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SUSTAINABILITY
AS A STRATEGIC
BUSINESS
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GLOBAL ECONOMY
RECOVERY PHASE

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SUSTAINABILITY AS A STRATEGIC BUSINESS ORIENTATION IN GLOBAL ECONOMY RECOVERY PHASE

SUSTAINABILITY AS A STRATEGIC BUSINESS ORIENTATION IN GLOBAL ECONOMY RECOVERY PHASE

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FOREWORD

INSYMA has become a tradition of its own for the Management Department of Universitas Surabaya. For more than a decade this event has become a forum for academics and practitioners to share knowledge. Every year Management Department always brings the latest theme that becomes an important issue for the development of science.

This year, INSYMA raise the theme **SUSTAINABILITY AS A STRATEGIC BUSINESS ORIENTATION IN GLOBAL ECONOMY RECOVERY PHASE**. This theme interesting, considering recently, the companies are adapting to volatile and uncertain conditions as a way of life to survive. There are some important business issues and each requires a specific and appropriate response. These issues are namely governance, innovation technology, operations, regulations, risks, strategy & growth, sustainability, talent and the economy issues. The company requires its own way to deal with each of these issue so that the companies can achieve business growth and survival.

Hundreds of scientific papers are sent to a conference committee, and the results of a rigorous selection of more than 90 elected. This paper is derived from a variety of authors, both within and outside the country, academics and practitioners. All the articles are then presented at the symposium and documented in these proceedings.

We hope that these proceedings can contribute to the development of science and business practices. Hopefully you can enjoy and gain valuable lessons from this article collection. We look forward to your participation in next INSYMA.

Makassar, South Sulawesi, Indonesia
13th-15th March 2015

CONTENTS

HUMAN RESOURCES

FINANCE & ACCOUNTING

OPERATION MANAGEMENT

MARKETING

STRATEGIC MANAGEMENT

The Selection of Classification Methods in Kano Model for Service Industry

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ABSTRACT

Kano Model is a model that aims to categorize the attributes of service based on how well the attributes satisfy the needs of customers. Kano model is able to classify the service attributes into three categories, namely Must-be (M), One-dimensional (O) and Attractive (A) categories. The Must-be (M) category is a category that includes a must have attribute, the Attractive (A) category consists of a surprising service attribute to consumers and the One-dimensional (O) category is a category of attribute that the better its quality of fulfillment, the more satisfied of customers' feeling. In order to get the classification of A/O/M, several methods had been used i.e. Conventional, If-then and Better Worse methods. However, the usage of these different methods generated different categories for the same attribute. Thus, this paper showed a set of researches over six various service industries that used those three classification methods and the comparison among the methods in order to select the most appropriate methods in determining the categories for the service attributes. The result showed that, supported by a statistical testing at significant level 0.10, If-then method is selected as the most appropriate method to classify the Kano category.

Keywords: Kano category, classification, service industry

1. RESEARCH BACKGROUND

The improvement of service quality becomes a major concern for both private and government organizations in achieving customer satisfaction. The triggers of the improvement of service quality can be caused by the complaints of the public facilities that have been provided (especially for services provided by the government) as well as the fierce competition that faced by private business (especially related to commercial services industry) which requires an organization to be able to survive or even to improve continually. In improving the quality of services provided, many organizations are measuring the customer satisfaction using the Service Quality (SERVQUAL) model throughout the analysis of gap between perceived and expected service (Parasuraman, et al. [9]) in which a customer is satisfied if the perceived service exceeded the expected service. Some researches had been done related to improvement of the quality of service industry by using the SERVQUAL model (see Tan & Pawitra [18], Sari et al. [14], Hartono et al. [4]), showed that customers tend to express their dissatisfaction that caused many attributes of services should be focused for improvement.

However, it is aware that not all of the services attributes that being improved can increase customer satisfaction level effectively. Kano model (Kano [5], Berger [2]) is then used widely for classifying the quality of service into several levels or different categories (see also Puspitasari et al. [10], Tan & Pawitra [18]), the categories of service attribute can be (a) *Must be (M)*, a category in which the service attribute must exist, otherwise it can lead to customer

dissatisfaction. This attribute is often referred to as a "must have" or "basic" requirement of a service; (b) *One-dimensional (O)*, a category of the attribute that the better quality of its fulfillment, the customers feel more satisfied, and vice versa. The attribute is known as "more/less is better" and become the competitive service attribute; (c) *Attractive (A)*, a category in which the attribute provided will be able to make customer feel surprised. This attribute becomes the differentiation attribute, and (d) *Indifferent (I)*, a category of the attribute that its fulfillment does not effect on customer satisfaction significantly, (e) *Questionable (Q),* sometimes customers are satisfied or dissatisfied with the presence of the attributes in this category, so it is not clear whether the attribute in this category is expected or not expected by the consumer, (f) *Reverse (R),* consumers are not satisfied if these attributes are exist, but consumers will be satisfied if the attribute does not exist. The first four categories (M/O/A/I) are the primary categories that had been seek throughout Kano model while the last two categories (R/Q) are usually used to test the validity of customers' answer. Based on the classification of the service attributes, some organizations had been done the improvement on service quality by focusing on the attributes with the categories of Attractive and One-dimensional (Tan & Pawitra [18]) which give a reduction on the numbers of service attributes that need to be improved (Sari et al. [14], Hartono et al. [4])

To determine the Kano categories for those service attributes, several methods had been introduced (Berger [2], Walden [19]) i.e. Conventional, If-then, Better and Worse method. The classification using different methods, however, give different results, for an instance, a service attribute "waiting area for the passengers in Juanda Airport" (Sari [17]), the classification of Conventional method give a category of indifferent meanwhile If-then method classify the certain attribute into an attractive category. The differences among the classification result brought complications for further analysis (see also MacDonald [7]), and raises a presumption of certain categorization method may produce better classification. Therefore, the objectives of this research are to compare different methods of Kano classification in various fields of service industry and to obtain the most appropriate classification method to determine the category of Kano.

2. LITERATURE REVIEW

The Kano model, which was developed by Noriaki Kano, is a model that aims to categorize the attributes of services based on how well the services capable of satisfying customer needs. According to Berger [2] and Puspitasari et al. [10], the Kano model classified the attributes of services into several primary categories of A/O/M/I (see Figure 1), by using the Kano Evaluation Table to tabulate the customers' answer which were collected throughout Kano questionnaire. Each service attribute will be asked into two kinds of questions, namely the question of functional and dysfunctional of the service attribute (e.g. functional "how do you feel when the receptionist and information desk is visually appearing" and dysfunctional "how do you feel when the receptionist and information desk is not visually appearing") and customers will answer for each questions with five options, i.e. "I like it that way", "It must be that way", "I am neutral", "I can live with it that way" or "I didn't like it that way". By combining the functional and dysfunctional answers, then the category can be achieved by using Kano Evaluation Table (see Table 1). Figure 2 showed how the evaluation process of Kano classification was done (Hartono & Tan [3]), the results of the Kano evaluation that registered in the table show the overall distribution of the Kano category for every service attribute.

Table 1 – Kano Evaluation Table

Service Attribute		Dysfunctional				
		1. like	2. must-be	3. neutral	4. live with	5. dislike
Functional	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

Kano Categories: A (Attractive), O (One-Dimensional), M (Must-be), I (Indifferent), Q (Questionable) and R (Reverse)
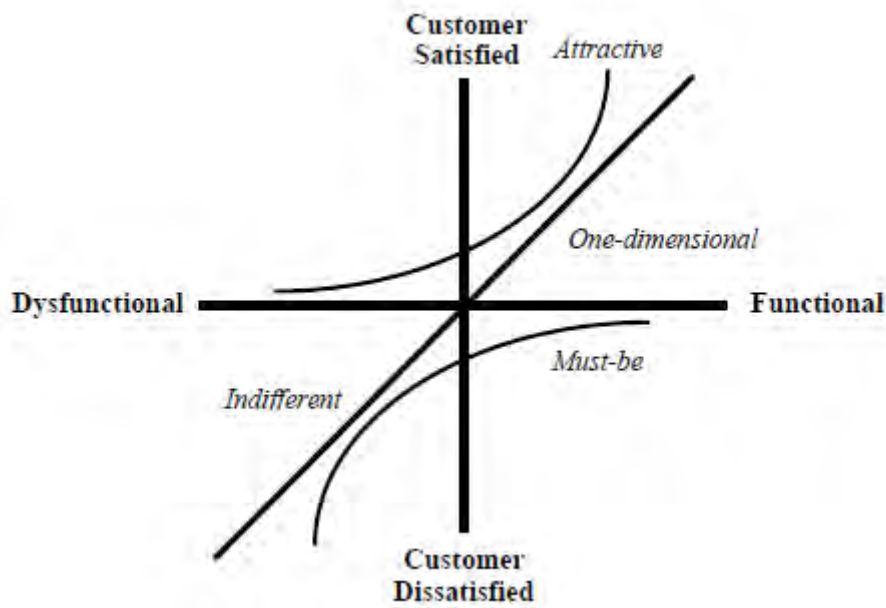
Figure 1 – Four Primary Categories of Kano (modified form Berger [2])
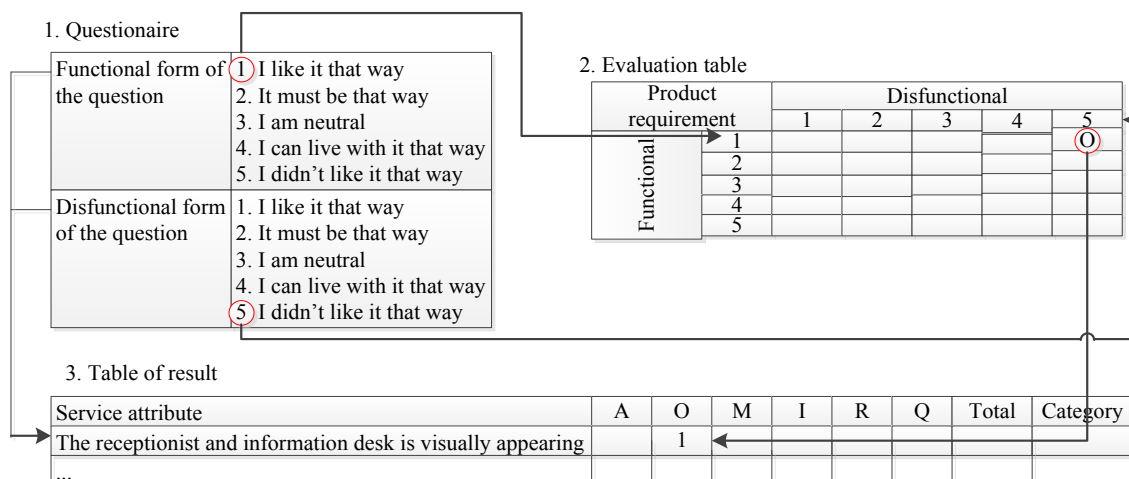
Figure 2 – Kano Evaluation Process (Hartono & Tan [3])

According to Berger [2] and Walden [19], there are several ways that can be used to determine Kano category, as mentioned below:

1. Conventional method, the determination of Kano category based on the greatest frequency of Kano selected category.
2. If-then method, it is a statistical modification which is also known as Blauth's Formula, in which Kano category is determined from:
   - If (*one-dimensional + attractive + must be*) > (*indifferent + reverse + questionable*), then the Kano category is maximum from (*one-dimensional, attractive, must be*)
   - If (*one-dimensional + attractive + must be*) < (*indifferent + reverse + questionable*), then the Kano category is maximum from (*indifferent, questionable, reverse*)
3. Better and Worse method, It ignores the Reverse and Questionable categories and calculated the Better and Worse value from the formulas of:

$$Better = \frac{A+O}{A+O+M+I} \qquad Worse = -\frac{O+M}{A+O+M+I}$$

The results of the Better and Worse values will be plotted in two-dimensional graph, with the maximum value of 1, where the value of the Worse (which is absolutized in advance to get the positive value) as the X-axis and the value of the Better as Y-axis. The Kano category is determined to the areas of (see Figure 3):

- If (*Worse value ≤ 0.5, Better value ≤ 0.5*), then the category is Indifferent
- If (*Worse value ≤ 0.5, Better value > 0.5*), then the category is Attractive
- If (*Worse value > 0.5, Better value ≤ 0.5*), then the category is Must-be
- If (*Worse value > 0.5, Better value > 0.5*), then the category is One-dimensional
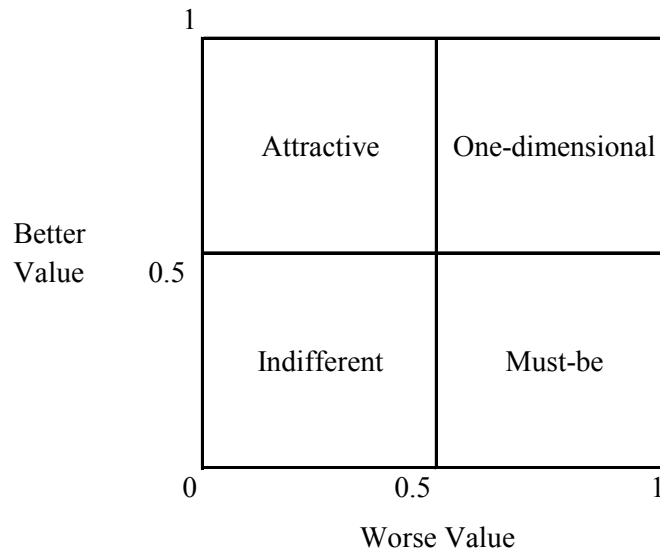
. Figure 3 – Two-dimensional graph of Better and Worse Method (modified from Berger [2])

The Kano categories which were obtained can be used to improve quality of services, for an instance, the impact of an Attractive category play a role in the success of a service whereas an Indifferent category, although it mentioned in the voice of the customer, is not the main focus in the improvement of service quality. Macdonald [7] summarized in Table 2 about the Kano categories and the relationship between the categories and action should be taken for improvement.

Table 2 – Description of the Kano categories to customers (modified from Macdonald [7])

Kano Category	Description to Customers	Action taken for improvement
Attractive	If the attribute is "Attractive", it means that the attribute provides extra satisfaction for customers when it is present, but the service still does its job perfectly when the attribute is absent.	Work to include attribute at a basic functioning level, as the mere presence of the attribute will induce satisfaction
One-dimensional	If the attribute is "One-dimensional", it means that the more attention the companies or organizations pay to this feature in the design of the product/service, the more satisfied the customers, are with the product/service and the better the product/service performs for customers.	Work to increase the functionality of the attribute past industry standards.
Must-be	If the attribute is "Must-be", it means the lack of this attribute would definitely cause dissatisfaction, and probably make the service not as useful for customers. However, unlike a One-dimensional category, extra improvement effort spent on improving a Must-be category would not make much difference to customers – it just needs to be included and functioning normally.	Make sure the attribute is included and functioning properly at an industry-standard level.
Indifferent	If the attribute is "Indifferent", it means that the attribute does not provide either satisfaction or dissatisfaction to customers.	Do not focus any attention here. Note that some attributes are Attractive to some customers while others feel indifferent or even reverse about these attributes
Reverse	If the attribute is "Reverse", it means that the attribute causes the customers annoyance/dissatisfaction and probably makes the service less useful to customers.	Make sure not to include these attributes.

3. RESEARCH METHODS

The researches had been done using the survey research in various sectors of service industry; each followed the similar steps of the research which were explained as below:

1. The formulation of service attributes and the design of Kano questionnaire. In this stage, the initial study among related publication and initial survey to some potential customers (about 10-30 respondents) were carried out in order to formulate the service attributes. After the formulation of service attributes was done, the Kano questionnaire had been developed in which each service attribute will asked into functional and dysfunctional way and the customers filled the questionnaire using five possible answers (see Figure 2).

2. The Kano survey (the distribution of Kano questionnaire)
   The research had been done in six different service organizations, as shown in Table 3. The six service organizations which were involved in this research are explained briefly as follow:
   a. "Juanda" airport (Sari & Rosiawan [17]), is an international airport owned by Indonesian government, which was just relocated to "New Juanda Airport" in 2006

(which is known as Terminal I) and had a service capacity of six millions passengers per year.

b. "Sanggar Kreativitas" Playgroup (Sari & Rosiawan [15]), is a playgroup for pre-school children (2-4 years old), established in 1993, which had about 60 – 80 children annually.

c. "SJ" Vehicle Service Centre (Sari & Rosiawan [16]), is a private service centre that had 9 mechanics and provided maintenance service for motorcycles. It was established since 1996.

d. "Ebel" Beauty Clinic (Rosiawan & Sari [11]), is a private beauty clinic which was established in 2004.

e. "PHS" Tour & Travel (Rosiawan & Sari [12]), is a private tour and travel agency which located in Gianyar, Bali island.

f. "BCA" Bank (Sari & Hadiyat [14]), is a branch bank of a national private bank which is located in Blitar and serves about 40 customers per day by 10 employees.

The survey itself used the purposive sampling, which means that the customers who become the respondents of survey should be the ones that used the services of the organization at least 2 times.

Table 3 – The objects of research

No	Service Organization	Sector[*]	Location	Number of respondents[*]
1	"Juanda" Airport	Transportation	Surabaya	500
2	"Sanggar Kreativitas" Playgroup	Education	Surabaya	49
3	"SJ" Vehicle Service Centre	Maintenance	Surabaya	100
4	"Ebel" Beauty Clinic	Health	Surabaya	70
5	"PHS" Bali Tour & Travel	Entertainment	Gianyar	100
6	"BCA" Bank	Financial	Blitar	100

[*] *Service sector was determined due to Lovelock [6],*
the number of respondents was calculated regarding to Slovin formula in Altares [1]

3. The determination of Kano category by using those three methods of classification
   After the questionnaires being distributed, the validity testing was done accordingly by checking whether any of the service attributes fell into the category of R/Q. These two categories showed whether any misphrased of the questions which can cause the customers confused to fill the questionnaire. Then, the results of this survey Kano processed using three existing methods of categorization in Kano models, namely Conventional methods, If-then and Better Worse for service attribute classification into categories A / O / M / I.

4. In addition to the Kano survey via questionnaire, the research also conducted a focus group discussion which included the representative of target customers and the management team of related service organization and moderated by surveyor (later we called it as "the control group"). The control group was explained the definition of Kano categories (refer to Table 2) and been asked to classify the service attributes into Kano classification, the answer options for every service attribute are Attractive, One-dimensional, Must-be, Indifferent or none of them. The classification process was done directly from the discussion of the control group. The similar scheme ever conducted in the research of Macdonald [7] concerning to the shortcomings of the various methods of Kano categorization. However, in these researches, the focus group discussion was only done to those service attributes which have different result among the Kano classification methods that derived from previous stage. Furthermore, the validation process is pursued

through the comparison between the classification results obtained from the previous stage (Conventional, If-then and Better Worse method) and the results of the control group. The objective was to see the level of concordance between the results of those three methods and the control group.

5. The final step of the research is doing the statistical testing to test against the difference between those three methods of classification. The factorial design, especially the randomized block design, was carried out (Montgomery [8]). A blocking factor was referred to the different service organization meanwhile the factor which was primary interest of Analysis of Variance (ANOVA) was those three methods of classification.

4. RESULT & DISCUSSION

To describe the result of research steps from 1 to 4, a service organization was chosen i.e. the result of Kano survey of "BCA" Bank to be discussed. There were 22 service attributes being examined in Kano survey, a pre-sampling of 30 respondents showed that the questionnaire was valid and then a sampling of 100 respondents was done accordingly. By doing Kano evaluation process (refer to Figure 2), it can be seen from Table 4 that no service attribute fell into the categories of R/Q, which it meant that the result of Kano survey was valid for further classification.

Table 4 – Kano Survey (Sampling of 100 Customers)

No	Service Attribute	A	O	M	I	Q	R	Total
1	Bank has a large parking area	17	21	43	19	0	0	100
2	The room interior design is interesting	18	14	11	57	0	0	100
3	Bank has comfortable waiting room	7	59	23	11	0	0	100
4	The appearance of Teller staff is neat and attractive	22	14	39	25	0	0	100
5	The appearance of Customer Service Officer (CSO) is neat and attractive	13	26	52	9	0	0	100
6	The cleanliness of Bank	11	23	49	17	0	0	100
7	Bank provides a completeness services	29	27	31	13	0	0	100
8	CSO serves customers quickly and precisely	44	19	28	9	0	0	100
9	Teller serves customers quickly and precisely	51	16	17	16	0	0	100
10	Security serves customers quickly and precisely	15	42	21	22	0	0	100
11	Teller and CSO are competence in doing their tasks	25	37	21	17	0	0	100
12	Teller, CSO and Security are be able to understand and answer customers' problem	46	26	24	4	0	0	100
13	Teller and CSO are available at the counter of service	3	53	33	11	0	0	100
14	Security is available at the counter of service	13	27	43	17	0	0	100
15	Security quickly respond to customers' need	4	51	39	6	0	0	100
16	Teller, CSO and Security serve customers friendly	6	49	31	14	0	0	100
17	Sense of confidence and secure when on transactions	7	23	46	24	0	0	100
18	Bank has a secure parking area	7	29	37	27	0	0	100
19	Customers are easy to submit complaint	26	17	52	5	0	0	100
20	Teller, CSO and Security serve customer attentively	48	27	7	18	0	0	100
21	Teller, CSO and Security perform the service under fair circumstance	33	8	44	15	0	0	100
22	Teller, CSO and Security use their Identity Card	8	11	32	49	0	0	100

To classify each service attribute into the categories of A/O/M/I, three methods were being used, the calculation was shown for an example of service attribute no. 22 "Teller, CSO and Security use their Identity Card" as explained as below:

Table 5 – Kano Classification for "BCA" Bank

No	Service Attribute	C	I	B	Control Group	Validity C	Validity I	Validity B
1	Bank has a large parking area	M	M	M		v	v	v
2	The room interior design is interesting	I	I	I		v	v	v
3	Bank has comfortable waiting room	O	O	O		v	v	v
4	The appearance of Teller staff is neat and attractive	M	M	M		v	v	v
5	The appearance of Customer Service Officer (CSO) is neat and attractive	M	M	M		v	v	v
6	The cleanliness of Bank	M	M	M		v	v	v
7	Bank provides a completeness services	M	M	O	M	v	v	
8	CSO serves customers quickly and precisely	A	A	A		v	v	v
9	Teller serves customers quickly and precisely	A	A	A		v	v	v
10	Security serves customers quickly and precisely	O	O	O		v	v	v
11	Teller and CSO are competence in doing their tasks	O	O	O		v	v	v
12	Teller, CSO and Security are be able to understand and answer customers' problem	A	A	O	O			v
13	Teller and CSO are available at the counter of service	O	O	O		v	v	v
14	Security is available at the counter of service	M	M	M		v	v	v
15	Security quickly respond to customers' need	O	O	O		v	v	v
16	Teller, CSO and Security serve customers friendly	O	O	O		v	v	v
17	Sense of confidence and secure when on transactions	M	M	M		v	v	v
18	Bank has a secure parking area	M	M	M		v	v	v
19	Customers are easy to submit complaint	M	M	M		v	v	v
20	Teller, CSO and Security serve customer attentively	A	A	A		v	v	v
21	Teller, CSO and Security perform the service under fair circumstance	M	M	M		v	v	v
22	Teller, CSO and Security use their Identity Card	I	M	I	M		v	
	number of concordance (out of 22)					20	21	20
% level of concordance (number of concordance/number of attributes)						**90,91**	**95,45**	**90,91**

1. Conventional method (code: C) showed that the greatest frequency fell into the Kano category of Indifferent (frequency = 49).
2. If-then method (code: I) showed that (8+11+32)>(49+0+0) then the Kano category is maximum from (8, 11, 32) which fell into the Kano category of Must-be (frequency = 32)

3. Better and Worse method (code: B) calculated the value of Better = (8+11)/(8+11+32+49) = 0.19 and Worse = (11+32)/(8+11+32+49) = 0.42, referred to Figure 3, it fell into the Kano category of Indifferent.
4. Because of the differences result among the three methods (Indifferent category from Conventional and Better- Worse methods, Must-be category from If-then method), the focus group discussion was done and this control group's result is the Kano category of Must-be.

The classification result was shown in Table 5. From the validity checking, it can be seen that there were 21 out of 22 service attributes in If-then method in concordance with the classification, except for attribute no. 12 (If-then classified it as an Attractive category, but the validity mentioned a One-dimensional category was more appropriate). The percentage of level of concordance was calculated through dividing number of concordances by number of service attributes. The levels of concordance for other service organization can be obtained by using the same methodology, the summary was shown in Table 6.

Table 6 – Level of Concordance for the Kano Classification Methods

No	Service Organization	% Level of Concordance		
		Conventional	If Then	Better-Worse
1	"Juanda" Airport	45%	**75%**	**75%**
2	"Sanggar Kreativitas" Playgroup	91,67%	94,44%	**97,22%**
3	"SJ" Vehicle Service Centre	61,90%	**85,71%**	57,14%
4	"Ebel" Beauty Clinic	70,83%	**91,67%**	70,83%
5	"PHS" Bali Tour & Travel	48,28%	58,62%	**72,41%**
6	"BCA" Bank	90,91%	**95,45%**	90,91%
	Average	68,10%	**83,48%**	77,25%

Further statistical testing was being done to test the hypothesis of: H_0 (there is no difference among the Kano Classification Methods) versus H_1 (at least one of the Kano Classification Methods is different). The randomized block design was used, the service organization was set as the block factor and percentage of the concordance level became the primary factor to be tested.

```
Two-way ANOVA: Concordance Level versus Service Organization; Method

Source                  DF        SS         MS      F       P
Service Organization     5   0,317044   0,0634089   6,59   0,006
Method                   2   0,071873   0,0359366   3,74   0,061
Error                   10   0,096179   0,0096179
Total                   17   0,485096

S = 0,09807   R-Sq = 80,17%   R-Sq(adj) = 66,29%

                          Individual 90% CIs For Mean Based on
                          Pooled StDev
Method           Mean   ----+---------+---------+---------+-----
Better Worse   0,772520              (---------*--------)
Conventional   0,680968   (--------*--------)
If-then        0,834827                    (--------*--------)
                        ----+---------+---------+---------+-----
                          0,640     0,720     0,800     0,880
```
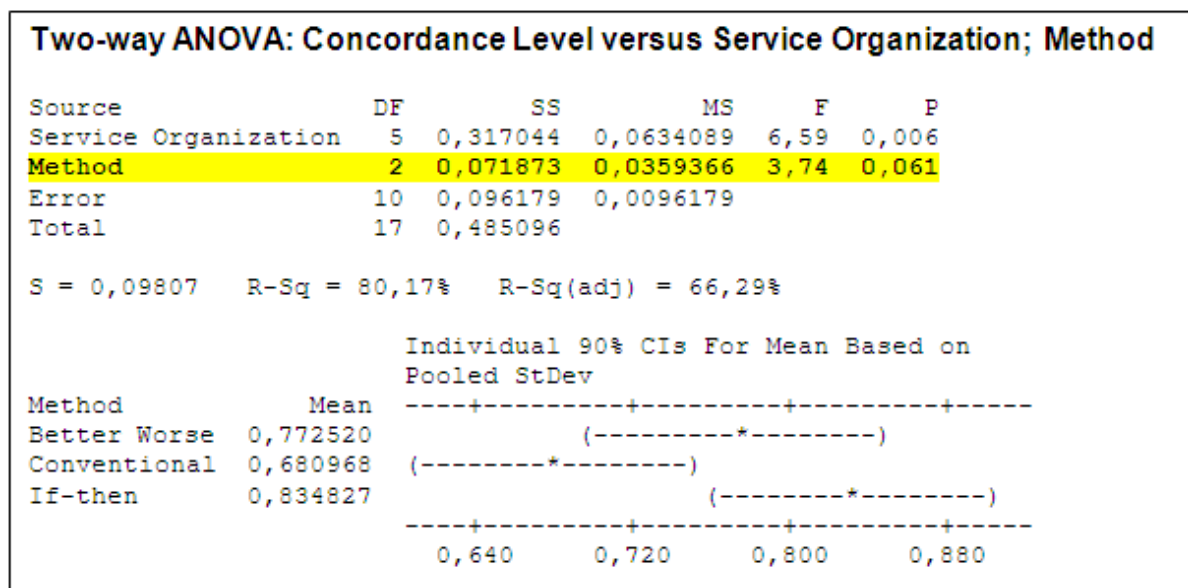
Figure 4 – ANOVA Testing to select the most appropriate selection methods in Kano Model

The result, as shown in Figure 4, rejected H_0 at P-Value = 0,061 (using the significant level of α = 10%). The result of statistical testing said that there was at least one of classification method which differed from other methods, the If-then method (Blauth's formula) had the highest level of concordance (83,48%), the conventional method was at the lowest level (68,10%) and the Better-Worse method was in the midst among them (77,25%). Hence, it can be concluded that If-then method is the most appropriate method in classifying the Kano category.

5. CONCLUSION

To classify the service attributes into Kano categories of A/O/M/I, three classification methods were introduced. The usage of different classification methods can give different result of category; however, this research concluded that the If-then method became the most appropriate classification method to determine the Kano categories in various fields of service industry. If it is compared to Conventional method, If-then method has made a modification in determining the category which the modification is aimed to decrease the noise level i.e. the mistake of classifying important service attribute into the Kano category of Indifferent. The noise level tends to be occurred when using conventional method, for an illustration, 21 customers' answers for a certain service attribute are classified as Attractive, 19 as One-dimensional, 18 as Must-be and 22 as Indifferent, conventional method will classify this attribute as Indifferent, even though there are 58 out of 80 customers mentioned that they needed the attribute. The determination of Kano category in If-then method is simpler and easier, when it is compared to Better-Worse method, one should calculate the better and worse value in advance before being able to determine the Kano categories.

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