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Spreadsheet-Based Medical and Financial Record in The First Level Health Facilities

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***Abstract*—First Level Health Facilities (FLHF) require medical and financial record for local and foreign patients. The purpose of the study was to implement and to obtain an overview of user acceptance of spreadsheet-based medical and financial records. The study used a descriptive qualitative approach. The application was implemented in an FLHF, a clinic that provides health services to local and foreign patients. The conversion was done by direct conversion method, by stopping the old system and replacing it with a new system. Spreadsheet-based financial and medical records were stated valid if they were able to provide the same results as a manual system. User acceptance of the application is obtained based on user perceptions of usefulness aspects and ease of use aspects. The result shows that application is valid to be used to replace or complete the manual medical and financial records that have been used previously. Users, especially administration officers, can accept applications and are interested in using the application further. While doctors also consider that the application is useful and easy to use, it's just that doctors are not interested in using this application.**

Keywords—spreadsheet, medical record, financial, patient

I. INTRODUCTION

The First Level Health Facility (FLHF) is a place for organizing health service efforts that can be used for medical or dental practices that provide first-rate health services [1]. FLHF provides quality health services to improve patient satisfaction.

The FLHF must make the patient's medical and financial records. Medical records are files that contain records and documents about the patient's identity, examination, treatment, actions and other services that have been given to the patient [2]. Financial records are files that contain records and documents about patient relating to financial reporting. The FLHF must make a complete and clear medical and financial record. Medical records as supporting the achievement of orderly administration in the context of efforts to improve health services [3].

Medical and financial records can be done manually or electronically. Electronic medical records are one of the uses of information technology in the health sector. Electronic Medical Record (EMR) has been widely used as a substitute or complement to paper health medical records. There are benefits related to the adaptation of electronic medical records to health services [4]. Adoption of EMR system has shown to reduce weaknesses of paper-based medical records and improve patients' safety [5]. In contrast the systems can be inefficient and hard to use [6]. Developing countries have very limited adoption of EMR systems because of challenges associated with limited resources [4].

In this study, the computer-based medical and financial records were based on spreadsheet application. It's implemented in FLHF, a clinic in Badung Regency that provides health services to local and foreign patients. The implementation of computer-based medical and financial records is intended to facilitate doctors and health workers in accessing patient information and assisting in clinical decision making [7], increase patient and provider satisfaction [8]. The implementation of computer-based medical and financial records guarantees data accuracy and data search speed [9], but it is recognized that there are still constraints in the adoption of electronic medical records [10].

II. RESEARCH METHODS

The research uses a descriptive method. The data type used is qualitative data obtained from primary and secondary sources. Qualitative data were analysed using descriptive qualitative analysis techniques. The conversion was done by direct conversion method, by stopping the old system and replacing it with a new system. Spreadsheet-based medical and financial records were stated valid if they were able to provide the same results as a manual system. User acceptance of the application is obtained based on user perceptions of usefulness and ease of use aspects of usability of the application.

III. RESULTS AND DISCUSSIONS

A. Medical Record Application

Medical and financial record applications are made using Microsoft Excel. The application combines the medical records application with the accounting cycle application. Medical record application consists of several sheets, namely, patient data, insurance data, treatment data, Confidential Medical Certificate (CMC) reports. The application main menu is presented in Fig. 1.

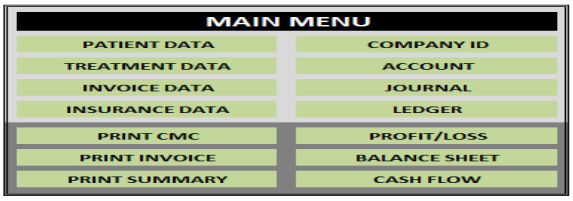

Fig. 1. Application main menu.

Patient data consist of patient no, patient name, date of birth, age, personal no, sex, nationality, hotel, room, phone, address. Patient data form is presented in Fig. 2.

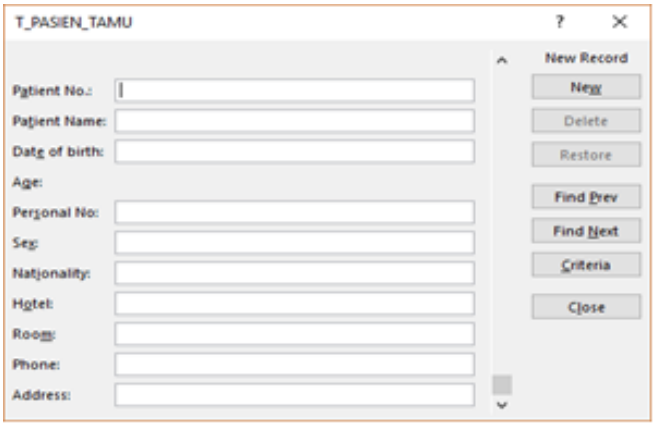

Fig. 2. Patient data form.

Insurance data consists of no, insurance name, address, country, and telephone number. Insurance data form is presented in Fig. 3.

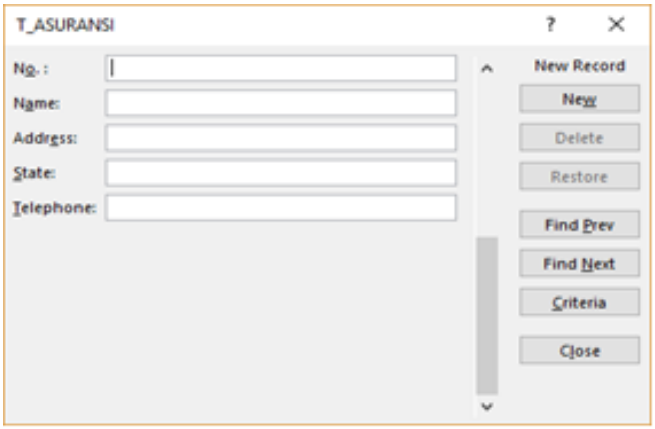

Fig. 3. Insurance data form.

Examination data includes Confidential Medical Certificate (CMC) data, patient history and complaint, vital sign, physical examination, diagnosis and treatment. CMC data consists of number, treatment date, CMC date, CMC no, patient no, personal no, patient name, bird date, and nationality. Examination data form is presented in Fig. 4.

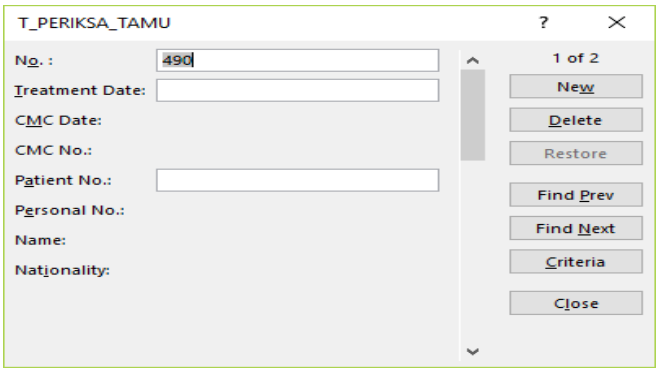

Fig. 4. Examination data form.

Patient history and complaint data consists of present patient history or complaint, past medical history, allergic history, medical currently, treatment so far. Patient history and complaint data form is presented in Fig. 5.

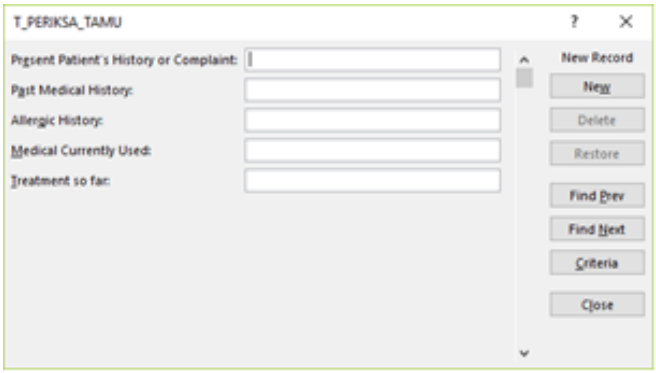

Fig. 5. Patient history and complaint data.

Vital sign data consists of appearance, GCS, temperature, respiratory rate, blood pressure, pulse rate, SPO2. Vital sign data form is presented in Figure is presented in Fig. 6.

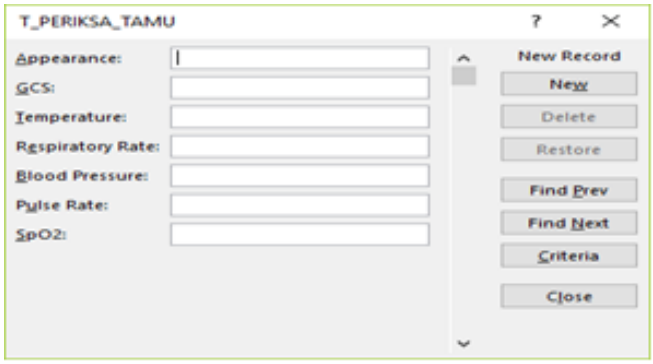

Fig. 6. History vital sign data form.

Data physical examination consists of examination of eyes, ENT, chest, abdomen, limbs, other examination. Data physical examination form is presented in Fig. 7.

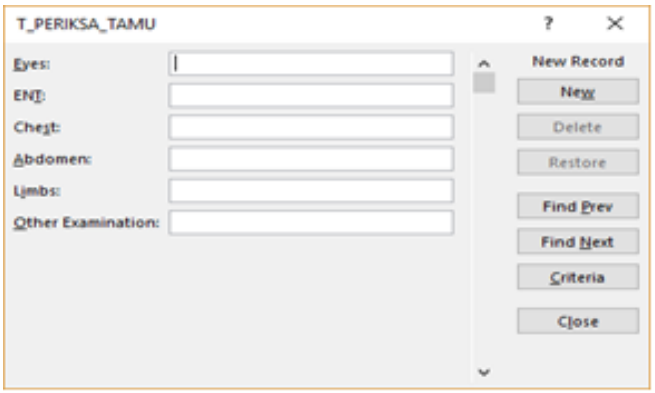

Fig. 7. Data physical examination form.

Diagnosis and treatment data consist of diagnosis, differential diagnosis, treatment/medication, doctor's recommendation, doctor. Diagnosis and treatment data form is presented in Fig. 8.

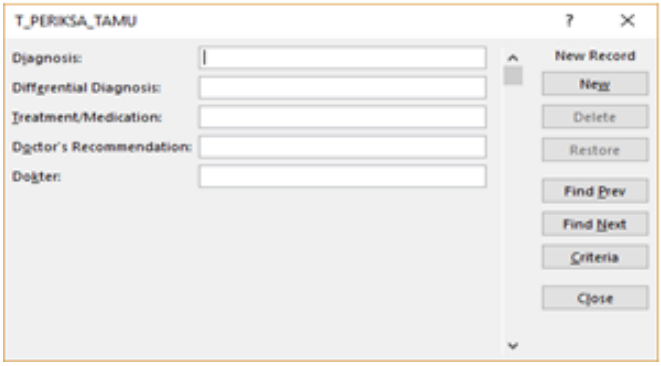

Fig. 8. Diagnosis and treatment data form.

Information in the Confidential Medical Certificate (CMC) report including personal identity, medical report, vital sign, physical examination, other examination, diagnosis, differential diagnosis, treatment and medication, doctor's recommendation. The Confidential Medical Certificate (CMC) report is presented in Fig. 9.

The Financial application consists of invoice data, invoice, and patient financial distribution reports and financial statements. Invoice data consists of number, treatment date, invoice date, name, receipt from, currency, GP fees, specialist's fees, medicines' fees, laboratories, laboratory descriptions, x ray, ultrasound, IVFD, injection's fee, wound toilet/dressing, stitching, ear toilets, others, others descriptions, administration, amount, spelled, payment type, paid/not yet paid. Invoice data form is presented in Fig. 10.

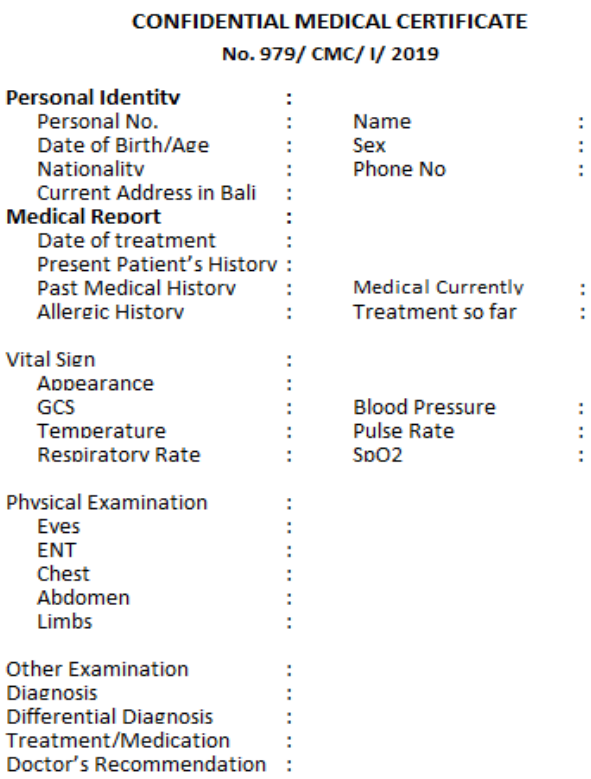

Fig. 9. Confidential medical certificate.

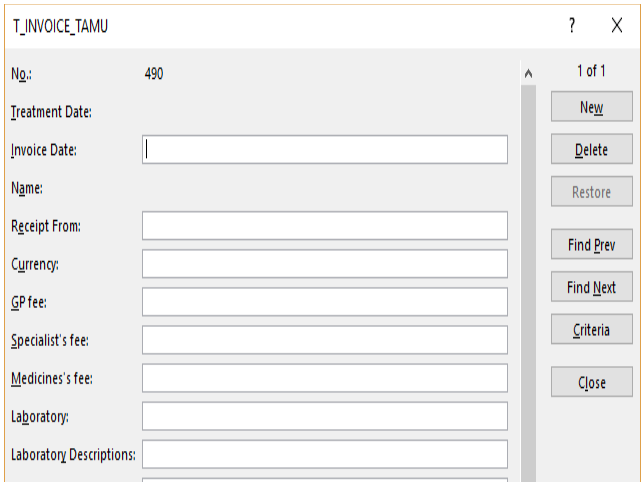

Fig. 10. Invoice data form

An invoice is a document that is used as a proof that contains the amount of payment that must be paid by the patient for health services received. Invoice is presented in Fig. 11.

INVOICE

No. 979/ / I/ 2019

RECEIPT FROM	:		
FOR THE PAYMENT	:	Medical expenses of:	
Name	:		
Date of treatment	:		
AMOUNT OF ()	:		
	-	General Practitioner's fee	: -
	-	Specialist's fee	: -
	-	Medicines's fee	: -
	-	Laboratory ()	: -
	-	X ray	: -
	-	USG	: -
	-	IVFD	: -
	-	Injection's fee	: -
	-	Wound toilet/dressing	: -
	-	Stitching	: -
	-	Ear toilet	: -
	-	Others ()	: -
	-	Administration	: -
		TOTAL	: -

(==)

Fig. 11. Invoice Report.

Patient distribution report based on insurance, inspection, or payment. This report is used as an attachment when collecting payments to insurance that covers patients. Patient distribution report is presented in Fig. 12.

RECAPITULATION OF BILL

Period:

Insurance Name:

NO	PATIENT'S NAME	DATE OF TREATMENT	INVOICE NUMBER	AMOUNT (USD)
0				
0				
0				
0				
0				
0				

Fig. 12. Patient distribution report.

Financial reports include Clinic ID, account list, vendor data, customer data, drugs, journals, ledgers, ledgers, trial balance, balance sheet, financial statements, debt and receivables lists, and closing trial balance.

B. User Conversion and Acceptance

The implementation stage important in the development of information technology to ensure the success of the new system development. Implementation is a difficult process and time-consuming. The implementation stage includes testing the system, training the user to operate the new system, changing the old system to the new business system, and regulating the consequences of system changes to the end-user.

Conversion of the application using a direct conversion method. The direct conversion method is done by stopping the old system and replacing it with the new system. The direct conversion method is used because of the new system is small or simple or both. The system does not replace other systems.

The conversion indicates that the results of the application are the same as the manual systems. It's indicates that the application is valid to be used to replace or complete the manual medical and financial records. Spreadsheet-based transaction processing systems and financial reporting systems is feasible from the technical aspects and operational aspects [11].

Users who are directly related to the use of the application are administrative officers and doctors. According to administration officials, the application of medical and financial records is useful in making medical and financial records more quickly. In line with previous research, applications can improve work effectiveness and productivity [12], can reduce the costs of medical expenditures [13], improves the availability and quality of patient care [14]. Application is easy to learn, flexible and easy to use. Administration officer is interested in using this application further because this application is useful and facilitates its work. In line with previous research, the perceived usefulness play a significant role in influencing attitude towards applications adoption [15]. The Perception of usefulness was shown to be the strongest predictor of intention to use application [16].

According to administration officials, the application of medical and financial records is ease of use in making medical and financial records. The application is considered easy to use because before using this application, administration officers and doctors have used Microsoft Excel to process data. The spreadsheet application is widely used in finance and accounting. Previous research findings that perception of usefulness and ease of use influence user acceptance of information technology [17]. Perceived ease of use positively affects perceived usefulness [18]. Perceived usefulness and perceived ease of use influence on the continuous use intention to use the system [19]. Other research also supports the argument that the technologies are not only useful but should also easy to use [20].

According to the doctor, this application is useful in making medical records and can get information about patients more quickly so that they can make medical decisions more quickly. However, doctors are less interested in using this application because they consider the work to be administrative in nature, which should be done by administrative employees. If doctors overwork administrative activities can cause doctors to focus less on their main tasks. In line with previous research result that doctors are still reluctant to Electronic Medical Record (EMR) usage, mainly because of the attitude of the people. They do not want the doctors to look into the computer or take down notes while consulting them [10].

IV. Conclusion

The purpose of the study was to implement and to obtain an overview of user acceptance of spreadsheet-based medical and financial records. The result shows that application is valid to be used to replace or complete the manual medical and financial records that have been used previously. Users, especially administration officers, can accept applications and are interested in using the application further. While doctors also consider that the application is useful and easy to use, it's just that doctors are not interested in using this application. FLHF needs to provide training for the employee on the integration of spreadsheet-based medical record application with the financial statement application. The ability to use the application will increase the acceptance of the application.

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