



PRIMARY RESEARCH

# Integrating customer experience quality and QFD for improving quality of wifi broadband service experience in telecommunication company

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## Keywords

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## Abstract

Nowadays, contemporary consumers look for engaging, robust, compelling, and memorable experience services so that competent service is not enough; services need to provide a good customer experience as a competitive advantage. In this research, the quality of service experience will be improved based on the Customer Experience Quality model integrated with Quality Function Deployment (QFD) method. This research will be conducted on a telecommunication companies in South Surabaya, Indonesia, which has decreased the number of Wifi Broadband Services users. Customer perceptions and importances of each Customer Experience Quality attribute in every customer touch point will be processed to identify which attributes are prioritized for improvement with the Important-Performance Analysis method. Then those priority attributes further processed using QFD to design the improvements and the technical recommendations. By improving quality of service based on Customer Experience Quality, it is expected increasing services in providing good experience for customer. Framework integration of Customer Experience Quality (EXQ) model and Importance-Performance Analysis into QFD will be developed in this study.

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## I. INTRODUCTION

Contemporary consumer now look for engaging, robust, compelling, and memorable experience [1, 2]. According to that, business needs to be emphasized to go beyond more than providing competent services but also providing services that have service experience quality which can provide good customer experience quality. Moreover in telecommunication services, especially internet broadband which in high competition in Indonesia, customer experience could be one of competitive advantage for telecommunication company.

The company, besides being demanded to increase sales, it is also required to retain customers. In researchs such as in [3, 4, 5], positive word of mouth can influence increasing sales. Meanwhile, customer loyalty can increase customer retention and decrease turnover [6, 7, 8]. Therefore,

customer experience is the answer to fulfill both increasing sales and retaining customer. That is because customer experience has significant relationship between positive word of mouth intention and customer loyalty [9, 10].

In Indonesia, the number of internet users has increased from year to year, in 2017 the number is 143 million which is half of the total population, so that is a big opportunity. However, the telecommunication company in south Surabaya, Indonesia, has decreased the number of internet wifi broadband services. It can be influenced by quality of service. Thus, in this research, it will be conducted improving quality of wifi broadband services especially in telecommunication company south Surabaya area based on customer experience.

Quality improvement design of wifi broadband services will be designed using QFD method which has been used in

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many quality improvement and product development studies such as in [11, 12, 13]. In many researchs, QFD also combined by other quality model such as Servqual [14] and combined with weighting method such as Fuzzy and AHP [14, 15, 16]. But there is not yet quality improvement design using QFD integrated with customer experience quality.

Therefore, in this research, it will conducted valuation and analysis quality of wifi broadband services based on customer experience quality dimensions as customer voice then design the improvement of priority quality attributes with QFD method.

## II. LITERATURE REVIEW

In this section, will be described the material regarding this research from many literature about Customer Experience Quality, Important-Performance Analysis and Quality Function Deployment.

### A. Customer Experience

In the past few decades, when raw materials and goods have become commoditized, services became differentiation from the competitors [17]. When the services increases and have become commoditized, it was no longer became differentiation anymore. Then experience is the next step of value creation as differentiation [18, 19]. The authors emphasized that businesses need to go beyond providing ser-

vices to providing unique experiences.

Customer experience is defined as the sum of all experiences, direct and indirect, that a customer has at every touch-point of the service process and customer-company relationship such as the organization, the facilities, the service firm's representatives and other customers [20]. Customer touch points itself are all the point of contacts of customers with services. A study identified experience factors as the main ingredients in building a new concept of service quality and including emotional factors in building the concept of service experience [9]. By improving customer experience quality, a services organization can achieve a different advantage, create positive moments of truth for customers, generate a better customer experience, increase revenue, get customer retention and positive customer word of mouth [20].

Customer Experience Quality is a better predictor for Customer Loyalty and Word-of-Mouth compared to Customer Satisfaction [9]. Therefore, in this study, Customer Experience Quality was used as a reference in assessing the quality of a service in terms of customer experience, not from the Customer Satisfaction point of view.

There are much research regarding customer experience, see Table 1. However there is not yet research or study which is used customer experience futher process into another application such as for improving quality (quality management) based on customer experience.

TABLE 1  
RESEARCH OR STUDY REGARDING CUSTOMER EXPERIENCE

No	Penulis (Tahun)	Keterangan
1	[21]	Speed is not the one and only factor of customer experience in internet broadband
2	[20]	Formulation the impact of service attributes on DTH-TV customer experience uses business intelligence.
3	[22]	Explanation of customer experience implementation (Customer Experience) to help business organizations maintain long-term customer satisfaction and how to gain competitive advantage.
4	[23]	Making the Customer Experience Framework that focuses on customer journey in a service.
5	[9]	Customer/Service Experience Quality Model (construct dimensions and attributes)

### B. Customer/Service Experience Quality

There are several conceptual models of Customer/Service Experience such as Customer Experience Quality or EXQ [9], Customer Experience Creation [24], Customer Experience [25]. According to [9], among the three models, the research that using empirical methods is EXQ by [9] and Customer

Experience by [25]. EXQ by [9] uses the Exploratory Research method to explore and define Customer Experience construction and create an EXQ measurement scale. [9] did the formation of dimensions and EXQ attributes starting from the beginning. Whereas Customer Experience by [25] does not carry out exploratory research where over-

lapping and interrelation between variables can occur [25]. Customer Experience by [25] also did not build construction to create a scale of Customer Experience measurement. In addition, the EXQ owned by [9] has more proof of relationship with marketing outcomes including repurchasing behavior, customer satisfaction, loyalty, and positive word-of-mouth intentions. While Customer Experience by [25] only proves the relationship with two marketing outcomes, that is Customer commitment and Customer involvement. Therefore, in this study the dimensions of EXQ from [9] will be used, because EXQ is a measurement scale that has been empirically proven through exploratory research in a case study and no longer just in study literature. EXQ also has a relationship with Customer Loyalty and Positive Word-of-Mouth Intentions which is needed in this study in relation to increasing customer retention and increasing sales.

**C. Dimensions and Attributes of Customer/Service Experience Quality**

Experience reflects the overall customer assessment of a value, so that experience assessment uses the perceptual attributes. These attributes reflect the purpose of a high level of customer leading to purchasing behaviour [9]. The dimensions and perceptual attributes of level 1 in this study will refer to [9], see Table 4.

[20] has examined the factors that influence Customer Experience on mobile broadband services in telecommunications companies. So the factors of Customer Experience according to [20] will have a greater likelihood of being in accordance with the services attributes of telecommunications companies in this study. His research also uses exploratory research to find out which factors influence the Customer Experience of cellular mobile services. However, to determine the dimensions/groups of factors, [20] was not constructive from the beginning but from a literature study, then later the explored factors were carried out confirmatory factor analysis to be included in the corresponding dimension/group. Therefore, attributes level 2 mostly refers to [20] and [20].

**D. Important-Performance Analysis**

Initially, Important-Performance Analysis (IPA) by [26] was used to evaluating consumer acceptance of a marketing program. But its appliation expands such as for customer satisfaction analysis. That is because IPA has “performance” component indicated the measure of result or outcome of process or work. Beside that IPA has “importance” component indicated the measure of significance or value. Importance and performance is assessed by customer or user who

go through the process. IPA result is shown in 4 quadrants looked like on Figure 1, those are:

- a). Quadrant I (Concentrate Here)  
The factors located in this quadrant are considered to be very important factors by consumers but the conditions at the moment are in low performance.
- b). Quadrant II (Keep Up The Good Work)  
The factors located in this quadrant are considered in high performance so that the management is obliged to ensure that the performance of the institutions can maintain the achievements.
- c). Quadrant III (Low Priority)  
The factors located in this quadrant have a low performance and at the same time are considered not too important for consumers.
- d). Quadrant IV (Possible Overkill)  
The factors located in this quadrant are considered not too important but in high performance so that the management needs to allocate resources related to these factors to other factors that have a higher priority of treatment that still need improvement.

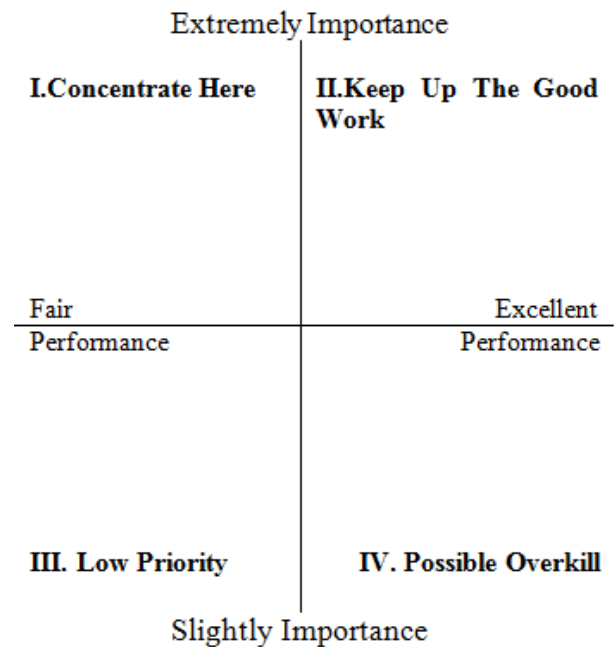


Fig. 1. Importance performance grid (reproduced from [26])

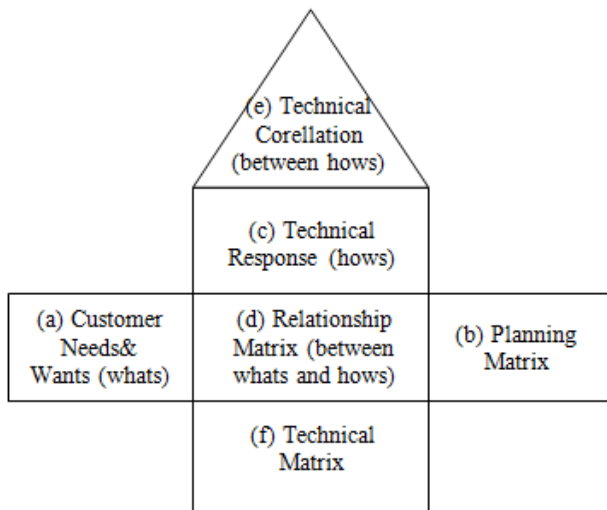


Fig. 2. House of Quality in QFD Method (reproduced from [27] [28])

**E. QFD**

QFD is one of the tools in Total Quality Management that uses customer needs in designing a product. The basic element of QFD is the quality defined by the customers. Historically, the QFD was developed in 1972 by Dr. Yoji Akao in Japan. Implementation of the QFD method in the process of designing products (goods/services) begins with the mak-

ing of House of Quality (HoQ). According to [28], House of Quality has 6 matrices/stages looked like on Figure 2, they are:

- (a). Customer Needs and Wants (Voice of customer)–extracting, developing, and categorizing customer requirements,
- (b). Planning Matrix –set target levels (goal), improvement ratio, sales point and prioritizing customer requirements (weight) and comparing the performances with competitors,
- (c). Technical Response–translate customer requirements to functional requiremen/design requirements by company or organization,
- (d). Relationship Matrix – evaluating impact of functional/design requirements on customer requirements,
- (e). Technical Correlation – describe the role of interdependence and interrelationship between functional/design requirements,
- (f). Technical Matrix – specifying target values and prioritizing functional/design requirements.

There are many research regarding QFD. Some of them, QFD were combined and integrated with other models and or other methods, see Table 2. However, there is not yet research which integrating QFD with customer experience quality.

TABLE 2  
RESEARCH AND STUDY REGARDING QFD INTEGRATED WITH OTHER MODELS AND METHODS

No	Authors (Year)	Methods	Objectives
1	[11]	QFD	Design development of PDA device.
2	[14]	QFD, Servqual, Kano	Framework integration of Servqual and Kano into QFD.
3	[29]	QFD, Servqual	Servqual and QFD approach to total quality education.
5	[12]	QFD, AHP	Application of QFD to improve quality of teaching.

**F. Conceptual Framework**

The Customer/Service Experience Quality and QFD integration framework models proposed in this study looked like on Figure 3.

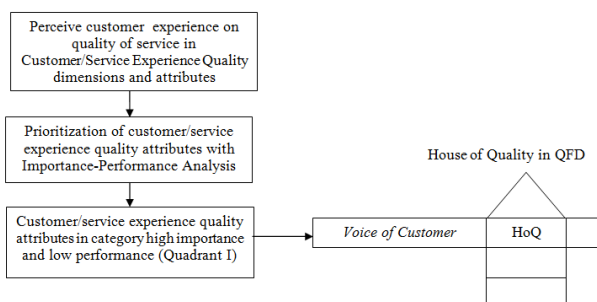


Fig. 3. Framework integration of customer/service experience quality model into QFD

**G. Quality Function Deployment**

First, an assessment of the perception of customer experience on service quality is assessed in the dimensions and attributes of the EXQ. Assessment is conducted using perceptual attributes with a Likert scale.

After the assessment data of all attributes are collected, then priority analysis is carried out to get the attributes which are the priority for service improvement using the Importance-Performance Analysis method.

Attributes that located in quadrant I (high importance, low performance) are priority attributes to be improved based on customer judgment.

Attributes in quadrant I are the voice of customer as input from the house of quality part of the customer needs and wants matrix in the Quality Function Deployment method

### III. CASE STUDY

In these sections, will be described a case study, the data analysis, results and discussion about the implementation of integrating EXQ for improving wifi broadband service experience in telecommunication company south Surabaya area.

#### A. Preliminary

This case study conducted in a telecommunication company south Surabaya, Indonesia which the number of wifi broadband service users had decreased almost 50% in September 2018 from the number of users a month before. Assessment was conducted on the quality of wifi broadband service based on perceiving customer experience referred to EXQ dimensions and attributes.

Firstly, dimensions and attributes extracted from the liter-

ature. After that, determine customer touch point to support the determining of attributes, see Table 3. Then confirm those attributes by focus group discussion with manager and staff of the company regarding to this case study. The number of attributes which used for perceiving quality of services based on customer experience/EXQ perception and EXQ expectation/goal were 35 attributes.

Respondent was selected in purposive sampling in total number of 60 users/customers. The half for validity and reliability test of the attributes, and the half one for collecting the level importance and performance of perception and expectation of the valid and reliable attributes.

After that, validity and reliability test conducted using Pearson Corellation and Cronbanch-Alpha method, the number of valid and reliable attributes were 32 attributes, see Table 4. Then collected the level importance, perception EXQ, and expectation/goal EXQ of those 32 attributes. Valuation of level EXQ perception and importance uses Likert scale 1–5 where the bigger value is the higher level.

TABLE 3  
CUSTOMER TOUCH POINT OF WIFI BROADBAND SERVICES IN THIS STUDY

Before using services	When using services	After using services
Website, application	Wifi Corner/hotspot	Online live chat
Social media: testimony, ratings, reviews	Point of sales wifi voucher	Support technician
Word of mouth (WoM)	Website	Customer care service
Community involvement	SMS Activation	E-mail
Advertisement	Welcome Page	Customer call center
Marketing program	E-mail	Social media

TABLE 4  
CUSTOMER/SERVICE EXPERIENCE QUALITY (EXQ) DIMENSIONS AND ATTRIBUTES

Dimension	Attribute Level-1	Attribute Level-2	Mean EXQ Perception (xi)	Mean EXQ Importance (yi)
A. Product Experience [9]	a). Freedom of choice [9]	1) Having chance to choose service type/package [9]	3.633	3.533

TABLE 4  
CONTINUE

Dimension	Attribute Level-1	Attribute Level-2	Mean EXQ Perception (xi)	Mean EXQ Importance (yi)
	b). Data connectivity [20]	2) Fast connectivity service [20]	3.733	4.6
		3) Stable connectivity service [20]	3.367	4.633
	c). Quality of product/service [20]	4) Online Live Chat feature is useful.	3.533	3.33
	d). Product comparison [9]	5) Services that are appropriate with marketing information [20]	3.367	3.467
		6) Prices are appropriate with the value enjoyed [20]	3.667	4
		7) Prices are better than competitors [20]	3.7	4.233
B. Moments of Truth [9]	a). Service recovery [9]	8) Quick response of complaints by customer call center (Joshi, 2014)	3.133	4.167
		9) Fast handling of complaints by technician support [20]	3.133	4.1
	b). Interpersonal skills [9]	10) Efficient customer care services (Joshi, 2014)	3.433	4.033
		11) Good service at Wifi Corner (wifi hotspot provided)	3.5	4.067
		12) Treated is very valuable as a customer [20]	3.5	4.167
	c). Flexibility [9]	13) Easy to switch service pack [9]	3.433	3.933
	d). Pro-activity [9]	14) Notification of Wifi Corner/hotspot locations from application	3.2	3.467
		15) Notification of access to wifi besides Wifi Corner/hotspot	3.233	3.467

TABLE 4  
CONTINUE

Dimension	Attribute Level-1	Attribute Level-2	Mean EXQ Perception (xi)	Mean EXQ Importance (yi)
		16) Latest information updates about services in social media, email (Joshi, 2014)	3.467	3.467
		17) Information about new technologies service being launched from email, social media [20]	3.6	3.4
C. Peace of Mind [9]	a). Expertise	18) Expert in service [9]	3.7	3.9
	b). Process ease	19) Easy to do service activation via SMS activation [9]	3.767	4.3
		20) Fast service installation / activation using wifi voucher [9]	3.7	4.467
	c). Convenience retention	21) Easily find Wifi Corner/hotspot locations	3.767	4.133
		22) Easily find access to wifi besides the Wifi Corner/hotspot	3.3	4
	d). Relationship vs transaction [25]	23) Attractive promotions / discounts [20]	3.167	3.9
		24) Reward for loyal customer	2.8	4
	e). Familiarity	26) Have ever used the same service from the same provider before [9]	3.467	3.733
	f). Independent advice	27) An independent advice from marketing personnel [9]	3.5	3.733

TABLE 4  
CONTINUE

Dimension	Attribute Level-1	Attribute Level-2	Mean EXQ Perception (xi)	Mean EXQ Importance (yi)
D. Outcome focus (Klaus & Maklan, 2012)	a). Inertia 28)	If there is another provider, it will not change the service provider [9]	3.467	3.033
	b). Result focus	29) Stay on this provider instead of looking for another provider [9]	3.6	3.533
	c). Past experience	30) Stay on this provider because you feel confident about using other provider services[9]	3.5	3.267
	d). Common grounding	31) Marketing staff also uses the services offered [9]	3.7	3.533
		32) Recommend this service to others [9]	3.833	3.233
Total (Total: 32)			111.133 X = 3.473	122.433 Y = 3.826

**B. Data Analysis**

Each of 32 attributes perception and importance was calculated its mean by divided total value with number of respondent. Each of 32 mean of “perception” attributes became “xi” coordinat point. And each of 32 mean of “importance” attributes became “yi” coordinat point. Then sum up all of 32 mean “perception” attributes and divided by number of

attributes that was 32, its result became line X. And sum up all of 32 mean “importance” attributes and divided by 32, its result became line Y. And then all of “xi” and “yi” coordinat point, and line X and Y (see Table 4) located in grid. All the calculation above were able using software statistic application e.g Minitab, Ms.Excell, or SPSS). So the importance-performance grid looks like Figure 4.

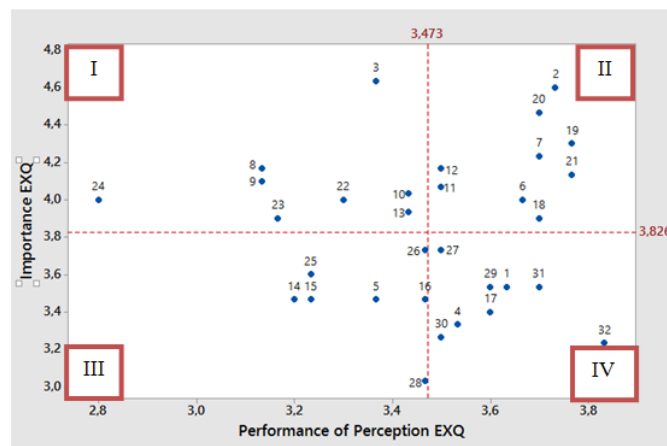


Fig. 4. The importance-performance analysis grid in this study



IV. RESULTS

Based on important-performance analysis grid in this study, see Figure 4, there were 8 attributes that in quadrant I “con-

centrate here”, that was high importance and low performance.

TABLE 5  
PLANNING MATRIX PREPARATION TABLE WITH PRIORITY ATTRIBUTES TO BE IMPROVED

Attributes	EXQ	EXQ	EXQ	Improvement Ratio	Sales Point	Weight	Relative Weight	Priority
	Percep-tion	Goal	Impor-tance					
	a	b	c		d = (b/a)	e	f = (c*d*e)	g = (f/8) *100%
1 Stable connectivity service.	3.367	4.467	4.633	1.327	1.5	9.219	15.470	2
2 Quick response on complaints by customer call centre.	3.133	4.333	4.167	1.383	1.5	8.644	14.505	3
3 Fast handling of complaints by technician.	3.133	4.333	4.1	1.383	1.2	6.804	11.417	5
4 Efficient customer care services.	3.433	4.333	4.033	1.262	1.2	6.108	10,250	7
5 Easy to switch service pack.	3.433	4.3	3.933	1.253	1	4.926	8.266	8
6 Easily find access to wifi besides in the Wifi Corner/hotspot.	3.3	4.367	4	1.323	1,5	7.94	13.324	4
7 Attractive promotions/discounts.	3.167	4.367	3.9	1.379	1.2	6.453	10.828	6
8 Rewards for loyal customer.	2.8	4.433	4	1.583	1.5	9.499	15.940	1
						Total	59.593	100%

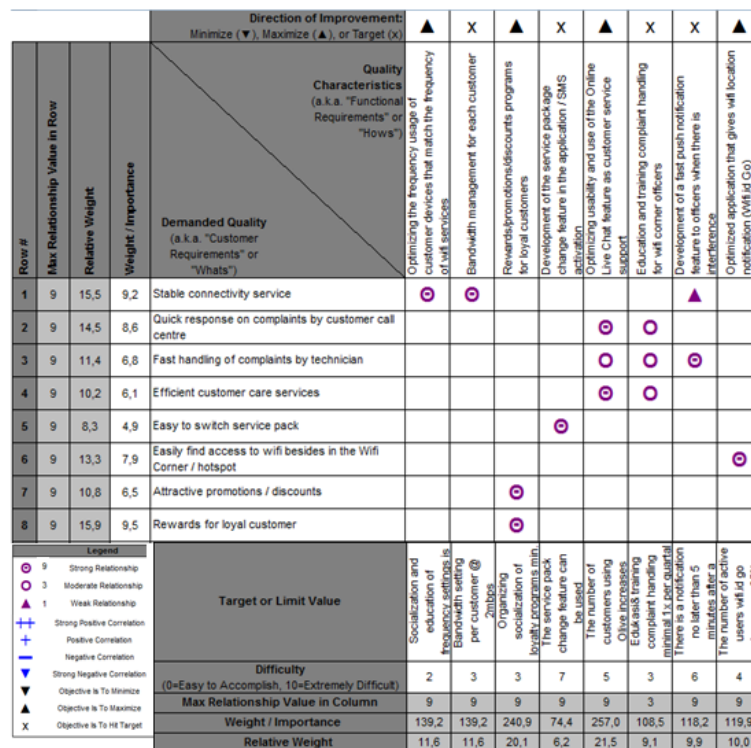


Fig. 5. House of quality in this study (“Quality function deployment tools and information for real life application,” 2007)

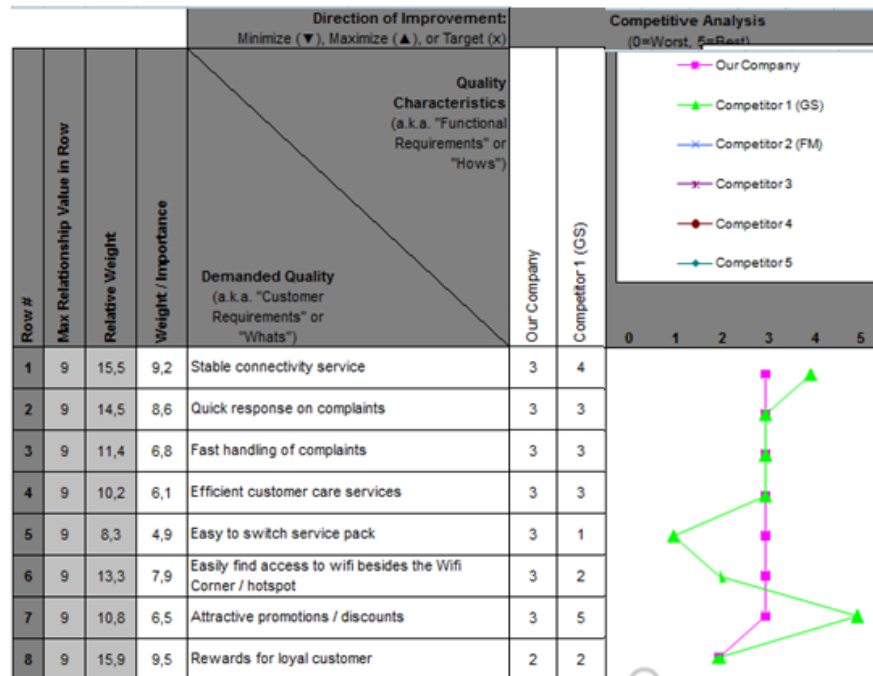


Fig. 6. House of quality in this study: Comparison with the competitor's ("Quality function deployment tools and information for real life application," 2007)

They were (3) Stable connectivity service; (8) Quick response of complaints by customer call centre; (9) Fast handling of complaints by technician; (10) Efficient customer care services; (13) Easy to switch service pack; (22) Easily find access to wifi besides in the Wifi Corner/hotspot; (23) Attractive promotions/discounts; (24) Reward for loyal customer. Those 8 attributes as priority attributes became input into house of quality (QFD) as voice of customer in the Customer Needs and Wants stage.

After finished Customer Needs and Wants stage, prepared the Planning Matrix stage to set target levels or goal (from customer expectations of EXQ), improvement ratio, sales point and priority customer requirements (weight and relative weight), see Table 5. Sales point defined as follow: 1.0 if less profitable; 1.2 if quite profitable and 1.5 if profitable for the company/organization. Based on the calculation of weight and relative weight in Table 5, the priority of attributes can be determined.

Then designed the functional requirements of those 8 attributes as customer requirements. In this example case study, there were 8 functional requirements. Determined the relationship between 8 functional requirements and 8 customer requirements. And determined direction of improvement of functional requirements and the correlation among functional requirements themselves. After that, specifying the target or limit value and priority (weight and relative weight) of those functional requirements. The re-

sult of those process arranged become house of quality look like Figure 5 and Figure 6.

## V. DISCUSSION

In this discussion section, will be discuss about the general discussion of results, benefit of the study, limitation of this study, and managerial impact.

### A. General Discussion of the Results

There are 8 attributes customer experience quality that are priority to be improved in this study, in descending order, they are: (1) Reward for loyal customer; (2) Stable connectivity service; (3) Quick response of complaints by customer call centre; (4) Easily find access to wifi besides in the Wifi Corner/hotspot; (5) Fast handling of complaints by technician; (6) Attractive promotions/discounts; (7) Efficient customer care services; (8) Easy to switch service pack.

While there are 5 priority functional/design requirement as technical response of those 8 attributes, they are: (1) Optimizing usability and use of the Online Live Chat feature as customer service support; (2) Rewards/promotions/discounts programs for loyal customers; (3) Optimizing the frequency usage of customer devices that match the frequency of wifi services; (4) Bandwidth management for each customer; (5) Optimized application that gives wifi location notification (Wifi.id Go).

### B. Benefit of the Study

By using Customer Experience Quality to generate dimensions and attributes, the attributes of service experience quality can be determined detail based on experience of the customer on every customer touch points of the services. Customer experience quality has stronger positive relationship with customer loyalty and positive word of mouth intention instead of customer satisfaction according to [9]. So that, the expectation is by applying customer experience quality in improving services, it can increase customer loyalty and positive word of mouth intention higher too. Beside that, customer experience can become differentiation value of other competent services and competitive advantage.

### C. Limitation of the Study

This study was restricted to the city south Surabaya area, Indonesia and did not include other regions. The study was also implemented in wifi broadband services which can be different in attributes from other services.

### D. Managerial Implication of the Study

For telecommunication company management, the study findings can be used as a material for decision making in designing improvements in the quality of wifi broadband services and competitive advantages based on Customer Experience.

### E. Scope of Future Study

This study was limited in wifi broadband services, the same research can be conducted on other services with generating appropriate attributes. The scope can be expanded to other regions. The method to prioritize the attributes can use other method appropriate with the complexity of the study.

## VI. CONCLUSION

The main goal of this study is integrating customer experience quality and importance-performance analysis into QFD to improve wifi broadband service experience quality in telecommunication company south Surabaya, Indonesia by using framework proposed in this study. Customer Experience Quality is to generate dimensions and attributes used for valuation the customer experience on quality of service experience. Meanwhile Importance-Performance Analysis is to determine the priority of those customer experience quality attributes. The priority attributes are become voice of customers in the Customer Needs and Wants stage of House of Quality in QFD method.

## VII. ACKNOWLEDGMENT

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