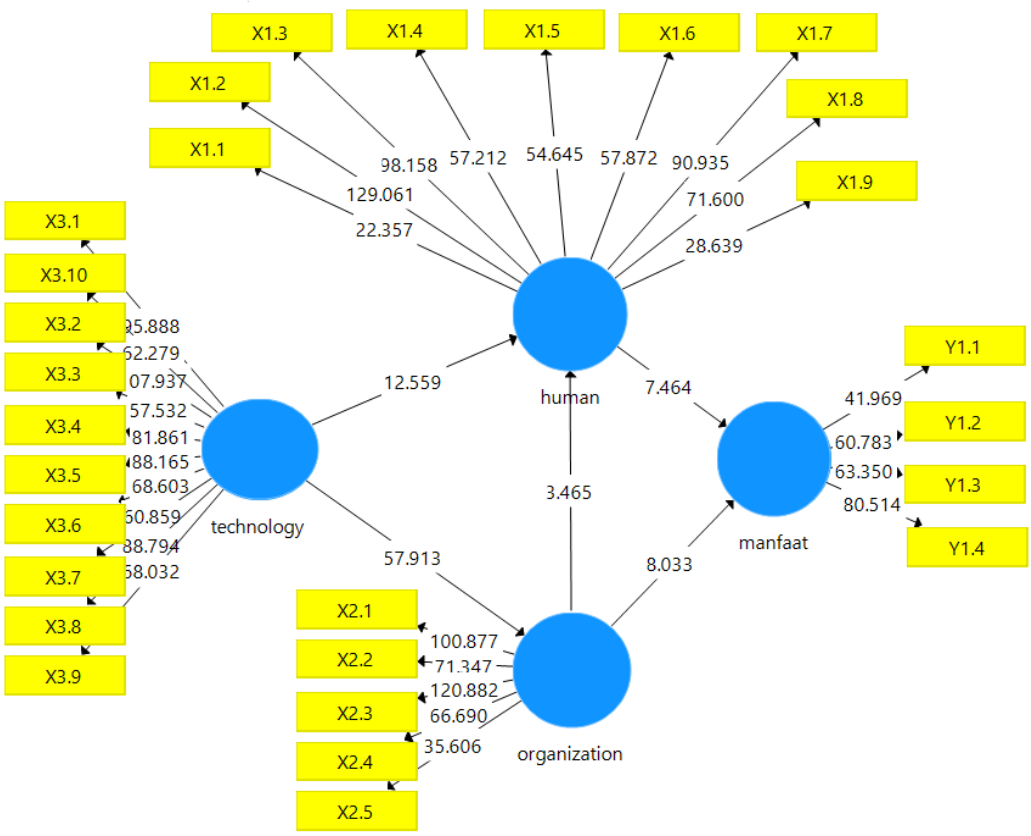

Figure 1 Bootstraping

The relationship between human, organization, technology, and net benefit variables can be seen in the following table:

Table 2.
Direct Effect Result Test

Variable	Original Sample (O)	T Statistics (|O/STDEV|)	P Values
X1 -> Y	0.393	7.464	0.000
X2 -> X1	0.210	3.465	0.001
X2 ->Y	0.424	8.033	0.000
X3 -> X1	0.683	12.559	0.000
X3 -> X2	0.839	57.913	0.000

Table 3.
Indirect Effect Result Test

	Original Sample (O)	T Statistics (|O/STDEV|)	P Values
technology -> organization -> human	0.176	3.432	0.001
organization -> human -> manfaat	0.083	3.602	0.000
technology -> organization -> human -> manfaat	0.069	3.606	0.000
technology -> human -> manfaat	0.269	5.605	0.000
technology -> organization -> manfaat	0.356	7.512	0.000

Direct Influence Test Results

1. This shows that the better the human factor, the higher the utilization of telemedicine. The p-value is 0.000, this result is significant because the p-value is less than 0.05. Based on the p-value, it can be concluded that there is an influence between the human variable (X1) on the utilization of telemedicine (Y)
2. The better the organizational factor, the better the users (HR) utilize telemedicine. The p-value is 0.001, this result is significant because the p-value is less than 0.05. Based on the

p-value, it can be concluded that there is an influence between the organizational variable (X2) on the utilization of telemedicine (Y).
3. the better the technology factor, the higher the utilization of telemedicine. The p-value is 0.000, this result is significant because the p-value is less than 0.05. Based on the p-value, it can be concluded that there is an influence between the technology variable (X3) on the utilization of telemedicine (Y).
4. the higher the user of telemedicine. The p-value is 0.000, this result is significant because the p-value is less than 0.05. Based on the p-value, it can be concluded that there is an influence between the technology variable (X3) on human (X1). The better the technology factor, the higher the organizational support in telemedicine services. The p-value is 0.000, this result is significant because the p-value is less than 0.05. Based on the p-value, it can be concluded that there is an influence between the technology variable (X3) on the organization (X2).

Results of the specific influence test of indirect relationships between variables:
1. Technology indirectly affects humans through organizations. This means that the better the technology, the better the organization will be, which will have a positive impact on humans (users) of telemedicine (p value = 0.001).
2. Organizations indirectly affect benefits through humans. This means that a good organization will increase the use and satisfaction of humans (users) which ultimately increases the utilization of telemedicine services (p value = 0.000).
3. Technology indirectly affects the utilization of telemedicine through humans or humans as users and also organizations. This means that technology affects how organizations adopt and support systems, then affects user behavior, which ultimately contributes to the benefits of telemedicine applications (p value = 0.000).
4. Technology indirectly affects benefits through humans. This means that good technology improves the experience/utilization of humans as users, thereby increasing the utilization of telemedicine services (p value = 0.000).
5. Technology affects benefits through organizations. Thus, good technology strengthens organizations and good organizations result in increased utilization of telemedicine services (p value = 0.000).

DISCUSSION

Direct and Indirect Influence of Technology on Human through Organization in the Utilization of Telemedicine Applications

Based on the results of the study, it can be seen that there is a direct influence between technology and human resources in the utilization of telemedicine applications at the X Hospital in Jember Regency. This shows that the higher the quality of technology, the higher the satisfaction and intensity of use by users. The more sophisticated and user-friendly the technology used, and the higher the digital literacy of human resources, the more optimal the utilization of telemedicine applications will be. This is in line with the theory of Yusof et al. (2008) which states that system quality, information quality, and service quality affect user satisfaction and the use of information systems. In the context of telemedicine, system reliability, speed of information access, and ease of service are important factors that determine the adoption and utilization of applications. Reliable and easy-to-use technology provides a positive experience for users (patients). Good system quality includes aspects of reliability, response speed, data integration, and information security. Accurate, relevant, and timely information quality helps medical personnel in making clinical decisions and provides a sense of security and satisfaction for patients as service users. Meanwhile, service quality, such as responsive technical assistance and user training, are important factors in building trust and comfort in using the system .This is similar to previous research which stated that the level of patient satisfaction with digital health services in Indonesia has also increased

significantly. Many patients feel more comfortable and satisfied with the telemedicine service because they can consult a doctor without having to leave their home (Dermawan Supriatna, 2024).

In addition, the results of the study also showed that there was a significant indirect effect between technology and humans (users and user satisfaction) through the organization p-value 0.001. This means that although technology directly affects humans, its effect will be stronger and more meaningful if mediated by the readiness and role of the organization. In other words, the quality of systems, information, and technology services will not fully impact users if they are not supported by organizational support, such as user training, internal policies, and a conducive work environment. The role of the organization is an important enabler or liaison that bridges the sophistication of technology and end-user acceptance. According to Kho et al. (2020), organizations play an important role in mediating the relationship between technology and user behavior. In the context of e-health, supportive organizations facilitate the adoption of the system by health workers, through training, managerial roles, and good adaptation processes. In addition, the adoption of quality telemedicine systems by users will be successful if supported by organizational interventions, such as standard operating procedures (SOPs), internal communication, and managerial supervision (Kho et al., 2020). Organizations can strengthen the positive influence of the system on user satisfaction through interdepartmental coordination, leadership involvement, and a participatory approach to decision making.

Direct and Indirect Influence of Organization on Net Benefit Through Human in the Utilization of Telemedicine Applications

Based on the results of the study, it can be seen that there is a significant influence between the organizational environment and the utilization of telemedicine applications at Hospital X, Jember Regency. This means that the better the readiness, structure, and support of the organization for the implementation of telemedicine, the greater the net benefit that can be obtained. This is in accordance with the theory of Yusof et al. (2008) that the organization influences the net benefit of a health information system. Almazan in (Wirajaya & Nugraha, 2022) stated that strong organizational support (through training, leadership, and work process integration) greatly influences the success and benefits of digital health information systems such as telemedicine.

In addition, the results of the study also showed that there was a significant indirect influence between the organization and net benefit through the mediating variable human (user usage and satisfaction), with a p-value of 0.000. This shows that the role of the organization in supporting the system not only directly affects the benefits obtained, but also depends heavily on how the organization influences user behavior, experience, and satisfaction with telemedicine applications. This is in line with Riyanto (2021) who stated that organizations that provide structural support and a digital-based work culture increase user satisfaction and the effectiveness of the telemedicine system. The relationship between the organization and system benefits is greatly influenced by the role of users as the main actors in utilizing technology. The higher the organizational support, the greater the use of the system by HR, and ultimately increase the overall benefits of the system (Riyanto, 2021)**.**

Direct and Indirect Effects of Technology on Net Benefit Through Organization and Human in the Utilization of Telemedicine Applications

The results of the study indicate that there is a direct influence between technology and the organization in the utilization of telemedicine applications at the X Hospital, Jember Regency. This means that the implementation of good technology can strengthen the organizational structure and support a more effective work environment. This finding is reinforced by a

study by Yusof et al. (2008) which revealed that the quality of information technology in health services contributes to organizational efficiency and facilitates a more structured work process. In this case, telemedicine technology is able to optimize the referral system, distribution of patient information, and collaboration between work units (Mulyadi & Choliq, 2019).

The implementation of telemedicine allows hospital managers to improve services for patients. The improvement of existing services is expected to be in line with the increase in patient satisfaction and loyalty to the hospital. Patient loyalty will affect the interest of patient repeat visits, so it will also have an impact on hospital profits. Patient loyalty reflects patient trust and satisfaction with the services provided by the hospital. When patients are satisfied with the services received, they tend to return to use the service in the future. This is reinforced by research showing that patient satisfaction has a significant effect on patient loyalty, which in turn increases the intention to make repeat visits. For example, a study by Sitorus and Adjeng (2025) showed that digitalization of health services, such as the implementation of telemedicine, can increase patient satisfaction through service efficiency, which then strengthens patient loyalty (Sitorus & Adjeng, 2025).

The results of the study showed that the organization has a significant direct influence on patients as users in utilizing telemedicine applications. This is in accordance with the theory of Yusof et al. (2008) that the structure and support of the organizational environment greatly influence patient satisfaction and use of the system. which shows that the better the readiness and support of the organization, the more likely patients are to accept and actively use telemedicine services. Aytekin et al. (2025) stated that organizational factors play a role in shaping the perception of the quality of digital services in patients. If the hospital organization provides consistent, clear, and user-friendly services, then the patient's perception of the system will be positive, thereby increasing the loyalty of the application's use (Aytekin et al., 2025). The results of the study also showed that there was a significant indirect effect of technology on net benefits through the organization and humans as mediators. Theoretically, these results support the HOT-Fit Model framework (Yusof et al., 2008), which states that technology, organization, and humans have an integrated relationship in influencing the success of the health information system. So it can be concluded that the influence of technology on system benefits is indirect, but is mediated by organizational readiness and user acceptance. Application implementation will only provide maximum benefits when the technology used can be adopted in a supportive organizational environment and is actively accepted by users.

Direct and Indirect Effects of Technology on Net Benefit Through Human in the Utilization of Telemedicine Applications

The results of the study indicate that there is an indirect effect of technology on net benefits through humans significantly. This means that the technology applied in the telemedicine system does not directly produce benefits for the hospital or patients, but rather the benefits are obtained through the intermediary role of users, both medical personnel and patients in terms of acceptance, use, and satisfaction with the system. In the context of the HOT-Fit model (Yusof et al., 2008), this relationship emphasizes the importance of the human factor as the key to the successful implementation of health information technology. Salendra et al. (2024) found that user satisfaction is an intermediary between technological advances and improved hospital service performance. The quality of accurate and easy-to-understand technological information increases patient satisfaction, which has a positive effect on system benefits in the form of service efficiency and effectiveness (Salendra et al., 2024). So it can be concluded that technology in telemedicine applications will only provide benefits when users are satisfied and actively use the system. Therefore, hospitals must emphasize a human-

centered approach in implementing health technology to ensure that every digital investment truly has a real positive impact.

In addition, the results of the study also showed a direct positive and significant effect between human variables or human resources and the utilization of telemedicine applications. This can be interpreted that the higher the capacity of human resources, the higher the utilization of telemedicine applications. This is indicated by the level of education, use of the system or frequency of human resources in utilizing a system consisting of the level of use, user attitudes, and acceptance, as well as overall human resource satisfaction in using telemedicine applications. This is in accordance with the theory of Yusof et al. (2008) which states that the success of a health information system in this case telemedicine is determined by the user or patient acceptance and user satisfaction. This is in line with Farhany et al. (2022) who stated that in terms of the use of a system that can help work or facilitate services, it can increase the motivation to use telemedicine services (Farhany et al., 2022).

Direct and Indirect Effects of Technology on Net Benefit Through Organization in the Utilization of Telemedicine Applications

The results of the analysis show that there is a significant indirect effect between technology and net benefit through organization, with a p-value of 0.000. This indicates that the net benefit from using telemedicine applications is not only determined by the quality of technology alone, but also depends on the readiness and support of the organization as an intermediary. Conceptually, the HOT-Fit model (Yusof et al., 2008) places the organizational dimension as an element that bridges the information technology system with the achievement of benefits. In other words, technology will only produce added value if supported by a responsive organizational structure, supportive leadership, adaptive SOPs, and a work culture that is open to digital innovation.

The organization is the key to the success of utilizing the telemedicine system in increasing service effectiveness, cost efficiency, and patient accessibility. Implementation of technology is not enough to focus only on technical aspects, but also requires organizational readiness as a mediator so that the real benefits of the system can be felt. Without a change management system, HR training, visionary leadership, and supporting internal regulations, no matter how sophisticated the technology is, it will not provide optimal contribution to the hospital (Lestyoningsih, 2021).

CONCLUSION

The study confirms that the successful utilization of telemedicine applications at Hospital X in Jember Regency is significantly influenced by the interplay of technology, human resources, and organizational support. Technology exerts both direct and indirect effects on human resource capacity, organizational readiness, and ultimately on the net benefits derived from the system. The study validates the HOT-Fit Model's premise that the alignment between Human, Organization, and Technology is essential for maximizing the Net Benefit of health information systems. Hospitals aiming to implement or expand telemedicine must prioritize not only technological infrastructure but also user readiness and organizational adaptability.

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