The level of acceptance of the child growth and development information system

F Agushybana1, A Sadida2, N R Ayuningtyas3

1Program Study Master of Public Health Diponegoro University, Indonesia
2District Health Office of Brebes, Central Java, Indonesia
3Public Health Union (PERSAKMI), Central Java, Indonesia

Corresponding author: aguhsybana@gmail.com

Abstract. Child Growth and Development Information System (Sistem Informasi Tumbuh Kembang Anak/ SITUKA) is intended to help mothers and health officers easily and completely monitor child growth and development. This study aims to evaluate the level of acceptance of the use of SITUKA. This research method uses a quantitative approach with a cross-sectional approach. The sample in this study was taken by non-probability sampling. Respondents in this study were data managers of the health department (4 people), data managers at the puskesmas (3 people), midwives at the puskesmas (3 people), and 30 mothers who had children under five. In this study, respondents were trained and then asked to provide opinions about the application of SITUKA. To assess the system usability, the PSSUQ (Post Study System Usability Questionnaire) questionnaire was used consisting of 19 questions, consisting of items of use (sysuse), items of quality of information (infoqual), items of quality of interface (interqual) and items of overall satisfaction (overall). SITUKA features include charts, Data Register menus, Child Services, Mother Services, Child Cohort Reports, Mother Cohort Reports, Cadre Data and Posyandu Data. The results of PSSUQ measurements have been carried out to produce the following scores, namely the sysuse aspect of 75.94%, 76.7% infoqual, 70% interqual, 77.50% overall. The SITUKA system acceptance assessment results can be categorized as "Eligible" for further development and use in implementing health programs.

1. Introduction

Children's health is an effort to reach a healthy, smart, and high quality for the next generation. Based on the data from Brebes District Health Office and nutritional status monitoring data from the Family Health and Nutrition Section, the prevalence of stunting in the Brebes district is still below the tolerance limit, which was appointed by WHO, respectively 20% from the number of children under five years of age. However, Brebes Regency is included in the ten priority districts for stunting intervention even though the stunting prevalence data from 2013 - 2017 tends to be static [1,2]. Moreover, stunting, Malnutrition, Neonatal Mortality Rate, Infant Mortality Rate, Infant Mortality Rate are the kind of problems that must be resolved collectively through comprehensive programs [3,4].

One of the ways to monitor mothers and children is by monitoring child development. The child development monitoring program aims to obtain more valid and reliable data, including managing the KIA Handbook information through the KIA Surveillance Information System and Nutrition. The management of family health and nutrition data in Brebes Regency is still done manually. Sometimes, the data recapitulation mistakes occurred, even though the data has been printed in the profile book that has gone through the data validation stage. However, some data on child development was not well managed. The completeness of data and ease of access to the information about SDIDTK for mothers is still lacking; therefore, it is necessary to develop an information system that facilitates information provision [6].
Development of Information System for Child Development Android-based also provides information about stimulation data for early detection and intervention for children's early development, which integrated with maternal child health and nutrition systems. Hopefully, it will facilitate parents' access to information to obtain several reports on their child's growth and development and complete information on the health office's child development data. Thereby, those data are more valid; therefore, the program implemented will be more targeted.

The Android-based Child Growth and Development Information System (SITUKA) is carried out using qualitative and quantitative methods. The qualitative stage describes research steps by identifying problems, collecting data, designing, and developing applications with systems development methods using the FAST approach or the Framework for The Application of System Thinking. On the other hand, the quantitative approaches measure the results of testing information systems by conducting system tests using usability factors, namely overall satisfaction (OVERALL), system usefulness (SYSUSE), information quality (INFOQUAL) and interface quality (INTERQUAL) [6].

2. Methods

This research was conducted by using qualitative and quantitative. The qualitative stage was carried out by extracting data from informants to see existing problems, conditions and opportunities regarding the recording and reporting system for maternal health and SDIDTK. The quantitative stage was carried out to evaluate the quality of the information system using the PSSUQ system trial measurement (Post-study system usability questionnaire). This research was quasi-experimental, followed by problem identification, data collection, design, and application development. A cross-sectional approach was used [7].

A cross-sectional approach is an approach that collects all types of data at the same time, namely the development of an existing PWS-KIA information system, equipped with information on stimulation detection and early intervention for growth and development. The data collection methods used were questionnaires, observations and interviews [8]. The research object was an Android-based information system, and the research subjects are all people involved with the Information System for Early Detection and Early Child Development Stimulation. The informants come from The Health Office of Brebes Regency, namely the head of the Kesga and Nutrition Section (as the main informant), the Head of Public Health Center, MCH and SDIDTK data managers. Also, 3 (three) midwives, 3 (three) puskesmas data managers and 30 (thirty) mothers who live in villages locus for stunting intervention in Brebes District.

3. Results and Discussions

Android Based Child Development Information System, was developed by making a Business Process, Context Diagram, commonly known as DFD 0 (Zero), and Level 1 Data Flow Diagram (DFD). Data Flow Diagram (DFD) is one of the diagrams that used notations to describe the flow of system data, and it was very helpful for understanding the system logically, structured and clear. Moreover, it helps to depict a large circle that can represent all processes contained in a system [9].

Context Diagram is the highest level in DFD and is usually numbered as 0 (zero). All external entities are shown in the context diagram, with the main data flows to and from the system. This diagram does not contain data storage at all and looks simple to create [10], [11]. Context Diagram of the Android-Based Child Development Information System (SITUKA) is as presented at figure 1.
Figure 1. Context Diagram for Android-Based Child Development Information System (SITUKA)

The entities contained in the above child development information system can be described below:

1. Public health office, entities were logged in first step. After that, the system was provided information in the form of SDIDTK then MCH was reported at the district level. Then, it was received SDIDTK and KIA reports. All of the information can be accessed on MCH and SDIDTK for all public health centers in their area.

2. Public health center, the Public health center entity was logged in first, then can access SDIDTK and MCH information for all villages in the Public health center area.

3. Midwife, midwives were logged in first before inputting SDIDTK and KIA data. Midwives were collected the data according to the criteria for stimulating instruments to detect early intervention for child development, then entered into the system. Midwives have the right to access data on children's growth and development and see data collection status in their area.

4. Mother, mothers or parents logged in first using the child's or mother's NIK. Mothers have received the information on the results of SDIDTK and KIA examinations themselves. However, information about the other was not able to check.

Design Interface or display interface is a medium interaction between users and the system being built. The user interface design was aimed to create an effective medium of communication between humans and computers. Software engineer designs were used interfaces by implementing processes that refer to predefined design principles. The software interface design is very important because it was useful to make it easier for users [12], [13]. There are four types of users in this information system. The first is the type of service, health center, midwife and mother. The SDIDTK check menu for children is a menu intended to use for mothers or parents who want to know their children's growth and development after the growth and development check was conducted. This menu was accessed by filling in the NIK on the child's SDIDTK check display, as shown below:
Figure 2. Cheking menu on SITUKA

The Cadre Data menu includes the cadre name, cellphone number, sub-district, posyandu, status, action and added icons. The posyandu data menu consists of filling in the name of the posyandu, contact person, cellphone number, household, household, sub-district, address, action and added icon.

The quantitative stage is carried out during system testing. The success of an information system or software was measured by usability. Usability measurement aimed to assess that a system can be used properly according to making the system. ISO-9421-11 states that a system has good usability if effective, efficient, and satisfactory.

Post Study System Usability Questionnaire (PSSUQ) was used to develop the level of reusability. IBM developed PSSUQ as a research tool in usability evaluation. Assessment of the satisfaction with PSSUQ uses the usability aspect with four categories, namely usability (SYSUSE), information quality (INFOQUAL), interface quality (INTERQUAL) and the overall satisfaction system (OVERALL). The results of the PSSUQ measurement recapitulation given to respondents are as presented in Table 1. In the recapitulation table of PSSUQ measurements was based on question grouping and scale, it can be seen that the measurement results of each question are as follows:

3.1. Sysuse
From the calculation results in Table 1, it can be explained according to the interpretation of the Likert scale, where the percentage score of 75.94% is obtained, and according to the table of the system's usefulness, the information system on children's growth and development is included in the category "Appropriate" to use because it is following the needs of system development.

3.2. Infoqual
In Table 1, the result showed that the information quality scores was 76.07%. This scores depicted that the information quality was in the "Feasible" category. Accordingly, the application was feasible because the quality of information was easy, accurate, and according to the needs and accuracy data presentation time.

Table 1. Results of PSSUQ Measurement Recapitulation

| Question | Scale | Total |
|----------|-------|-------|
|          | 1     | 2     | 3     | 4     |       |
| Sysuse   | 0     | 0     | 77    | 3     | 243   |
| Total Score | 0     | 0     | 231   | 12    | 320   |
| Highest Score | 10    | 8     | 4     | 320   |       |
| Eligible Percentage |       |       |       | 75.94 |
| Infoqual | 0     | 0     | 67    | 3     |       |
| Question       | Scale | Total |
|---------------|-------|-------|
|               | 1     | 2     | 3     | 4     |       |
| Total Score   | 0     | 0     | 201   | 12    | 213   |
| Highest Score | 10    | 7     | 4     |       | 280   |
| Eligible Percentage |       |       |       |       | 76.07 |
| Interqual     | 0     | 6     | 24    | 0     | 84    |
| Total Score   | 0     | 12    | 72    | 0     | 120   |
| Highest Score | 10    | 3     | 4     |       | 40    |
| Eligible Percentage |       |       |       |       | 70.00 |
| Overall       | 0     | 0     | 9     | 1     | 10    |
| Total Score   | 0     | 0     | 27    | 4     | 31    |
| Highest Score | 10    | 1     | 4     |       | 20    |
| Eligible Percentage |       |       |       |       | 77.50 |

3.3. Interqual
From the calculation results in Table 1 following the interpretation of the Likert scale, the interface score was 70%. This score articulated that quality of the SITUKA included in the "Eligible" category. In the other word, the quality of the system interface is attractive and easy to operate.

3.4. Overall
In Table 1, according to the Likert scale interpretation obtained, the overall score was 77.50%. It means that the overall satisfaction of the information system on children's growth and development was in the "Feasible" category. Accordingly, the overall assessment gave satisfaction to users [14].

This child development information system still has limitations because it does not have an offline version; thereby, it must be connected to an internet network and requires a large server capacity to display files in pdf form. However, system development also has advantages such as easy access, especially for the latest data. Besides, data presentation is shown to be faster, more attractive and easier to understand. This system can make it easier to detect developmental disorders in children, accelerate early intervention actions that must be taken and opensource software that facilitates future development.

4. Conclusions
Based on this research showed that the acceptance of the SITUKA is feasible to use as an information system in supporting child health monitoring for nutrition program at District Health Office of Brebes. However, as we know that users can use the system, it is necessary to have socialization about the information system on children's growth and development. To anticipate obstacles that might arise, such as internet connection error, it would be better if developed again in the offline version. The information generated by this information system on child development will be more useful if it is used as a source of data in planning and evaluating maternal and child health programs and SDIDTK.

Acknowledgments
The author would like to thank the leadership and all statutes of the Brebes District Health Office, Central Java who have deigned to be a place of research. Also to the leaders and staff of the Public Health Study Program, the Faculty of Public Health, Diponegoro University, who have provided the opportunity for authors to gain knowledge and provide laboratory facilities during the research.

References
[1] KRR Indonesia 2018 Buletin Jendela Data dan Informasi Kesehatan
[2] TNPP Kemiskinan 2017 100 Kabupaten / Kota Prioritas untuk Intervensi Anak Kerdil (Stunting)
[3] Dinas Kesehatan Kabupaten Brebes 2016 Profil Kesehatan Kabupaten Brebes
[4] Dinas Kesehatan Kabupaten Brebes 2015 Profil Kesehatan Kabupaten Brebes 2015
[5] Dinas Kesehatan Kabupaten Brebes 2104 Profil Kesehatan Kabupaten Brebes Tahun 2014
[6] Chandra L S 2015 Efektifitas Aplikasi SDIDTK Berbasis Android dalam Peningkatan Motivasi Bidan Melakukan SDIDTK 10 2
[7] Sarwono J 2006 Metode Penelitian Kuantitatif dan Kualitatif. Pertama Yogyakarta Graha Ilmu,
[8] Sugiyono 2011 Metode Penelitian Kuantitatif Kualitatif dan R&D Bandung Alfabeta
[9] Gaol C J L 2008 Sistem Informasi Manajemen, Pemahaman dan Aplikasi Jakarta Grasindo
[10] Kadir A 2011 Konsep dan Tuntunan Praktis Basis Data Yogyakarta Andi Offset
[11] Gupta P C 2006 Data Communications and Computer Network New Delhi Ghosh
[12] Pressman R S 2015 Software Engineering. A Practitioner’s Approach. Mc Graw Hill Education
[13] Pressman R 2012 Rekayasa perangkat lunak Yogyakarta Andi Offset
[14] Lestari S 2014 J. Ilm. Teknol. Inf. Terap. 1 1