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User Satisfaction Analysis of Primary Care Information Systems in Semarang City with EUCS Model

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Abstract

Primary Care Information System (P-Care) is used at the first level health facility (FKTP) for the service of patients of the National Health Insurance. The purpose of this study was to determine the success of using the P-Care information system by evaluating the system using the End User Computing Satisfaction (EUCS) Model. This is a cross-sectional survey research with Primary Care information system objects. The variables studied were the user satisfaction factors of the p-care information system including content aspects, accuracy, format, ease of use, and timeliness. The research subjects were primary care information system operators with 61 FKTPs as samples. Data were analyzed using descriptive analytical methods. P-care application user satisfaction index was 75.5 (satisfied category). This shows that respondents generally have received the primary care information system. The lowest index on A1 (system accuracy), C1 (accuracy of information), and T1&2 (timeliness of information). The lowest average user satisfaction index is on aspects of system accuracy and timeliness. To improve the index of primary care information system user satisfaction, the BPJS needs to improve system monitoring, increase feedback and increase report output. FKTP can develop a bridging P-Care system and structuring the medical record system to be more effective and efficient.

Abstrak

Sistem Informasi Primary Care (P-Care) digunakan pada fasilitas kesehatan tingkat pertama (FKTP) untuk pelayanan pasien Jaminan Kesehatan Nasional (JKN). Kepuasan pengguna aplikasi P-Care merupakan faktor penting dalam kinerja sistem informasi. Tujuan penelitian ini adalah mengetahui keberhasilan penggunaan sistem informasi p-care dengan melakukan evaluasi sistem menggunakan End User Computing Satisfaction (EUCS) Model. Jenis penelitian adalah penelitian survey bersifat cross sectional dengan obyek sistem informasi Primary Care. Variabel yang diteliti adalah faktor kepuasan pengguna sistem informasi p-care meliputi aspek content, accuracy, format, ease of use, dan timeliness. Subyek penelitian adalah operator sistem informasi primay care dengan 61 sampel FKTP. Data dianalisis dengan cara diskriptif analitik. Indeks kepuasan pengguna aplikasi P-care adalah 75,5 (kategori puas). Hal ini menunjukkan bahwa responden secara umum sudah menerima sistem informasi primay care. Indeks terendah pada A1 (akurasi sistem), C1 (ketepatan informasi), dan T1&2 (ketepatan waktu informasi). Rata-rata indeks kepuasan pengguna paling rendah pada aspek akurasi sistem dan ketepatan waktu. Untuk meningkatkan indeks kepuasan pengguna sistem informasi primary care, maka pihak BPJS perlu meningkatkan monitoring sistem, meningkatkan feedback dan penambahan output laporan. FKTP dapat mengembangkan sistem bridging p-care dan penataan sistem rekam medis untuk pelayanan pasien yang lebih efektif dan efisien.

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INTRODUCTION

The Indonesian government began implementing the Jaminan Kesehatan Nasional or JKN (National Health Care Insurance) system in 2014. The JKN system covers all health services at the primary level to tertiary level. Health services are implemented in stages through a referral system. Fasilitas Kesehatan Tingkat Pertama or FKTP (First Level Health Services) or Primary Health Facilities must be strengthened because they become the main gate of BPJS Kesehatan or Badan Penyelenggara Jaminan Sosial untuk Kesehatan (Social Security Administrator for Health) participants in accessing health services. If FKTPs are not strengthened, the community will continue to access hospitals as FKTLs or Fasilitas Kesehatan Tingkat Lanjut (advanced health facilities) so that hospitals will be overworked (Sumarni, 2017).

The patient service system at FKTP has been strengthened by the use of information technology. BPJS Kesehatan as the administrator of the JKN system develops an Information Technology-based system, namely the P-Care (Primary Care) application. The patient service information system for BPJS Kesehatan participants is online based. All FKTP have used the P-Care system to access BPJS participant data and report on services performed online. The system also assists health facilities in providing online referral systems to higher health facilities.

Health information system (HIS) is one of the important aspects of supporting health development. HIS is needed to carry out and monitor health efforts so that these efforts run effectively and efficiently. HIS is one of six building blocks or major components in the health system. Accurate information data, careful data collection, and right decisions are now a necessity. The development of information technology and telecommunications has a major role in contributing significantly to the advancement of SIK in a more professional manner. Implementation of information technology is one of the inevitable solutions (WHO, 2014).

Components in information systems are hardware, software, and brainware. Brainware components are human resources as users of information systems. Satisfaction of P-Care application users is an important factor in the performance of information systems. Evaluation of the application of P-Care needs to be done considering that this application has been available since 2014. There are several publications that take P-Care evaluation material but are still limited to the scope of the health center. Research on BPJS information system acceptance analysis shows that facilitation factors, user interface, organizational support, personal control influence the acceptance of information systems (Rakasiwi, 2016, Listiyana, 2017). Research on evaluating the implementation of P-Care software at first-level health facilities or FKTP shows that the main obstacle is networking and regulation (Hazewinkel, 2016).

The results of the preliminary survey on five first-level health facilities showed that there were still problems with the use of the p-care information system, including errors in the system, changing participants' databases, and outputs that did not meet needs. Internal organizational problems include organizational structure and unclear SOPs. There are many evaluation models used to measure the acceptance of an information system used by an organization or public institution. One evaluation model used to measure information system acceptance is End-User Computing Satisfaction (EUCS). The end-user is interpreted as: 1) the ultimate source or destination of information flowing through a system; 2) a person, process, program, device, or system that employs a user-aplication network for the purpose of data processing and information exchange. End-user computing (EUC) refers to a system where non-programmers can make application work (Hidayatullah, 2014). This study aimed to determine the level of satisfaction of Primary Care information system users with the EUC-End User Computing Satisfaction model.

METHOD

This type of research is a cross sectional survey research with Primary Care information system objects. The variable studied was the EUCS (End User Computing Satisfaction) satisfaction variable. The research subjects were primay care information system operators with a sample of 61 FKTP. The research instrument used questionnaires, interview guidelines and observation guidelines.

Data collection methods used questionnaires that contained questions of respondents' opinions about the content, accuracy, format, convenience, and timeliness of the primary care information system.

Questionnaires are used to explore user satisfaction factors with linkert scale. Alternative answers can be given a score of 1 to 5 as follows: 5 = Strongly Agree; 4 = Agree; 3 = neutral / enough; 2 = Disagree and 1 = Strongly Disagree.

Data were analyzed using descriptive analytical methods. The results of p-care application user satisfaction are known by the satisfaction index.

Indeks Formula % = Total of Score / Y x 100

Y is the highest score of Likert multiplied by the number of respondents. The following interpretation criteria are based on intervals

- Scale of 0% – 19.99% = very dissatisfied

- Scale of 20% – 39.99% = dissatisfied
- Scale of 40% – 59.99% = quite satisfied
- Scale of 60% – 79.99% = satisfied
- Scale of 80% – 100% = very satisfied

RESULTS AND DISCUSSION

Characteristic of Respondent

Respondents in this study were primary care information system operators at level 1 health facilities. The number of female respondents was 49 people (80.3%). While the number of male respondents was 12 people (80.3%). Respondents who worked less than 1 year were 8 people (13.1%), most of the respondents had worked for 2 - 10 years so they had enough experience in the use of information systems, respondents who had worked for 2-10 years as many as 40 people (65.6%) and respondents who have worked between 11-20 years were 13 people (3.3%). The respondent's education level is quite high. Educational factors will affect the level of use, expectations, attitudes of receiving information systems. The higher the education, the higher the level of usage, expectation and attitude of receiving information (Yusof, 2008). The highest number of respondents is as an administrative officer of 19 people (31.1%). All respondents work concurrently with primary care operators. The work is concurrent because there is no clear organizational structure and job description regarding the work of primary care operators.

Table 1. Distribution of Respondents Characteristics

Characteristics	f	%
Age		
≤20 years	4	6.6%
21 – 30 years	29	47.5%
31 – 40 years	20	32.8%
41 – 50 years	6	9.8%
≥ 50 years	2	3.3%
Education Level		
Junior High School	2	3.3%
High School	12	19.7%
Associate's Degree	22	36.1%
Bachelor	25	41.0%
Job Position		
Administration	19	31.1%
Medical records	12	19.7%
Nurse	11	18.0%
Midwife	5	8.2%
Doctor	7	11.5%
IT staff	6	9.8%
Marketing	1	1.6%

Identify User Satisfaction Factors

The User Satisfaction Factor was explored with the EUCS (End User Computing Satisfaction) model to measure user acceptance of the primary care information system. The satisfaction assessment can be seen from 5 perspectives / dimensions namely, content, accuracy, format, ease of use, and timeliness (Aji, 2013). The following user satisfaction levels are shown in Table 2.

Table 2. Primary Care Information System User Satisfaction Level

No	Satisfaction Aspect	Index	Category
C.1	Accuracy of information according to needs	72.5	Satisfied
C.2	Information content as needed	75.4	Satisfied
C.3	Report according to what is needed	78.0	Satisfied
C.4	Adequacy of information in accordance with what is needed	78.4	Satisfied
	Content Satisfaction	**76.1**	Satisfied
A.1	System accuracy	70.4	Satisfied
A.2	Information accuracy	73.9	Satisfied
	Accuracy satisfaction	**72.6**	satisfied
F.1	Useful format	76.4	Satisfied
F.2	Clarity of information	75.1	Satisfied
	Format Satisfaction	**75.7**	satisfied
E.1	System friendliness	77.7	Satisfied
E.2	System ease	75.7	Satisfied
	Easy of Use satisfaction	**76.7**	Satisfied
T.1	Timely information	73.1	Satisfied
T.2	The system provides the latest information	73.1	Satisfied
	Timeliness Satisfaction	**73.1**	**Satisfied**
	Satisfaction Level	**75.5**	**Satisfied**

Table 2 shows the index of patient satisfaction for each aspect ranging from 70% to 78%. The average satisfaction of p-care application users is 75.5 (satisfied). This shows that respondents in general are satisfied with the primay care information system. The lowest index on A1 (system accuracy), C1 (accuracy of information), and T1 & 2 (timeliness of information). The average index of p-care application user satisfaction is the lowest in terms of system accuracy and timeliness.

Most respondents were satisfied with the primary care information system, but there were some aspects that were still not accepted by users. Aspects that need to be considered are the timeliness, ease, accuracy, format, and content of the information

Table 3. Frequency Distribution of Primary Care Information System User Satisfaction

No	Satisfaction Aspect	Dissatisfied		Satisfied	
		Total	%	Total	%
1.	Content	2	3.3	59	96.7
2	Accuracy	3	4.9	58	95.1
3	Format	2	3.3	59	96.7
4	Easiness	3	4.9	58	95.1
5	Timeliness	6	9.8	55	90.2

system. The interviews found that JKN patient databases were sometimes not in accordance with ID cards, changes in membership activity, and changes in health facilities. Disruption in the form of a down system in P-care is also an obstacle to the service system. As a result, the data input process and the referral process become time constrained.

The FKTP studied consisted of three types of health service facilities, namely private clinics, general (dental and general) doctors, and health centers. P-care application user satisfaction data has been taken from a sample of 61 FKPTs studies. Following are the levels of user satisfaction based on FKTP types.

The level of satisfaction of p-care users according to FKTP type showed that the highest satisfaction was in the health center group, while the lowest was the private clinic. There are several factors that make it possible to increase user satisfaction. User satisfaction can be linked to perceptions of benefits and user attitudes toward information systems that are influenced by personal characteristics (Erimalata, 2016). Satisfaction is also influenced by the structure and environment of the organization. The level of system usage can affect the level of user satisfaction and vice versa. An effective usage system increases User Satisfaction. As a User can explore and make full use of system features and functions, higher User Satisfaction then motivates/directs users to improve system usability. System quality, information quality, and service quality contained in information technology can affect user satisfaction (Pamugar, 2014). The better the value of the system quality level will increase user satisfaction and the intensity of the system users.

Health Center have high human resources with education and more training intensity compared to clinics and doctor practice. Organizational structure, job description, financing planning at health centers are more organized and clearer. This can affect the system of using p-care. The health center also has a neat medical record system with a lean service flow. In a sample of doctors' practice, it was found that the practice of doctors did not have a good medical record system. A neat medical record system will facilitate recording, storing, retrieving, and processing healthcare data (Hatta, 2008). Private clinics have a neat medical record system than doctor practice, but more work volume certainly affects the level of system usage. User characteristics will influence the perception of benefits and the attitude of users of the information system of p-care (Thenu, 2013).

User satisfaction is one indicator in evaluating information systems. Between factors in user satisfaction (content, accuracy, format, ease, and timeliness) have a strong relationship (Aji, 2013). The results of the identification of satisfaction in this study indicate that users, in general, were satisfied with the primary care information system, but need to be considered especially in the aspects of accuracy and timeliness.

The results of interviews with respondents found several obstacles to the use of the p-care information system which ultimately could influence the amount of information system acceptance. Some obstacles faced by P-care users namely:

(1) Down Internet network or system

The use of the P-care application is sometimes interrupted by the disconnection of the internet

Table 4. User Satisfaction Level of Primary Care Information System According to FKTP Type

No	Satisfaction Aspect	Private Clinic	General Doctor Practices	Health Center
1.	Content	71.1	78.3	81.7
2	Accuracy	73.1	74.2	81.9
3	Format	73.9	75.2	82.2
4	Easiness	76.5	75.9	80.0
5	Timeliness	72.2	69.7	86.7
	Average	72.9	75.6	82.1

network and the system, due to the amount of traffic and exposure, or the provider is doing maintenance. To overcome this, the operator can communicate with IT from BPJS to improve the system. Of course, this is a bit of a hindrance to JKN patient service time.

(2) Changes in JKN participants database

There are cases of active JKN patients who can turn into inactive. JKN participants were found with changed FKTP choice. Other cases are changes in patient name, date of birth and FKTP. Patients are forced to take care directly to the BPJS to clarify these changes. Therefore, IT of BPJS needs to improve system and database monitoring.

(3) The Pcare system does not provide output reports for BPJS

Monthly reports sent to BPJS have a standard format, as in Figure 1.

Figure 1. BPJS Manual Report Format

This report must be recapitulated manually by *FKTP* because the P-care system does not provide output reports in accordance with the specified format. The P-care system also does not provide outputs for each patient's report and recap of *PBI* and non-*PBI* patient visits (*PBI* is *Penerima Bantuan Iuran* or Premium-Aid-Recipient) so operators must recap manually. The P-care system should add a report menu in the system output to facilitate the reporting process.

Reports that can be generated from the P-care information system consist of visit reports per patient and recapitulation reports. Reports can also be made in tables or graphs to facilitate analysis for *FKTP*. The draft report that can be proposed are Patient Disease History Form (*Format Riwayat Penyakit Pasien*) and *BPJS* Report Form (*Format Laporan BPJS*). Figure 2 is the display of patient disease history form design at each visit. Figure 3 is the display of *BPJS* report form design. This report for *BPJS* adjusts the manual report format that has been created. This report contains the identity of *BPJS* participants, diagnosis, referral information, and type of *PBI*.

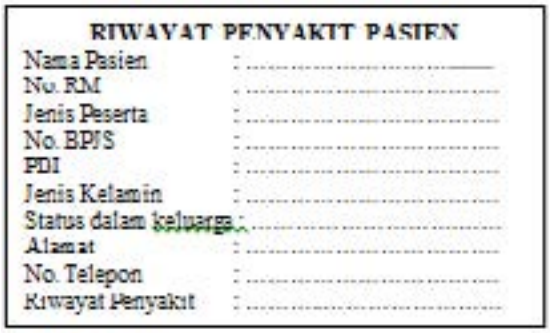

Figure 2. Draft of Patient Disease History Format

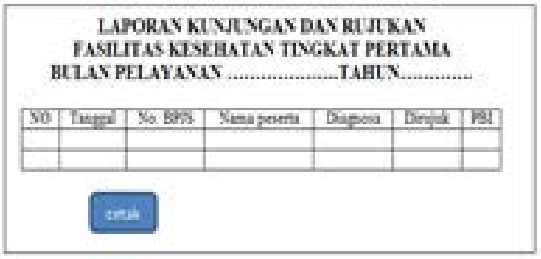

Figure 3. Draft of *BPJS* Report Format

(4) The P-care system does not provide a commitment-based performance information system for *BPJS*.

Commitment-based performance is applied in order to improve the service quality of *FKTP*. The indicators that were assessed were the number of contacts (*Angka Kontak* or *AK*), referral ratio of non-specialist outpatient cases (*Rasio Rujukan Rawat Jalan Kasus Non Reproduksi* or *RRNS*), routine visit ratio of *prolanis* (*Rasio Peserta Prolanis Rutin Berkunjung* or *RPPB*), and home visit ratio (*Rasio Kunjungan Rumah* or *RKR*). The system should be able to provide performance reports for *FKTP* so that it can be used for monitoring and evaluation for both *FKTP* and *BPJS*. Number of Contacts (*Angka Kontak* or *AK*) is the number of contacts per patient (service in building and outside building) or number of registered participants. It is counted with formula *contact/number of participants x 1000*. The standarrd is ≥ 150 permil per month. *RRNS* (referral ratio of non-specialist outpatient cases) is number of referrals for non-specialist outpatient cases or number of referrals. It is counted with formula *number of non-specialist referrals / number of referrals x 100*. The standard is < 5 % per month. *RPPB* (routine visit ratio of *prolanis*) is the number of routine *prolanis* participants visited or *prolanis* participants were registered at *FKTP*. It is counted with formula *number of regular prolanis participants / prolanis participants registered at FKTP x 100*. The standard is ≥ 50% per month. *RKR* (home visit ratio) is number of home visits or number of households. It is counted with formula *number of home visits / number of house-*

holds x100. The standard is 8,33% per month.

(5) Difficulties in medical record service for general patients

FKTP serves *JKN* patients and general patients, so recording patients is performed separately with *JKN* patients. This causes recording to be performed on a separate system. Semarang City Health Center has *SIMPUS* (*Sistem Informasi Manajemen Puskesmas* or Management Information System of Health Center) which each polyclinic has a LAN. *SIMPUS* has not been integrated with the P-care application. Private clinics and doctor practices use a manual system for recording general patients. There are several *FKTP*s that use the patient data search system using alphabetical patient names. The difficulty encountered is the similarity of the patient's name. Search code with medical record number is more recommended because it can facilitate the search for patient data (Hatta, 2008). *FKTP* should be able to collaborate with IT of *BPJS* to develop a bridging P-care system so that the recording and reporting process becomes more effective and efficient.

(6) BPJS does not provide feedback for P-care to FKTP

Every month *FKTP* sends a report of patient visits manually to *BPJS*. Because the system does not provide output reports, the operator fills out the report recap manually. The feedback obtained is only limited to the complete report or not. *BPJS* should provide feed back reports on patient visits along with complete information about items in the form of a shortage of reports from *FKTP*. The P-care system can be added to the reporting menu so that operators can get periodic visit recapitulation data directly.

CONCLUSION

P-care application user satisfaction index was 75.5 (satisfied). This shows that respondents in general were satisfied with the primay care information system. The lowest index on A1 (system accuracy), C1 (accuracy of information), and T1 & 2 (timeliness of information). The lowest average user satisfaction indeks was on aspects of system accuracy and timeliness.

To improve the index of primary care information system user satisfaction, the *BPJS* needs to improve and develop primary care information systems. Some input from *FKTP* operators is improving system monitoring, feedback and adding report output. *FKTP* can develop a bridging P-care system and structuring a medical record system, to be more effective and efficient for patient services.

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