Surabaya City Health Office's Readiness In Facing 'EHR' Era Through Doq-It

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ABSTRACT

Background: E-Health is an innovation created by the City Government of Surabaya in the realm of health services. E-Health integrates data between Puskesmas (Public Health Center), Hospitals, Dispendukcapil (the Department of Population and Civil Registration), and the City Health Office of Surabaya. E-Health is the latest health service program prior to the Electronic Health Record (EHR). An assessment on its readiness is important and necessary. One way to realize the readiness for implementing the Electronic Health Record (EHR) is by using the EHR Assessment and Readiness Starter Assessment tool by the Doctor's Office Quality - Information Technology (DOQ-IT). This research will analyze the readiness of the Surabaya City Health Office in applying e-Health in order to implement the Electronic Health Record (EHR).

Methods: This research is a quantitative-descriptive type of research with cross sectional design. The main subject is the Surabaya City Health Office, and the data collection technique used is interviews. The data are processed through coding and calculating the respondent's answer to be then categorized.

Results: The indicators in this research are Organizational Alignment and Organizational Capacity. The results show that the City Health Office and Puskesmas are strong enough to face the challenges of developing the Electronic Health Record (EHR), which is in range III. This indicates their readiness in facing changes towards the Electronic Health Record (EHR) and denotes its success. The indicator smallest value lies in the section of coordination with all related parties which is less optimal.

Conclusions: Surabaya City Health Office is ready to implement the Electronic Health Record (EHR). The involvement of all components becomes the key to success towards a more innovative change in Electronic Health Record (EHR).

Keywords: e-Health, Organizational Alignment, Organizational Capacity, Puskesmas, Primary Healthcare.

INTRODUCTION

EHR (Electronic Health Record) is an information technology containing comprehensive documentations or health reports of the patients. One manifestation of EHR is e-Health[1].

E-Health is one of the Surabaya Government's best innovations to improve health services in Surabaya. E-Health is considered successful as a communication bridge between the government and the public in the matter of queuing for health services. The implementation of e-Health is carried out structurally, by optimizing all relevant regional government command

units (SKPD) down to districts and sub-districts, and culturally. The e-Health application is easy and informative by using three languages including Indonesian, Javanese and Madurese to conform the sociological characteristics of the people of Surabaya[2].

The e-Health application integrates data between Puskesmas (Public Health Center), Hospitals, Dispendukcapil (the Department of Population and Civil Registration), and also the City Health Office of Surabaya. This application is created to simplify the initial registration process of patients by reducing queuing time, facilitating the recording system of patients who come for treatment, and simplifying the online referral process through patient medical resumes. The implementation of e-Health services in several Puskesmas in Surabaya is yet optimal. In one of the health centers, e-Health was not well performed due to unutilized factor of technology. The health workers and staff of the health center did a terribly low innovation in implementing e-Health services. Leadership was only seen in IT staff, with inadequate planning and lack of transparency of e-Health services performed by the health center for the communities in its service area area[3].

The less-optimized implementation of e-Health needs to be assessed in the matter of its readiness at the policy-making level. One way to determine the level of readiness for EHR implementation is by using the EHR Assessment and Readiness Starter Assessment by Doctor's Office Quality - Information Technology (DOQ-IT). The EHR Assessment and Readiness Starter Assessment by DOQ-IT is an instrument created for assessing the implementation of technology in health agencies, which is established based on a national initiative to promote the adoption of EHR by DOQ-IT from the Healthcare Information and Management Systems Society (HIMSS). DOQ-IT is a more detailed method in assessing the readiness of implementing information systems in the health centers (Puskesmas), to improve health services by developing weak variable capacities[4]. Similar research stated that DOQ-IT assesses readiness by showing weak components as the efforts of anticipation and development[5].

The areas of readiness measured by DOQ-IT include the terms of culture, leadership, strategy, information management, clinical and administrative staff, training, accountability, budget and finance, IT management and support, and IT infrastructure[6]. The purpose of this research is to analyze the readiness of the Surabaya City Health Office in applying e-Health in order to implement the Electronic Health Record (EHR).

METHODS

This research is a descriptive- quantitative type of research with cross sectional design. Subjects for this research include the representative of the Surabaya City Health Office from the Division of Program, Information and Public Relations (PIH) served as the coordinator for the field of Information and Technology (IT) and Health Information Statistics (SIK) that is one person, and six people from Puskesmas occupying the unit of medical records and health information and IT. The research data is collected in a form of primary data resulted from interviews with the research subjects. The research instrument used is the standard interview guidelines on EHR readiness[6]. The analysis strategy starts from compiling the data, classifying the data, providing codification of answers, then analyzing them. This is all according to the guidelines of the standard observation sheet.

RESULTS

This research, since the City of Surabaya is not yet implemented the EHR, sees the application of e-Health as the latest health service program prior to the existence of EHR. The

results of this research can be useful to show the readiness of the City of Surabaya in preparing the EHR.

A less optimal score lies in the lack of communication with the field executors such as doctors and other professional officers in the health sector, which is described in Table 1. Whereas in Table 2, the results of interviews regarding organizational capacity for e-Health will be explained.

Table 1. Interview Results on the Organizational Alignment for e-Health

Indicator	No.	Interview Results	Score
Culture	1	e-Health is a special system to fulfill data coverage and services related to health in Surabaya. This system consists of several applications of SIMPUS (*Puskesmas* Management Systems), *SIM RS* (Hospital Management Systems), Drug Warehouse Applications, *Posyandu* (Integrated Healthcare) Applications, also Queuing and Online Referral Applications	5
	2	The e-Health planning and implementation process involves a complete team. Other government-owned institutions of the City of Surabaya are also involved, for example: the Communication and Information Office, as the provider of network needs in each of health facility; the Population and Civil Registration Office, as a source data of all residents in Surabaya; and *BPJS Kesehatan* (the Social Security Administrator of Health) for the online referral of the patients	5
	3	Having their own team for the development of e-Health, however, not involving doctors in their planning and decision-making as it is not reflected in the respondents' answers, yet stating that the making of e-Health has gone through a series of processes according to the needs in the field	3
	4	The main framework of e-Health already exists, but not accessible for evaluation by vendors	3
Leadership	1	The leaders have a good understanding in the importance of e-Health to improve service quality	5
	2	The dedicated IT development team has a particular time to enhance the quality of e-Health technology	5
Strategy	1	The IT team's strategic planning is integrated with the organization's work plan	5
		The long-scale development strategy plan for e-Health is still in the process of internal discussion at the Health Office, an annual planning regarding the development of health management information system has been contained in the work plan with a target of 1 application	
	2	A survey is always conducted every year for every user of the application to be asked for opinion on the may-still-lacked needs and what-to-be-added needs	5
		Monitoring of quality and level of efficiency is carried out through surveys (conducted by the Health Office), and monitoring of ICT (Information and Communication Technology) conducted by *Dinkominfo* (the Communication and Information Office). Since the launching of e-Health, its satisfaction level of use is also been asked during a community satisfaction survey of service users at *Puskesmas* (health centers) and *RSUD* (Regional Public Hospital).	
Total			**31**

From the interview results, the implementation of e-Health is already on its maximum value, with an average of 5. While the minimum score (score 1) stands for the not-yet-implicitly-implied IT development by the vendors. Meanwhile, the interview results for indicator of organizational capacity are completely shown in Table 2 below.

Table 2. Interview Results on the Organizational Capacity for e-Health

Indicator	No.	Interview Results	Score
Information Management	1	The e-Health management system has been optimized, and the existed module supports its use in the management of patients	5
	2	Standard e-Health management is accomplished, and the results are reported for the improvement of the program, but the exact form of evaluation is still blurred	3
Clinical and Administrative Staff	1	The field executors are specially involved in IT and e-Health, but not in the aspect of decision making, no vendor as well	1
	2	Officer placement for e-Health already exists, but no sense of future planning whether there will be a development in its capacity or not	3
	3	There are staff specifically dedicated to e-Health, but not involved in decision making	1
Training	1	Planning for training on e-Health is provided to all parties involved, including doctors	5
	2	Training on IT management for Project Managers and IT staff has not been described, this includes unidentified training needs	1
Workflow Process	1	The workflow includes staff and patients. However, in majority, e-Health is yet evaluated independently, only general issues such as service satisfaction which its results are not shown	3
	2	Policies, procedures, protocols are important to be analyzed and developed, including information on access rights, medical records, and reports	5
Accountability	1	The roles and responsibilities of officers are clear and specifically assigned to manage IT, not negotiable	3
Financing and Budgeting	1	E-Health financing and budgeting are considered as operating costs rather than investment costs	1
	2	The maintenance cost of e-Health is given gradually, specially allocated, per year	5
Patient Involvement	1	Patients are already participated in the using of e-Health and take it for the planning process	5
	2	Correction on the policies and procedures for patients have been analyzed for program improvement, but the documentation is inaccessible	3
	3	e-Health simplifies the process of referrals, prescribing drugs	5
IT Management and Support	1	IT management has experience in integrating systems, data conversion, managing expert resources according to their skills	5
	2	The assignment of IT staff for e-Health, maintenance, and usage has been documented in Staff Planning and entered the planning process	5
	3	IT staff has no authority in making decisions on the infrastructure requirements	1
Infrastructure	1	Requires an assessment on the hardwares and other requirements used for the administration of e-Health. It has been accomplished, but yet documented in the planning process	3

2	Planning for infrastructure engineering uses a large server, upgradeable according to the standards, easy to maintain, and carried out according to the standards, for each user		5
Total			**65**

Table 2 above shows that the assessment of organizational capacity reaches a score of 68 from the range of 0-100 and the sub range of 67-100. This score range means the capacity or ability of the organization in managing and operating e-Health is strong.

Table 3. E-Health conditions for assessing the Readiness of Electronic Health Record (EHR)

Description	Score	Range
Organizational Alignment for e-Health	31	31 – 45
Organizational Capacity for e-Health	68	67 – 100
Total Score	**99**	**98 – 145**

Puskesmas and the City Health Office of Surabaya already hold a good value regarding e-Health, and this will be developed into an EHR as shown in Table 3. Both health organizations also have a sufficiently strong organizational capacity to face the challenges of EHR development.

DISCUSSION

E-Health has the aim of making health access easier to the communities. Furthermore, it helps health workers to coordinate easily regarding services, thus an accurate data can be obtained. This is in accordance with the Decree of the Minister of Health No. 192 / MENKES / SK / VI / 2012 which states that e-Health is the using of Information and Communication Technology (TIK) in the health sector, especially to improve health services to the public[7].

Apart from the organizational alignment, The EHR Assessment and Readiness Starter Assessment instrument by Doctor's Office Quality - Information Technology (DOQ-IT) also gives concern on the capacity of the organization[6]. From the interview results, the implementation of e-Health is already on its maximum value, with an average of 5. While the minimum score (score 1) stands for the not-yet-implicitly-implied IT development by the vendors. Vendors in this case are the IT experts used as consultants in IT development. Another thing emerged from the indicator of organizational alignment is the non-involvement of the specialized IT staff in the decision-making process in terms of training, development, and infrastructure needs. A low assessment is also found in term of financing, which e-Health financing is still named an operational cost, not an investment cost for the organization.

The results of this research are obtained through interviews containing indicators such us organizational alignment for e-Health, organizational capacity for e-Health, and e-Health conditions to assess Electronic Health Record (EHR) readiness. The first research result is presented in Table 1. It shows the organizational alignment indicator which scores 31, from the range 0-45 and the sub-range 31-45. This score range means that the organization, in this case the Surabaya City Health Office, is considered good in embedding the culture of IT importance and its use for community services. The Surabaya City Health Office also holds a good leadership, thus fostering a working atmosphere for a good IT development. Leadership

policies have a major influence on the successful implementation of EHR [5]. The leadership support affects the development of EHR, since leaders are the highest ranks in the decision making[8].

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The implementation of e-Health at Puskesmas in Surabaya is not evenly distributed through the city yet. This is proven by not all Puskesmas feel the ease of implementing e-Health[9]. This research also found a similar case. Community participation in the using of e-Health is lacking as well. Of the five Puskesmas selected as respondents, the average use of e-Health to facilitate the queuing process was still 66%. In their expected that the government will let the community to participate more in the selection of their needs to bring health access closer to them, therefore can be used optimally. Table 2 above shows that the assessment of organizational capacity reaches a score of 68 from the range of 0-100 and the sub range of 67-100. This score range means the capacity or ability of the organization in managing and operating e-Health is strong. The field executors of e-Health are the officers at the health centers/ Puskesmas. The lowest score is on the lack of communication between Puskesmas and the central management (Surabaya City Health Office), that makes Puskesmas seems only carries out tasks from the upper, there is no involvement in the decision making. The development of EHR is taken not only from the created system, but also through the participation of all teams, especially in its design and implementation planning process which determines the success of the EHR[8].

Puskesmas and the City Health Office of Surabaya already hold a good value regarding e-Health, and this will be developed into an EHR as shown in Table 3. Both health organizations also have a sufficiently strong organizational capacity to face the challenges of EHR development. Therefore, this research uses instruments that are considered to be effective to see the readiness of a health organization (health service facilities) in receiving the EHR program[6,10,11]. This research realizes facts that an assessment towards infrastructure is performed, and its fulfillment is adjusted to the existing standards. However, the assessment process involves no user in the Puskesmas. Assessment on the need of infrastructure is highly important. Not only to the top management level, but also according to the needs in the field. The participation of the low management as the technical/ field executors is greatly necessary, as by this way, both organizational planning program and implementation could find its match[12]. Communication among co-workers is also substantial that will let the organizational goals to be achieved.

A research stated that the level of accuracy of a diagnosis will be more accurate by using EHR[13]. Based on the interview results with PIH staff, the EHR that will be developed in Surabaya is functioned as a link service data in the form of patient medical resumes between first-tier health facilities and hospitals. The expectation is that when a referral process occurs, the hospital where the patient will be referred to, already has the patient's medical resume.

Thus, treatment for patients will be faster and more effective. Therefore, it will be minimizing the repetition of supporting examinations conducted previously[14,15].

The running e-Health program in the City of Surabaya, as one great responsibility of the Surabaya City Health Office, holds a good assessment for its implementation. Thus, it can be developed into a form of Electronic Health Record (EHR). It is expected that the implementation of health services will be more effective and comprehensive. It takes the readiness of the organizational work cultures in designing the Electronic Health Record (EHR). The Involvement of the whole team is necessary, by increasing an effective communication as one good step into the area of change.

CONCLUSIONS

Surabaya City Health Office is ready to implement the Electronic Health Record (EHR). The involvement of all components becomes the key to success towards a more innovative change in Electronic Health Record (EHR).

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