Utilization of Data and Applications to Increase The Services Quality of Hospital Industry Accreditation in Indonesia

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Abstract: In recent years, information technology has become a part of the power to engage in business activities. However, no studies have tested the effects of the adoption of information technology on the performance of surveyors in performing their duties at the Indonesian Commission for Accreditation of Hospitals (KARS). The purpose of research is to test empirically the external factors that influence the adoption of applications for increased surveyors' works performance as an assessor of hospitals in Indonesia. External factors studied were: (1) the support of top management, (2) self-efficacy, (3) the quality of the system, and (4) training. Technology Acceptance Model (TAM) is the best way to evaluate the factors that influence the decision of the assessor and the hospital professionals on the acceptance of a system. Through the distribution of questionnaires were processed using SmartPLS, proving that the four external factors studied had a significant influence on the acceptance of information technology. Based on observations also prove that through the use of Information System of Indonesian Commission for Accreditation of Hospitals or SIKARS application, assessor performance is more effective and efficient. So that, through the data and information provided on the application can support all stakeholders in decision-making. SIKARS as national accreditation database can be used as a reference for service quality improvement in Indonesian hospitals.

Index Terms: Hospitals accreditation, Technology Acceptance Model, Information System of Indonesian Commission for Accreditation of Hospitals

I. INTRODUCTION

The sophistication of information technology as we see and feel today, it has brought significant impact on human survival. By using information technology, it helps someone in working with information and doing work-related to information processing (Haag & Keen, 1996). The capabilities of information technology are not just limited to computer technology used to process and store information, but also include communications technology for data transmission (Martin & Walker, 1999).

Not all information technology used can improve the performance of the company and not a few that fail (Berg, 2011) because it does not fit with the business process run. A Standish Group survey conducted in 2015 concluded that only 29% of information technology projects are successful and meet user needs (Hastie & Wojewoda, 2015). Therefore, it is important to always evaluate the use of the application to ensure the suitability of the expectations of the management and whether the system has good data and information quality, and to evaluate the implementation of training programs that can improve the level of self-efficacy of users (Kong, Chai, Tan, Hasbee, & Ting, 2014).

The Indonesian Commission for Hospital Accreditation (KARS - Komisi Akreditasi Rumah Sakit) is an independent institution that performs hospital accreditation in Indonesia. One of the tasks of KARS is to assess the quality of service in hospitals in Indonesia, by assigning assessors to report on evaluation results and recommendations. The task of KARS is to assess the service quality of hospitals in Indonesia, by assigning assessors to produce evaluation reports and recommendations. Today, the number of hospitals in Indonesia is more than 2700 units, spread across cities and villages. During the 19 years since the establishment of in 1995, the organization has difficulty reaching targets and making decisions. Problems encountered are: (1) delay in conducting surveys, (2) scheduling of conflicting assessors, (3) manually reporting results, (4) difficulty in monitoring results and graduation status. This problem has resulted in a graduation status that takes more than six months, costing enormously with results that are not in accordance with the target.

Considering the complex business processes of accreditation activities and various obstacles that arise, the management of KARS plans to apply the use of information technology; its usage began in 2014. Then, KARS management develops strategies in the utilization of SIKARS application, which is to give full support for application implementation, educate assessors through training in system usage, recruit assessors who can adapt to technology through competency tests, and ensure the data and information generated are appropriate to the business process.

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The successful implementation of information systems technology at KARS has become a hot topic for assessors, hospitals, and government since it is realized that the role of technology is enormous in the continuity of KARS business process and is expected to be the best practice to be applied in other accreditation industries. Therefore, it is necessary to evaluate what factors influence the successful implementation of the system, especially on top management support (Chen & Hsiao, 2012), self-efficacy (Lopez & Manson, 1997), quality systems (DeLone & McLean, 1992) and training (Bechina & Ndlela, 2007).

To explain the external factors that affect the intentions of user behavior and become the determinant of the use of technology in this study is the Technology Acceptance Model (TAM). This model considers two individual beliefs that perceived usefulness and perceived ease of use are important determinants of information technology usage behavior (Abdullah, 2015). TAM's primary purpose according to Davis (1989) is to provide a basis for tracking the influence of individual behavioral aspects of perceptions, attitudes, and interests in system usage.

II. LITERATUR REVIEW

A. Review Stage

Currently, the information system is an important element in most areas of business, whether it is health, business, education, research or other fields. Increasing the number of daily activities requires the support of information systems. The success or failure of the business depends on the services offered, productivity improvements, time efficiency, business goals to be achieved, user needs and expectations (O'Brien, 2001).

Several factors influence the attitude of the use of information technology. Some of these factors are perceived usefulness and perceived ease of use. Perceived usefulness is a belief that the individual believes about the usefulness to be perceived will affect the individual's interest in using or not using a system. Perceived usefulness is defined as a measure where the use of technology is believed to bring benefits to the person using it (Davis, 1989). The usefulness of a system will be closely related to the utility of the system in assisting the tasks of the system users. Usability perception is subjective probability using technology will improve the way users can complete the assigned task (Jahangir & Begum, 2008).

The perception of ease of use (Davis, 1989) is a level where one believes that computers can be easily understood (Branco, 2015). The intentions of use and interaction between users with the system can also indicate ease of use (Alharbi, 2014). The more frequently used systems show that the system is better known, easier to operate and easier to use by its users (Al-Mamary, 2015).

Ease of use of applications will reduce the effort (both time and effort) of a person to learn the system (Mohamed, 2014) and indicate that people who use information technology work more easily than people who work manually (Boakye, 2014). Information technology users believe that the indicators of ease of use of information technology include; (1) the computer is very easy to learn, (2) the computer does

easily what the user wants (3) the user's skill increases by using the computer (4) the computer is very easy to operate (Davis, 1989).

III. MATERIAL AND METHODS

In this research, the method used is the descriptive survey and explanatory survey method. The unit of analysis is KARS, and the observation unit is the surveyors who have received survey duties more than five times.

The data were analyzed using Partial Least Square (PLS), which is a variance based Structural Equation Modeling (SEM) to analyze the relationship between one variable based on the assumption that the relationship between the specified variable refers to the obvious knowledge base (theory). Each variable is assumed to represent a theoretical concept represented as a latent variable (Lowry & Gaskin, 2014).

Indicator test is done reflectively, that is doing validity test with loading factor value > 0.7, and reliability test with composite value > 0.6 and Average Variance Extracted (AVE)> 0.5.

Based on the theory of TAM Framework that introduced and developed by Davis, the following hypotheses are proposed. The tenth hypotheses are expected to influence the acceptance of technology for assessors and hospital professionals.

H1: Top Management Support affects the perceived usefulness

H2: Top Management Support affects the perceived ease of use

H3: Self Efficacy affects the perceived usefulness

H4: Self Efficacy affects the perceived ease of use

H5: System Quality affects the perceived usefulness

H6: System Quality affects the perceived ease of use

H7: Training affects the perceived usefulness

H8: Training affects the perceived ease of use

H9: Perceived usefulness affects the behavioral intentions

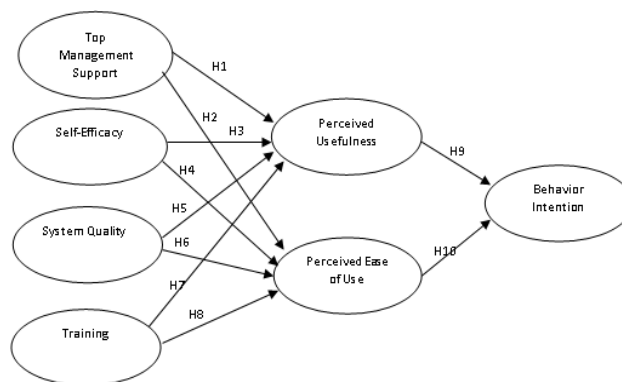H10: Perceived ease of use affects the behavioral intentions

Figure 1. Research Model

The model depicted in Figure 1 is further formulated regarding the following four mathematical regression equations:

$$Y1 =$$

$\beta 10+\beta 11 X 1+\beta 12 X 2+\beta 13 X 3+\beta 14 X 4+\varepsilon 1$…….. (1)

$Y 2 = \beta 20+\beta 21 X 1+\beta 22 X 2+\beta 23 X 3+\beta 24 X 4+\varepsilon 2$…..… (2)

$Y 3 = \beta 30+\beta 31 Y 1+\beta 32 Y$ ………….. …….. (3)

Where, Y1, Y2, Y3 are the three perspectives of the Technology Acceptance Model, i.e.

Y1 = Perceived usefulness,

Y2 = Perceived ease of use,

Y3 = Behavior intention.

Independent variables X1, X2, X3, and X4 are the four aspects of external factor, i.e.

X1 = top management support,

X2 = self-efficacy,

X3 = system quality,

X4 = training.

Parameters βijs are the coefficient of the regressions corresponding to equation i and independent variable j, to be estimated and εi are the error term corresponding to equation i.

First hypothesis:	impact of X1 on Y1 is equivalent to testing H0 : β11 = 0 and H1 : β11 ≠ 0
Second hypothesis:	impact of X1 on Y2 is equivalent to testing H0 : β12 = 0 and H1 : β12 ≠ 0
Third hypothesis:	impact of X2 on Y1 is equivalent to testing H0 : β21 = 0 and H1 : β21 ≠ 0
Fourth hypothesis:	impact of X2 on Y2 is equivalent to testing H0 : β22 = 0 and H1 : β22 ≠ 0
Fifth hypothesis:	impact of X3 on Y1 is equivalent to testing H0 : β31 = 0 and H1 : β31 ≠ 0
Sixth hypothesis:	impact of X3 on Y2 is equivalent to testing H0 : β32 = 0 and H1 : β32 ≠ 0
Seventh hypothesis:	impact of X4 on Y1 is equivalent to testing H0 : β41 = 0 and H1 : β41 ≠ 0
Eighth hypothesis:	impact of X4 on Y1 is equivalent to testing H0 : β42 = 0 and H1 : β42 ≠ 0
Ninth hypothesis:	impact of X1 on Y1 is equivalent to testing H0 : β51 = 0 and H1 : β51 ≠ 0
Tenth hypothesis:	impact of X1 on Y1 is equivalent to testing H0 : β51 = 0 and H1 : β51 ≠ 0

The hypothesis is accepted if the value of the T-test > 1.96.

IV. RESULT AND DISCUSSION

Hospital accreditation is official recognition from the government to hospitals that meet health service standards and must be performed by all hospitals in Indonesia. Through regulation no. 44 of 2009 which states that every hospital is required to improve the quality and maintain the standard of hospital services. Thus, quality improvement and standardized services must be provided by all hospitals in Indonesia.

To assess the quality of service at the hospital, KARS will assign assessors. Accreditation is needed by every hospital as a real hospital commitment to improve service oriented to quality and patient safety and provide a guarantee, satisfaction, and protection to patient/family of the patient that service given in accordance with service standard. To know the opinions of the assessors regarding the acceptance of information technology, the questionnaires were distributed to 112 assessors, and only 98 returned questionnaires. Once validated, only 88 completed the data, while 24 respondent questionnaires were not used because the questionnaires were filled partially. Then, 93 indicators tested, only 68 indicators had a loading factor >0.7 and were used to test composite reliability. From the composite reliability test results obtained that all factors have a value >0.6, so it is concluded reliable.

Table 1. Test Results Based on the Model Path

	Hypothesis	T Statistics >1.96	Conclusion
H1	Top management support -> Perceived usefulness	0.937	Reject
H2	Top management support -> Perceived ease of use	2.268	Accept
H3	Self-efficacy -> Perceived usefulness	1.397	Accept
H4	Self-efficacy -> Perceived ease of use	3.313	Accept
H5	System quality -> Perceived usefulness	2.924	Accept
H6	System quality -> Perceived ease of use	4.577	Accept
H7	Training -> Perceived usefulness	2.966	Accept
H8	Training -> Perceived ease of use	3.136	Accept
H9	Perceived usefulness -> Behavioral intention	1.979	Accept
H10	Perceived ease of use -> Behavioral intention	3.019	Accept

Referring to the indicators used, it is known that the acceptance of information technology for assessors will be easier if the system has four main characteristics; they are (1) data quality, (2) structured, (3) integrated and (4) have accessibility.

The first implication for KARS management is to focus on system development. KARS management needs to align KARS vision and mission through target planning to be achieved in short and long-term. Provision of budgets for system development, sufficient infrastructure budgets will enable rapid application development, increase accessibility to systems to serve data requests from all the more interested parties.

Changes in policy and business processes will impact on built applications. The most perceived impact is an understanding of the business process and its mapping of the existing system and the possibility of change. Therefore, KARS management needs to support the improvement of developer staff skills to be able to compensate for policy changes, such as cost and time.

In terms of system development, it is also necessary to plan how to integrate data and applications (Yeoh & Wee, 2017) with data and applications managed by the Ministry of Health and Hospitals. To understand these needs, KARS management plays a role to initiate the needs of each related department, as well as the establishment of rules in terms of data access and applications.

The second implication is the socialization of the use of the application to the user. Provision of training needs to be improved through:

Conduct regular delivery of training materials to assessors in order to understand changes in appearance, policy, sequence of processes, and the addition of other modules.

Provision of training materials that are packaged in a form that is easily understood and accessible using e-learning applications. Packaging the material can be made video tutorials or user manuals that are easy to understand.

To minimize the cost and time, the provision of training can be done through webinar or web conference utilization.

The third implication is monitoring and evaluation of assessor performance through utilization of reporting and data system, perspective strategy and change management. Through the reporting system provided, KARS management can assess the effectiveness and efficiency of application usage, suitability, convenience and constraints during system use. Increasing the amount of data and will continue to grow, will increase the ability and capacity of KARS management in creating a perspective strategy that affects the improvement of accreditation services, knowledge enrichment (Gea & Jesica, 2014).

The changes to rules and regulations established by the government will have an impact on hospital accreditation services. The development of new technologies will also bring a great influence on user systems and behavior. KARS management plays a role to reduce the risks that may arise and have a major impact on already built applications.

Monitoring of data utilization is essential because the data is processed into information used to support decision-making for KARS management, government, and hospitals. This research explains that users will be facilitated in monitoring and enhancing performance through the provision of dashboard systems and which can be processed using data mining and business intelligence. The data maintenance system needs to be a concern of KARS management, to anticipate possibilities such as data loss, misuse of data and information, authorization of system usage and correctness of data stored in the database.

In anticipation of a surge in data access, it is necessary to provide information technology infrastructures such as adequate internet connection, server capacity, clouds computing utilization, and other technologies that support accessibility to data and hospital accreditation information. Also, KARS management needs to establish rules and standards of data-utilization procedures that can ensure the confidentiality and comfort of the user over the data available and stored on the system.

V. CONCLUSION

To meet the data needs nationally, the data must be managed intact, sustainable and integrated. Requires cooperation with health ministries and hospital associations to enrich the repository of data and promotion for all hospitals. Implementation of the system will be successful if the system is easy to use. With top management support regarding infrastructure provision, a commitment to produce a useful system, and have a quality system; users will be confident that

they can operate applications easily. An effective approach has been proven that through training activities can enhance individual skills. If the application can provide convenience for users, it will create a sense of comfort for users to collect and process data, make it easier for management to get a more rapid and accurate information. For older assessors, it is important to be provided with the ease of use of applications, as they have limitations in learning new technologies. For business continuity in KARS, it is important to evaluate the utilization of data and applications, since KARS activities have complexity. Due to the unequal availability of infrastructure in every hospital in Indonesia, application developers need to pay attention to the convenience of using the system, whether connected to the internet or without an internet connection.

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Sutoto is the Executive Chair (KARS) of the Indonesian Hospital Accreditation Committee. Dr. dr. Sutoto also served as the Board Member of ASQua (Asia Society for Quality in Health Care), Regional Advisory Council from JCI (Joint Commission International) since 2013, and as the Board of Trustees of the MKEK IDI Center. Dr. Sutoto once served as Chair of the Indonesian Hospital Association for the period 2009-2012 and 2012 - 2015. In addition, he also served as Managing Director of RSUP Fatmawati Jakarta, Director of the Dharmais Cancer Hospital National Cancer Center, and Acting Director General of Medical Services of the Republic of Indonesia Ministry of Health 2010