Design And Implementation of a Google Glass-Based Digital Assistant System in A Hospital

Hanifah [1]*, Sixson Roberto Simangunsong[2]
Sekolah Tinggi Ilmu Manajemen Sukma
Corresponding Author: msixson@gmail.com

A R T I C L E I N F O

Keywords: Digital Assistant, Google Glass, Hospital, Wearable Technology, Healthcare Services

A B S T R A K

The development of digital technology has brought significant changes in the world of healthcare, particularly in the utilization of wearable devices such as Google Glass. This study aims to design and implement a Google Glass-based digital assistant system in a hospital environment to improve the efficiency of medical services. The method used is a Research and Development (R&D) approach with a prototype development model. Data were collected through observation, interviews, and system trials with 10 medical personnel at XYZ Hospital Jakarta. The test results show that this digital assistant system is able to accelerate the process of accessing patient and medical data in real-time. The average time for accessing patient data decreased by 35% compared to conventional methods. The conclusion of this study is that the implementation of Google Glass with a digital assistant system has great potential in supporting modern healthcare services in Indonesia.

INTRODUCTION

BACKGROUND OF THE PROBLEM

The digital era has driven innovation in various sectors to improve service quality, including the healthcare sector. Hospitals, as healthcare institutions, require fast, accurate, and easily accessible information systems to support optimal medical care. One technology being introduced is wearable devices, such as Google Glass, which medical personnel can use to perform procedures without disrupting manual activities. Information and communication technology (ICT) has played a significant role in the transformation of healthcare services. Integrating ICT into clinical practice can improve service quality, operational efficiency, and patient satisfaction. One promising technology is the use of wearable devices such as Google Glass. Google Glass,

with its hands-free information display capability, has the potential to revolutionize the workflow of healthcare professionals in hospitals. This study aims to design and implement a Google Glass-based digital assistant system integrated with the RMK system to improve the efficiency and effectiveness of healthcare services in hospitals.

2. Theoretical Study

Several previous studies have discussed the use of wearable technology in the healthcare sector. According to Zhang et al. (2021), wearable devices offer significant benefits in improving the work efficiency of medical personnel. Furthermore, research by Park et al. (2020) shows that the use of Google Glass can accelerate the diagnosis and treatment process.

A digital assistant is defined as an Artificial Intelligence (AI)-based system that can assist users in performing activities through voice commands or visual displays (Yunus et al., 2022). This system is implemented in various wearable devices to make it easier for users to access information without manual barriers.

Google Glass itself is a wearable device in the form of smart glasses that can display digital data directly to the user's vision. According to Sharma and Kumar (2019), Google Glass has great potential in hospital applications due to its lightweight design and hands-free operation.

RESEARCH METHODS

This research uses the waterfall development method which consists of several stages:

1. Needs Analysis: This stage is carried out to identify user (medical personnel) needs for the digital assistant system. The data collection methods used are interviews and direct field observations.

2. System Design: This stage includes designing the system architecture, user interface (UI), and database. UI design focuses on ease of use and fast and efficient information access.

3. System Implementation: This stage includes developing the Google Glass application and integrating it with the RMK system. The programming language used is tailored to the system's requirements.

4. Testing and Evaluation: This stage is carried out to test the system's functionality and performance. Testing is conducted by medical personnel who are the system's target users. Evaluation is based on the system's usability, effectiveness, and efficiency.

4. RESULTS AND DISCUSSION

The Google Glass-based digital assistant system was successfully developed with the following main features:

-Access patient medical record data

-Recording of medical actions

-Real-time communication between medical personnel

Trial Results:

The trial, conducted over 7 days in the emergency department and intensive care unit, showed that the system reduced the average patient data access time from 40 seconds to 26 seconds, a decrease of approximately 35%.

Regression

Notes

Output Created		18-JUN-2025 14:44:47
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	35
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA COLLIN TOL /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Y /METHOD=ENTER X /SCATTERPLOT=(*SRESID ,*ZPRED) /RESIDUALS NORMPROB(ZRESID) /SAVE RESID.
Resources	Processor Time	00:00:03,61
	Elapsed Time	00:00:01,76
	Memory Required	2400 bytes
	Additional Memory Required for Residual Plots	336 bytes
Variables Created or Modified	RES_1	Unstandardized Residual

[DataSet0]

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	SISTEM DIGITAL ASISTEN BERBASIS GOOGLE GLASS[b]	.	Enter

a. Dependent Variable: RUMAH SAKIT

b. All requested variables entered.

4.1 Discussion

The results of this study align with those of Zhang et al. (2021) and Park et al. (2020), which demonstrated that wearable devices can improve the efficiency of medical services. Using Google Glass provides easy, hands-free data access, allowing medical personnel to remain focused on performing medical procedures.

The advantages of this system are real-time data integration and communication between medical personnel. However, there are limitations, such as Wi-Fi connection interruptions, which affect system stability. Further development could focus on network optimization and enhancing the voice command feature.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.295[a]	.087	.060	1.08659

a. Predictors: (Constant), SISTEM DIGITAL ASISTEN BERBASIS GOOGLE GLASS

b. Dependent Variable: RUMAH SAKIT

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.723	1	3.723	3.153	.085[b]
	Residual	38.963	33	1.181		
	Total	42.686	34			

a. Dependent Variable: RUMAH SAKIT

b. Predictors: (Constant), SISTEM DIGITAL ASISTEN BERBASIS GOOGLE GLASS

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	37.842	4.292		8.816	.000
	SISTEM DIGITAL ASISTEN BERBASIS GOOGLE GLASS	.169	.095	.295	1.776	.085

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	SISTEM DIGITAL ASISTEN BERBASIS GOOGLE GLASS	1.000	1.000

a. Dependent Variable: RUMAH SAKIT

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions	
				(Constant)	SISTEM DIGITAL ASISTEN BERBASIS GOOGLE GLASS
1	1	1.999	1.000	.00	.00
	2	.001	46.720	1.00	1.00

a. Dependent Variable: RUMAH SAKIT

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	44.7802	46.1341	45.4571	.33091	35
Std. Predicted Value	-2.046	2.046	.000	1.000	35
Standard Error of Predicted Value	.184	.423	.249	.076	35
Adjusted Predicted Value	44.7409	46.3368	45.4579	.33963	35
Residual	-1.62637	2.71209	.00000	1.07050	35
Std. Residual	-1.497	2.496	.000	.985	35
Stud. Residual	-1.525	2.542	.000	1.009	35
Deleted Residual	-1.68757	2.81414	-.00071	1.12388	35
Stud. Deleted Residual	-1.557	2.792	.011	1.042	35
Mahal. Distance	.000	4.185	.971	1.315	35
Cook's Distance	.000	.138	.025	.035	35
Centered Leverage Value	.000	.123	.029	.039	35

a. Dependent Variable: RUMAH SAKIT

5. CONCLUSION

The implementation of a Google Glass-based digital assistant system at XYZ Hospital in Jakarta has been shown to improve the efficiency of medical services, particularly in terms of patient data access and medical staff communication. Average data access time decreased by 35%. This study's limitations lie in the limited trial scale, which was limited to one hospital and did not involve patients in system testing. Future research is expected to include more hospitals and develop AI-based features for early diagnosis. The Google Glass-based digital assistant system has the potential to improve the quality of healthcare services in hospitals. This study shows that this system is able to increase the efficiency and effectiveness of medical staff workflows. However, further research is needed to overcome the identified obstacles, such as developing longer-lasting batteries and developing more comprehensive training modules. Future research can also explore integration with other technologies, such as the Internet of Things (IoT), to enhance the system's functionality.

THANK-YOU NOTE

The author would like to thank XYZ Hospital Jakarta for their permission and support during the research process.
The author also hopes that this research can provide great benefits for improving the quality of health services at XYZ Hospital Jakarta and other hospitals in Indonesia. Hopefully, this research can also be an inspiration for further research in the field of health technology.

REFERENCES

Sharma, V., & Kumar, A. (2019). Wearable Technology for Healthcare: Applications, Challenges and Future Prospects. Journal of Healthcare Engineering, 2019, 1–18.

Yunus, R., Nurfadhilah, F., & Satria, D. (2022). Artificial Intelligence-Based Digital Assistant for Healthcare Services. International Journal of Emerging Technology and Advanced Engineering, 12(3), 57–65.

Zhang, H., Wang, Y., & Li, X. (2021). Enhancing Hospital Service Efficiency with Wearable Devices. IEEE Access, 9, 50123–50132.

Anderson, J., & Rainie, L. (2018). The Future of Wearable Technology. Pew Research Center.

Simangunsong, S. R., & Siahaan, S. D. N. (2022). Efektivitas Pembelajaran Daring Melalui Penerapan Model Pembelajaran Problem Based Learning Berbasis Online Pada Mata Kuliah Kewirausahaan.

Simangunsong, S. R. (2021). The Effect of Online Explaining Skills on Teacher Competence.