The Hospital Application of Information System Service's Quality Adoption and User Information Satisfaction

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Abstract: Information is important resource in a health care organization. The quality of information will affectto the services being rendered. This study applies Myerscough study which combines User Information Satisfaction and Service Quality (SERVQUAL) instruments to measure the information system service qualityand to investigate the correlation between information system service quality and user's satisfaction. The results of this study report the model marginally fit with the previous studies.The only empathy variable affects the information system service quality through SERVQUAL variable. However, the information system user's satisfaction has been proved to be influenced by the information system service quality. This study also recommends further research into better instruments to assess information system service quality.

Key words: Information system, user information satisfaction, service quality, service quality (SERVQUAL)

INTRODUCTION

To date the use of information system is becoming a trend in the hospital administration and service quality (SERVQUAL). Trend in hospital information system can be elaborated as computer communication network, telecommunication, monitoring, physiologic and computerized medical record systems (Rada, 2015). Decision maker's initial and continuous use of information technology has traditionally been viewed as a mindful and intentional behavior. However when a decision aid makes mostly correct recommendations, its users may become complacent (Yetgin *et al.* (2015). Service quality is not the magniloquence of the today's business enterprise but also occupies a towering position in every business. Without providing accurate level of satisfaction to customer with good levels of service quality no business can survive; they are key points to the organization nowadays. Better service quality improves the relationship between customers and the organization and this is a two-way flow of value (Ojo, 2010). The paradigm developed at this time regarding company's strategy is not only on how to beat competitors but also how to create customer satisfaction. Creating customer satisfaction will encourage them to use our products/service again. In general, every company devotes to one concept of marketing philosophy, namely the philosophy or assumption believed by a company to be the basis of every activity in satisfying the needs and desires of customers (Jiang *et al.*, 2002; Peng and Wang, 2006).

Health issue is a crucial problem in human life because every human being must have health problems throughout his/her life. Similarly, hospitals must always strive to meet the needs and desires of patients and their families. Health system involves many parties, such as institution of health providers, the government as a regulator and the public as users of health services. Recently, a wide range of modern health care institutions has been recognized, such as hospitals, health centers, private practice physicians and others (Watson *et al.*, 1998; Bakar *et al.*, 2008; Ahmadi *et al.*, 2015).

Information is one of the resources that must be managed properly in a health institution. In a patient care, the information is to be obtained precisely, accurately and comprehensively. Errors or delays in obtaining information can sometimes affect patient's quality of life (Rose *et al.*, 2004; Aggelidis and Chatzoglov, 2012). In order to improve the service, we need an integrated information system and effective helpsof hospital operation. The information of patient's medical record should be organized to identify patients quickly where and how theyare treated and what medical problems that may arise in the future (Yesilada and Direktor, 2010; Grove *et al.*, 2010; Punnakitikashem *et al.*, 2012; Chakravarty, 2011).

There have been many studies conducted to measure the quality of service and user satisfaction of an information system. The instruments for measurement have also been widely studied. Ives *et al.* (1983) conducted a research to measure user satisfaction of an information system which is called UIS (User Information

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Satisfaction). Baroudi conducted exploratory factor analysis to the variables that affect the service quality of an information system. Parasuraman *et al.* (1988) conducted a research on the quality of service in the field of marketing, called SERVQUAL. Some researchers in management information system, for instance, Pitt *et al.* 1995, tried to conduct SERVQUAL applied research to measure the service quality of an information system. Their studies found that SERVQUAL was eligible to be used as an instrument to measure the quality of information system service. Kettinger and Lee (1997) had also tried to use SERVQUAL as an instrument to measure the service quality of an information system. In their research, the tangible dimension was the one which was not appropriate to apply but the other four dimensions were scientifically proven feasible to use. Nonetheless, SERVQUAL can be combined with UIS as the instrument to measure the service quality of an information system.

This study tried to find the effect of service quality on user satisfaction. This study used the instrument studied by Myerscough (2002) by using a combination of UIS (User Information Satisfaction) and SERVQUAL instruments as the instruments to measure service quality. Meanwhile, the questions on the Global Quality Assessment of UIS (UIS-4) were used as the instruments to measure user satisfaction. The dependent variable was the overall quality which was measured by using the indicators of UIS and SERVQUAL while the independent variable was user satisfaction. On the overall quality variables as the unobserved variables, the indicators of UIS were grouped into three dimensions of Myerscough, namely: knowledge and involvement, quality of information product and attitude toward EDP staff and service. On the other hand, the indicators to SERVQUAL only used two dimensions: reliability and empathy.

Literature review

Information system management: Information management can be defined as an activity to obtain information, using it as effective as possible and throwing it away at the right time. Brien (1999) in his managements information systems divides the area of information system into five major parts, i.e., management of information system, development of information system, application of information systems, technology of information system and foundation concepts of information system. Therefore, information system is a combination of organizing human, hardware, software, communication network and data sources in which information is collected, transformed and spread in an organization. Regarding a computer-based information

system, two kinds of literacy are required, namely: computer literacy and information literacy (Obrien, 1999). Information literacy is different for each domain. Information literacy in the field of construction Companyis different from that in medical field. It is necessary for each party to have expertise in developing information system. Lumbanbatu and Aryanto (2015) put emphasis that management information system is useful not only in manufacturing sectors but also in service sectors.

Ratnaningtyas and Surendro, (2013) contended that hospital delivered a number of health services and appropriate health amenities for people. One of the health-cares is patient. Because of the daily high demand of patient healthcare in a day, some hospitals apparently too subjugatedto handle the information flow. Mostly, hospital already utilized Hospital Information System (HIS) for dealing with information flow. However, some did not really bother concerning the quality of information. Information quality is a key element to settle the level of healthcare in hospital. To improve information quality, the quality of healthcare should be enhanced to support patient's satisfaction. The researchers used six sigma method.

Kivinen and Lammintakanen (2013) described perspectives on information and information use among users of a management information system in specialized health care organization. The Management Information System (MIS) is defined as the information system that provides management with information about financial and operational aspects of hospital management. The researchers found out information availability and information use. The results showed that the main category "usage of management information system" consisted of four sub-categories: system quality, information quality, use and user satisfaction and development of information culture. This study concluded that there were many organizational and cultural aspects which influenced the use of MIS in addition to factors concerning system usability and users. The connection between information culture and information use was recognized and the managers proposed numerous ways to increase the use of information in management work. The implementation and use of management information system did not seem to be planned as an essential tool in strategic information management in the health care organization studied.

Ahmadi *et al.* (2015) revealed their study mainly integrated the mature Technology Organization Environment (TOE) framework and recently developed Human-Organization-Technology (HOT) fit model to identify factors that affect the hospital decision in

adopting Hospital Information System (HIS). A hybrid Multi-Criteria-Decision-Making (MCDM) model was used to address the dependency relationships of factors withthe aid of Analytic Network Processes (ANP) and Decision Making Trial and Evaluation Laboratory (DEMATEL) approaches. The initial model of the study was designed by considering four main dimensions with 13 variables as organizational innovation adoption factors with respect to HIS. By using DEMATEL, the interdependencies strength among the dimensions and variables were tested. The ANP method was then adopted in order to determine the relative importance of the adoption factors and was used to identify how these factors were weighted and prioritized by the public hospital professionals, who were wholly familiar with the HIS and had years of experience in decision making in hospital's Information System (IS) department. The results of this study indicate that from the experts' viewpoint "Perceived Technical Competence" is the most important factor in the Human dimension. In the technology dimension, the experts agree that the "Relative Advantage" is more important in relation to the other factors. In the Organization dimension, "Hospital Size" is considered more important rather than others. And in the Environment dimension, according to the expert judgment, "Government Policy" is the most important factor. The results of ANP survey from experts also reveal that the experts in the HIS field believed that these factors should not be overlooked by managers of hospitals and the adoption of HIS is more related to more consideration of these factors. In addition, from the results, it is found that the experts are more concerned about environment and technology for the adoption HIS. The findings of this study make a novel contribution in the context of healthcare industry that is to improve the decision process of innovation in adoption stage and to help enhance more the diffusion of IS in the hospital setting which by doing so can provide plenty of profits to the patient community and the hospitals.

User information satisfaction: Information system is expensive. The decision to install an information system is an option to determine whether the information system is necessary and thereafter this system should be functioning properly. UIS is stated as a description in which system users believe that the information systemis available to them to meet their information needs. This instrument was developed by Ives *et al.* (1983).

Ives *et al.* (1983) tried to examine the difference between the use of two and four items of questions in a single variable without reducing the validity based on the research results of Pearson. It was aimed to reduce the

number of indicator items in Pearson models reaching 39 items. The method used was exploratory factor analysis. From the research, it was found that the reliability and validity of data were not affected on the measurement using two items per scale. However, these instruments werestill considered too long. It is necessary for selecting these indicators which were really relevant without reducing the validity and reliability. Some less meaningful indicators were excluded from the indicators. As a result, there were 22 items of indicators retained. The results of this simplification was often referred to a UIS short form.

According to Montesdioca and Mascada (2015) Information security is a major concern of organizational management. Security solutions based on technical aspects alone are insufficient to protect corporate data. Successful information security depends on appropriate user behavior while using information systems. User satisfaction is widely used to measure the success of information systems. The objective of this research is to develop a model to measure user satisfaction with information security practices. An instrument was developed based on this model. A survey was conducted and 173 valid responses were obtained. Structural equation modeling was used for the data analysis. The results indicated that users understand the benefits of information security practices but the use of information systems with security controls is considered a complex matter which reduces information systems productivity. The measurement of the user satisfaction with information security practices is a starting point to diagnose the behavior of users in relation to information security, providing metrics to management evaluate the investment in information security training and awareness program

Aggelidis and Chatzoglou (2012) said that over the past decade, hospitals in Greece have made significant investments in adopting and implementing new Hospital Information Systems (HISs). Whether these investments will prove beneficial for these organizations depends on the support that will be provided to ensure the effective use of the information systems implemented and also on the satisfaction of its users which is one of the most important determinants of the success of these systems. Measuring End-User computing satisfaction has a long history within the IS discipline. A number of attempts have been made to evaluate the overall post hoc impact of HIS, focusing on the end-users and more specifically on their satisfaction and the parameters that determine it. The purpose of this study is to build further upon the existing body of the relevant knowledge by testing past models and suggesting new conceptual perspectives on how

End-User Computing Satisfaction (EUCS) is formed among hospital information system users. All models are empirically tested using data from Hospital Information System (HIS) users (283). Correlation, explanatory and confirmation factor analysis was performed to test the reliability and validity of the measurement models. The structural equation modeling technique was also used to evaluate the causal models. The empirical results of the study provide support for the EUCS Model (incorporating new factors) and enhance the generalizability of the EUCS instrument and its robustness as a valid measure of computing satisfaction and a surrogate for system success in a variety of cultural and linguistic settings. Although, the psychometric properties of EUCS appear to be robust across studies and user groups, it should not be considered as the final chapter in the validation and refinement of these scales. Continuing efforts should be made to validate and extend the instrument.

IS SERVQUAL (information system service quality): As the service sector of the global economy grows, the study of services and innovation are becoming increasingly important. Service products distributed regionally, nationally and globally have become larger portions of company revenue streams; knowledge-intensive business services aimed at enhancing performance require reliable methods of measurement, assessment and improvement (Spohrer and Maglio, 2008). As a result, accurate and reliable instruments that assess service quality are of great interest to companies whose revenues come from service delivery. Perhaps the most popular and widely used service quality instrument is SERVQUAL (Parasuraman *et al.*, 1988, 1991).

Information system researchers often face the risk of incorrect effectiveness measurement of information systems as they often overlook the service quality of information system (Pitt *et al.*, 1995). Pitt suggested that the use of SERVQUAL as an instrument to measure the service quality of information system becausethe department of information system provides broader service in which previously they only served as the developer and the operation manager served as a service provider. The effectiveness of the information system is a multi-dimensional construct. Virtually, all tangible products have intangible attributes and all services have tangible values. In some cases, product is only a bridge to get services. For example, personal computer users do not only want a computer machine. They also expect the installation service, training in the use of software, technical support and others. Goods and services are not a matter which can be separated significantly. They are present in a tangibility spectrum, ranging from purely

product to services as a whole combined somewhere near the midpoint. Measurement is often focused on the end of the spectrum in terms of tangibility. Pitt *et al.* (1995) argued that service quality as a spectrum on the reverse side should be considered as an additional measurement of the success of information system.

There are two units which are possible to do the analysis of the service quality of information system: the Department of Information Technology and the Information System itself (Pitt *et al.*, 1995). When a user interacts with only one system, (e.g., sales clerk who serves customers over the phone), the user's impression on the service quality is limited to one such system. In this case, the unit of analysis is the information system itself. Meanwhile, when a user interacts with various systems, (e.g., personnel manager) that uses a human resource information system, a word processor, spreadsheet and others, the unit of analysis may be the system itself as well as the department of information systems. However, the separation of multi-user system is irrelevant. For example, when a user has trouble getting repair service, the concern is not addressed to the existing system, but to the service of the department of information system. Although, the quality of information and quality ofsystems are often associated with certain software products, this does not always mean service quality. Regardless a user interacts with one or many systems, the service quality can affect the use and satisfaction of users. The difference between the expected and received service is a gap. Parasuraman*et al.*,(1988) have operated a conceptual model of service quality through the measurement of gap as the measurement of marketing construct. The measurement uses two statements, in which one question measures expectations and one question measures perceptions.

The previous research done by Pitt *et al.* (1995), it shows that the measurements using SERVQUAL can be applied to the field of information system. Nevertheless, the tangible dimension has low reliability. As a further research, Kettinger and Lee *et al.* (1994) conducted a research on the Information Service Function. This research was followed by a cross-country psychometric research, namely the United States, the Netherlands, Hong Kong and South Korea. The instrument used wasbased on SERVQUAL that has been modified and referred to as ISF/SERVQUAL. The dimensions used were reliability, responsiveness, assurance and empathy. On the other hand, the tangible dimension was not used because of the weak convergence and internal inconsistencies. This is consistent with the findings of the research of Pitt *et al.* (1995). IS SERVQUAL dimensions are the same as the dimensions in the SERVQUAL with changes in the meaning of the dimension rather than the SERVQUAL dimension:

- Reliability is the ability to keep ISF services reliably and accurately
- Responsiveness is the willingness to help ISF customers and to provide prompt service
- Assurance is ISF employee's knowledge, reliability and politenessas well as trustworthy and confidence
- Empathy is caring and personal attention to ISF customers

The method used by Kettinger and Lee (1994) was confirmatory factor analysis. The survey results were processed using LISREL (MGAL) to see the magnitude and type of invariance between the results of respondents from different countries. This research shows that the feasibility of the ISF measurement standard is dependent upon the national relative magnitude effect. From these results, Kettinger and Lee (1997) suggested that ISF SERVQUAL measurements can be combined with other measurement methods, such as the UIS in order to obtain better ISF measurement instrument. They suggesteda combination using two instruments measuring the quality of UIS and ISF SERVQUAL into a single instrument to measure the service quality of information system.

Myerscough (2002) conducted a replication to the research of Lee and Kettinger by using a subset of the two instruments as suggested by Kettinger and Lee (1999). The respondents were taken from two companies of Fortune 500. The survey instrument consisted of several questions relating to the individual's perception of the quality of information systems. The components in the survey were the user's habits on information systems, the level of acceptance and confidence of respondents to the technology and the variation of some personal factors. It wasfound that the three traditional dimensions of UIS were strong predictors for measuring overall ISF user satisfaction, two dimensions of IS service quality and reliability and empathy.The study also proved that they were also significant predictors.

Handayani *et al.* (2015) revealed that Indonesia initially launched the Universal Health Coverage (UHC) program in early 2014 in an effort to ensure decent living conditions for all of its citizens through national health insurance. This program is mandated by the 1945 Constitution of the Republic of Indonesia Article 28 and 34 and is also aligned with the World Health Organization (WHO) program. However, as part of a program that provides health services, hospitals still have problems, such as the time-consuming administration process from registration to the payment process which results in patient dissatisfaction and subsequently, poor quality of hospital services. Therefore, the main purpose of this research is to analyze the dimensions that are required by the hospital to increase the quality of hospital services to meet the stakeholder's (i.e., hospital management, the Ministry of Health as a government policy maker, academicians and patients) needs and expectations. This research was carried out using a qualitative and quantitative study by conducting interviews and distributing questionnaires to the management group. This research shows that the main dimensions that are necessary to be implemented by the hospitals in order of priority are human resources, process, policy and infrastructure.

Purcarea *et al.* (2013) studied to explore the application of the original SERVQUAL scale in the context of public health care services in Romania. More specifically, we implemented the SERVQUAL scale in order to uncover whether it fits as the original version or adjustments should be done and to define the demographic profiles of health care consumers who use public services in Romania. We have selected our sample respondents from a list of a gynecological health care forum members, namely women from Bucharest who should have posted messages on the chosen forum no more than three months before the study was conducted and the messages should have comprised their experiences with certain physicians. The internal consistency, validity and reliability measured as the difference between perceptions and expectations known as the gap. Results indicated that the biggest gap score was registered by the tangibles dimension followed by responsiveness dimension and reliability dimension.

According to Charles and Kumar (2014) in an intensively competitive market, measuring the service quality of any entity becomes vital to self-benchmark and eventually, to improve the service quality beyond the predefined standards by the regulatory authorities. However, competing with similar entity in the market requires extra care towards service quality in order to outperform the peers and hence, to drive the market. This study attempts to measure the service quality of Malaysian banks through Data Envelopment Analysis (DEA) based on 688 customer's survey data in line with predefined service quality dimensions. It has been observed that the primary data involves stochastic noise; hence, such noise has been addressed through stochastic DEA to measure the relative efficiency in terms of the SERVQUAL gap. The proposed model not only reports the service quality efficiency but also handles the peer analysis and potential improvements in a satisfying approach.

Angeren *et al.* (2014) found out that the hospital barriers to effectively implement the information system

technology can be elaborated as organizational barrier such as adhoc IT management, financial capital, human resources and support from management, Technology barriers are described as availability of patient data, IT governance structure, legacy hardware. External barriers are elaborated as externalities and external collaborations. To cope with those barriers the hospitals should take into account on how to be capable in anticipating and solving the barriers.

MATERIALS AND METHODS

Hypothesis model: Based on previous literature study and research, the researcher developed the following conceptual framework in Fig. 1. Based on the above construct, it can be hypothesized as a temporary conclusion as follows:

- H_1: User's knowledge and involvement affect user'sinformation satisfaction positively and significantly
- H_2: The quality of information product affects user's information satisfaction positively and significantly
- H_3: The attitude toward EDP staff and service affects user's information satisfaction positively and significantly
- H_4: Reliability affects IS SERVQUAL positively and significantly
- H_5: Empathy affects IS SERVQUAL positively and significantly
- H_6:User's information satisfaction affects overall service quality of information system positively and significantly
- H_7: IS SERVQUAL affectsoverallservice quality of information system positively and significantly

- H_8: The overall service quality of information system affects user's satisfaction of information system positively and significantly

Sample and data collection: The population in this research was the employees using computers for everyday work atthe several public as well as private hospitals in Semarang Indonesia. In order to represent the entire population, the sample size should be sufficient. In calculating the number of samples, the formula Sekaran (2006) was used by incorporating the standard error of estimate, standard deviation of the mean of samples, the number of elements in population and estimated sample size in the formula. The required samples in this study were 260 respondents. They were hospital administrators who administered the hospital administration by using of information system technology. Questionnaire distribution was undertaken on June 2015 to December 2015.

Measurement: A self-administered questionnaire was developed in association with vigorous literatures traced. The questionnaires focus on hospital information system service quality concept. Investigating the conceptual model, present study adopts questionnaire which contains of user information satisfaction (three items), Information system service quality (two items), overall quality and user satisfactions. A 5point rating scale was used to measure the items which anchored by strongly disagree" and "strongly agree". Why we used 5 point-scale, Dawes (2008) pointed out that 5-point scale it is simple for interviewer to read out the complete list of scale descriptors (1 equal to strongly disagree to 5 equal to strongly agree). The clarification is lengthier for
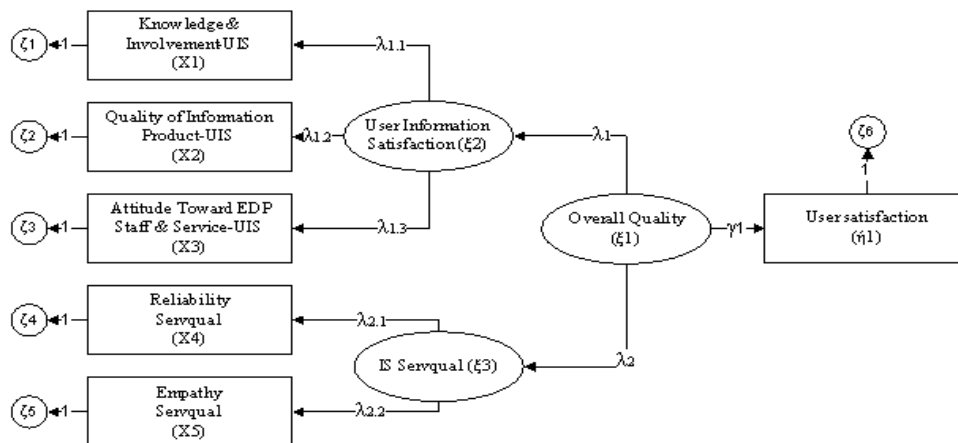

Fig. 1: Research construct

the 7-10 point scale. However, a 10-point scale places better reliance on the respondents using numerical response. In addition, the validity and reliability are improved by means of 7-10 point scale. The scale format might influence the mean score, variance, skewness and kurtosis.

RESULTS AND DISCUSSION

Hypothes test: Furthermore, the Table 1 shows the calculation results of the criteria of goodness of fit in the program of AMOS 7, confirmatory analysis and Structural Equation Modelingin this research were acceptable in accordance with the model fit (Table 2). On the basis of the model fit, the testing to the hypothesis proposed in this research could be conducted.

SEM analysis: Overall model feasibility test was conducted using the analysis of Structural Equation Model (SEM) which was also used to analyze the proposed hypothesis.The model testing result through SEM.

Analysis and testing data of eight research hypothesis described show that the five hypotheses can be accepted while the three hypotheses are rejected. The theoretical model was tested with the criteria of goodness of fit and get results that are not good. While testing data show good results. Conclusion the hypothesis can be seen in Table 3.

Having analyzed the research, there was a positive and significant association between service quality and user satisfaction of information systems. From these results, it is found that the success of an information system is not only by providing adequate hardware, software and networks. Users will not be satisfied by the availability of software, hardware and the most advanced network without getting adequate service quality. In this case, the role of information system personnel is vital in providing adequate service quality.

In terms of service quality, from the model, it can be seen overall service quality of information system is measured by the variables of UIS and IS SERVQUAL. From the analysis, it shows that in the sixth hypothesis,

Table1: Hypothesis testing

Hypothesis	Estimate	SE	CR	p-value	Label
ISSERVQUAL←Overall quality	0.842	0.111	7.569	***	par_4
UIS←Overall quality	1.000				
Kn and In-UIS←UIS	1.000				
QIP-UIS←UIS	0.925	0.099	9.354	***	par_1
AESS-UIS←UIS	0.485	0.076	6.344	***	par_2
Rel-SQ←IS SERVQUAL	1.000				
Emp-SQ←IS SERVQUAL	1.311	0.149	8.824	***	par_3
User satisfaction←Overall quality	1.492	0.161	9.289	***	par_19
UIS3←Kn and In-UIS	1.000				
UIS4←Kn and In-UIS	0.807	0.077	10.527	***	par_5
UIS5←Kn and In-UIS	0.682	0.067	10.164	***	par_6
UIS7←QIP-UIS	1.000				
UIS8←QIP-UIS	1.036	0.069	14.924	***	par_7
UIS9←QIP-UIS	0.951	0.074	12.877	***	par_8
UIS10←QIP-UIS	1.326	0.098	13.515	***	par_9
UIS6←AESS-UIS	1.000				
UIS11←AESS-UIS	0.502	0.105	4.790	***	par_10
SQ1←Rel-SQ	1.000				
SQ3←Rel-SQ	1.553	0.130	11.922	***	par_11
SQ4←Rel-SQ	1.540	0.130	11.866	***	par_12
SQ14←Emp-SQ	1.000				
SQ16←Emp-SQ	1.081	0.100	10.808	***	par_13
SQ17←Emp-SQ	1.096	0.105	10.469	***	par_14
SQ18←Emp-SQ	0.884	0.140	6.334	***	par_15
E1←User satisfaction	1.000				
E2←User satisfaction	1.050	0.084	12.465	***	par_16
E3←User satisfaction	1.021	0.054	18.839	***	par_17
E4←User satisfaction	1.029	0.084	12.197	***	par_18

Table 2: Goodness of fit index

Goodness of fit index	Cut-off value	Result of analysis	Modelevaluation
χ^2	p = 5% df = 98 $\chi^2 \leq$ 124.342	573.675	Marginal
Probabilitas	≥ 0.05	0.00000	Marginal
CMIN/DF	≤ 2.00	5.84500	Marginal
GFI	≥ 0.90	0.78100	Marginal
AGFI	≥ 0.90	0.69600	Marginal
TLI	≥ 0.95	0.76200	Marginal
CFI	≥ 0.95	0.80600	Marginal
RMSEA	≤ 0.08	0.14000	Marginal

Table 3: Hypothesis test results

Hypothesis	CR and p-value	Acceptance criteria	Results
H_1 = Knowledge and involvementdoes not affect; User Information Satisfaction (UIS) positevely		$CR \geq 1.96$	Rejected
H_2 = Quality product information affectsUser Information Satisfaction positively	$CR \leq 9.354$ $p<0.001$	$CR>1.96$ $p \leq 0.05$	Accepted
H_3 = Attitude toward EDP staffs and service affect User Information Satisfaction positively	$CR = 6.344$ $p<0.001$	$CR>1.96$ $p \leq 0.05$	Accepted
H_4 = Reliability doesnot affect IS SERVQUAL positively		$CR \geq 1.96$	Rejected
H_5 = Empahty affectsIS SERVQUAL positively	$CR = 8.824$ $p<0.001$	$CR>1.96$ $p \leq 0.05$	Accepted
H_6 = User Information Satisfactiondoes not affectoverall quality positevely		$CR \geq 1.96$	Rejected
H_7 = IS SERVQUAL affect overall quality positively	$CR = 7.569$ $p<0.001$	$CR>1.96$ $p \leq 0.05$	Accepted
H_8 = Overall quality affectuser satisfaction positively	$CR = 9.289$ $p<0.001$	$CR>1.96$ $p \leq 0.05$	Accepted

user information satisfaction does not have the effect onoverall service quality of information system. Meanwhile, the seventh hypothesis shows thatIS SERVQUAL has the effect onoverall service quality of information system positively and significantly. This shows that the factors within the variables of UIS (knowledge and involvement, information product quality and the attitude toward EDP staff and services) do not have the effect on overall service quality of information system. This is quite surprising because the research of Myerscough (2002) shows that this variable has positive and significant effect on overall service quality while the variable of IS SERVQUAL is proven to positively and significantly have the effect onoverall service quality of information system.

UIS variable was actually measured through the variables of knowledge and involvement, information product quality and the attitude toward EDP staff in providing services. Although, UIS variable is not significant and does not affect overall service quality, it should be noted that, of the three variables, only the variable of information product quality and attitude toward EDP staff in serving positively and significantly affect the variable of UIS. The variable of information product quality has amounted the figure of CR at 9.354 and the attitude toward EDP staff in providing services has CR value of 6.344. Each has p<0.001.

This Fig. 2 meets the acceptance criteria of CR>1.96 and p≤0.05 while the variables of knowledge and involvement were proven not to have the effect on the variable of UIS.

In addition to the variable of UIS, overall service quality is measured through a variable IS SERVQUAL. The variable of IS SERVQUAL consists of two measurement variables, namely reliability and empathy. The variable of IS SERVQUAL significantly and positively affectsoverall service quality of information system. This is evident from the value of CR≤7.569 and p<0.001. From the measurement results, it shows that only the variable of empathy positively and significantly affects the

variable of IS SERVQUAL. CR value is 8.824 and p ≤0.001. On the other hand, the variable of reliability was proven that it did not positively and significantly affect the variable of IS SERVQUAL. This makes empathy factor plays an important role in overall service quality of information system. In providing services, the personnel of information system is expected to provide more personalized and sufficient services toindividuals. This will greatly affect user satisfaction. Users can realize that an information system is not a machine that can work continuously without interruption and is able to satisfy all user's information needs. However, with the empathy to user's needs and can understand the importance of such information system in user's daily activities the attendants of information system can provide the best services and satisfy users of information system.

Empirically, this is consistent with the existing conditions in Semarang Hospital. The majority of the users of information systemis not a person who has a good knowledge of information system. In general, they use data entry information system. They do not know the system product beyond the system they use everyday. They also do not feel the need to be involved or have knowledge of information system. They generally do not really care about the quality of existing information. These factors that may cause UIS variables did not significantly affect the service quality of information system. The cultural factor which is not too demanding on Javanese community may because reliability becomes aninsignificant factor. They generally tolerate and consider as usualwhen there is a delay on the services. It is considered normal and something that can be tolerated. This is different with Western society which is more demanding in promptness. Meanwhile, empathy factor is an important matter in Javanese culture and this makes empathy to become a very important factor in service quality.

Concerning the difference in these research results from the previous ones, there has been a theory to explainthis phenomenon (Kettinger *et al.*, 1995, 1997, 1999
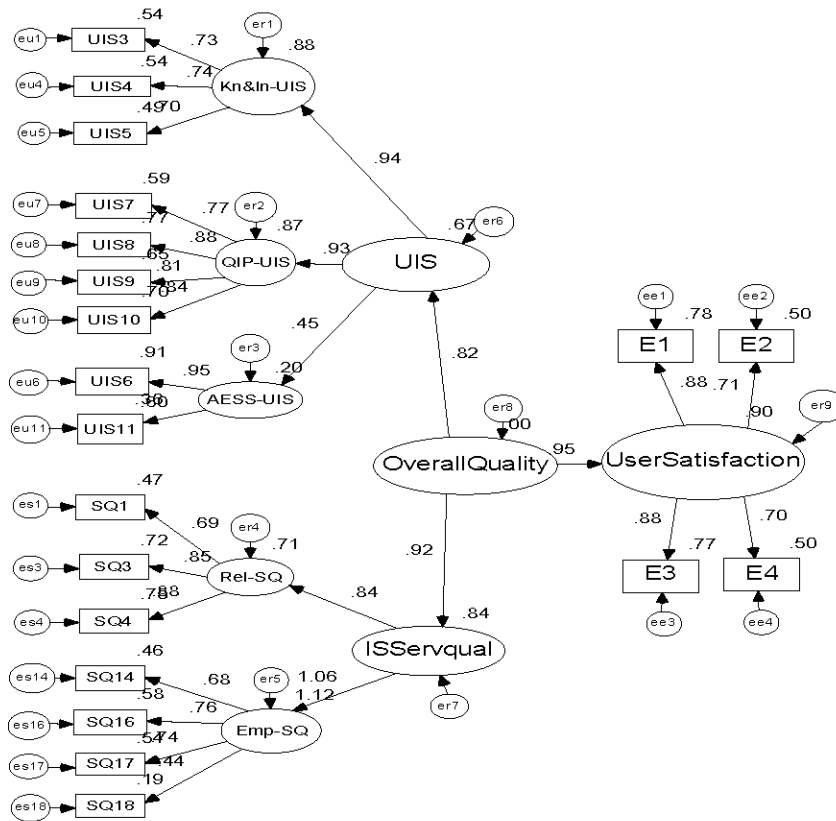
Fig. 2: The analysis result of Structural Equation Model (SEM)

Purcarea *et al.*, 2013; Charles and Kumar, 2014) conducted a research to prove that IS SERVQUAL is a valid instrument for measuring service quality of information system. They conducted the research either in four countries: the United States, the Netherlands, Korea and Hong Kong. The research in Hong Kong and Korea show that the examined model was not fit while in the Netherlands shows a marginal fit. They found that the valid and reliable design of research in the United States was not valid for the use in the entire country. There was one factor, called the "Asia Factor" which was indicated as a factor that distinguished with the "Western factor". The possible reasons are the existence of cultural differences, cultural maturity differences triggering the evolution of information system.

CONCLUSION

These research results support the previous research done by Kettinger and Lee (1997) that the dimension of empathy has an important role in Asia while the dimension of reliability is not or less affected. The

dimensions mentioned above also explain why the factors of knowledge and involvement are also less influential in this study. The confidence in Asia caused low desire to influence or control the services they received. These research results lead to a speculation that there are other factors that affect the service quality of information system which have not been covered in this research. These factors may be more specific and local in nature in accordance with the conditions in Indonesia. This leads to an opportunity for the next researchers to conduct research of exploratory factor analysis to these factors. Kettinger and Lee (1999) also suggested that the local version can be assessed for its development of measurement instruments to include the natural conditions of the perception of information system services abroad.

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