

# *IT Services Quality Measurement Using IT SERVQUAL at University X*

Tantri Febiara Putri<sup>1</sup>, Fida Nirmala Nugraha<sup>2</sup>, Devi Pratami<sup>3</sup>, Litasari Suwarsono<sup>4</sup>

<sup>1,2,3,4</sup>Industrial Engineering Faculty – Telkom University

tantrifp@gmail.com, Fida\_nugraha@yahoo.com, devipratami@telkomuniversity.ac.id, litasari@telkomuniversity.ac.id

Corresponding author: devipratami@telkomuniversity.ac.id

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**Abstract:** Information technology plays a major role to enhance service activities in organizations as well as in higher educational institutions / universities. A special unit (Sisfo) at University X is dedicated to handles daily technology-based services. Every year the performance of the unit is evaluated to increase customer satisfaction and yet the result is contradictory. Using balanced scorecard, the result showed that the unit's performance is in a good category, but when it comes to the satisfaction questionnaire the result said otherwise. This puzzling result due to not so appropriate tools of measurement for the unit' services.

This study conducted performance measurement using IT SERVQUAL to tap the perceived service and expected service of the Sisfo Unit', form the eyes of the students as the largest customers, on the 6 dimensions: tangibles, responsiveness, reliability, assurance, empathy and usability. Service dimensions that require immediate action are physical facilities such as hardware and software that are up to date, and processes related to academic activities such as failure to enter into a system, card recording errors, and students' presence list errors.

**Keywords**— IT SERVQUAL, performance measurement, satisfaction, services

## I. INTRODUCTION

Information system is a group of component that interrelated, gathered, process, stored and distributed information to support decision making and supervision in an organization [1]. It is also one of the most important elements in the organization, for having information system, organization assures the quality of information and makes decisions accordingly.

Information Technology (IT) is a software that designed to help human in handling information and related job activities that deals with information processing [2] so he customer can use the reliable information needed at fast pace and ease. Quality of services reflects how good the service level is provided by the service unit that met the expectation of the customers [3]. Put it differently, service quality is individual' perception on how the services are served and affected the customer satisfaction [3].

One of the universities in Bandung that include

information system in its services is University X. It has a special unit to handle the information management called SISFO Unit. Giving the important role of this unit, the performance measurement should reflect the actual activities that perceived to be important to its customers related to the services of this unit, which was not measured by the current performance measurement. Balanced scorecard measurement showed that SISFO Unit fall in a good category and yet the customer voices said differently. Students as the largest customer of this unit said that there were interferences in the connecting activities (40%), and the unit was not responsive enough to deal with the complaint (80%). It means that the current measurement did not yet tapped in the customers' need.

Mostly used measurement tools for services quality are SERVQUAL (Service Quality), KANO, IPA (Importance Performance Analysis), QFD (Quality Function Deployment), and CSI (Customer Satisfaction Index) [4]

This study aim is to close that gap by proposing a more suitable measurement tool for this unit that give hands on feedback. SERVQUAL that focus on IT services is the method chosen in this study. Results to increase services quality were based on average score of importance on expected and received services for each SERVQUAL dimensions. This method links the customer perceptions and services providers regarding services quality that serves as the bases of understanding, measuring and improving services quality. Originally SERVQUAL consist of 5 quality dimensions namely tangible, responsiveness, reliability, assurance, and empathy [5].

In this study used the IT SERVQUAL to measure perception on service quality from Kettinger & Lee [6] with some adjustment. Usability is an additional dimension on IT SERVQUAL that set apart from the original SERVQUAL measurement. [7]

IT SERVQUAL can identify the gaps of service quality on every dimension of services, customers' expectancy and satisfaction; identify which dimensions needed to be improved. On the other hand, it cannot directly set priority on which

dimensions that need improving [7]. Improvement based on the largest gap of services on the single dimension. The IT SERVQUAL measurement is needed to find clearer picture on the service activities delivered by the SISFO Unit from the eyes of the students.

## II. LITERATURE REVIEW

### A. IT SERVQUAL and the measurement of information technology service quality

IT SERVQUAL is an instrument that uses functional quality parameters on User Information Satisfaction (UIS): 1) user knowledge and involvement on system development and activities from the IT service unit, 2) attitude towards the staff unit and IT services [8]. Kettinger & Lee modified the SERVQUAL instrument to give more information and take into account the utilization of scores and different dimensions on the given IT services [6]. Modification on SERVQUAL dimension on IT service measurement was making 3 columns model of 16 questions.

Service dimension divided into two: technical skills and IT service attributes [9]. Kettinger & Lee's IT SERVQUAL consists of 22 items to evaluate customers' perception on expected as well as perceived service quality on IT services from the IT unit [8]. The modification was done due to the less detail and less specific on which dimensions that need to be improved [10]. IT quality services in the organization covers horizontal and vertical applications such as application upgrading, technical support, antivirus protection, data security, consultation, data integration, and staff training [10] suggest that every IT initiative should define specific services that they are offered: development, IT helpdesk, or consultation and open to voice of customers. This information should take into account if the services were dedicated to customers' satisfaction.

IT service quality can be portrayed into two generic functional services: technical (related to what was offered) and functional reference on how the services provided. These two dimensions are also relevance in determining the quality of services given by the organization [19]. IT service quality previously measure the basic services like sales, finance, and customer service that had been evolved to also measure internal customer of the organization [10]. This development showed that deem important to measure service quality form the internal customer point of view [7].

### B. IT SERVQUAL dimensions

There are 6 dimensions on IT SERVQUAL [10]:

1. Tangible: physical facilities, equipments, personnel, and communication media.
2. Reliability: the ability to deliver services as promised in an accurate and reliable manner.
3. Responsiveness: willingness to assist customer to deliver fast services.
4. Assurance: employee knowledge and respect to the customers.
5. Empathy: individual consideration for the customers.
6. Usability: quality related to website design that includes appearance, ease of use, navigation, and information for the users/customers.

## III. METHODOLOGY

SISFO Unit at University X performance was measured using IT SERVQUAL on *perceived service* and *expected service*. Sample in this study were 393 active University X' students.

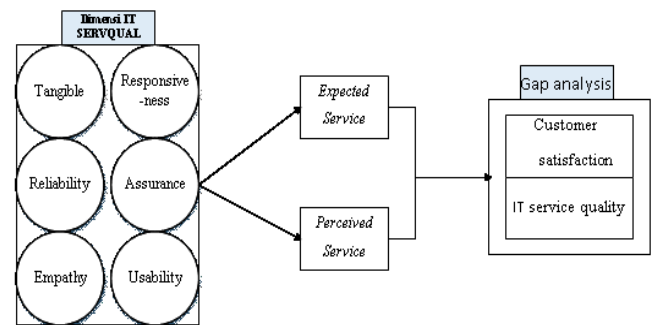


Fig.1 IT SERVQUAL Model [10]

Some series of step in this study are:

#### 1. Defining the variable development

Six dimensions used Tangible, Reliability, Responsiveness, Assurance, Empathy and Usability are break down into sub dimensions, indicators and items.

#### 2. Development of the Questionnaire

Questionnaire was developed in this stage. The questions are reflecting the 6 dimensions with 6 likert scale options: Absolutely disagree, disagree, somewhat disagree, somewhat agree, agree and absolutely agree.

#### 3. Validity testing

Validity testing is used with Pearson correlation using SPSS version 23.0. Of the 95 items that were processed, all 95 items of statements were said to be valid. Two items from each sub dimensions of the

highest loading were used, resulting in 60 items that all valid as well.

4. Reliability testing

Cronbach's Alpha calculation with SPSS version 23.0, for services received showed coefficient of 0.725 and for expected services showed coefficient 0.739 with  $\alpha = 0.05$ . The 60 items for services received showed coefficient of 0.805 and for expected services showed coefficient 0.906 with  $\alpha = 0.05$  It means that the questionnaire is reliable Malhotra (2007).

5. Calculating gap

Gap was obtained by subtracting the expected score by the perceived score. Negative gap showed that the customers were not satisfied by the services and vice versa. After calculating the gap, the largest 2 gaps of each sub-dimension were selected for the improvement of the SISFO Unit so that the results of the statements became 60 items.

6. Clustering items on Cartesius Diagram

Using SPSS 23.00 each item was plotted on four quadrants A, B, C, or D so SISFO Unit will be able to find out which items related to its IT services that need to be improved or which services that already as intended.

IV. RESULTS AND DISCUSSION

4.1 Gap Analysis

Here are the results of gap analysis on all six dimension of IT SERVQUAL:

Table 1 Gap Analysis Result

No	Dimensions	GAP	Rank
1	Tangible	-0.1503	3
2	Responsiveness	-0.0731	5
3	Reliability	-0.1400	4
4	Assurance	-0.1504	2
5	Empathy	-0.0372	6
6	Usability	-0.1165	1

Table 1 showed that overall; customer satisfaction of SISFO Unit services was still far from expected. Usability dimension showed the highest gap. The expected services that need improvement especially user friendliness, design on website, content and quality of information. Second largest gap is on Assurance dimension that deals with competence, courtesy and security of the services. Students perceived that the employees of this unit were not competent enough to carry out the services as expected not to mention professional attitude during

service delivery. Different treatments perceived to be exist to different customers (lecturer vs student).

Third largest gap is the Tangible dimension with gap score -0.1503. It shows the discrepancies on physical facilities, equipment, personnel and communicating content of services. Improvement action that can be taken to name a few: SOP on regular maintenance of facilities and reporting immediate feedback, monitoring complaint handling or website error complaint. Forth dimension gap is Reliability dimension. Reliability can be achieved by creating Standard Operating Procedure (SOP) on handling complaint process. Fifth dimension gap is Responsiveness which includes speed, accurate and agility. Shall it leave unimproved, customers' trust to the unit is at its stake. Sixth gap is on the Empathy dimension especially regarding ease of access in term of facilities for students with disabilities and understanding customer.

4.2 Matrix Analysis

Customer voices play an undeniably crucial in services activities. The result of IT SERVQUAL should be taken into account and serves as a basis to improve quality of services and decision making. Since IT SERVQUAL result cannot tell which dimension need to be improved first, the analysis is accompanied by mapping into Cartesian matrix.

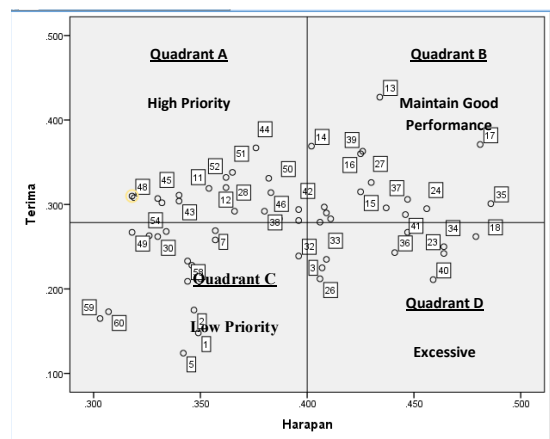


Figure 2. Matrix Expectation and Performance

7. Quadrant A (High Priority)

Items that fall into this quadrant are expected by customers and yet the real services are far from it. Items in this quadrant need to be prioritized to improve performance of the SISFO Unit. To name a few dimensions in this quadrant are items from the following dimensions: Responsiveness, Reliability, Assurance, Empathy and Usability. This includes area of cutting edge software, complaint handling (forgot password, login security, academic services (presence list, access to the parking lot).

### 8. *Quadrant B (Maintain Performance)*

Items in this quadrant are perceived relatively good by customer thus they need to be preserved for the sake of customer satisfaction. Some indicators that fall into this quadrant are formed the following dimensions: Responsiveness, Reliability, Assurance and Usability regarding complaint handling, fast response and academic related information.

### 9. *Quadrant C (Reducing or Stopping Resources on Certain Services)*

Quadrant C showed the items that were low performed and less expected from the customer point of view. Indicators that fall in this quadrant is Tangible, Responsiveness, Assurance, Empathy and Tangible that covers ease of access, information, language, website menu access.

### 10. *Quadrant D (If resources are limited, divert resources to high important attributes)*

Quadrant D is high performance but less expected. When it comes to priority, this quadrant is less important in the customer's eyes. Some indicators that fall within this category are from the following dimensions: Tangible, Reliability, and Assurance, for examples employee' ability in operating hardware and software.

## V. CONCLUSION

IT SERVQUAL measurement revealed more detail information regarding hands on services that delivered by SISFO Unit at University X. Thus, the results were closer to home regarding what kind of services that already as expected and vice versa. The Cartesian plotting gave us the picture specific aspects of the particular dimension that need immediate response, to be maintained, or ignored. Services that need immediate improvement (high priority) include updated software, process related to academic activities (login failure, presence list). To name a few, this study is limited and not yet taken into account the perspectives from other customer (lecturer and employee).

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## I. APENDIXES

<b>Dimensions</b>	<b>Sub Dimensions</b>	<b>No</b>	<b>Items</b>
<i><b>Tangible</b></i>	<b>Physical facilities</b>	1	Availability of facilities in the SISFO Unit service room such as AC, wifi, chairs, ables, PCs and furniture
		2	The SISFO Unit service room is clean
	<b>Equipments</b>	3	The equipment and technology used by the SISFO Unit are quite adequate
		4	The hardware used is a complete SISFO Unit such as PC Computers, Printers, Hard drives, etc.
	<b>Personnel</b>	5	The SISFO Unit employees are dressed politely
		6	The SISFO Unit employees are well-dressed
	<b>Communication Content</b>	7	The information displayed by the SISFO Unit is interesting to read
		8	Having the means to provide criticism and suggestions for services provided by the SISFO Unit
<i><b>Responsiveness</b></i>	<b>Fast Services</b>	9	The IT Helpdesk serves quickly regarding complaints / requests regarding student lecture activities on the i-Gracias website
		10	The IT Helpdesk serves quickly regarding complaints / requests regarding RFID for tapping student absences / parking on the i-Gracias website
	<b>Accurate Services</b>	11	The IT Helpdesk resolves complaints / requests appropriately related to student lecture activities on the i-Gracias website (within 2 hours to 3 days)
		12	The IT Helpdesk resolves complaints / requests appropriately related to RFID applications for tapping absences / student parking on the i-Gracias website (within 2 hours to 3 days)
		13	The IT Helpdesk is thorough in resolving complaints / requests regarding student lecture activities on the i-Gracias website
		14	The IT Helpdesk is careful in resolving complaints / requests regarding SSO (Single Sign On) (for example students fail to enter username / forget password to log in on the i-Gracias website)
	<b>Alertness</b>	15	The IT Helpdesk immediately responds to student questions regarding complaints / requests regarding lecture activities on the i-Gracias website

<b>Dimensions</b>	<b>Sub Dimensions</b>	<b>No</b>	<b>Items</b>
		16	The IT Helpdesk immediately responds to student questions regarding complaints / requests regarding RFID applications for tapping absences / student parking on the i-Gracias website
		17	The IT Helpdesk immediately responds to student questions regarding complaints / requests regarding SSO (Single Sign On) (for example students fail to enter username / forget password to log in on the i-Gracias website)
<b>Reliability</b>	<b>Consistency</b>	18	The SISFO unit provides information technology-based infrastructure services
		19	The SISFO unit provides i-Gracias website services in the form of academic information system applications such as student lecture activities
	<b>Accuracy</b>	20	The SISFO unit provides IT Helpdesk services in accordance with the Standard Operating Procedure (SOP) used
		21	The SISFO unit provides i-Gracias website services in accordance with the Standard Operating Procedure (SOP) used
		22	The SISFO unit provides accurate information about the i-Gracias website services in the form of academic information system applications such as student lecture activities
		23	The SISFO unit provides precise information about the i-Gracias website services in the form of a supporting information system application such as an RFID application for tapping absences / student parking
		24	The SISFO unit provides clear information about the i-Gracias website services in the form of academic information system applications such as student lecture activities
		25	The SISFO unit provides clear information about SSO (Single Sign On) (for example students fail to enter username / forget password to log in on the i-Gracias website)
	<b>Reliable</b>	26	The SISFO Unit provides services according to service hours, namely 08.00 - 16.00 WIB
		27	The IT Helpdesk is able to resolve complaints / requests regarding student lecture activities on the i-Gracias website (within 2 hours to 3 days)
		28	The IT Helpdesk is able to resolve complaints / requests regarding RFID applications for tapping absences / student parking on the i-Gracias website (within 2 hours to 3 days)
		29	The IT Helpdesk can be relied upon in resolving complaints / requests regarding student lecture activities on the i-Gracias website
30		IT Helpdesk can be relied upon in resolving complaints / requests regarding SSO (Single Sign On) (for example students fail to enter username / forget password to log in on the I-Gracias website)	
<b>Assurance</b>	<b>Competence</b>	31	The IT Helpdesk is able to answer student questions regarding complaints / requests regarding lecture activities on the

Dimensions	Sub Dimensions	No	Items
			I-Gracias website
		32	The IT Helpdesk is able to use hardware system equipment such as PC Computers, Printers, Hard drives, etc.
		33	The IT Helpdesk is able to use software system tools such as computer programs that function on hardware devices
		34	The SISFO unit runs work procedures in accordance with the job description of each employee
		35	The IT Helpdesk gives a sense of trust to students
		36	The IT Helpdesk is immediately responsible for correcting if an error occurs regarding complaints / requests regarding lecture activities on the I-Gracias website
		37	The IT helpdesk is immediately responsible for repairing if there is an error related to complaints / requests regarding RFID applications for tapping absences / student parking on the I-Gracias website
	<b>Courtesy</b>	38	The IT helpdesk is polite in serving students
		39	The IT helpdesk respects in serving students
	<b>Security</b>	40	The SISFO unit guarantees the security of I-Gracias website services
		41	The SISFO unit can be relied on in managing I-Gracias website services
<b>Empathy</b>	<b>Access</b>	42	The SISFO unit makes it easy for users to find information directly into the IT helpdesk service room
		43	The i-Gracias website services provide space for communities between students
	<b>Communication</b>	44	The IT helpdesk can communicate well with students
		45	The IT helpdesk communicates effectively to students
		46	The information provided clearly related to the i-Gracias website service can be understood by students
		47	Information provided clearly related to IT helpdesk services can be understood by students
		48	The i-Gracias website service makes it easy to communicate with the SIFO Unit
49	The i-Gracias website service provides relevant information		



<b>Dimensions</b>	<b>Sub Dimensions</b>	<b>No</b>	<b>Items</b>
	<b>Understanding Customer</b>	50	The IT Helpdesk took the initiative to provide solutions related to complaints / requests regarding RFID for tapping absences / student parking on the I-Gracias website
		51	The IT Helpdesk took the initiative to provide solutions related to complaints / requests regarding SSO (Single Sign On) (for example students failed to login / forget passwords on the I-Gracias website)
		52	The IT Helpdesk understands students regarding complaints / requests regarding student lecture activities on the I-Gracias website
		53	The IT Helpdesk understands students regarding complaints / requests regarding SSO (Single Sign On) (eg failing to login / forget passwords on the I-Gracias website)
		54	The IT Helpdesk has good relations with users
<b>Usability</b>	<b>Ease of use</b>	55	The navigation process on the I-Gracias website service is structured with planning
		56	The menus on the i-Gracias website service are easy to understand
	<b>Content</b>	57	The menus are clearly displayed on the i-Gracias website service
		58	Fill in the content on the I-Gracias website services related to education
	<b>Quality of Information</b>	59	The I-Gracias website service displays related to education
		60	The i-Gracias website services are not boring for users