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Analysis Of The Application Of Electronic Medical Record In RUMKITAL Dr. Mintohardjo With The Measures Of Effectiveness Method

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ABSTRACT

The phenomenon of the industrial revolution 4.0 accompanied by the rapid development of information technology has had a positive impact on the development of hospital management information systems. Currently, manual medical records are deemed no longer effective in relation to the community's need for quality, fast, precise, accurate and complete health services. Electronic Medical Record enables service providers to track patient data more quickly, identify visits, prevent and screen, help diagnose and manage disease so as to improve the quality of health services. This research was conducted to measure the effectiveness of the application of the Electronic Medical Record in Rumkital Dr. Mintohardjo by measuring the data input component, data integration and data security is assessed from the Usability, Flexibility and Efficiency of each component. Data collection was obtained from interviews and questionnaires from informants and respondents, namely officials and health workers at Dr. Rumkital. Mintohardjo regarding the application of Electronic Medical Records. The data obtained were then processed using the Measures of Effectiveness (MoE) method to measure the effectiveness of the application of the Electronic Medical Record. The hypothesis of this research is that the more effective the application of the Electronic Medical Record, the higher the quality of health services at Dr. Hospital. Mintohardjo and proven through data processing using the Measures of Effectiveness method. This study found the results that the effectiveness of the application of the Electronic Medical Record in Rumkital Dr. Mintohardjo has an MoE value of 0.676, it is included in the effective category.

Keywords *Electronic Medical Record*, *Measures Of Effectiveness, Rumkital Dr Mintoharjo*

Introduction

The phenomenon of the industrial revolution 4.0 accompanied by the rapid development of information technology has had a positive impact on the development of hospital management information systems (Kadir, 2003). The hospital management information system (SIMRS) is the main component in improving the quality of hospital services and medical records are the core of the hospital management information system in health services (Herlambang, 2016). Medical records are not only a place to store patient history data but are also a communication tool and source of information for doctors to enforce diagnosis, management and provide therapy to patients (Garret & Seidman, 2011).

It is now felt that manual medical records are no longer effective in relation to the community's need to obtain quality, fast, precise, accurate and complete health services. Conventional medical records (in the form of paper) require a large space for storing files, a long time to search for these files when needed and low security guarantees against loss or scattering of these files (Triyanti, 2018). In the current development of information technology, the development of Electronic Medical Records (EMR), which is a digital version of conventional medical records, has been widely used in hospitals throughout Indonesia. EMR allows service providers to track patient data over time more quickly, identify patients for preventive and screening visits, monitor patients, assist in diagnosing and managing diseases so that it will improve the quality of health services (Glandon, 2008). Not only that, in terms of costs, EMR is more efficient because it

does not cost money to print on paper and does not require a large space/place for storage (Garret & Seidman, 2011).

In an effort to improve the quality of health services at Rumkital Dr. Mintohardjo, at the end of 2017 Rumkital Dr. Mintohardjo began to build a hospital management information system (SIMRS) in stages. The focus of implementing integrated EMR between departments was implemented in 2019. In its development to date, EMR implementation has not yet been able to integrate all data between departments. There are many obstacles faced starting from hardware, software and brainware. In the implementation of EMR, there are still complaints about the complicated way of inputting data, the data display being less informative and not being able to display clinical supporting examinations which are not yet integrated so that they cannot meet the needs of doctors in patient management and the data security system in the EMR application cannot yet be implemented comprehensively. This is the background for researchers to write this thesis, namely to analyze the effectiveness of implementing EMR at Rumkital Dr. Mintohardjo using the Measures of Effectiveness (MoE) method. The hypothesis in this research is that the more effective the implementation of Electronic Medical Records, the higher the quality of health services at Rumkital Dr. Mintohardjo

METHOD

This research is a study using mixed methods with a concurrent embedded strategy approach in carrying out research related to the analysis of the implementation of Electronic Medical Records at Rumkital Dr. Mintohardjo (Sugiyono, 2015). Researchers used the Measures of Effectiveness (MoE) tool to measure the effectiveness of implementing Electronic Medical Records at Rumkital Dr. Mintohardjo uses data in the form of numbers as a tool to analyze information about what he wants to know (Sondang, 2008).

Researchers collected data by conducting interviews and distributing questionnaires which were carried out from June 8 to July 2 2020. Interviews were used to obtain qualitative primary data from informants who were officials related to the implementation of electronic medical records at Rumkital Dr. Mintohardjo. For quantitative primary data through the technique of distributing questionnaires to respondents with a sample of 237, namely health workers at Rumkital Dr. Mintohardjo related to the implementation of electronic medical records at Rumkital Dr. Mintohardjo reviewed the aspects of data input, data integration and data security in electronic medical records by measuring Usability, Flexibility and Efficiency. The results of data collection will then be processed using the Measures of Effectiveness (MoE) method. The research results will be discussed using existing theory and literature.

Result

In this study, a sample of 15 informants were obtained from officials related to the implementation of electronic medical records at Rumkital Dr. Mintohardjo, while the number of respondents was 237 people, namely health workers as users of the electronic medical record application at Rumkital Dr. Mintohardjo.

This research instrument consists of an interview guide and questionnaire related to the implementation of electronic medical records at Rumkital Dr. Mintohardjo. Researchers have determined the MoE value in the implementation of electronic medical records at Rumkital Dr. Mintohardjo viewed from the aspects of data input, data integration and data security as follows:

Very Ineffective = 0 – 0.20
Ineffective = 0.21 – 0.40
Less Effective = 0.41 – 0.60
Effective = 0.61 – 0.80
Very Effective = 0.81 – 1

The first data processing technique using the MoE method is that the researcher determines the weight value for each level based on the results of interviews with informants who are officials related to the implementation of electronic medical records at Rumkital Dr. Mintohardjo. Researchers will classify the interview results into weight values at the Component of Measure level for implementing electronic medical records at Rumkital Dr. Mintohardjo, namely data input, data integration and data security, and the More Specific Measures level in the

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implementation of Electronic Medical Records at Rumkital Dr. Mintohardjo namely Usability, Flexibility, and Efficiency.

Table 1. Medical Record Value

NO	LEVEL	RANKING					JML	VALUE	WEIGHT
		TP	KP	CP	P	SP			
		0	0,25	0,5	0,75	1			
A	***COMPONENT OF MEASURES***								
1.	Data Input	0	0	1	4	10	15	0,900	0,34
2.	Data Integration	0	0	1	5	9	15	0,883	0,34
3.	Data Safety	0	0	2	5	8	15	0,850	0,32
Total								**2,633**	**1,00**
B	***MORE SPECIFIC COMPONENT***								
1.	**Data Input**								
a	*Usability*	0	0	1	4	10	15	0,900	0,36
b	*Flexibility*	0	0	5	5	5	15	0,750	0,30
c	*Efficiency*	0	0	1	6	8	15	0,867	0,34
JUMLAH								**2,517**	**1,00**
2.	**Data Integration**								
a	*Usability*	0	0	2	7	6	15	0,817	0,34
b	*Flexibility*	0	0	4	9	2	15	0,717	0,30
c	*Efficiency*	0	0	1	6	8	15	0,867	0,36
TOTAL								**2,400**	**1,00**
3.	**Data Safety**								
a	*Usability*	0	0	5	8	2	15	0,700	0,33
b	*Flexibility*	0	2	5	6	2	15	0,633	0,30
c	*Efficiency*	0	0	1	10	4	15	0,800	0,38
TOTAL								**2,133**	**1,00**

Next, the researcher created an effectiveness value based on the results of the questionnaire recapitulation from respondents to determine the effectiveness value of the components being measured. The effectiveness value is determined based on the results of questionnaire answers to determine the effectiveness value at the More Specific Measures level in the implementation of electronic medical records at Rumkital Dr. Mintohardjo namely Usability, Flexibility, and Efficiency.

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Table 2. Total Of Component Effectiveness Value

NO	ASPECT	QUIZ	STS	TS	R	S	SS	SAMPLE	VALUE TOTAL	EFFECTIVENESS
			0	0,25	0,5	0,75	1			
1.	**Data Input**									
a	*Usability*	1	11	25	50	100	51	237	157,3	0,664
		2	4	15	45	97	76	237	175,0	0,738
		3	9	27	30	113	58	237	164,5	0,694
	Average Usability		24	67	125	310	185	711	496,8	0,699
b	*Flexibility*	4	25	34	57	69	52	237	140,8	0,594
		5	12	37	43	102	43	237	150,3	0,634
		6	7	49	55	86	40	237	144,3	0,609
	Average Flexibility		44	120	155	257	135	711	435,3	0,612
c	*Efficiency*	7	10	29	45	110	43	237	155,3	0,655
		8	8	15	41	122	51	237	166,8	0,704
		9	19	32	27	97	62	237	156,3	0,659
	Average Efficiency		37	76	113	329	156	711	478,3	0,673
2.	**Data Integration**									
a	*Usability*	10	2	27	34	117	57	237	168,5	0,711
		11	9	21	53	104	50	237	159,8	0,674
		12	1	23	36	111	66	237	173,0	0,730
	Average Usability		12	71	123	332	173	711	501,3	0,705
b	*Flexibility*	13	7	29	58	95	48	237	155,5	0,656
		14	10	32	75	76	44	237	146,5	0,618
		15	11	34	52	80	60	237	154,5	0,652
	Average Flexibility		28	95	185	251	152	711	456,5	0,642
c	*Efficiency*	16	21	43	38	86	49	237	143,3	0,604
		17	2	13	44	109	69	237	176,0	0,743
		18	1	13	41	117	65	237	176,5	0,745
	Average Efficiency		24	69	123	312	183	711	495,8	0,697
3.	**Data Safety**									
a	*Usability*	19	2	9	47	121	58	237	174,5	0,736
		20	7	24	53	108	45	237	158,5	0,669
		21	6	18	55	95	63	237	166,3	0,701
	Average Usability		15	51	155	324	166	711	499,3	0,702

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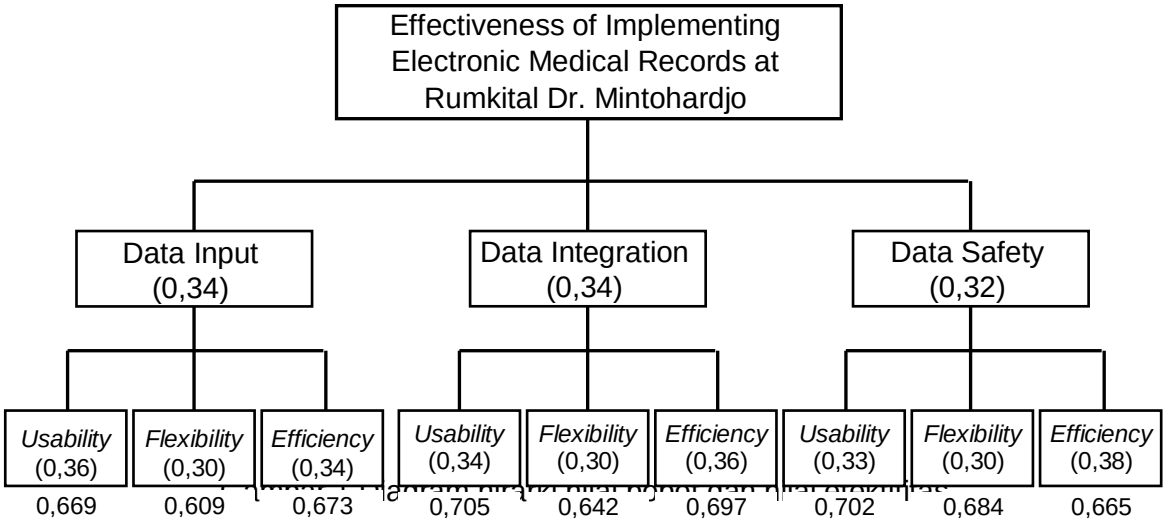
b	*Flexibility*	22	17	37	49	93	41	237	144,5	0,610
		23	2	16	56	100	63	237	170,0	0,717
		24	5	16	43	108	65	237	171,5	0,724
	Average Flexibility		24	69	148	301	169	711	486,0	0,684
c	*Efficiency*	25	5	26	58	114	34	237	155,0	0,654
		26	8	31	48	98	52	237	157,3	0,664
		27	11	23	53	87	63	237	160,5	0,677
	Average Efficiency		24	80	159	299	149	711	472,8	0,665

Table 2 shows a recapitulation of the questionnaire results that have been processed by researchers based on the effectiveness values that have been determined, so that the effectiveness values for Usability, Flexibility and Efficiency from the More Specific Measures level are obtained.



Calculate the MoE value of each Component of Measures by multiplying the weight value of each item by the effectiveness value of each item downwards following the hierarchical line. The formula for calculating the MoE value for each Component of Measures is as follows:

∑ Data Input Value = (Data Input Weight x Usability Weight x Effectiveness Value)+(Data Input Weight x Flexibility Weight x Effectiveness Value)+(Data Input Weight x Efficiency Weight x Effectiveness Value).

∑ Data Integration Value = (Data Integration Weight x Usability Weight x Effectiveness Value)+(Data Integration Weight x Flexibility Weight x Effectiveness Value)+(Data Integration Weight x Efficiency Weight x Effectiveness Value).

∑ Data Security Value = +(Data Security Weight x Usability Weight x Effectiveness Value)+(Data Security Weight x Flexibility Weight x Effectiveness Value)+(Data Security Weight x Efficiency Weight x Effectiveness Value).

Next, calculate the total value of MoE effectiveness from the implementation of Electronic Medical Records at Rumkital Dr. Mintohardjo is MoE Value = ∑ Data Input Value + ∑ Data Integration Value + ∑ Data Security Value.

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Table 3. Medical Record MoE Value

	Value		Effectiveness Value	Total Value
	Component of Measures	***More Specific Measures***		
Data Input	0,34			
Usability		0,36	0,699	0,085
Flexibility		0,30	0,612	0,062
Efficiency		0,34	0,673	0,079
				0,227
Data Integration	0,34			
Usability		0,34	0,705	0,080
Flexibility		0,30	0,642	0,064
Efficiency		0,36	0,697	0,084
				0,229
Data Safety	0,32			
Usability		0,33	0,702	0,074
Flexibility		0,30	0,684	0,066
Efficiency		0,38	0,665	0,080
				0,220
Total MoE Value				**0,677**

Table 3 shows the MoE value from the electronic medical record of Rumkital Dr. Mintohardjo. After processing the MoE value data from the implementation of Electronic Medical Records at Rumkital Dr. Mintohardjo to improve quality health services based on data processing using the MoE method is 0.676. In accordance with the effectiveness value that has been determined, the MoE value of 0.676 is included in the effective category so that based on these results, the effectiveness of implementing electronic medical records at Rumkital Dr. Mintohardjo has been effective.

Effectiveness of data input

Based on the results of data processing using the MoE method, the value of data input effectiveness is 0.227. From the results of interviews with informants, it was found that the weight value for the data input aspect of the implementation of Electronic Medical Records at Rumkital Dr. Mintohardjo is 0.34. At the more specific measures level, the data input usability weight value was 0.36, the data input flexibility weight value was 0.30 and the data input efficiency weight value was 0.34. The results of the recapitulation of respondents who are users of electronic medical records showed that the usability value of data input in electronic medical records was 0.699. Meanwhile, the effectiveness value of data input flexibility in electronic medical records is 0.612 and the effectiveness value of data input efficiency in electronic medical records is 0.673. The effectiveness value of usability, flexibility and efficiency from input data is above 0.610 so it is still in the effective category.

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Effectiveness of Data Integration

Based on the results of data processing using the MoE method, the data integration effectiveness value is 0.229. From the results of interviews with informants, it was found that the weight value for the data integration aspect of implementing Electronic Medical Records at Rumkital Dr. Mintohardjo is 0.34. At the more specific measures level, the data integration usability weight value was 0.34, the data integration flexibility weight value was 0.30 and the data integration efficiency weight value was 0.36. The results of the recapitulation of respondents who are users of electronic medical records showed that the usability value of data integration in electronic medical records was 0.705. Meanwhile, the value of the effectiveness of data integration flexibility in electronic medical records is 0.642 and the value of the effectiveness of data integration efficiency in electronic medical records is 0.697. The effectiveness value of usability, flexibility and efficiency from input data is above 0.610 so it is still in the effective category.

Data Security Effectiveness

Based on the results of data processing using the MoE method, the data security effectiveness value is 0.220. From the results of interviews with informants, it was found that the weight value for the data security aspect in the implementation of Electronic Medical Records at Rumkital Dr. Mintohardjo is 0.32. At the more specific measures level, the data security usability weight value was 0.33, the data security flexibility weight value was 0.30 and the data security efficiency weight value was 0.38. The results of the recapitulation of respondents who are users of electronic medical records showed that the usability and security data effectiveness value in electronic medical records was 0.702. Meanwhile, the effective value of data security flexibility in electronic medical records is 0.684 and the effective value of data security efficiency in electronic medical records is 0.665. The effectiveness value of usability, flexibility and efficiency from input data is above 0.610 so it is still in the effective category.

CONCLUSION

After carrying out discussions related to the analysis of the application of electronic medical records at Rumkital Dr. Mintohardjo, in order to improve quality health services using the MoE method, seen from the aspects of data input, data integration and data security, researchers concluded that the effectiveness of implementing electronic medical records at Rumkital Dr. Mintohardjo is included in the effective category.

SUGGESTION

Researchers provide recommendations to the Indonesian Navy leadership, especially Rumkital Dr. Mintohardjo said that efforts need to be made to increase the effectiveness of implementing electronic medical records, especially in the aspects of data input, data integration and data security because to improve the quality of health services at Rumkital Dr. Mintohardjo needs continuous training for health workers to input data, improve electronic medical record application software in data integration and socialize the use of usernames and passwords to health workers at Rumkital Dr. Mintohardjo to increase the security of electronic medical record data.

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