

INTEGRATION OF KANO'S MODEL AND SERVQUAL INTO HOUSE OF QUALITY (HOQ) FOR DEVELOPING QMS TRAINING PROGRAM

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Abstract

Quality Management System (QMS) is a very important knowledge that is very crucial in any industrial organization. It is very important for the industrial workers to know and understand the correct QMS knowledge & concept. Because of that it is very important for them to attend sufficient and relevant QMS training in order for them to attain the QMS knowledge. These training must be effective and have sufficient impact. For that purpose a new method is used in this research. The Kano's Model and SERVQUAL are integrated into the House of Quality (HOQ) for the purpose of developing a QMS training course that would not only satisfy the requirement and needs of the industry but also unexpected factors towards the trainee who attended the course. By using this method we can see that the level of understanding for the training participant using this new model is higher compared to the level of understanding for the participant from the conventional QMS training program that had been conducted by the training provider. With the increment in the level of understanding the level of effectiveness for doing QMS related jobs for the training participant would also be different. We can prove this by using the Kirkpatrick's Evaluation Model, whereby we would evaluate the trainee from the conventional QMS training program against the newly developed QMS training program. The evaluation would be based on their level of understanding and the level of effectiveness of doing QMS related jobs in their respective workplace.

Keywords: Quality Management System; Training; House of Quality (HOQ)

Introduction

A good employee is a worker who can perform excellently on the task given as stated in the Job Description and the Key Performance Indicator. In order to fulfill the Job Description and Key Performance Index, every employee should have adequate skills and knowledge. They can obtain the skills and knowledge by attending courses related which are provided by the employer or external trainer. A good course is a course that puts into consideration of the needs of the customers and fulfills them. Customer in this context is the employer of the said worker. This study provides a new perspective on a new method of constructing skills and learning course based on the needs of the employer by using House of Quality (HOQ). In theory, the course model produced will grant maximum output to the employer. In order to measure the employer's satisfaction, it is suggested to use Kirkpatrick Evaluation Model. This model measures the performance of staff who has attended the training program and it is also used to measure the results of the employer's investment by sending their staff to undergo the training program.

Literature Review

Kano Model

Kano et al. (1984) developed a model for improvement and enhancement of a product or service. According to Kano, customer needs can be classified into three categories (Kano, 1995, 2001; Bergman and Klefsjo, 2003). These categories must be one dimensional and attractive. These categories can be considered as the basic requirements for the product or services. Both the customer and the service or product providers agree on the importance of the needs in these categories; they are expected but unspoken and unarticulated (Cheng Lim et al., 1999). For these categories of needs, the level of satisfaction of customer will not raise above the normal level if the product or service provider is unable to fulfill those needs. In other words while a low performance on such attributes leads to dissatisfaction in a customer; a high performance does not lead to satisfaction (Kano et al., 1984; Matzler and Hinterhuber, 1998; Busacca and Padula, 2005). Meanwhile for the one dimensional categories, the needs that falls in these categories are actually the expectation of the customer towards the product function or the services that have been provided by the service provider. These needs are very well expected, expressed and articulated by the customer. For the needs in this categories it can be expressed in a linear relationship, whereby if the customer needs are not fulfilled the level of satisfaction will be low. On the other hand, if the needs are fulfilled the level of satisfaction will become high (Redfem and Davey, 2003) and by providing for such needs, the product or service provider creates the expected quality for their product or services. It is important for the product and service provider to focus their resource to compete with their competitor in order for them to sustain themselves in the market.

Lastly would be the attractive dimension. The needs that fall in this category are the customer needs that they themselves do not realize that they need it. In other words the needs are unexpected and unspoken. The relationship between the needs in this categories and the customer satisfaction is a one way linear relationship. If the product or service provider is able to provide the unexpected towards the customer, their level of satisfaction will increase, however if the satisfaction level will not be affected if the product or service provider attribute in this category does not perform well. In other words they lead to satisfaction of customers when present but do not lead to any dissatisfaction if not present (Berger et al., 1993) and by discovering such needs and expectations, and providing the customer with these, the product or service provider creates what can be called the attractive quality (Kano et al., 1984; Lilja and Wiklund, 2006). By integrating the Kano Model and SERVQUAL we would able to determine the service quality criteria that falls into the must be, one dimensional and attractive category. This information will be an important input towards developing a training course model.

SERVQUAL

Service Quality is one of the main factors that can contribute to the success or failure of a manufacturing or service organization in today's competitive environment. (Kuei and Lu, 1997) considered service quality as a critical determinant criterion for competitiveness. Compare to product quality whereby it can be easily determined, service quality is very intangible and qualitative. The customer has to undergo the service in order to determine the level of service provided to them. (Parasuraman et.al., 1985, 1988) suggest that in a service setting, the customers judge its quality by comparing their perceptions of what they receive with their expectations of what they should have received. Kim et.al. (2003) have determined two key elements in the attainment of high quality. The first one is the identification of customer's service requirements and expectations whereby it is generally recognized that consumers evaluate the service they receive and their expectations are critically important in determining whether or not they are satisfied (Brown and Swartz, 1989). It can

be simplified that consumers' expectations are the key criteria to the quality of service that a firm delivers. The second key factor of service quality is customer perception. Zeithaml (1988) suggests that the notion of perceived quality reflects the opinion of the customer regarding the superiority or global excellence of a product or service. Finally Parasuraman et. al. (1985, 1989) suggests that service quality should be represented as the difference or gap between service expectation and actual service performance. They also suggest that service quality can be measured using the SERVQUAL scale which consists of a set of 22 questions built from the five SERVQUAL dimensions; reliability, assurance, tangible, empathy and responsiveness. In this research we will use the Modified SERVQUAL scale whereby we add two more dimensions to the current SERVQUAL dimensions: competence and content. These two dimensions are very crucial dimension in determining the service quality for training programs. In the end we also add eight new questions to the 22 SERVQUAL questions making the total questions to 30. We can use the set of 30 questions to determine the strengths and weaknesses of the current training courses and at the same time it can be integrated with the Kano Model analysis to determine the training courses must be of one dimensional and attractive criterion.

House of Quality (HOQ) or Quality Function Deployment (QFD)

House of Quality (HOQ) also known as Quality Function Deployment (QFD) can be considered an outstanding matrix diagram that can be used as a powerful tool for product development. It involves the integration between different departments in an organization such as the Design Department, Quality Department, Manufacturing Department and even the Marketing Department. (Griffin, 1992) considered QFD as an investment in people and information. It enables an organization to measure customer "wants" and map them against the engineering "how" in a way that highlights trade-offs and drives the product's design towards customer requirements (Vonderemse and Ragunathan, 1997) QFD facilitates the growth and prosperity of a firm by developing an array of products that are attractive to existing and new customers (Akao, 1990; Cohen, 1988; Hales, 1994). Products designed with QFD may have lower production cost, shorter development time, and higher quality than products developed without QFD (Graessel, 1993; Hunter, 1994; Raynor, 1994). These benefits are attracting an increasing number of product development practitioners to the QFD methodology (Akao, 1990; Ealey, 1988; Garvin, 1988; King, 1989). Although manufacturing industries were the first to adopt QFD, service and government organizations are also using it in their efforts to improve performance (Garvin, 1987; Hauser and Clausing, 1988; Kogure and Akao, 1983; Sullivan, 1986 and 1988). Based on the above, we can say that QFD is one of the most appropriate tools that can be used to develop a training course using the customer requirements that we obtained using the integration of Kano Model and Modified SERVQUAL. The new training courses will have all the necessary criteria that are needed to increase the level of satisfaction of the trainee.

Kirkpatrick Model

Training evaluation is a very crucial step in determining the level of effectiveness for training program. Kirkpatrick (1994) had designed a model with four levels of evaluation. Those levels are reaction to the training, learning measures, behavior measures and results. Steensma and Groeneveld (2009) explain the method of evaluation for each level. The explanation is as stated below.

1. Reactions to the training

Trainees are asked if they enjoyed the training and if they have learned from it.

2. Learning measures

For example, if the purpose of a training program is to increase knowledge, an appropriate knowledge test should be used to determine whether the trainees have actually learned from the training. So, learning measures test retention of training material.

3. Behavior measures

Behavior measures indicate the extent to which the training transfers to the job, to the workplace of the trainee.

4. Results

Results measures are used to show whether broad, often more long-term organizational goals are attained through the training.

Measures used may vary from return on investment to lower sickness absenteeism or even reduction of turnover. The link between the training and such long-term results is, of course, often not clear. More often than not, long-term results are affected by multiple causes, and training may be only one of the many possible causes. Still, careful utility assessments and other large-scale evaluations are useful instruments to indicate the effectiveness of the training on this fourth level of evaluation.

It is very important for us to use this evaluation model to measure the effectiveness of the newly develop training program and compare it with the results from the traditional training models.

Research Outcome

A survey was conducted to 100 industrial workers in the state of Johor, Malaysia. Based on Survey 1 the SERVQUAL dimensions have been modified whereby in the case of training provider there should be two more dimensions added to the original SERVQUAL dimensions. The new dimensions are Trainer Competency and Course Contents. The SERVQUAL questionnaire has also been modified by adding eight more questions as a tool to measure the new dimensions. Below are the modified SERVQUAL dimensions and the respective questions that are related to each one of it.

Table 1: Modified SERVQUAL

Dimensions	No of Questions
Tangible	4
Reliability	5
Responsiveness	4
Assurance	4
Empathy	5
Trainer Competency	4
Course Contents	4

The research continues by conducting another survey using the integration of Kano Model into the SERVQUAL Questionnaire. The results have shown training competency and course contents), one dimension falls into the one dimensional categories (empathy) and two dimensions falls into the attractive categories (responsiveness and assurance).

The surveys also have shown the level of satisfaction for the traditional training program based on the Modified SERVQUAL dimensions. The results are stated in Table 2:

Table 2: Training Participant Level of Satisfaction for Traditional Training Program

Dimensions	Satisfaction Level
Tangible	71%
Reliability	72%
Responsiveness	64%
Assurance	67%
Empathy	66%
Trainer Competency	77%
Course Contents	75%

From the results we can say that the weaknesses in the traditional training program are responsiveness and empathy. These two dimensions must be improved in order to increase the level of satisfaction among the training participants. Next is the process of constructing a training program (in this case it would be Occupational Safety & Health Training) based on the findings above using QFD. The program would focus on the attractive factors and at the same time improve the weak factors. In the end a training program that can overcome the weakness of a traditional training program and provide an attractive input can be constructed and run by the training provider.

An Occupational Safety & Health Training Program was later conducted to 30 industrial workers. Survey 2 was then conducted after the participants had finished attending the training courses and the results are as stated in Table 3. Survey 2 also had able to determine the level of satisfaction for the newly develop training program based on the Modified SERVQUAL dimensions. The results are stated in Table 4:

Table 3: Comparison of the Training Model

Measurements	Traditional Training Courses Program	Newly Develop Training Courses Program	Difference in Percentage
Reaction to the Training	68%	85%	17%
Learning Measurements	70%	86%	16%
Behavior Measurements	71%	87%	16%
Results	70%	84%	14%
Average	70%	86%	16%

Table 4: Training Participant Level of Satisfaction for the Newly Develop Training Program

Dimensions	Satisfaction Level
Tangible	85%
Reliability	90%
Responsiveness	93%
Assurance	87%
Empathy	90%
Trainer Competency	95%
Course Contents	96%

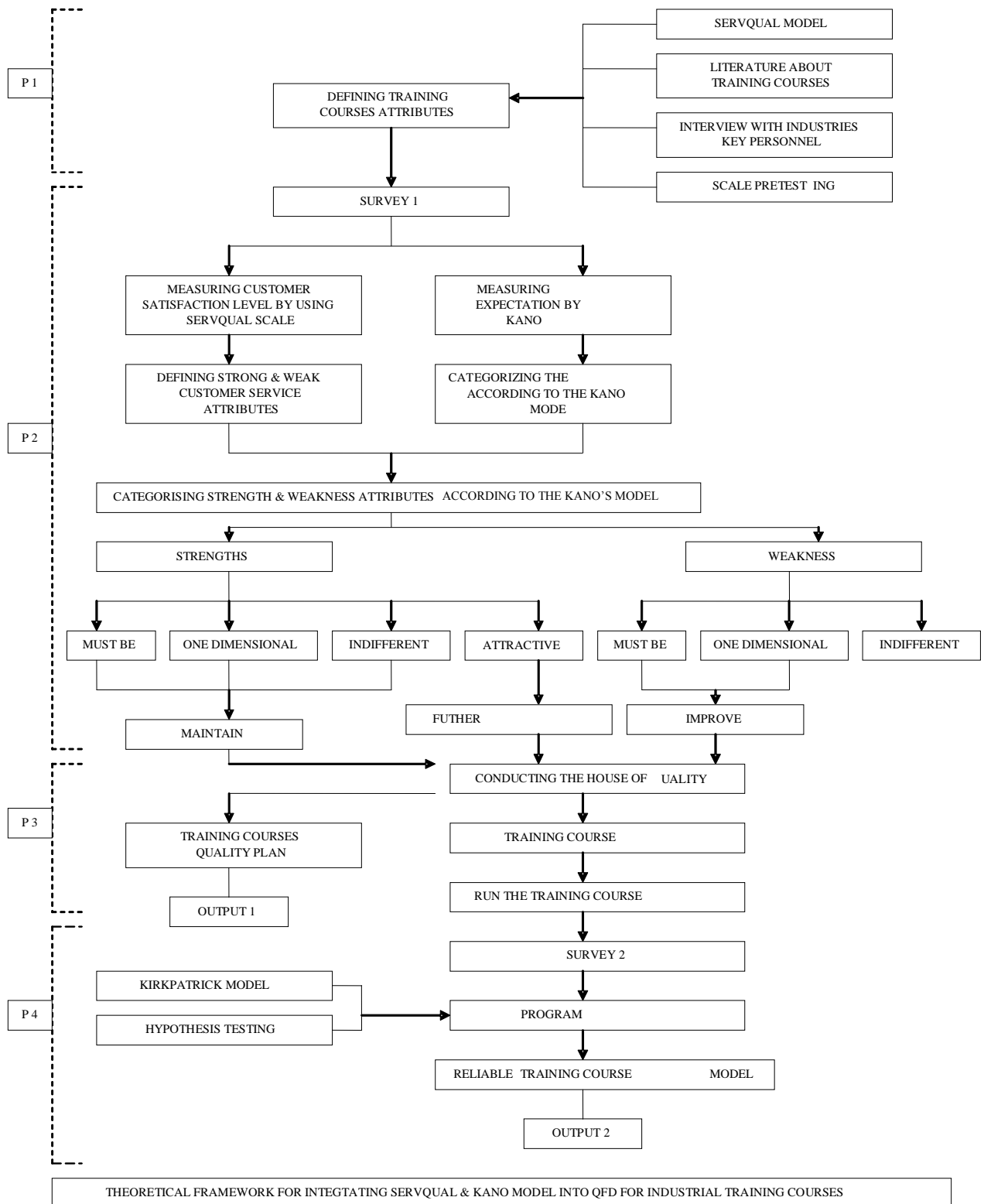
From the Table 3 we can see clearly that the difference of performance between the ordinary training courses model and the newly developed training courses model is 16%. This is a very significant value and can play a major factor for the staff performance and also for the company's return on investment in staff training. Based on Table 5 we may conclude that the level of satisfaction increased rapidly (19%). This is a proof that the newly develop training program is better than the traditional training program in every aspect of the Modified SERVQUAL dimensions.

Table 5: Traditional Training Program versus Newly Develop Training Program

Dimensions	Traditional Training Courses Program	Newly Develop Training Courses Program	Difference in Percentage
Tangible	71%	85%	14%
Reliability	72%	90%	18%
Responsiveness	64%	93%	29%
Assurance	67%	87%	20%
Empathy	66%	90%	24%
Trainer Competency	77%	95%	18%
Course Contents	75%	96%	21%
Average	70%	91%	21%

Conclusion

By integrating Kano Model and SERVQUAL into HOQ, an OSH training course model which can fulfill the customer's needs and wants can be created. This model can overcome linear problem or SERVQUAL model. This new model can produce OSH training program which consists of unexpected aspects. This can be achieved by using Kano Model. Service providers will also obtain benefits from this model. With HOQ, OSH training providers can identify needs to be prepared in order to complete the OSH training course program. Finally we can see that by using this method we can increase the level of reaction, learning, behavior and results of the OSH training participant.



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