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Integrating Importance-Performance Analysis into E-S-QUAL and E-RecS-QUAL scales for Assessing Electronic Service Quality

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Abstract. In this globalization era, service sector has been arguably affected and influenced by the internet for doing several activities, especially in doing business. As a result, service sector nowadays has transformed from the conventional way into the electronic service (e-service). This paper tried to integrate the importance-performance analysis (IPA) model to E-S-QUAL and E-RecS-QUAL scales to assess the e-service quality. It implies that not only the performance of e-service quality is assessed, but also its importance. It is according to the fact that every service provider is believed to have limited resources. Therefore, the resources have to be best deployed based on the priorities (i.e., importance) to achieve customer satisfaction. A case study was performed in one of the largest online fashion shops in Indonesia to show the applicability of the methods. It is believed that this research could offer the service providers with valued understanding of the service attributes that manifest point of views of the customers.

1. Introduction

In this competitive global market era, the internet has developed remarkably fast to facilitate tons of people in the world. The internet users are estimated to be more than 40% of the world population [1]. The internet, over the past decades, has strengthen itself as an impressive platform that has transformed the way people behave, in this sense, to do business. With the aid of the internet, the companies have adopted new information and communication technology to help their businesses. They tried to enhance some competitive advantages to interact with their customers by using electronic transactions or electronic commerce (e-commerce). Most successful companies have realized that the vital factors for being successful or being failed in employing the e-commerce are not simply the presence of website and lower products price, but also the quality of electronic service (e-service) [2]. Consequently, they need to move from e-commerce, i.e., the transactions only, to e-service, i.e., all signals and encounters involving the transactions [3].

Contrasting with the notion of traditional service quality that has been investigated by abundant researchers (e.g., [4]−[9]), the research on the e-service quality are still at an initial phase [10]. The e-service quality is defined by Santos as "overall customer assessment and judgment of e-service delivery in the virtual marketplace" [11]. There are several assessing schemes to assess and measure the e-service quality, such as: SITEQUAL [12], WebQual 4.0. [13], WebQualTM [14], eTailQ [15], e-SERVQUAL [16], eTransQual [17], and PeSQ [18].

Although the previous research has defined the exact area of the quality construct and deliver a clear definition of the e-service, most of those do not present a wide-ranging assessment of the web-site and

have not been properly examined in terms of the psychometric properties [19]. In addition, most of the research often conceptualize the e-service quality as being equal to the website design quality [16], [17]. In an endeavor to deal with all those concerns, [20] systematically identified some dimensions that influence to the e-service quality and classified them in term of an e-SERVQUAL scale. However, according to a thorough examination by [2], the e-SERVQUAL scale was then modified to produce a more comprehensive concept of e-service quality in terms of seven dimensions that evaluates the whole service encounter, including both the transaction and the post-transaction process. Those seven dimensions further were divided into two different scales [3]: the first is called E-S-QUAL and the second is E-RecS-QUAL. The first refers to the *core* e-service quality features and the second measures the *recovery* aspects i.e., the effectiveness of the service providers to handling and compensate encountered problems.

In this research, to assess the e-service quality, we attempt to combine those E-S-QUAL and E-RecS-QUAL scales with importance-performance analysis (IPA) model [21]. Most of service quality assessment tools are failed to include such importance ranking in their survey methods. In fact, every company has limited resources; and as a consequence, it has to be determined how the limited resources are utilized efficiently based on the priorities (importance) to pursue customer satisfaction.

The IPA model is believed to be a simple and effective method to identify attributes that performed well and those which were needed an improvement. It is usually used to determine the priority of the service attributes according to the importance and performance. The output coming from the E-S-QUAL and the E-RecS-QUAL scales would be the input for the IPA model. The IPA model is still popular till today due to its simplicity, easy to be used, and simple to be interpreted (e.g., [22]−[26]).

To demonstrate the applicability of the method, a case study has been carried out in Indonesia, in one of the biggest fashion online shopping sites. Online shopping was chosen because it is a prosperous market. The sales of retail e-commerce worldwide amounted to 1.08 trillion USD in 2013 and it is projected to grow up to 2.48 trillion USD by 2018 [27]. In a narrower scope, Indonesia, online shopping has expanded tremendously. The research from SP e-Commerce illustrates that the online retail sales amounted to 2.6 billion USD. The figure is projected to touch 4.49 billion USD in 2016 [28].

2. Research design

The E-S-QUAL and E-RecS-QUAL scales are employed to assess the quality of e-service. The first scale comprises four dimensions, i.e., efficiency, fulfilment, system availability, and privacy, with 22 attributes; while the later entails three dimensions, i.e., responsiveness, compensation, and contact, with 11 attributes. The stand-alone performance scale [7] was employed and combined with the importance scale. Arguably, the stand-alone performance scale is believed to suppress the disconfirmation model or difference scores, i.e. perception minus expectation [7], [9], [29], [30]. The disconfirmation model, moreover, has been subjected to a number of operational as well as theoretical criticisms [31].

2.1. E-S-QUAL scale

The E-S-QUAL scale consists of four dimensions, i.e., efficiency, fulfilment, system availability, and privacy. The first dimension, efficiency, is defined as the easiness and quickness when the users are accessing the website. The website must be simple to use and operate, structured appropriately, and needs a minimum information to be input. Efficiency consists of eight attributes, i.e., (i) the website makes it easy to find what the customers want (EFF1); (ii) it makes it easy to get anywhere on the website (EFF2); (iii) the website enables the customers to complete a transaction fast (EFF3); (iv) information at the website is well-ordered (EFF4); (v) the website loads its pages quickly (EFF5); (vi) the website is simple to use (EFF6); (vii) the website enables the customer to get on to it fast (EFF7); and (viii) the website is well-ordered (EFF8).

Fulfilment as the second dimension is defined as the degree to which the service provider's promises about order delivery and fulfilment of the availability of the products. It comprises of seven attributes, i.e., (i) it delivers orders when promised (FUL1); (ii) it makes products available for delivery within an appropriate period (FUL2); (iii) it delivers what the customer order quickly (FUL3); (iv) it sends out the

products ordered (FUL4); (v) when the service provider claims to have a product, the product is in stock (FUL5); (vi) the offerings are truthful (FUL6); and (vii) it makes precise promises towards delivery of the products (FUL7).

System availability refers to the accurate technical functioning of the website. It is related to the ability of the service provider to maintain the website so that it works appropriately. This third dimension consists of four attributes, i.e., (i) the website is available for business anytime (SYS1); the website launches and loads right away (SYS2); the website does not crash (SYS3); and pages at this website do not freeze after the customers enter the order information (SYS4). The last dimension, privacy, refers to the level of protection of customer information. It comprises of three attributes, i.e., (i) it protects the web-shopping behavior information of the customers (PRI1); (ii) the customer's personal information is not shared to other websites (PRI2); and (iii) the website protects the customers' credit card information (PRI3).

The overall score of E-S-QUAL can be calculated by multiplying the weighting factor of attribute *j* to an individual *i* WS_{ij} with the performance scores as follows:

$$\text{E-S-QUAL}_j = \sum_{i=1}^{n} WS_{ij} \cdot PS_{ij} \,, \tag{1}$$

where E-S-QUAL_j is the e-service quality score of attribute *j* and PS_{ij} is the score from individual *i* for the performance of e-service quality on attribute *j*. The weighting factor is in a normalized form and could be computed as follows:

$$WS_{ij} = \frac{IS_{ij} - \min_i\left(IS_j\right)}{\max_i\left(IS_j\right) - \min_i\left(IS_j\right)}, \tag{2}$$

where IS_{ij} is the score of importance of the quality of e-service of attribute *j* to an individual *i*.

2.2. E-RecS-QUAL scale

The scale is utilized to assess the quality of e-service when the problem(s) is(are) occurred. The scale contains three dimensions, i.e., responsiveness, compensation, and contact. The first dimension, responsiveness, denotes the effectively handling of problems through the website. It contains five attributes, i.e., (i) it offers the customers with appropriate options to return the items (RES1); (ii) the website manages product returns well (RES2); (iii) it suggests a good guarantee (RES3); (iv) it tells what to do if the transaction is not well processed (RES4), and it carefully takes care of problems (RES5).

The second dimension, compensation, is defined as the level to which the service provider compensates customers for any problem that might happen. It encompasses three attributes, i.e., (i) the website compensates for problems it creates (COM1); (ii) it compensates when the order does not arrive punctually (COM2); (iii) it picks up products to be returned to the service provider from customer's home or work address (COM3). Finally, the third dimension is contact. It is defined as the accessibility of any help from the service provider either through online representative or telephone. It entails three attributes, i.e., (i) the website provides a telephone number to grasp the service provider (CON1); (ii) it has online and available customer service (CON2); and (iii) it offers the possibility to speak to a *live* person, i.e., not a robot (CON3).

The overall score of E-RecS-QUAL can be calculated by multiplying the weighting factor of attribute *j* to an individual *i*, WR_{ij}, with the performance scores as follows:

$$\text{E-RecS-QUAL}_j = \sum_{i=1}^{n} WR_{ij} \cdot PR_{ij} \,, \tag{3}$$

where E-RecS-QUAL_j is the e-service quality's recovery score of attribute *j* and PR_{ij} is the score from individual *i* with respect to the performance of e-service quality's recovery on attribute *j*. The WR_{ij} is in a normalized form and could be computed as follows:

$$WR_{ij} = \frac{IR_{ij} - \min_i(IR_j)}{\max_i(IR_j) - \min_i(IR_j)}, \quad (4)$$

where IR_{ij} is the score of importance of e-service quality's recovery of attribute j to an individual i.

2.3. Importance-performance analysis

The IPA, introduced by [21], is an analytical technique that is used to identify the performance of the service provider along with its corresponding importance. The importance and performance scores for each attribute are utilized to create the IPA diagram. The performance score is depicted in the horizontal axis while the importance score is labelled by the vertical axis. This plot classifies attributes into four quadrants. The four quadrants are identified as concentrate here (I), keep up the good work (II), low priority (III), and possibly overkill (IV).

The first quadrant is positioned in the north-west. It has low performance but perceived important. Therefore, the firm is suggested to invest more to improve these attributes. The attributes fall into the second quadrant performed good and considered as important by the customers. The third quadrant is low priority. The attributes belong here perform well yet the customers observe as less important. The last quadrant is believed to be less important but the well-performed, so that they are needed to be downgraded because of the unnecessary investment.

3. Case study result

A case study was performed to evaluate the e-service quality and e-service quality's recovery of an online fashion shops in Indonesia. Note that the results (i.e., Table 1 and Table 2) are coming from [32] because this research is a continuation research.

The IPA model is used here to establish strategic strategies to achieve customer satisfaction according to the importance and the performance of the service attributes from the perspectives of the customers. It combines the performance and importance into a diagram to give an important understanding through the performance of the service provider corresponding with the importance. Figure 1 depicts the diagram for the E-S-QUAL result.

Attributes located in the fourth quadrant are: EFF1, EFF7, FUL3, FUL7, SYS4, and PRI3. Those attributes are regarded as have high performance with low importance. It implies that the management tends to give so much attention for those attributes. It is suggested to reduce these *unnecessary activities* due to the excessive investment. Five attributes located in the third quadrant are EFF3 and EFF5 for efficiency dimension, FUL1 for fulfilment dimension, as well as SYS2 and SYS3 for system availability. It refers to the attributes that are perceived as not important and have low performance. Even though these attributes perform poorly, it is highly suggested that the management ought not expend much investment since they are labelled as not important. Next, in the second quadrant, there are numerous attributes located here. They are EFF2, EFF6, and EFF8 for efficiency dimension, FUL4 and FUL5 for fulfilment dimension, PRI1 and PRI2 for privacy dimension, and there is only one attribute for system availability: SYS1. The customers believed that those are important, and the service provider has performed as their best. For example, FUL5 refers that the object of the research always has the items it claims to have in its stock. The customers feel glad about this since they can purchase their desired items with-out worrying about stock-out problem. Overall, it implies that the service provider has to keep these attributes at their top level to improve customer satisfaction.

The most important quadrant respects to all quadrants is the first quadrant, i.e., concentrate here. All attributes in this quadrant are importantly perceived by the customers but have low performance scores. Those should be the focus of the service provider's improvement agenda to attain customer satisfaction. Fortunately, there are only three attributes from two dimensions located in this quadrant, i.e., EFF4 from efficiency dimension, as well as FUL2 and FUL6 from fulfilment dimension. EFF4 refers that any information given in the website is well organized. Since the customers perceived it poorly perform, it means that the information in the website is not well organized, or in other word, it is messy. The management should arrange the information properly so that the customers would perceive

it well. Referring to FUL2 attribute, the object of the research could not make a delivery within a suitable period that it being promised to the customers. The on-time schedule for item deliveries must be the priority of the management to pursue customer satisfaction. Since FUL6 refers to being truthful about the offerings, consequently, the management has to keep its promises so that the customers not to feel disappointed.

Table 1. The E-S-QUAL results

Dimensions		IS_j	WS_j	PS_j	E-S-QUAL$_j$
Efficiency	EFF1	4.030	0.757	3.997	3.027
	EFF2	4.149	0.787	4.033	3.175
	EFF3	4.020	0.755	3.801	2.870
	EFF4	4.036	0.759	3.894	2.956
	EFF5	3.858	0.714	3.732	2.666
	EFF6	4.060	0.765	3.957	3.027
	EFF7	4.017	0.754	3.993	3.012
	EFF8	4.040	0.760	3.927	2.984
Fulfillment	FUL1	4.030	0.757	3.732	2.827
	FUL2	4.109	0.777	3.861	3.001
	FUL3	3.844	0.711	3.977	2.828
	FUL4	4.248	0.812	4.026	3.270
	FUL5	4.222	0.805	3.967	3.195
	FUL6	4.046	0.762	3.868	2.945
	FUL7	3.940	0.735	3.993	2.936
System Availability	SYS1	4.189	0.797	3.977	3.170
	SYS2	3.940	0.735	3.801	2.794
	SYS3	3.666	0.666	3.632	2.421
	SYS4	3.887	0.722	3.957	2.856
Privacy	PRI1	4.149	0.787	3.967	3.123
	PRI2	4.182	0.796	4.007	3.187
	PRI3	4.000	0.750	3.967	2.975
Average		4.030	0.758	3.912	2.966

Table 2. The E-RecS-QUAL results

Dimensions		IR_j	WR_j	PR_j	E-RecS-QUAL$_j$
Responsiveness	RES1	3.964	0.741	3.762	2.788
	RES2	4.012	0.753	3.738	2.815
	RES3	4.012	0.753	3.940	2.967
	RES4	4.095	0.774	3.738	2.893
	RES5	4.048	0.762	3.369	2.567
Compensation	COM1	3.798	0.699	3.440	2.406
	COM2	3.643	0.661	3.369	2.226
	COM3	3.310	0.577	3.405	1.966
Contact	CON1	4.310	0.827	4.119	3.408
	CON2	4.369	0.842	4.190	3.529
	CON3	4.143	0.786	3.940	3.096
Average		3.973	0.743	3.728	2.787

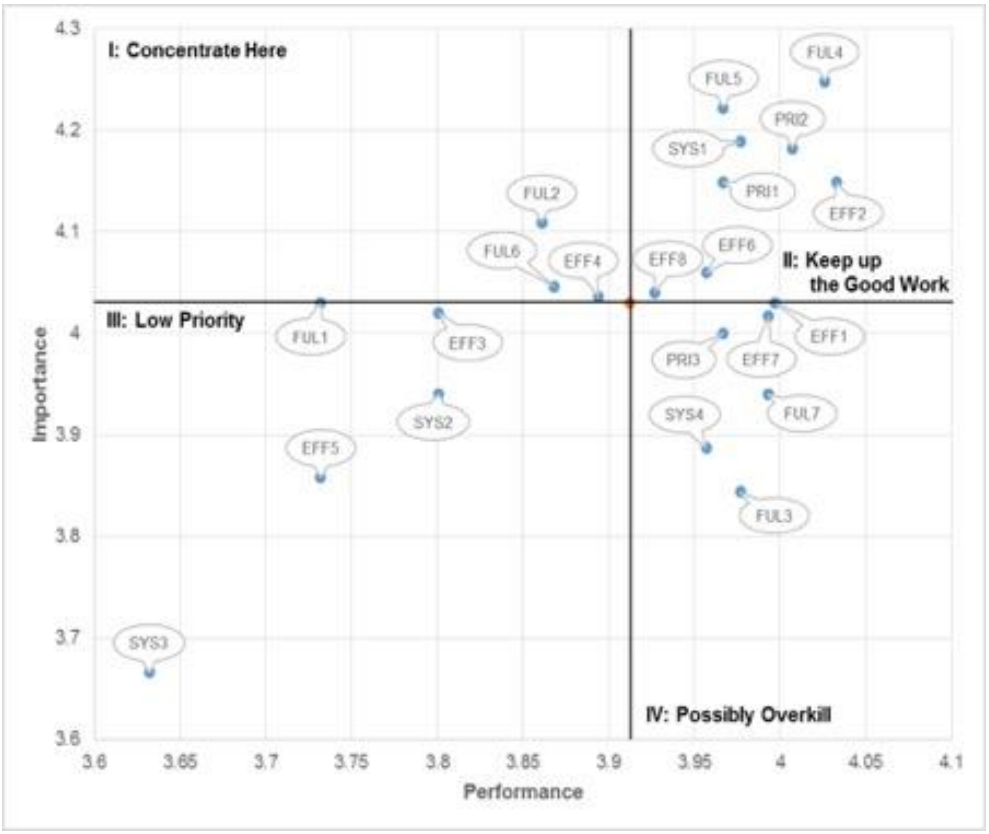

Figure 1. IPA Diagram for the E-S-QUAL result

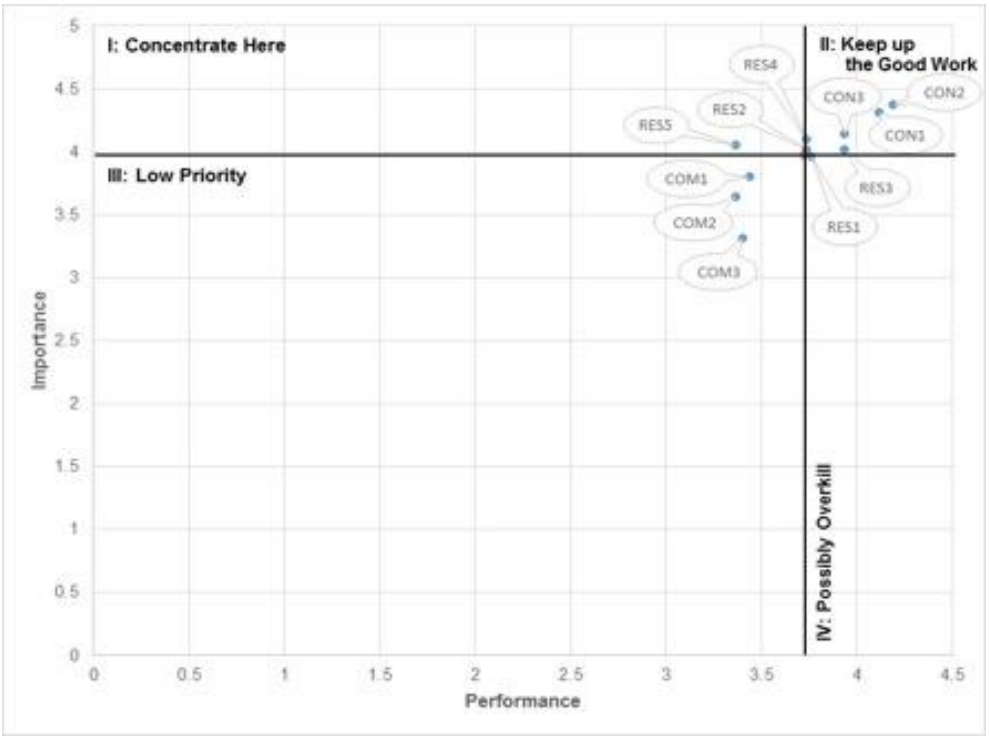

Figure 2. IPA Diagram for the E-RecS-QUAL result

Figure 2 depicts the IPA diagram for E-RecS-QUAL scale. Surprisingly, only one attribute belongs to the first quadrant, i.e., RES5 from responsiveness dimension. It means that from all of attributes in E-RecS-QUAL scale, the management only has to improve its performance in taking care of the problems carefully. It goes along with the fact that there are more than 50% of the attributes are located in the second quad-rant, i.e., RES2, RES3, and RES4 from responsiveness dimension; and all of attributes in the contact dimension (contact has the highest average score in performance among other dimensions). Moving to the next quadrant, there is only one attribute belongs to the fourth quadrant, i.e., RES1 from responsiveness dimension; and three attributes (all from compensation dimension) that belong to the third quadrant. It is also considered as an unexpected finding since the customers perceived the compensation as not important!

4. Conclusions

This study shows how to integrate E-S-QUAL and E-RecS-QUAL scales with the IPA model. A case study has been performed to assess an online fashion shops in Indonesia. It has many benefits for the service providers. To do improvement, the service provider is suggested to utilize the IPA model to identify the attributes that are considered as important by the customers. By utilizing the IPA model, the service provider could prioritize what attribute should be improved first so that not all attributes have to be enhanced simultaneously. It is believed to reduce the excessive investment. Only the attributes that located in the first quadrant that immediately are needed to be bettered. For example, for E-S-QUAL scale, there are three attributes (i.e., EFF4, FUL2, and FUL4) and only one attribute (RES5) for E-RecS-QUAL scale.

The proposed methods are considered to be easy to apply, simple to be interpreted, and economical to be conducted. It is also considered to be beneficial for the manager of the online fashion shop because it could get helpful understanding regarding to what service attributes are needed to be developed and improved based on customers' point of view.

For the next future research, it is suggested applying the customer zone of tolerance-based service quality (CZSQ) and CZSQ-based IPA (CZIPA) [33]. The methods could be used for assessing the service quality based on the competitive zone of tolerance by comparing against the competitor(s) and to focus on the service attributes that have to be enhanced. The method is believed to be able to be further applied to assess the quality of e-service. However, despite of the advantages that could be gained, the applications remain limited—see [34], [35] that were applying these methods to the different service areas.

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