Indonesian Journal of Global Health Research
Volume 4 Number 2, May 2022
e-ISSN 2715-1972; p-ISSN 2714-9749
http://jurnal.globalhealthsciencegroup.com/index.php/IJGHR

COMPUTER-BASED NURSING CARE INTERVENTION INFORMATION SYSTEM DESIGN

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ABSTRACT
The development of a nursing care documentation system is based on making it easier for nurses to do their jobs. The documentation system developed is expected to be able to predict clearly and accurately, besides that the system must be efficient both in terms of saving time, facilitating the work of nurses. There needs to be the development of a nursing information system that can be used in educational institutions that are expected to be able to facilitate the student learning process in accordance with the needs of the field of nursing clinical practice. The purpose of this study is to design a computer-based nursing intervention documentation system. The method used is to use several stages of activity including System Requirements Analysis, Database Planning, Application Planning, and User Interface Design. The results obtained are the design of an information system for nursing intervention documentation for students. The recommendation of this research is that the design of nursing care interventions can be applied in nursing learning.

Keywords: information systems; nursing; nursing care interventions

First Received	Revised	Accepted
28 March 2022	16 April 2022	24 May 2022
Final Proof Received		**Published**
25 May 2022		30 May 2022

How to cite (in APA style)
Puspitasari, E., & Mulyono, M. (2022). Computer-Based Nursing Care Intervention Information System Design. *Indonesian Journal of Global Health Research*, *4*(2), 343-352. https://doi.org/10.37287/ijghr.v4i2.1170.

INTRODUCTION

The development of a nursing care documentation system is based on making it easier for nurses to do their jobs. Qing Li, (2021) developed a health information system to realize network communication, which is clear and intuitive. Li also explained that the built-in health information system is applied to security control, medical order information, condition information, and information inquiry, which can save work time and complete fast transmission and accurate execution of medical orders, making medical care network communication faster and more convenient. and maximize overall efficiency. The documentation system developed is expected to be able to predict clearly and accurately, besides that the system must be efficient both in terms of saving time, facilitating the work of nurses. Mulyaningsih, (2011) explained the results of the study found that the application of nursing information systems in nursing care documentation was able to increase the quantity and quality of nursing care documentation. In addition, to obtain quality documentation, nurses must understand and be able to apply the software in implementing nursing concepts and implementing the nursing process.

Almost every hospital today has developed a nursing care documentation system, this needs

to be supported by the understanding and skills of nurses in applying the system. Mulyono, (2021) explains that this ability will be more skilled if the implementation of computer-based nursing documentation is applied since becoming a student, so that when working on nursing care, it is normal to do computer-based documentation when working. One of the obstacles encountered is the lack of educational institutions, especially nursing, using computer-based nursing care report recording, currently, most student nursing care reports are still using the conventional method by writing. In addition, Mulyono also explained.

The nursing intervention process is one of the stages of the nursing process where the nurse prepares an action plan from the results of the patient's problem assessment. Ministry of Health, (2020); DPP PPNI DPP SDKI Pokja Team, (2016); Pokja SIKI DPP PPNI Team, (2018); The Pokja SLKI DPP PPNI Team, (2018) Explaining the nursing profession standards, states that the list of nursing diagnoses contains nursing diagnoses referring to the Indonesian Nursing Diagnosis Standards (IDHS) and the skills list contains nursing interventions that refer to the Indonesian Nursing Intervention Standards (SIKI) and outcome criteria. refers to the Indonesian Nursing Outcome Standard (SLKI). These standards are made to facilitate nurses in carrying out their work. The nursing care process in Indonesia is expected to refer to the nursing care standards that have been established in Indonesia, namely referring to the IDHS, SLKI, SIKI. Likewise in the development of nursing information systems should also refer to these three components. Based on this, it is necessary to develop a nursing information system that can be used in educational institutions which is expected to be able to facilitate the student learning process in accordance with the needs of the field of nursing clinical practice. The purpose of this study was to design a computer-based nursing intervention documentation system.

METHOD

This research method uses several stages of activities including System Requirements Analysis, Database Planning, Application Planning, and User Interface Design. The explanation of the stages is as follows:

System Requirements Analysis

Analysis of system requirements begins with an inventory of the needs in the manufacture of the system that will be made related to the information system about nursing care documentation. This basic analysis is needed to design the system so that the system can run and meet the needs. There are two requirements, namely the functional requirements of the system itself and non-functional requirements, namely the needs in making the system both from hardware and software. The needs are as follows:

1.) Functional requirements in the basic nursing care system are as follows:
   a. All systems must be able to be used to input patient data.
   b. All systems must be able to display the types of diagnoses, interventions, and outcomes that match the criteria (IDHS, SLKI, SIKI) for patient data input.
   c. The system must be able to display diagnoses, interventions, and outcomes that match the criteria (IDHS, SLKI, SIKI) for patient data input that has been selected by the nurse/user

2.) As for the non-functional requirements are as follows:
   a. PC or Laptop
   b. Web Server (Php, MySQL)
   c. Text Editor
   d. Browser (Edge or google chrome)

Database Planning

The database design for the system is carried out according to the concept of the nursing care report (Conceptual Design). Starting with testing the data requirements in the system, then creating a Database Management System (DBMS) to design the databases and tables needed in the system. To describe the logical relationship between the entities involved in a system, a database. Entity Relationship Diagram (ERD) is used.

Picture 1. Database conceptual schema

Figure 1 illustrates the design of the nursing care Intervention Information System database, obtained 2 (two) entities, namely nurses and patients. The existing ERD 2 entities will be matched with nursing care data consisting of nursing diagnosis codes, interventions, nursing implementation and symptoms of each nursing problem.

Application Planning

Application planning consists of four activities, namely use case design, Activity diagrams, Sequence Diagrams, and User Interface Design.

1.) Use Case Design

In the application of information systems, nursing care interventions consist of three actors including administrators and users/nurses. Administrator is in charge of the system and is in charge of inputting source data for nursing care documentation. Furthermore, users/nurses are students who input patient data and choose a diagnosis according to the symptoms felt by the patient and select interventions, expected outcomes and inputted actions. In this application there are 7 use cases consisting of 2 special use cases for administrators, 3 special use cases for nurses, 2 use cases for both actors.

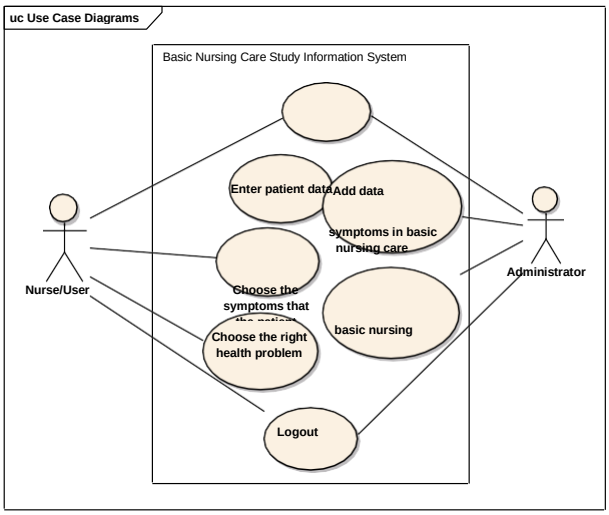

Figure 2. Use Case of Nursing Care Intervention Information System

2.) Activity Diagrams

*Activity diagrams*made to describe the flow of activity in the system from the beginning, the decisions that may exist and the end of the flow in the designed system. Activity diagrams can also describe processes that may occur in parallel that can occur in concurrent activities.

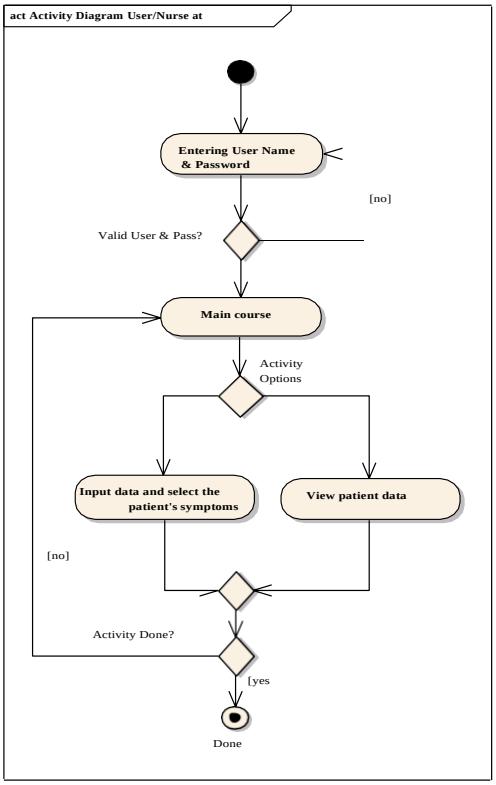

Figure 3. Nurse Activity Diagram

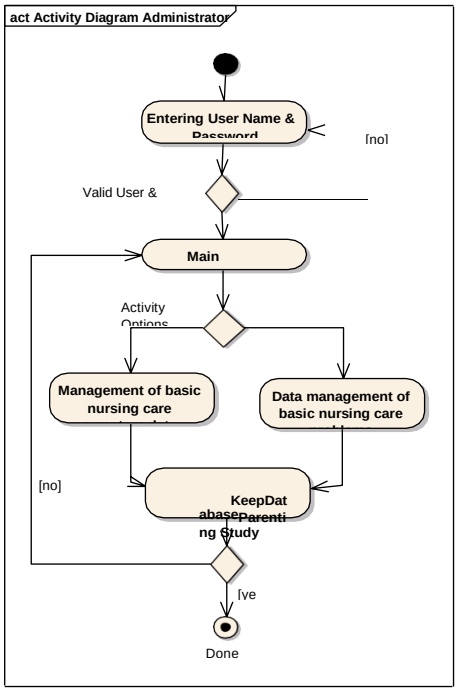

Figure 4 Administrator Activity Diagram

3.) Sequence Diagrams

*Sequence Diagrams*used for describes the user's interaction with the system that is ordered by time in response to an event to produce output.

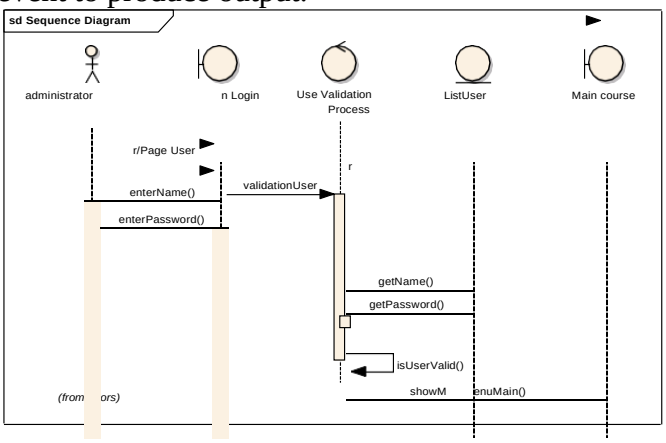

Figure 5. Sequence Diagram Login

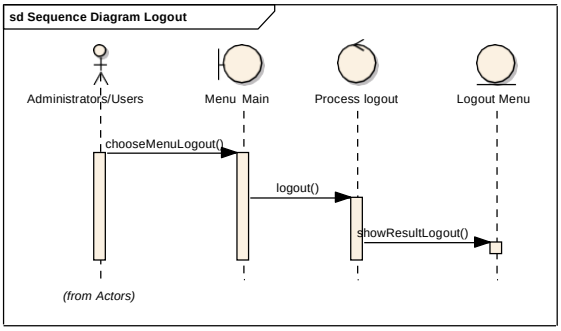

Figure 6. Logout Diagram Sequence

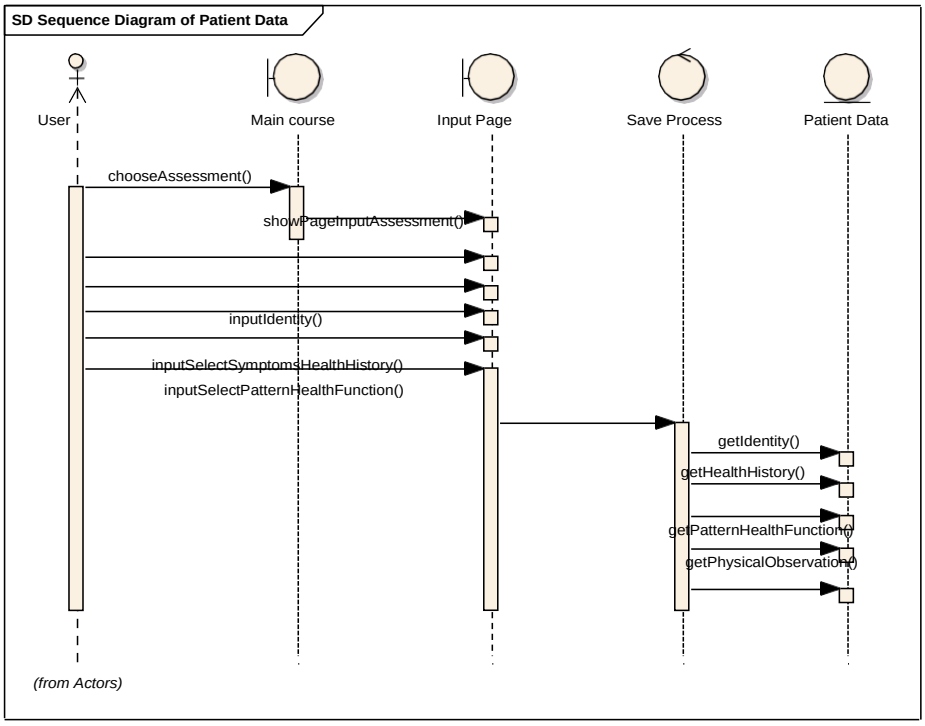

Figure 7. Sequence Diagram of Patient Data Input

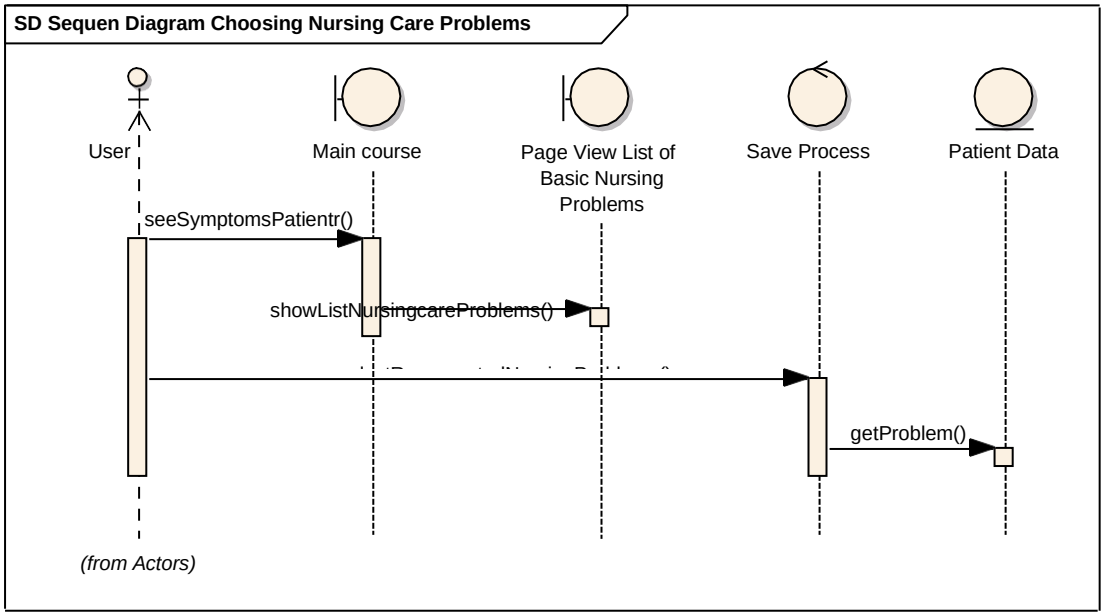

Figure 8. Sequence Diagram of Patient Problem Data

4.) User Interface Design

The design of the user interface system is intended to make it easier for users to use the system created by the user interface system including the user interface for input interversion, outcome criteria (outputs), implementation and evaluation of nursing action input interfaces, where the basis of the system refers to ADKI, SLKI, and SIKI.

RESULTS

After the nurse enters the nursing care review information system, then inputs complete patient data. For data related to symptoms, you can choose according to the list displayed according to the category. For the main complaint in category B (history of illness and health) you can only choose one from the list of existing symptoms, while for symptoms in other categories you can select more than one symptom by pressing the Ctrl key on the keyboard. After completing data collection related to patients, nurses can press the Save button to save the inputted data.

Figure 9 shows that the main intervention input will be displayed according to the selected diagnosis. The nurse just chooses one of the interventions to be implemented and the criteria to be achieved.

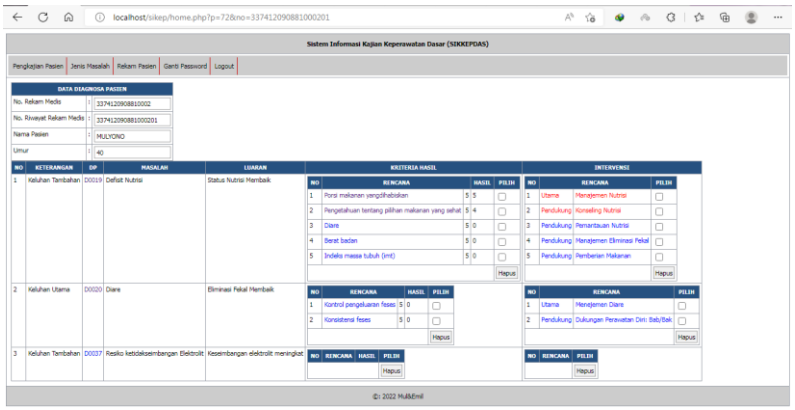

Figure 9. User Interface Input Intervention and Outcome Criteria

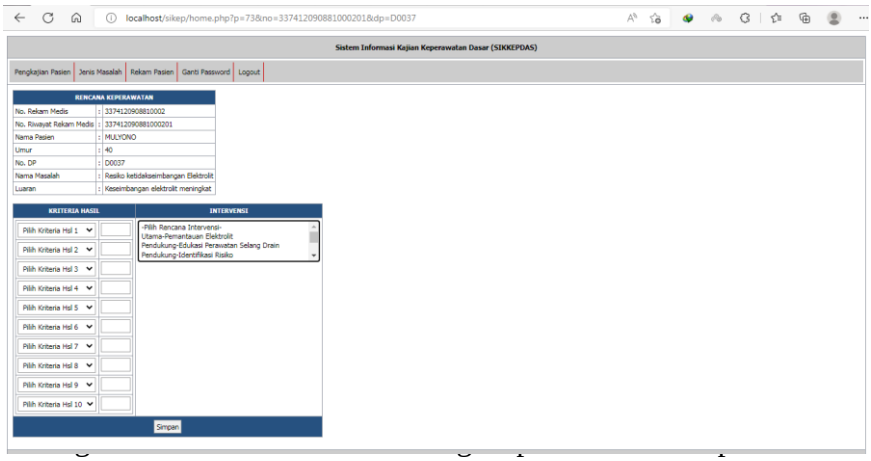

Figure 10. In the implementation input the nurse chooses the actions that have been carried out according to the selected intervention.

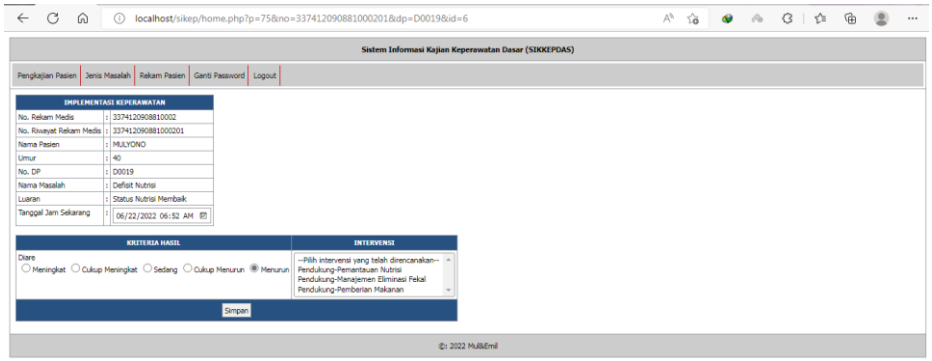

Figure 11. User Interface Input achievement Outcome Action

Figure 11. In the nurse's implementation input, besides selecting the actions that have been carried out according to the selected intervention, they also assess the outcomes achieved after the action.

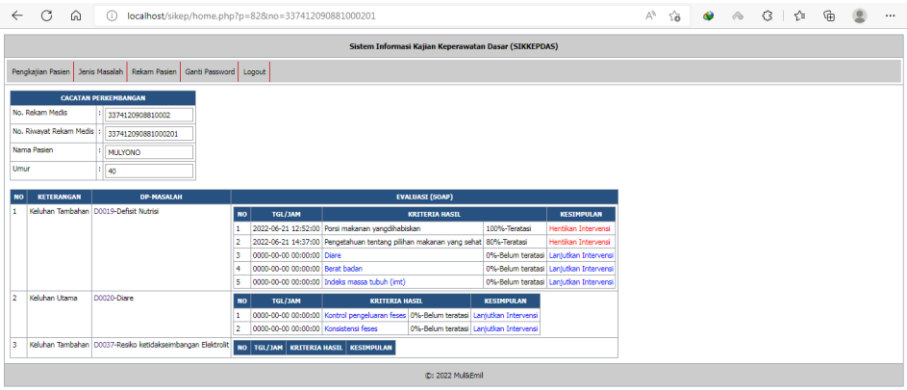

Figure 12. User Interface Input Evaluation

Figure 12. In the evaluation input, the nurse can choose a conclusion from the resulting output whether the problem experienced by the patient is resolved or not, then the nurse can plan again the action to be taken according to the patient's condition. The cycle will

repeat until the patient goes home.

DISCUSSION

The development of Information and Communication Technology (ICT) is a tool to process and convey information. ICT applied to nursing care intervention documentation is related to processing activities, as a tool, by manipulating, and managing information. Baderi, (2018) Explains that ICT is all activities related to processing, manipulating, managing, transferring information between media. It can be concluded that information communication technology can be used as a tool to process and transfer data between devices. As described in the prepared nursing care intervention information system, it is a tool that can be used by students to compile, document interventions, outcomes from the results of nursing actions (implementation) according to IDHS standards, SLKI, and SIKI. As is well known, the development of information and communication technology has now developed many benefits, one of which is to facilitate work. Prasetyanto, (2019) explained that computer-based management information systems have now begun to be widely used, one of which is in the nursing field. This can be used as a basis for educational institutions to prepare prospective nurses who have the ability and skills to carry out computer-based nursing care documentation. (2019) explained that computer-based management information systems have now begun to be widely used, one of which is in the nursing field. This can be used as a basis for educational institutions to prepare prospective nurses who have the ability and skills to carry out computer-based nursing care documentation. (2019) explained that computer-based management information systems have now begun to be widely used, one of which is in the nursing field. This can be used as a basis for educational institutions to prepare prospective nurses who have the ability and skills to carry out computer-based nursing care documentation.

Halila LE, (2014)which discusses "Nursing students' use of the Internet and Computer for their Education in the College of Nursing", where computers and the internet are now important in the learning process, nursing students must have skills in using computers and the internet. The current era of globalization requires everyone, including students, to have skills in operating computers and the internet in carrying out their duties. Mulyono, (2021) explains that this ability will be more skilled if the implementation of computer-based nursing documentation is applied since becoming a student, so that when working on nursing care, it is normal to do computer-based documentation when working. One of the obstacles encountered is the lack of educational institutions, especially nursing, using computer-based nursing care report recording, currently, most student nursing care reports are still using the conventional method by writing. Supported by Arizal's research, (2018) in his research identifies the implementation of integrated documentation will be more efficient than the paper base and its use is more practical.

Development of information systems This nursing intervention uses a root system with a causal approach. Meo, (2015), Kesumaningtyas, (2017) explained that the Clinical pathway is an action plan for patients that is multidisciplinary, and contains details about the steps for handling a patient from entering the hospital to leaving the hospital, the clinical pathway approach is implemented with an expert system that explain cause and effect. Budiana, (2016) explains nursing care includes the process of assessment, formulation of diagnoses, interventions, implementation and evaluation. The activities of the nursing care process are integrated with each other. The results of the assessment will be the basis for the formulation of diagnoses, interventions, implementation and evaluation.

CONCLUSION

The nursing care intervention information system helps nursing students in developing nursing interventions in accordance with the standards of the IDHS, SLKI and SIKI. Nursing intervention information systems help students learn to document computer-based nursing care. It is necessary to develop applications that are easily accessible and used in the documentation of nursing care.

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