Chapter 3
Integrating E-SERVQUAL and Kano Model into Quality Function Deployment to Improve Website Service Quality: An Application to University's Website

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ABSTRACT

Today's internet technology has been utilized in various fields, one of which is to provide services in the field of education. Internet technology in the form of website enables organizations to provide anywhere anytime services to their customers, thus it is expected increasing customers' satisfaction. This research aims to develop a service design framework that can be used to evaluate the quality of website service at the university and formulate solutions for its improvement, by combining E-SERVQUAL, Kano Model, and Quality Function Deployment (QFD). To demonstrate the use of the proposed framework, we conducted a case study in one of the private universities in Palembang, Indonesia. Step by step of the framework usage is discussed, to provide a better understanding of the framework we are proposing.

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INTRODUCTION

The internet growth in 1990's has triggered the appearance of world-wide-web (www) or website, a global information media where everyone can access or interact with certain information via internet-connected computer. Internet has changed the way organizations provide services to their customers and allows co-creation value, especially with the Web 2.0 technology. Internet allows organizations to provide interactive services, with the expectation that customers can get closer to the organization (Mathwick, Wiertz, & de Ruyter, 2008; Shin, 2014; Verhagen et al., 2015; Van Doorn et al., 2010; Wagner &Majchrzak, 2007).

One of the sectors that use a lot of Internet technology is the education sector. The Internet has changed how the university runs both its primary and supporting business processes. Internet technologies allow prospective customers to perform various administrative tasks that previously had to be done manually, for example an online admission process. Students as the main customers of universities are also able to perform various activities such as online course registration, online consultation with their advisor, etc. Moreover, Internet technology has also altered how the learning process is done, from the conventional one through face-to-face method to blended learning (combination of face-to-face and online learning) and fully online learning or commonly known as e-learning. E-Learning allows the learning process becomes more collaborative in nature, especially since the emergence of Web 2.0 technologies (Hew & Cheung, 2013, Cheng et al., 2014). There are also many efforts to use and integrate social media (like Facebook) as part of Web 2.0 technologies in the learning process (Balakrishnan, Liew, & Pourgholaminejad, 2015; Chen, Fan, & Sun, 2015; Mao, 2014; Won et al., 2015). The use of the internet is expected to be one of the tools to improve higher educations' service quality and compete in global level (Aldridge & Rowley,1998; Athiyaman, 1997; de Jager & Gbadamosi, 2013; Moogan, Baron, & Bainbridge, 2001; Oldfield & Baron, 2000).

Now, Internet is considered as the backbone for universities to deliver their services to both prospective and main customers, and one of them is in form of web-based services such as online course registration. The internet usage has changed customer's way of thinking due to the existence of a more intense interaction and the expectation of a better and faster service quality from the university. This challenges the university management side to define and provide web-based service that can fulfill customer's requirement and get the desired service performance (Goldstein et al., 2002). Regarding this, the management needs to be able to formulate a website service attribute and quality that can be a guide for the developers to plan, implement, operate, and evaluate the website service made for university customer.

In the service design context, the university management surely wants to implement a service with high quality by considering and responding customer's requirements in all service's processes (Edvardsson, 1997; Lin, Yeh, & Wang, 2015). Unfortunately, the meaning of "quality" might be different for each person due to its various criteria. Juran & Godfrey (1999) said that quality can be meant as product's features that can fulfill the user's' needs and in the end create satisfaction to the users. Quality can also mean free from flaws, or in other words free from mistakes or errors that can lead to users' dissatisfaction. The concept of quality itself often times taken as a relative measurement of a product's or service's goodness, which consists of design quality and suitability quality. Design quality means product's specification, while suitability quality means a measurement of how far a product fulfill the requirement or quality specification that has been decided (Tjiptono et al., 2003).

With the service design concept, the management is expected to be capable in creating a high quality website, thus be able to give the best online experience to the customer. This experience will surely trigger satisfaction from the user, and in the future it is expected to improve loyalty and engagement level

from the customer, including the desire to do a positive word-of-mouth about the university's service. Good website service quality is also an important factor because it shows that the web owner is not a newcomer (not a 'fly-by-night' operator) in the online business environment (Wingfield cited from Holsapple & Wu, 2008), but a reliable service provider (Bramall, Schoefer, & McKechnie, 2004). Fogg et al. (2003) said that in some past researches, one main reasons why people are not interested in using online service is because the website does not have a professional interface design, which indicates that the lack of credibility from the web owner, and creates a feeling that the web is not reliable. This factor has grown into an important thing because in online business environment, physical factors and direct, personal contact (between users and service provider) has become almost non-existent (Gefen, 2002) and websites has become the main media for service providers to interact with their customers (Yang & Lester, 2004).

Even though service quality is an important thing to improve customer's satisfaction and loyalty, not all organization put enough effort to improve their website service quality. There are still a lot of university websites that are poorly managed and do not fulfill their customers' demands (Kuo, 2006; Kuo & Chen, 2011). Prospective students also find difficulties in looking for information regarding registration, current curriculum, etc. It is a shame because website is the first gate for prospective students to assess the quality of a university. Prospective students have to make sure that the university's service quality fits their expectation, especially considering the type of education service where it is long term and customers cannot easily change their university. Poor website service quality can create a perception that the university's education service quality is also poor (Hidayanto, Rofalina, & Handayani, 2015).

In Indonesia, education is one of the sectors that ranks high in the government's priority list. With 20% of the nation's yearly budget is allocated to education. Regarding university as one of Indonesia's national education systems, up until 2014, there are 3.151 universities Indonesia, where 3.068 or 97% of them are private universities, and 83 or 3% of them are state universities (http://kuliahmurahjakarta.blogspot.com/2014/01/jumlah-perguruan-tinggi-swasta-dan.html). Unfortunately, according to the international ranking system, Indonesian university's rank is still low. QS World Ranking Asia's survey in 2015 for example, placed Universitas Indonesia as the best university Indonesia with rank 79th in Asia. Webometrics ranking also shows those Indonesian universities only have 518th as their highest rank per January 2015 compared to global rank. Although Webometrics ranking itself measures more on the quality of content information instead of evaluates the quality of the website, this can be an indicator of how weak the quality of education in Indonesia, which one of them is related to IT facility management, including website service management from the universities themselves.

To improve Indonesia university's website service quality, an integrated framework that can be a guide to the university is necessary. The simplest approach possible is by identifying the website service quality attribute and measure the customer satisfaction level based on the service quality attribute. SERVQUAL (Parasuraman, Zeithmal, & Berry, 1988) is one of the most commonly used framework to calculate satisfaction level on a service and often times also adapted to calculate website and IT service satisfaction level (Hidayanto et al., 2013; van Iwaarden et al., 2003), which commonly termed as E-SERVQUAL.

Some approaches were also suggested in the past to help improving the website quality in order to improve users' satisfaction. One of the approaches is by using Quality Function Deployment (QFD) (Kuo & Chen, 2011; Islam, Ahmed, & Alias, 2007) which formerly used in industry sector to translate users' demands into technical conditions in every production process, from creating concept into sales or sales service (Akao, 1990). Unfortunately, QFD does not have its own tools to calculate quality

aspects that are important for the users. Aside of that, QFD does not have good ability to classify the services attributes according to how a product or service can fulfill the users' demands as Kano Model has (Kano et al., 1984).

Thus, this research aims to propose a framework for improving website service quality by integrating E-SERVQUAL, Kano Model and QFD. The three model integration is expected to help universities improving their website service quality, from the scoring process into the technical response necessary to overcome the flaw. We demonstrate the use of the proposed framework for evaluating a university website.

BACKGROUND

Service Design Concept

One of the emerging disciplines right now is service design. Service design is an activity of planning and organizing people, infrastructure, communication, and material components of a service in order to improve its quality and the interaction between service provider and customer (Tan et al., 2010). The purpose of service design methodologies is to design according to the needs of customers, so that the service is user-friendly, competitive, relevant and providing added value to the customers. Service design is one of the activities in service design process (Shostack 1982; Shostack 1984) aimed to create a "service blueprint" and gives service specification offered to the customer.

In order to make the customer enjoys the service from an organization, the service has to be created systematically and consistently, and also complemented with functions that can improve customer's experience in using the service effectively (Shostack, 1984). The good experience in using a service will improve customer's satisfaction and loyalty to the service provide (Human & Naude, 2014; Rodger, Taplin, & Moore, 2015; Shi, Prentice, & He, 2014). According to Lee & Chen (2009), a service design has to be an integral experience felt by the customer, where the service provider has to fulfill customer's expectations, providing a service that suits the customer's needs, and in the end, the customer can feel the satisfaction on the service provided.

In a service design process, the service designer team has to show service attributes that decides the service's quality to the customer. The service attributes can be tangible such as building cleanliness, or intangible such as speed and responsiveness in handling the customer. In the electronic service context, interface quality is an example for a tangible service attributes. SERVQUAL (Parasuraman, Zeithaml, & Berry, 1985) is one of the frameworks that provide a guideline of service attributes that need attention in designing and evaluating a service.

In practice, service attributes the customer expects will be a lot and widely varied. Service designer won't be able to consider all the service attributes in designing a service, since it will cost a lot of money. Thus, service designer has to be able to decide the critical service attributes. Therefore, a mechanism to decide priority on each attribute is required. By identifying the critical service attributes concerned by the customer, service designer can calculate the trade-off of every single service design option prepared, therefore the service delivered to the customer will be the best product that can bring satisfaction to the customer without servicing service provider's interest. In order to give a comprehensive experience to the customer, service provider should not only focus on the experience gained while using the service,

but also all attributes felt by the customer, both before and after using the service (Marentakis & Emiris, 2010). Considering this issue, we integrate Kano Model in the QFD process to design a high-quality website service.

Service Quality Based on SERVQUAL

Service quality concept is something really important for company because it is a vital factor in creating superior value for customers. Service quality in a lot of literature has strong relation to users' satisfaction, loyalty, and even profitability as explained in some researches such as Rodger, Taplin & Moore (2015), Shi, Pretince & He (2014), Orel & Kara (2014), Lee et al. (2015), Kuppelwieser & Sarstedt (2014), and de Reuver, Nikou & Bouwman (2015). The goal of providing service quality is to satisfy the users. Measuring the service quality is a better way to find out whether a service is good or bad, or whether the users are satisfied or not. Gronroos (1984) said that users compare their expectation with their experience they get from the service quality in form of rating. Gronroos (1992) the developed three dimensions in identifying service quality, which are functionality quality, technical quality, and service provider image.

One of the service quality models that is well-known and applied in various industries is SERVQUAL introduced by Parasuraman, Zeithaml, & Berry (1985). SERVQUAL is a method used to measure service quality by looking into the gap between users' perception and expectation on a service. With the method, we can know how much the gap is between customer's perception and expectation on a service. The gaps that will be possibly occurred and affect the service quality are:

1. The gap between customer's expectation and management perception. The difference between user's expectation and management's perception about the customer's expectation.
2. The gap between management perception and service quality specification. The gap of management's perception on customer's expectation and service quality specification.
3. The gap between service quality specification and service presentation.
4. The gap between service presentation and marketing communication. The gap of service presentation with external communication team.
5. The gap in the service that is felt.

SERVQUAL scales include five service quality dimensions, which are: Tangibles, Reliability, Responsiveness, Assurance, and Empathy, which are explained as the following (Parasuraman, Zeithaml, & Berry, 1988):

1. Tangibles portray physical facilities, equipment, and appearance of staffs and users attendance.
2. Reliability refers to the ability to provide the promised service accurately reliably.
3. Responsiveness is the willingness to help and give the right attention to users.
4. Assurance is the polite and knowledgeable employees that create trust and conviction.
5. Empathy includes individual's awareness and care to the users.

SERVQUAL is the most commonly used method to measure service quality (Brysland & Curry, 2001). Aside from that, SERVQUAL is perceived to statistically fulfill validity requirements (Arasli, Mehtap-Smadi, & Katircioglu, 2005). This SERVQUAL was first built for assumption that customer compares the ideal performance attributes for each attribute. If the performance attribute exceeds the

desired standard, the perception on service's quality will be improved as a whole. In short, this model analyzes gaps between two core variables: the expected service and the actual experience of the service felt by customer. From various gaps found in SERVQUAL, the 5th gap, which is the gap between the service received with the service expected usually comes as the main focus.

Parasuraman, Zeithaml, & Berry (1988) stated operational perceived quality approach (Q) as the difference degree and direction of customer perception and expectation by defining and measuring the service performance (P) the customer gets and customer expectation (E). The key to maximize service quality is maximizing the difference between the two measurement ($Q = P - E$), or in other word to maximize the value of service received by customer compared to the customer's expectation to the service. Service quality measurement with SERVQUAL includes calculating the differences between the value given to customer for every pair of questions related with expectation and perception.

Company's service quality in the five SERVQUAL dimensions can be calculated for all respondents by calculating their SERVQUAL average score on the statements that shows all service quality's dimension. The data from SERVQUAL instruments can then be used to calculate the service's gap score on various levels in detail. With the analysis on the gap scores, service manager no only be able to measure all of their service quality perceived by the customer, but also be able to identify the key dimensions and aspects in all of the dimensions that requires quality improvement.

The SERVQUAL score that turns into a gap score between perception score and expectation score can be used to diagnose where the performance improvement needs to be done. A highly negative gap score will be prioritized to be improved. On the other hand, if the gap score is positive, the over-supplying can be analyzed. This will be an evaluation to share the resource to improve the low-performance attribute.

SERVQUAL Modification to Measure IT Service Quality

In the past decades, there was a development that focuses on creating concept, measuring, and managing the service quality and its effects on electronic environment (Carlson & O'Cass, 2011) as well as an effort to evaluate traditional service quality to then adapt it into the information technology context (Bressolles, Durrieu, & Senecal, 2014). The experiences from the customers when using an IT-based services (especially web-based) is certainly different than the traditional services, where in the web-based service (or also known as e-services), customers have to be actively involved in the service delivery, and even have to make their own time and effort to gain the service. Parasuraman, Zeithaml, & Malhotra (2005) identified e-service quality as *how far a website can facilitate product shopping, purchase, and delivery process efficiently and effectively*.

This web-based service quality dimension is different compared to traditional service quality, even though the early basis is taken from the established theory such as SERVQUAL. There are some measurement dimensions that are widely used by some researchers in their research to measure an e-service quality (or known as E-SERVQUAL), such as tangibles dimension (Zeithaml, Parasuraman, & Berry, 1990; Aladwani & Palvia, 2002; Madu & Madu, 2002; Ranganathan & Ganapathy, 2002; Wan, 2000; Cox & Dale, 2001), website usability dimension (Parasuraman, Zeithaml, & Malhotra, 2005), information quality dimension (Li, Tan, & Xie, 2002), services reliability dimension (Zeithaml, Parasuraman, & Berry, 1990; Madu & Madu, 2002; Wan, 2000), assurance dimension (Zeithaml, Parasuraman, & Berry, 1990; Madu & Madu, 2002; Ranganathan & Ganapathy, 2002), and empathy dimension (Zeithaml, Parasuraman, & Berry, 1990; Madu & Madu, 2002; Wan, 2000).

Table 1 shows some sample researches related to SERVQUAL usage in IT field.

Table 1. Samples of SERVQUAL Implementation in Information Technology

SERVQUAL Application	Measure	Empirical Findings	Source
SERVQUAL is combined with usability measures to model usability of *web* based information systems	Perception of service performance	The service quality dimensions of SERVQUAL are an important aspect of usability for *web* based information systems	Oztekin, Nikov, & Zaim (2009)
SERVQUAL is tested as a measure of service quality of online systems to complement teaching quality	Perception of service performance less expectation of service (difference score)	All SERVQUAL dimensions determine satisfaction of online learning systems along with teacher quality	Sohn, Park, & Chang (2009)
Developed and applied a modified SERVQUAL model for online shopping (as an independent variable)	Perception of service performance	Eight dimensions were found in a perception only measure and they were significantly related to satisfaction	Lee & Lin (2005)
Measured the service quality of *web* sites	Perception of service performance less expectation of service (difference score)	Concluded that a gap score SERVQUAL was applicable to web sites	van Iwaarden et al. (2003)
Measured the service quality of virtual community websites with a modified SERVQUAL	Perception of service performance less expectation of service (difference score)	Gap measure found that perceptions fall below expectations	Kuo (2003)
Measured the service quality of web-based customer support systems (as an independent variable)	Perception of service performance less expectation of service (difference score)	Information and system quality determined user satisfaction while the gap score SERVQUAL had no impact	Negash, Ryan, & Igbaria (2003)
Measured web-based service quality	Perception of service performance	A perception-only SERVQUAL measure indicated a need to modify SERVQUAL for the context of the web-based service	Li, Tan, & Xie (2002)

Kano Model

In 1980's, Noriaki Kano developed a highly useful diagram to classify the attributes of a product or service based on how the product or service can satisfy the users' demands. The classification process can be useful for the new design guide as a solution to innovation element that can be attained by SERVQUAL. This diagram was then known as Kano Diagram or Kano Model.

Kano Model is usually used in activities such as users' demands identification, functional requirements determination, concept development, and competitive product analysis. In Kano Model, users' demands can be divided into three attributes (Tan & Pawitra, 2001), which are:

1. The must be (basic needs) (M)
2. The one dimensional (performance needs) (O)
3. The attractive (excitement needs (A)

The must be attribute is an attribute based on product or service the users automatically expect from it. Users will be satisfied if the attributes from this category are fulfilled, but will also be dissatisfied if the attributes are not fulfilled. However, the attributes from this category cannot improve users' satisfaction and can only trigger dissatisfaction if not fulfilled. The one-dimensional attribute is an attributes that can create satisfaction and dissatisfaction from the users. The satisfaction comes from the fulfillment of this attribute. In other words, the higher this attribute performs, the higher the users' satisfaction level

will be. Attractive attribute is an attribute that creates satisfaction if fulfilled, but will not trigger dissatisfaction if not fulfilled. The attributes from this category is the attributes that are not really expected by the users. Thus, if the attribute is not there, users will not be disappointed. However, if the attribute is included in the product or service, users will be happy (Ratanasawadwat, 2015). The relation between these three needs can be seen in the Figure 1.

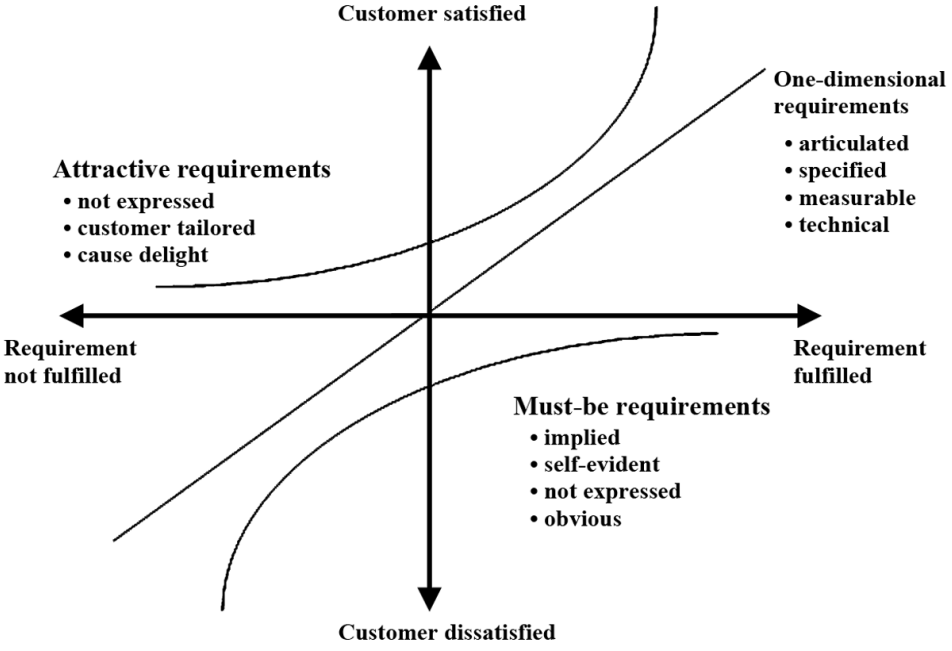
In addition to the categories above, Kano Model also has three other categories to classify users demand, which are Indifferent (I), Reverse (R) (Rashid et al., 2011), and Questionable (Q) (Sauerwein et al., 1996). If one of the users demands are included in the (I) category, it shows that users do not care about the attribute, thus the (I) category can be ignored. The (Q) category indicates contradiction on users demands (Ji et al., 2014), while the (R) category shows displeasure on certain quality attributes where if this category is fulfilled, it will trigger dissatisfaction from the users because they feel uncomfortable and seen as an obstacle for other service attributes (Byun, Lee & Rye, 2014).

Regarding Kano Model implementation in measuring website service quality, there are several sample researches including research by Lee, Shih & Tu (2002) for performance improvement on web-based learning application, Chu, Wang & Lai (2010) which studied digital storage system based on Web 2.0, Khalid, Mustafa & Haqua (2008) which evaluated information quality on university web, Oh, Yoon & Park (2011) which used structured approach to test quality attributes on e-shopping mall.

Quality Function Deployment (QFD)

The QFD concept was first announced by Yoji Akao from Japan in 1966 in an article published in 1972 with the title "Hinshitu Teinkai System" or also known as Quality Deployment and for the first time

Figure 1. Kano Model
(Source: Berger et al., 1993)



implemented to Mitsubishi Company in 1978. The main goal of QFD is to translate subjective quality criteria into the objective one that can be accumulated and measured, and then used to design and create a product (Reilly, 1999).

QFD uses comprehensive matrix to document information, perception, and decision or also known as House of Quality (HoQ) and often times treated as the whole process of QFD. HoQ is used to translate a set of customer requirements, customer importance level, as well as customer satisfaction level on product/service from market and data research from benchmarking process into technical target priority required to satisfy the customer requirements. There are various version of HoQ that are not significantly different one to another. HoQ's ability to be adjusted based on requirements from certain problem type is one of the strength it has.

According to Herzwurm, Shockert & Mellis (1999), Quality Function Deployment on software development has started in the year of 70's and end of 80's in America. Some sample QFD implementation on web development includes by Ioannou, Pramataris & Prastacos (2004) for electronic retailing, Chang & Kim (2010) for health information website, Islam, Ahmed, & Alias (2007) for redesigning web TV3, Barutcu (2006) for web e-store design, Kuo & Chen (2011) for web internet shopping interface design quality improvement.

E-SERVQUAL, KANO MODEL, AND QFD INTEGRATION PROPOSAL TO IMPROVE WEBSITE SERVICE QUALITY

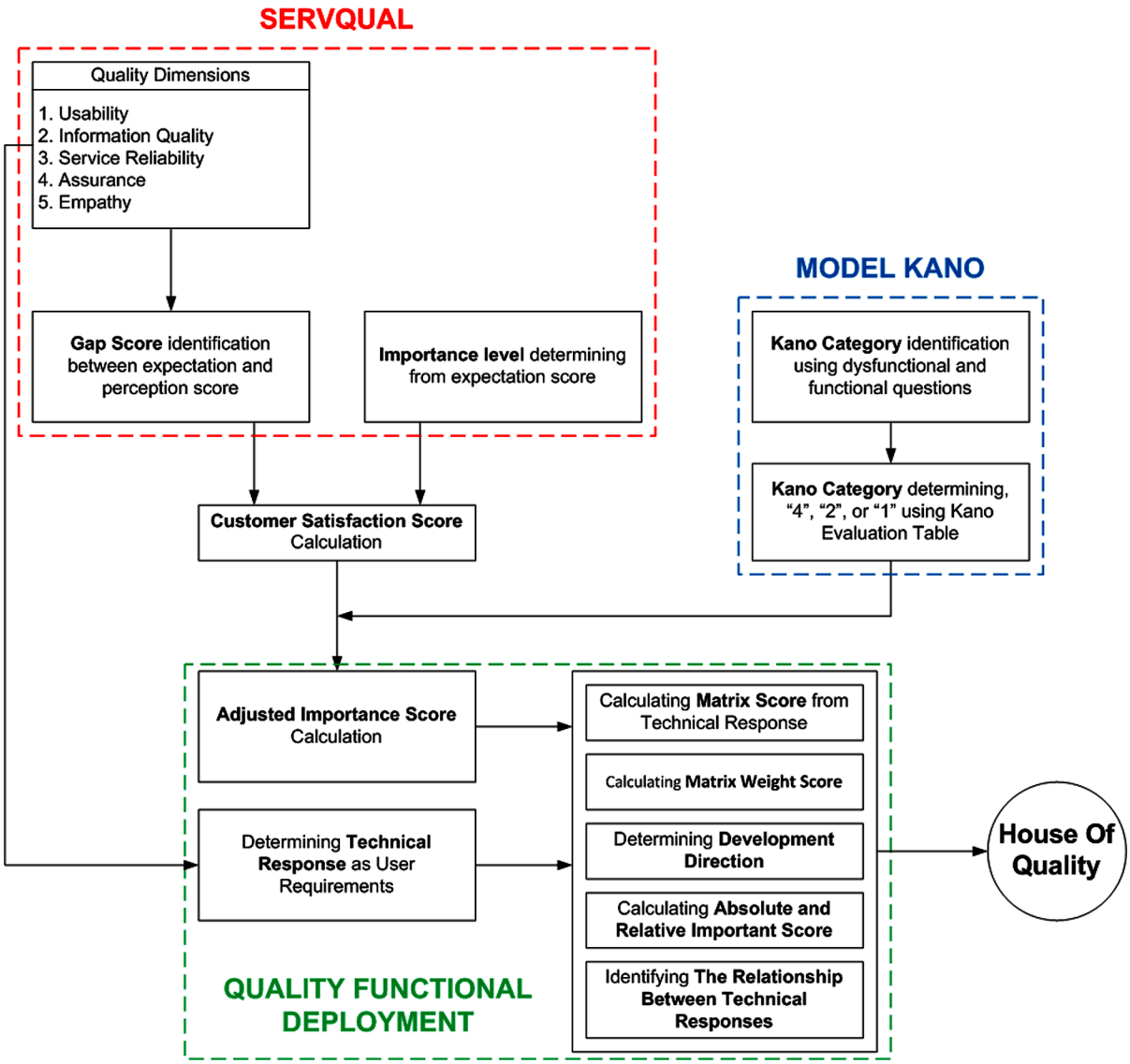
To improve website service quality, this research adapts the model developed by Tan & Pawitra (2001) that combine SERVQUAL, Kano Model, and QFD to help service provider to evaluate users' satisfaction, provide guidance on empowering the weak service attributes, and quicken innovative services development by identifying attractive attributes and including it to the future service. The combination between Kano Model and SERVQUAL can cover each other's weaknesses, compared to if used separately. According to Bhardwaj & Menon (1997), Kano Model cannot evaluate attribute's performance. Using Kano Model with SERVQUAL will provide better overview on the relationship between product attributes and customer requirements.

The information created is useful to fix and improve the quality of those attributes. However, both will not be done systematically and operationally since the combination of SERVQUAL and Kano Model doesn't provide a device for that. Therefore, the integration of SERVQUAL and Kano Model into QFD will cover that weakness. With HoQ from QFD, there will be connection between customer requirements attributes and company's or service provider's technical responses. The integration of SERVQUAL and Kano Model combination into QFD will provide systematic and operational steps to fix and improve those attributes' quality.

In this research, the SERVQUAL context is used to measure website service's quality, thus in this research we will use the term E-SERVQUAL. The E-SERVQUAL, Kano Model, and QFD combination frame used in this research can be seen in the Figure 2 below.

In this theoretical framework, there are three part of processes required. The first is measurement on the E-SERVQUAL which includes identifying the gap score between expectation and perception score, as well as importance level measurement process taken from expectation score. The second process is measurement on Kano Model where the Kano categories are identified and the categories' scores are determined. Then, with the result of E-SERVQUAL and Kano Model's measurements, we will measure

Figure 2. The proposed E-SERVQUAL, Kano Model, and QFD combination frame



the Customer Satisfaction Score. The third process is the combination process with the QFD, where there are several measurement process required, which are finding Adjusted Importance score, deciding the technical response, finding matrix score, calculating matrix weight, deciding development direction, calculating absolute and relative importance, as well as identifying the relationship between technical responses to create House of Quality as the overall process of QFD.

In the E-SERVQUAL model measurement process, the thing that has to be paid attention to is selecting the quality dimension that will be used to create questionnaire. The quality dimension selection will decide quality attributes measured to find the gap score. Table 2 shows the dimensions that we summarized from various researches to show website service quality attributes. The quality dimensions used are the combination of quality dimensions proposed by Swaid & Wigand (2009) with reference provided by van Iwaarden et al. (2003).

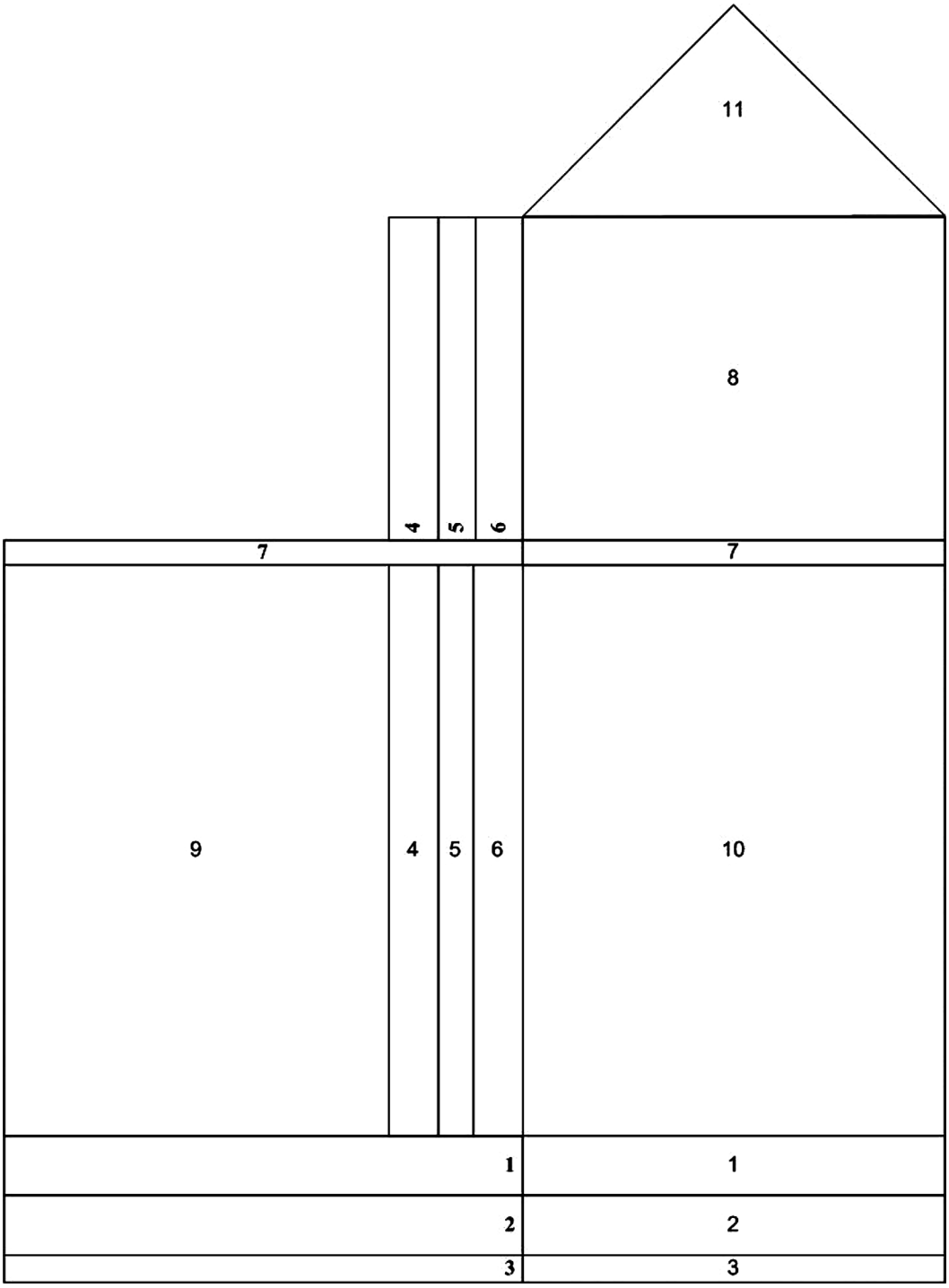
Table 2. E-SERVQUAL Dimensions and Attributes

Quality Dimension	Definition	Quality Attributes	References
Usability	Shows users' perception level on website's ease of navigation and level of user-friendliness (Swaid & Wigand, 2009)	1. The web appearance is interesting 2. The web appearance is not confusing	Zhang (2006), Djajadikerta & Trireksani (2006), Mebrate (2010)
		3. The menus are shown and placed clearly (menu appearance) 4. The web's content is related to education 5. The grammar in the web is good and correct 6. The navigation process in the web is not confusing 7. The web has good search engine facility 8. The web can show up perfectly in different browsers	Stockdale & Borovicka (2006)
Information Quality	Users' perception on website content's benefit and quality	9. The information in the web is useful 10. The information in the web is complete 11. The information in the web is clear 12. The information in the web is up to date 13. The information in the web is accurate 14. The information in the web is concise	Djajadikerta & Trireksani (2006)
Services Reliability	Users' perception on website's reliability level (Swaid & Wigand, 2009)	15. The website address is active and directs into the correct web 16. The web name is easy to remember 17. All links in the web are valid 18. The web is accessible anytime 19. The web can be opened quickly every time it is accessed 20. The web reactivates quickly when damaged 21. All forms in the web function well 22. Email and contacts are active 23. There is a notification on newest information	Mebrate (2010), Stockdale & Borovicka (2006)
Assurance	Users' perception on website's assurance	24. The web's security is good 25. The website service provider has good reputation 26. The web management staffs are reliable in their task	Swaid & Wigand (2009)
Empathy	Users' perception on website's personalization/ customization that can give personal care (Ratanasawadwat, 2015)	27. Users are comfortable when looking for information in the web	Zhang (2006)

The last process is combining all the measurement results based on theoretical framework above into House of Quality structure from QFD. The used HoQ structure can be seen in the Figure 3.

1. Part 1 is Total row and the content is taken from Absolute Importance score.
2. Part 2 is Percentage row and the content is taken from Relative Importance score.
3. Part 3 is Priority Order row and the content is the sorting of absolute importance to see which score has the highest priority and all the way to the lowest.
4. Part 4 is Customer Importance column and the content is the Expectation Score.
5. Part 5 is Kano Category column and the content is the Kano category classification of each attribute.
6. Part 6 is Importance Level column and the content is taken from adjusted importance score.
7. Part 7 is Development Direction column and the content is the development direction for every existing technical response.

Figure 3. Website Service's House of Quality Structure



8. Part 8 consists of Technical Response on website service.
9. Part 9 is website service quality attributes included in A, M, and O classification in Kano Model category.
10. Part 10 is Relationship Matrix that portrays the relationship between service attributes and technical response.
11. Part 11 is Correlation Matrix or often called as roof of HoQ which contains Relationship Matrix between technical responses.

APPLICATION OF THE FRAMEWORK FOR UNIVERSITY WEBSITE EVALUATION

Case Study Profile

University that is selected to be the place for case study of this research is STMIK MDP located in Palembang, South Sumatera. STMIK MDP is one of private universities in Palembang that is oriented to computer education for the bachelor and diploma level with around 2000 students. As one of computer universities in Palembang, STMIK MDP has its own website-based online service since 2001 using www.stmik-mdp.net as the address. On the further development, STMIK MDP website got a lot of changes from technical to functional side and has changed its address into www.mdp.ac.id since 2009.

Data Collection

One of the required steps in this research is survey on the STMIK MDP website service users. The survey is conducted to measure the quality of the website service measured by the E-SERVQUAL dimensions defined prior to the survey. The survey is made in form of 27 question items questionnaire arranged using Likert scale and divided into two question groups, group for expectation variable and group for perception variable. The expectation variable will use the scale of Unimportant, Less important, Quite important, Important, Really important. The perception variable will use the scale of Really bad, Bad, Enough, Good, Really good. On the other hand, the measurement for Kano Model will use functional questionnaire list and dysfunctional question developed based on research attribute used on E-SERVQUAL method. The Kano Model will also use Likert scale as answer choice for the respondents. There are five scales, which are Satisfied, It should be like that, Neutral, Not satisfied but can tolerate, Totally not satisfied, marked with the number 1 (Satisfied) to 5 (Totally not satisfied).

The population in this research is the user of STMIK MDP web, which is the students and lecturers. The overall total population, both student and lecturers is around 2000 people. The number of sample that will be used is 200 respondents. The respondents selected are students at least in the second year with the expectation that they are familiar and frequently access the STMIK MDP website. The lecturers selected are the permanent lecturers because they access the website most frequently compared to the part-time lecturers. The questionnaire will be distributed offline to the targeted respondents.

E-SERVQUAL Measurement Results

Result summary from the questionnaire distributed to 200 respondents, for both expectation variable and respondents' perception on STMIK MDP website service attributes can be seen in the Table 3.

Table 3 shows the gap between expectation and perception dimension from E-SERVQUAL measurement conducted before. The table shows that the gap score results are all in negatives, thus creates the conclusion that respondents' expectations are not matched by their perception therefore affect the gap score into negative. This proves that STMIK MDP's website service has not fulfilled its users' expectations.

Table 3. Respondents Expectation Score on Service Quality Attributes

Quality Attributes	Expectation Score	Perception Score	Gap Score	Average Gap Score
The web appearance is interesting	4.02	3.54	-0.48	-0.42
The web appearance is not confusing	4.17	3.84	-0.33	
The menus are shown and placed clearly (menu appearance)	4.23	3.86	-0.37	
The web's content is related to education	4.23	3.92	-0.31	
The grammar in the web is good and correct	4.37	4.16	-0.21	
The navigation process in the web is not confusing	4.18	3.75	-0.43	
The web has good search engine facility	4.00	3.34	-0.66	
The web can show up perfectly in different browsers	4.26	3.68	-0.58	
The information in the web is useful	4.46	4.02	-0.44	-0.62
The information in the web is complete	4.39	3.67	-0.72	
The information in the web is clear	4.32	3.78	-0.54	
The information in the web is up to date	4.48	3.58	-0.91	
The information in the web is accurate	4.43	3.68	-0.75	
The information in the web is concise	4.05	3.68	-0.37	
The website address is active and directs into the correct web	4.52	4.25	-0.27	-0.70
The web name is easy to remember	4.50	4.32	-0.18	
All links in the web are valid	4.31	3.85	-0.46	
The web is accessible anytime	4.49	3.53	-0.96	
The web can be opened quickly every time it is accessed	4.41	3.27	-1.14	
The web reactivates quickly when damaged	4.40	3.25	-1.15	
All forms in the web function well	4.27	3.25	-0.54	
Email and contacts are active	4.17	3.72	-0.90	
There is a notification on newest information	4.44	3.76	-0.68	
The web's security is good	4.51	3.62	-0.89	-0.65
The website service provider has good reputation	4.31	3.79	-0.52	
The web management staffs are reliable in their task	4.33	3.78	-0.56	
Users are comfortable when looking for information in the web	4.42	3.82	-0.60	-0.60

Kano Model Measurement

On the Kano Model measurement process, the most important thing is to decide each attribute's classification. Sauerwein et al. (1996) explained that attribute classification based on Kano Model is conducted by asking functional (positive) and dysfunctional (negative) questions in the questionnaire. Each question has five types of answers, which are "I like it that way", "It must be that way", "I am neutral", "I can live with it that way", and "I dislike it that way" or can be rephrased into "Satisfied", "That's how it should be", "Neutral", "Not satisfied, but can tolerate", and "Totally not satisfied".

For the illustration of each attribute's classification to identify its category, whether it's included in Attractive, Must-be, One-Dimensional, Indifferent, and Questionable, can be seen in the Figure 4.

For each functional and dysfunctional question, we will find the intersection on each question's answers. According to the picture above, it can be explained as the following. For instance, question number 1 in functional question is answered "Satisfied", while the dysfunctional question is answered "Totally not satisfied". Therefore according to the Kano Model Evaluation Table intersection, the attribute of the number 1 question is included into one-dimensional classification. Keep in mind that for 1 question attribute, the total number of Kano Model categories has to be equal with the number of respondents.

Next, using Kano Evaluation Table (Sauerwin et al., 1996), we figured out the classification of each attributes.

After each attribute's classification is identified, the next step is to determine the Kano Category Score on each of those attributes into Table 4 using this set of rules: The Kano Category Score of 4 belongs to attractive category, 2 belongs to one-dimensional category, and 1 belongs to must-be. Table

Figure 4. Attribute Classification Process into Kano Model Categories

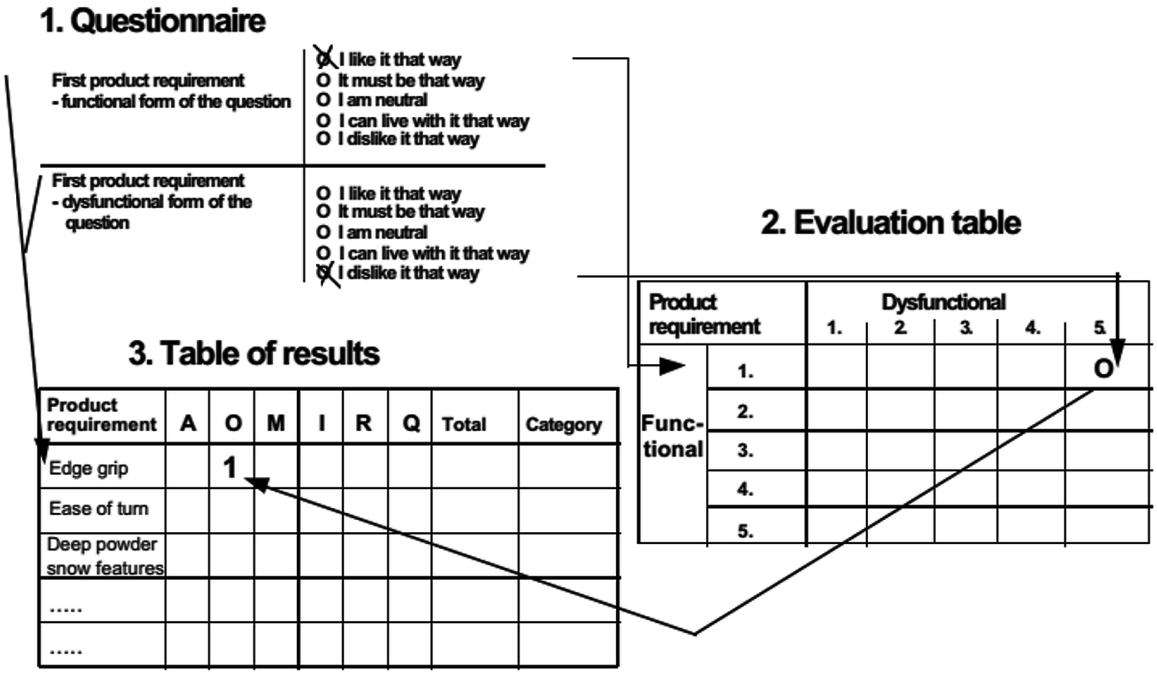


Figure 5. Kano Model Evaluation Table

Customer requirements → / ↓		Dysfunctional (negative) question				
		1. like	2. must be	3. neutral	4. live with	5. dislike
Functional (positive) question	1. like	Q	A	A	A	O
	2. must-be	R	I	I	I	M
	3. neutral	R	I	I	I	M
	4. live with	R	I	I	I	M
	5. dislike	R	R	R	R	Q

Customer requirement is ...

A: Attractive
M: Must-be
R: Reverse

O: One-dimensional
Q: Questionable
I: Indifferent

4 shows the classification total recapitulation result from respondents' scoring regarding Kano Model of functional question and dysfunctional question about STMIK MDP website service and Kano category for each attributes.

According to the Table 4 above, from 27 STMIK MDP website service attributes, 11 of them are included into Kano Category "I" or indifferent. The rest, or 16 of the attributes are included into Kano Category "A" or attractive, "M" or must-be, and "O" or one-dimensional. The attributes included into indifferent category will be ignored and deleted, thus not included in the next calculation process, which is finding adjusted importance score.

QFD House of Quality Creation

In the House of Quality creation process, we use the data related to customer requirements that are also the website service attributes, as well as the data from technical responses from STMIK MPD website service management.

Adjusted Importance Score

Adjusted Importance score is found with this formula:

||Customer Satisfaction Score (CSS)|| * Kano Category Score
The Customer Satisfaction Score is found with this formula:
Customer Satisfaction Score = Gap score * Importance Level

Table 4. Attribute Classification Choices of STMIK MDP Website Service

No	Quality Attributes	Classification Total						Category Kano	Kano Category Score
		A	M	O	I	R	Q		
1	The web appearance is interesting	30	68	32	66	0	4	M	1
2	The web appearance is not confusing	19	68	38	64	3	8	M	1
3	The menus are shown and placed clearly (menu appearance)	19	59	51	66	1	4	M	1
4	The web's content is related to education	31	51	32	84	2	0	I	-
5	The grammar in the web is good and correct	24	58	51	65	2	0	I	-
6	The navigation process in the web is not confusing	25	58	25	89	3	0	I	-
7	The web has good search engine facility	42	44	29	82	2	1	I	-
8	The web can show up perfectly in different browsers	40	55	61	43	1	0	I	-
9	The information in the web is useful	38	53	54	51	4	0	O	2
10	The information in the web is complete	57	46	49	47	1	0	A	4
11	The information in the web is clear	25	71	38	62	3	1	M	1
12	The information in the web is up to date	42	49	48	56	2	3	M	1
13	The information in the web is accurate	23	63	62	50	2	0	M	1
14	The information in the web is concise	34	36	38	90	2	0	I	-
15	The website address is active and directs into the correct web	22	76	45	55	1	1	M	1
16	The web name is easy to remember	51	29	28	92	0	0	I	-
17	All links in the web are valid	21	73	48	56	2	0	M	1
18	The web is accessible anytime	28	60	58	51	1	2	M	1
19	The web can be opened quickly every time it is accessed	47	53	52	46	1	1	M	1
20	The web reactivates quickly when damaged	26	62	55	54	1	2	M	1
21	All forms in the web function well	22	56	39	81	0	2	I	-
22	Email and contacts are active	27	54	25	92	2	0	I	-
23	There is a notification on newest information	32	62	43	58	2	3	M	1
24	The web's security is good	19	58	68	54	1	0	O	2
25	The website service provider has good reputation	34	53	54	56	2	1	I	-
26	The web management staffs are reliable in their task	22	59	51	66	2	0	I	-
27	Users are comfortable when looking for information in the web	26	45	65	61	1	2	O	2

The gap score in the formula is from the E-SERVQUAL calculation. The Importance Level score is from calculating users' expectation total score from E-SERVQUAL. Users' expectation scale (not important, less important, quite important, important, and very important) is given the score of 1 to 5 respectively. Considering the research has 200 respondents, the users' expectation total score from E-SERVQUAL will be in the range of 200x1 (= 200) until 200x5 (= 1000). The range will be broken down into 5 parts to reflect Importance Level of an attribute according to the Table 5.

Using the Table 5, the Importance Level for each E-SERVQUAL attributes can be determined, which result can be seen in the Table 6. The table also shows customer satisfaction score, adjusted importance score, and also priorities for attribute development gained by sorting the attributes based on the adjusted

Table 5. Service's Importance Level's Category Score

E-SERVQUAL Total Expectation Score	Importance Level	Score
900-1000	Very Important	5
700-899	Important	4
500-699	Quite Important	3
300-499	Less Important	2
200-299	Not Important	1

importance score. From the Table 6, it is seen that the top priority is attribute number 10, while the lowest one is attribute number 2. Keep in mind that this table only shows quality attributes that have the Kano category of attractive, must-be, and one-dimensional.

Deciding Technical Response

Technical response is the translation of customer requirements on a service they're getting into organizational language. Organizational language means process, procedure, or solution organization has or uses to fulfill customer requirements. To decide the technical response in this research, writer conducted a discussion with STMIK MPD web manager, who are Information Technology unit staffs. From the discussion with the Information Technology unit staffs, we gained some technical response information regarding university's website service requirements.

1. Server capacity improvement.
2. Backup server addition.
3. Database and application synchronization.
4. Bandwidth addition.
5. Optimization and efficiency improvement on the current web coding.
6. Software technology upgrade for the web.
7. Web database optimization and efficiency improvement.
8. Redesigning layout.
9. Staff addition.
10. Staff training for web security matters.
11. Adding communication media for users.
12. Mobile web implementation.
13. Cooperation with other organization unit.
14. Notification feature implementation.

Matrix Score and Matrix Weight from Technical Response

To gain the relationship matrix score between technical responses, we will use this set of rules:

1. Strong relationship (●), which is a strong relationship between technical response and service's attribute, with relationship weight of 9.

Table 6. Quality Attribute Priority Level on University's Website Service

No	Quality Attributes	Total score of expectations	Gap Score	Importance Level	CSS	Kano Category Score	Adjusted Importance Score	Priority No
1	The web appearance is interesting	803	-0.48	4	-1.92	1	1.92	12
2	The web appearance is not confusing	834	-0.33	4	-1.32	1	1.32	16
3	The menus are shown and placed clearly (menu appearance)	845	-0.37	4	-1.48	1	1.48	14
9	The information in the web is useful	892	-0.44	4	-1.76	2	3.52	8
10	The information in the web is complete	878	-0.72	4	-2.88	4	11.52	1
11	The information in the web is clear	863	-0.54	4	-2.16	1	2.16	11
12	The information in the web is up to date	896	-0.91	4	-8.19	1	8.19	3
13	The information in the web is accurate	885	-0.75	4	-3.00	1	3.00	9
15	The website address is active and directs into the correct web	904	-0.27	5	-1.35	1	1.35	15
17	All links in the web are valid	861	-0.46	4	-1.84	1	1.84	13
18	The web is accessible anytime	898	-0.96	4	-3.84	1	3.84	7
19	The web can be opened quickly every time it is accessed	881	-1.14	4	-4.56	1	4.56	6
20	The web reactivates quickly when damaged	879	-1.15	4	-4.60	1	4.60	5
23	There is a notification on newest information	887	-0.68	4	-2.72	1	2.72	10
24	The web's security is good	902	-0.89	5	-4.45	2	8.9	2
27	Users are comfortable when looking for information in the web	884	-0.60	4	-2.4	2	4.8	4

2. Moderate relationship (◯), which is a moderate relationship between technical response and service's attribute, with relationship weight of 3.
3. Weak relationship (Δ), which is a weak relationship between technical response and service's attribute, with relationship weight of 1,

The Relationship Matrix's weight score is shown in Table 8, where to gain it, we used this formula:
Relationship Matrix's Weight Score:
Adjusted importance score* relationship matrix score between technical response and service attribute.

The adjusted importance score can be found in Table 6.

With the rules above, each relationship decided by the Table 8 can have its relationship matrix score figured out. These scores, 9, 3, or 1, will be multiplied by the adjusted importance score.

As an example, for the "server capacity improvement" technical response, there are 4 types of relationship, which are 3 strong relationships, and 1 moderate relationship. As already known, the strong relationship weight is scored 9, and moderate is 3. Those 4 attributes, which are "The web is accessible any time", "The web can be opened quickly every time it is accessed", "The web reactivates quickly after damaged", and "User is comfortable searching for information in the web have adjusted importance score of 3.84, 4.56, 4.60, and 4.8 respectively. Each of these score will be multiplied with its relationship weight 3.84 * 9, 4.56 * 9, 4.60 * 9, and 4.8 * 3.

Table 7 shows the relationship between each technical response with each university's website service attribute. Each service attribute can have relationship with more than one technical response. On the other hand, Table 8 shows the results of the weighting for each relationship between technical response and service attribute.

Technical Response Development Direction

Table 9 shows the feedbacks on the development directions of STMIK MPD website service's technical response based on the discussion with the web management staff.

From the 14 technical responses created, there are 10 technical responses which development direction needs to be improved, and 4 which development direction is stagnant. For the technical responses that require improved development direction, an improvement action is required since it is not planned yet. On the other hand, the technical responses with stagnant development, an improvement is not required since the improvement plan is there or currently ongoing, but needs attention to prevent any drop.

Absolute and Relative Importance Score

Technical Response Weight is a measurement for each technical response calculated based on relationship level (relationship matrix) between technical responses on customer requirements that has relationship with the said technical response. The technical response weight is a measurement that shows technical response that requires attention or priority from the web manager since it has relationship with customer requirements fulfillment. The technical responses calculation is also called as absolute importance (AI) calculation and relative importance (RI).

The calculation of both uses these formulas:

1. Absolute Importance score = $\sum$ (importance level score * relationship matrix score between technical response and service attribute)

In the other words, the absolute importance score for each technical responses from total of each relationship matrix weight score in Table 9.

2. Relative Importance score = $\frac{\textit{Absolute importance}}{\sum \text{technical response}}$

Table 7. The Relationship between Service Attribute and Technical Response

	Server capacity improvement	Backup server addition	Database and application synchronization	Bandwidth addition	Optimization and efficiency improvement on the current web coding	Software technology upgrade for the web	Web database optimization and efficiency improvement	Redesigning layout	Staff addition	Staff training for web security matters	Mobile web implementation	Adding communication media for users	Cooperation with other organization unit	Notification feature implementation
The web appearance is interesting						○		●	Δ					Δ
The web appearance is not confusing						○		●	Δ					
The menus are shown and placed clearly (menu appearance)						○		●	Δ					
The information in the web is useful									●					
The information in the web is complete									●			Δ	○	
The information in the web is clear									●			Δ	○	
The information in the web is up to date			●						●			Δ	○	
The information in the web is accurate			●						●			Δ	○	
The website address is active and directs into the correct web						Δ			●					
All links in the web are valid						●		●	Δ					
The web is accessible anytime	●	Δ		●	○	○	●				○			
The web can be opened quickly every time it is accessed	●	Δ		●	○	○	●				○			
The web reactivates quickly when damaged	●	●			○	○			○	○		○		
There is a notification on newest information			○		○	○		○	●			Δ	○	●
The web's security is good		○			○	●			○	●		○		
Users are comfortable when looking for information in the web	○			○		○		●	●	○		○		Δ

Table 8. The Relationship Weight between Service Attribute and Technical Response

	Server capacity improvement	Backup server addition	Database and application synchronization	Bandwidth addition	Optimization and efficiency improvement on the current web coding	Software technology upgrade for the web	Web database optimization and efficiency improvement	Redesigning layout	Staff addition	Staff training for web security matters	Mobile web implementation	Adding communication media for users	Cooperation with other organization unit	Notification feature implementation
The web appearance is interesting						5.8		17.3	1.9					1.9
The web appearance is not confusing						4		11.9	1.3					
The menus are shown and placed clearly (menu appearance)						4.4		13.3	1.49					
The information in the web is useful									31.7					
The information in the web is complete									103.7			11.5	34.6	
The information in the web is clear									19.4			2.2	6.5	
The information in the web is up to date			73.7						73.7			8.2	24.6	
The information in the web is accurate			27						27			3	9	
The website address is active and directs into the correct web						1.4			12.2					
All links in the web are valid						16.6		16.6	1.8					
The web is accessible anytime	34.6	3.8		34.6	11.5	11.5	34.6				11.5			
The web can be opened quickly every time it is accessed	41	4.6		41	13.7	13.7	41				13.7			
The web reactivates quickly when damaged	41.4	41.4			13.8	13.8			13.8	13.8		13.8		
There is a notification on newest information			8.2		8.2	8.2		8.2	24.5			2.7	8.2	24.5
The web's security is good		26.7			26.7	80.1			26.7	80.1		2.67		
Users are comfortable when looking for information in the web	14.4			14.4		14.4		43.2	43.2	14.4		14.4		4.8

Table 9. Technical Response Development Direction

No	Technical Response	Development Direction
1	Server capacity improvement	↑
2	Backup server addition	↑
3	Database and application synchronization	↑
4	Bandwidth addition	↑
5	Optimization and efficiency improvement on the current web coding	o
6	Software technology upgrade for the web	↑
7	Web database optimization and efficiency improvement	↑
8	Redesigning layout	o
9	Staff addition	↑
10	Staff training for web security matters	o
11	Adding communication media for users	↑
12	Mobile web implementation	o
13	Cooperation with other organization unit	↑
14	Notification feature implementation	↑

Where $\sum$ technical response score is 14

The calculation result of absolute importance and relative importance score can be seen in the Table 10 below.

Table 10 above shows priority order of the existing technical responses. The priority order is based on relative importance scores sorted from the highest to the lowest. The priority order portrays what technical

Table 10. Absolute Importance and Relative Importance Score

No	Technical Response	AI	RI	Priority Order
1	Server capacity improvement	131.4	9.4%	3
2	Backup server addition	76.5	5.5%	9
3	Database and application synchronization	108.9	7.8%	5
4	Bandwidth addition	90	6.4%	7
5	Optimization and efficiency improvement on the current web coding	73.9	5.3%	11
6	Software technology upgrade for the web	173.9	12.4%	2
7	Web database optimization and efficiency improvement	75.6	5.4%	10
8	Redesigning layout	110.5	7.9%	4
9	Staff addition	382.4	27.3%	1
10	Staff training for web security matters	108.3	7.7%	6
11	Adding communication media for users	58.5	4.2%	12
12	Mobile web implementation	25.2	1.8%	14
13	Cooperation with other organization unit	82.9	6%	8
14	Notification feature implementation	31.2	2.2%	13

responses that need priority attention from web management and staff to fulfill customer requirements. According to the table above, the technical response with the highest priority is "staff addition" and the lowest one is "mobile web implementation".

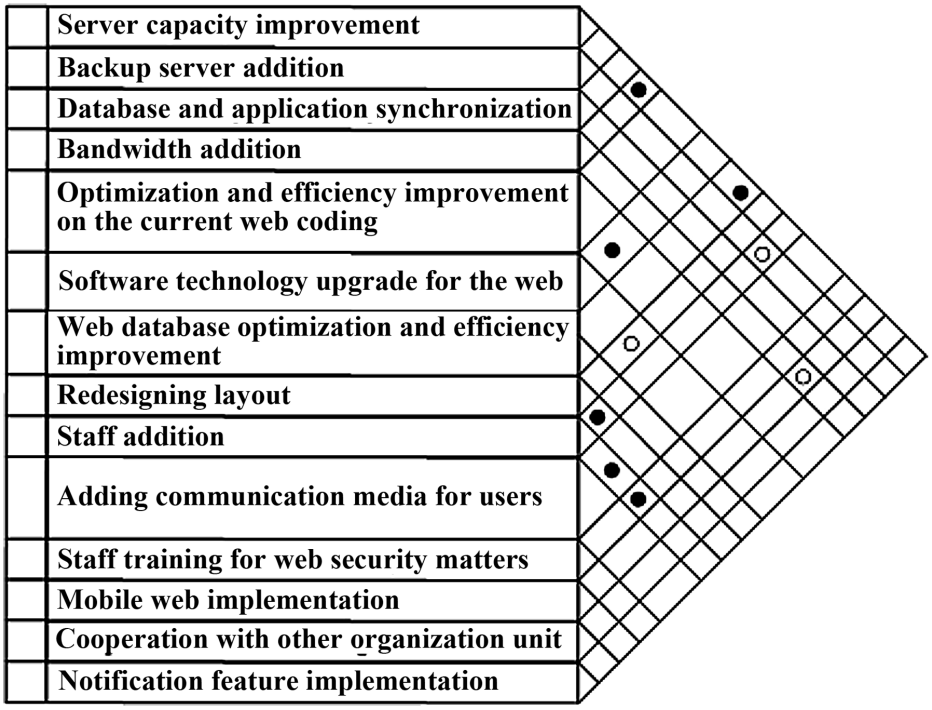
Relationship between Technical Responses

The relationship between technical responses is a relationship between each other existing technical responses. The relationship between technical responses is decided by identifying the trade off required in deciding the technical responses that need to get attention from service provider. The relationship is based on interview with university's UPT Information System staffs. The relationship between technical responses is portrayed using the following symbols:

1. **Strong Positive Relationship** (●)**:** The linear relationship between technical responses, where if one of the technical responses has an improvement or drop, it will strongly affect on the improvement or drop of other related items.
2. **Positive Relationship** (○)**:** The relationship where if one technical response has an improvement or drop, it will affect on the improvement or drop of the related technical responses.

Figure 6 shows the end result of relationship matrix between technical responses used to fulfill customer requirements according to the service attribute gained. From the picture above, we can find that from 14 technical responses, there are 10 relationships between technical responses, where 7 of them are positive strong relationships and 3 are positive relationships.

Figure 6. Relationship Matrix between Technical Responses



Server capacity improvement has strong positive relationship with bandwidth addition and web database optimization and efficiency improvement. Web coding optimization and efficiency improvement has strong positive relationship with software technology upgrade for the web, while software technology upgrade for the web has strong relationship with redesign layout. Redesign layout has strong positive relationship with staff addition, while staff addition has strong positive relationship with adding communication media with users and staff training for web security matters. Backup server addition has strong relationship with staff addition. Database and application synchronization has strong positive relationship with cooperation with other organization unit, and finally, bandwidth addition has strong relationship with mobile web implementation.

After each of the House of Quality creation process is done, each part of the process is combined into one thus creating website service House of Quality as seen in Figure 7.

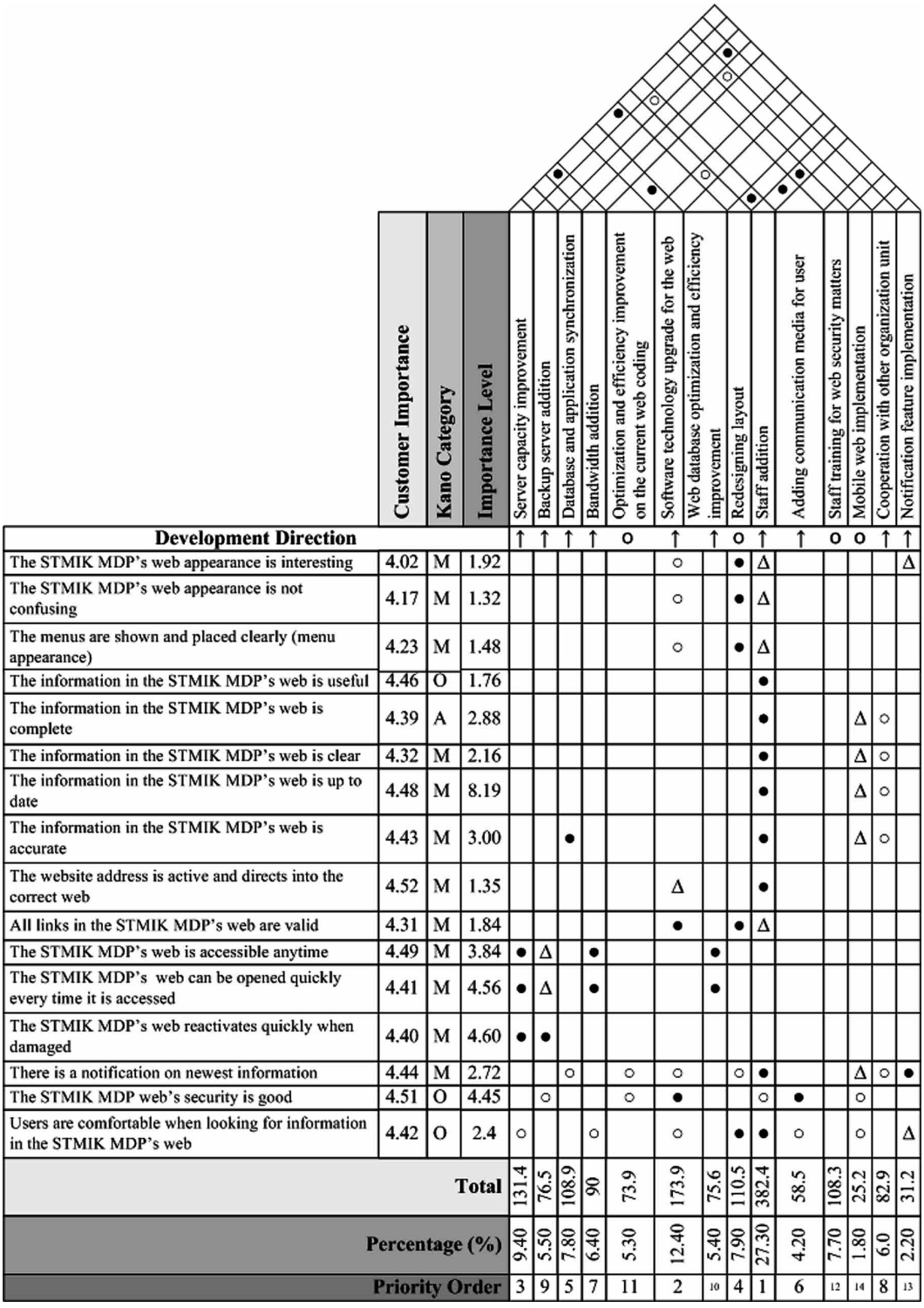
FUTURE RESEARCH DIRECTIONS

This study only considers website services in organization, whereas currently social media is also a popular channel to provide services, for example through the use of Facebook and Twitter. Moreover, social media is one of the most effective forms of channel for electronic word of mouth (e-WOM). It would be interesting if this study can be extended to evaluate university services that utilize social media. In addition, this study can also be applied to evaluate website-based service in other fields such as online-gaming that involves intense interaction with the user or news portals that focus on the provision of information services.

THEORETICAL SIGNIFICANCE

SERVQUAL is a theory that is widely used to evaluate the quality of services. The SERVQUAL concept is then spread to evaluate electronic service quality (or also known as E-SERVQUAL) like what was done by Carrasco et al. (2012), Udo, Bagchi, & Kirs (2011), Büyüközkan & Çifçi (2012), and so on. The SERVQUAL usage allowed organizations to identify the electronic service quality dimensions' condition. In the design service context, the SERVQUAL concept is often times integrated with Kano Model, especially to identify the dimensions that have to be prioritized by the organizations, like what was done by Zhao & Dholakia (2009).Unfortunately, so far we only find few literatures discussing integrated framework for end-to-end electronic services design, from evaluating their quality to formulating responses to improve the quality. This study successfully confirms integration of E-SERVQUAL, Kano Model and QFD can be applied also in the context of website services of universities. The integration between the three frameworks on university website service quality was implemented successfully to evaluate website service quality which includes at least three things: (1) identifying the strong and weak university website service quality dimensions, (2) identifying website service quality dimensions that need to be focused on, (3) decide the technical response required to improve the website service quality. This research is also successfully the result of Tan & Pawitra (2001) study which successfully applied the SERVQUAL, Kano Model, and QFD integration to improve organization's service quality.

Figure 7. University's Website Service House of Quality



Development Direction	Customer Importance	Kano Category	Importance Level	Server capacity improvement	Backup server addition	Database and application synchronization	Bandwidth addition	Optimization and efficiency improvement on the current web coding	Software technology upgrade for the web	Web database optimization and efficiency improvement	Redesigning layout	Staff addition	Adding communication media for user	Staff training for web security matters	Mobile web implementation	Cooperation with other organization unit	Notification feature implementation
				↑	↑	↑	↑	o	↑	↑	o	↑	↑	o	o	↑	↑
The STMIK MDP's web appearance is interesting	4.02	M	1.92						○		●	Δ					Δ
The STMIK MDP's web appearance is not confusing	4.17	M	1.32						○		●	Δ					
The menus are shown and placed clearly (menu appearance)	4.23	M	1.48						○		●	Δ					
The information in the STMIK MDP's web is useful	4.46	O	1.76									●					
The information in the STMIK MDP's web is complete	4.39	A	2.88									●			Δ	○	
The information in the STMIK MDP's web is clear	4.32	M	2.16									●			Δ	○	
The information in the STMIK MDP's web is up to date	4.48	M	8.19									●			Δ	○	
The information in the STMIK MDP's web is accurate	4.43	M	3.00			●						●			Δ	○	
The website address is active and directs into the correct web	4.52	M	1.35						Δ			●					
All links in the STMIK MDP's web are valid	4.31	M	1.84						●		●	Δ					
The STMIK MDP's web is accessible anytime	4.49	M	3.84	●	Δ		●			●							
The STMIK MDP's web can be opened quickly every time it is accessed	4.41	M	4.56	●	Δ		●			●							
The STMIK MDP's web reactivates quickly when damaged	4.40	M	4.60	●	●												
There is a notification on newest information	4.44	M	2.72			○		○	○		○	●			Δ	○	●
The STMIK MDP web's security is good	4.51	O	4.45		○			○	●			○	●		○		
Users are comfortable when looking for information in the STMIK MDP's web	4.42	O	2.4	○			○		○		●	●	○		○		Δ
Total				131.4	76.5	108.9	90	73.9	173.9	75.6	110.5	382.4	58.5	108.3	25.2	82.9	31.2
Percentage (%)				9.40	5.50	7.80	6.40	5.30	12.40	5.40	7.90	27.30	4.20	7.70	1.80	6.0	2.20
Priority Order				3	9	5	7	11	2	10	4	1	6	12	14	8	13

CONCLUSION

This study successfully integrates E-SERVQUAL, Kano Model and Quality Function Deployment (QFD) to evaluate the quality of website services in the universities. E-SERVQUAL attributes used in this study were grouped into five (5) dimensions of quality attributes, namely usability dimension as much as eight attributes, information quality dimension as much as six attributes, service reliability dimension as much as nine attributes, assurance dimension as much as three attributes and empathy dimension as much as one attribute. The dimensions from the electronic service are then evaluated with Kano Model to identify the dimensions that are prioritized by the electronic service customer in the university. And finally, QFD is applied successfully to decide the technical response required to improve the university's electronic service quality. Framework that we developed is also successfully applied to one of the private universities in Palembang, Indonesia. Based on our processing results by using Kano Model, we found 1 attribute classified as A (attractive) category, 3 attributes classified as O (one-dimensional) category, 12 attributes classified as M (Must-Be) category and the remaining 11 attributes classified as I (indifferent) category. Of the 14 technical responses were found at the stage of QFD, acquired five major action priorities to be carried out by the university, namely: adding staff, upgrading software technology for the web, increasing server capacity, redesigning the layout and database synchronization between applications.

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KEY TERMS AND DEFINITIONS

House of Quality (HoQ): A comprehensive matrix that is used to translate a set of customer requirements, customer importance level, as well as customer satisfaction level on product/service from market and data research from benchmarking process into technical target priority required to satisfy the customer requirements.

Kano Model or Kano Diagram: A highly useful diagram to classify the attributes of a product or service based on how the product or service can satisfy the users' demands.

Quality Function Deployment (QFD): Is a method that is used to translate subjective quality criteria into the objective one that can be accumulated and measured, and then used to design and create a product.

Quality: The standard of something as measured against other things of a similar kind; the degree of excellence of something.

Service Design: An activity of planning and organizing people, infrastructure, communication, and material components of a service in order to improve its quality and the interaction between service provider and customer.

Service Quality: A comparison of expectations with performance. A business with high service quality will meet customer needs whilst remaining economically competitive. Improved service quality may increase economic competitiveness.

Service: Assistance or advise given to customers during and after the sale of goods.

SERVQUAL: A method used to measure service quality by looking into the gap between users' perception and expectation on a service. With the method, we can know how much the gap is between customer's perception and expectation on a service.

Technical Response: The translation of customer requirements on a service they're getting into organizational language.