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EVALUATION OF SUGGESTIONS BY THE ANALYTIC HIERARCHY PROCESS: A CASE STUDY ON A PUBLIC UNIVERSITY IN MALAYSIA

Rafikul Islam
Department of Business Administration
International Islamic University Malaysia
P.O. Box 10, 50728 Kuala Lumpur, Malaysia
rislam@iiu.edu.my

Abstract: *Employee/customer suggestion systems have been used by many organizations to improve quality and productivity. However, the system lacks objective evaluation procedure that can be used to identify the best suggestions from a pool of suggestions. The present paper intends to fill up this gap by proposing absolute measurement technique of the Analytic Hierarchy Process (AHP) as an objective methodology to evaluate suggestions. To show how the methodology works, 841 students drawn from six faculties of a public university in Malaysia were contacted and their suggestions pertaining to improvement of various services provided by the University's Instruction Division (ID) were collected. Altogether 150 different suggestions were obtained and all these were evaluated taking the inputs from the Dean of the ID. At the end of the AHP exercise, we identified 16 suggestions for implementation by the ID. The proposed methodology promises more applications to improve quality and productivity in organizations.*

Keywords: suggestions system, evaluation, quality improvement, analytic hierarchy process

1. Introduction

Employee Involvement (EI) is one of the approaches to improve quality and productivity in the organizations. During the last 20 years, EI programs have become fairly widespread. According to a 1987 study conducted by the US General Accounting Office, more than 80 percent of all the responding companies had implemented some form of EI over the prior three-to-five years period (Misra and McKendall, 1993). Major ways to involve employees in the organizations are: empowerment, teamwork, employee suggestion program (also known as employee suggestion system or simply suggestion system), etc. This paper deals with employee suggestion program as one of the vehicles to involve employees and consequently to improve quality. Suggestion system is a tool through which employees can channel their ideas for workplace improvement. The goal of a successful suggestion system is to tap the reservoir of the ideas and creative thinking of all employees for the improvement of the working process and products. Marx (1995) states that:

> Everything mankind has and will have in the future is and will be the result of people's ideas. Ideas are derived not only from people of above average intelligence, but also from those of average intelligence. Some of the more progressive companies in the history of modern management realized the potential value of their employees' ideas for the improvements in the general functioning of their organizations. They have realized that "idea power is the most tremendous human force in the world.

Suggestion program is in use in organizations since more than a century ago. In 1880, William Denny, a Scottish shipbuilder asked his employees to offer suggestions in order to build ships in better ways but simultaneously at lower cost. Misra and McKendall (1993) have described that in 1885, William Connors, an Eastman Kodak employee received $2 as a taken of appreciation for his suggestion to wash windows of the company plant buildings.

2. Literature Review

Considerable amount of literature is available on various aspects of employee suggestion system. Moore (1988) mentions that most suggestion systems solicit two types of ideas – tangible and intangible. "Tangible" ideas can result in measurable increase in profitability with resultant employee rewards equal to a set sum or a percentage of the increased profit (usually with a stated maximum award). "Intangible" ideas, on the other hand, do not directly influence profitability. They usually relate to items such as working condition, employee safety, public relations or internal communication. Berman (1998) states that many companies encourage employee participation in the business through suggestion system, self-managed work teams and other empowerment programs. When the companies ask employees to participate, they are actually asking the employees to participate and contribute actively to the success of the organization. Tesluk et al. (1999) report that employee participation practices have become increasingly popular. Further, a number of researchers have suggested that participative practices that are integrated within the systems of the organization create work environments that are more effective than narrow and limited involvement efforts.

Lansing (1989) showed the importance of employees' involvement in cost cutting and savings. He said that when Harleysville Insurance Company launched its new idea development program in February 1987, the company was mainly interested in increasing employee involvement. But in the end, its "Discovery" program, which used a team approach to generate ideas, yielded more than just increased enthusiasm and involvement among employees. It also saved the company $3.5 million – a lofty 10 percent more than what Harleysville estimated. According to Trunko (1993), there is an increasing trend among U.S organizations to involve their employees in the successful operation of the business. Suggestion programs not only offer employees to develop their full potential, but also make the employees to have a good impact on the achievement of the organizational goals. Anfuso (1995) believed that organizations should encourage employees to make suggestions according to their own environment rather than on global issues. Also supervisors should respond to employee's suggestions as soon as possible. He said that suggestion process should be simple; suggestion box, e-mail, or toll-free numbers can be used to collect the suggestions. The company should recognize employees who make suggestions giving monetary or non-monetary rewards. According to him, this is the best way to make suggestion system to succeed.

Dupont (1999) has described the suggestion system process implemented in Haworth Inc, as follows: first, employees provide their suggestions to their supervisor. Then the idea goes to a committee of between eight to ten members, which decides to implement it or pass it to a specialist. If the suggestion is not approved, then the employee receives a note indicating or stating the reason behind the disapproval. This is, in addition to a "thank you" and $1, to appreciate and to motivate employees to keep on providing their suggestions. So, their system was to ensure that all suggestions were reviewed as soon as possible after they were submitted and widely publicized the implemented suggestions and their good impact on the organization. As a result, the company saved close to $370,000 and paid out nearly $73,000 in rewards. Tschohl (1998) believed that if you want to succeed in business today, you have to look for ways to cut costs. Tschohl narrates that Service Quality Institute markets an employee suggestion program called Buck-A-Day, or BAD, which asks employees to give suggestions to cut costs by at least $1. This program concentrates on five categories: reducing costs, identifying problems, improving quality, eliminating delays, and generating revenue. Many companies in USA have used this program and have gained substantial benefits. For example, American Bankers Group in Florida offered suggestions that generated more than $170,000 in savings and also The Plastic Division of Mobil Chemical in Jacksonville, Illinois, received about 1,200 BAD ideas from their 950 employees that led the company to save about $228,000. This shows us the importance of involving employees in decision making process to cut costs and increase the organizational profits. Brandon (1993) has asserted that most organizations face great pressure to improve their products, service quality and operational processes. He has described suggestion system as a program that offers simple, practical, and low cost method for achieving solutions for many complex problems which sometimes are difficult to solve even by specialists. According to him, Textron's Aerostructure established its suggestion program which focused on two key issues: people and operation. There were three major objectives regarding the issue of people: 1. to remove barriers. 2. to foster interactions, and 3. to assure high visibility and recognition.

Lorenzo and Prado (2003) have said that despite the importance placed upon new technologies, continuous improvement or generally incremental improvement, without substantial investment and based on the contributions from all members of the company, constitutes a fundamental way to maintain and increase a firm's competitiveness. Their judgment is based on a study of 444 companies that showed suggestion systems and employees empowerment program were becoming relevant and useful in the progress of decision making process. Prather and Turell (2002) believed that involving all employees in the innovation process would improve the "climate for innovation" and ultimately, the contribution of R&D to the bottom line. They added that although leaders readily agree on its importance, few have been able to accomplish it in practice because two opposing problems must be solved at the same time: 1. giving everyone an opportunity to submit his or her ideas to meet a specific challenge without causing administrative and organizational overload and, at the same time, 2. getting truly innovative ideas. And for those critical issues where truly breakthrough ideas are required, selected employee teams can participate in special intensive workshops to develop breakthrough yet workable ideas for especially difficult problems. Polzin (1998) highlights the importance of suggestion system and maintains that it is very much relevant in this era of team-based work systems, lean production system and organizational learning. The concept of the employee suggestion system in which an employee identifies a problem as well as its solution and receives a reward commensurate with the savings generated by the suggestion - is still getting the attention of managers. He adds that employee suggestion system may represent a starting point on the organizational change continuum and make a solid contribution to the organizational development process.

Asean Bintulu Fertiliser Sdn. Bhd. (ABF) (winner of 1999 (Malaysian) Prime Minister's Quality Award) envisions the company to be a "world-class ammonia-based petrochemical company that is a model of Asean Economic Cooperation". In order to cut down costs, the company in 1988 launched employee suggestion program. Under the scheme, an employee is encouraged to think of any idea or work technique that will increase productivity in various areas such as work methods in plant operations or production processes, quality control and plant reliability, health, safety and the environment, general environmental facilities, and product, raw materials and utilities. Each successful suggestion is awarded points and these points can be exchanged for goodies through the Quality Award Voucher. Since the time of implementation, the company has estimated that it has saved RM 500,000 (Ruhanie, 2002).

Automotive component maker Ingress Corp. Bhd. pays its employees RM 1.00 per suggestion whether it is implemented or not. Every week, the company holds a Quality Control Circle (QCC) meeting where all employees are divided into small groups to discuss quality improvements and cost reduction method. The company's vice chairman Rameli Musa says, "By proposing an idea, employees get RM 1 and if the idea is implemented, there is profit sharing." He further adds, "Last year (2001), the company saved about RM 2 million in research and development costs and this year Ingress hopes to save up to RM 3 million with the help of its 800 employees" (Moreira, 2002).

Employee suggestion system creates a win-win situation in organizations. It does not only give benefits to the organizations, but also the employees can reap benefits in the form of rewards. Marx (1995, Page 16) states that:

> Not only does the suggestion system offer employees the opportunity to make suggestions regarding all the factors which influence productivity but also they can benefit through monetary and/or other tangible rewards.

There are numerous examples which prove the above assertion of Marx. Walter (1998) mentions that since 1992, Maritz Inc, a performance improvement company based in St. Louis has approved more than 3,000 suggestions submitted from its 5,500 employees, resulting in savings of nearly $12 million. Walter also mentions that Westinghouse Electronics Systems business unit in Baltimore, Md., has saved more than $1 million since David Cecil, director of recognition program, expanded the Electronic Systems Suggestion Program in 1993. Cecil says, "If someone turns in an idea that saves the company $420,00 in the first year of the idea being implemented, we give him/her 20 percent of the first year's net savings." Dupont (1999) mentions that American Axle and Manufacturing Inc, has saved $370,00 and paid out nearly $73,00 in

rewards. The Abex NWL division of Parker Hannifin Corp. in Kalamazoo, Mich. has saved $8.5 million in five years and the company paid out about $300,000 in rewards. Brunswick Mining and Smelting Corporation Ltd. in New Brunswick implemented 20 of its training coordinator Donald Gagnon's suggestions. These suggestions have saved the company $2.3 million (Tuzzolino, 1991). In recognition, Gagnon received 1990 suggestor of the year award from National Association of Suggestion Systems (NASS), a Chicago-based organization.

Suggestion system does not mean placing a suggestion box somewhere in the organization and doing almost nothing afterwards. In many organizations, the system fails to provide desired results. According to Bell (1997), the failure of suggestion system derives primarily from the planning and communications stages. He summarizes the following reasons for failure:

- Unclear messages regarding who is invited to participate
- Lukewarm invitations to submit suggestions
- Too many qualifiers or parameters for suggestions
- An atmosphere of intimidation regarding a suggestion
- The requirement that suggestions be submitted in complete and lucid, written form
- An unpredictable reward system
- A lack of response, or slow response to participants
- Capricious judgments regarding the acceptance of suggestions, and
- A lack of continuous support for the system

According to Marx (1995) management commitment is the most important cornerstone for the success of the suggestion system. Dupont (1993) observes that many times suggestion system doesn't work because of "the roach motel" method: stuff goes in and never comes out. This means that all the suggestions should be responded as quickly as possible. NASS (cited in Mangan (1992)) has recommended the following tips for having successful suggestion programs:

- Enlist the support of top management
- Lay out the goals the programs should achieve
- Be sure managers and supervisors are receptive to ideas from others
- Designate an individual or committee to administer the program
- Set up an awards schedule and stick with it
- Inform employees about the plan in writing, explaining how it works and how they can benefit from it
- Publicize the program often
- Respond promptly to each suggestion, whether it is adopted or not
- Keep accurate records of all suggestions to ensure proper awarding to prizes
- Have a company officer present the awards

In 1989, National Association of Suggestion System (NASS) conducted a survey among its 900 member companies. Altogether these companies collected 996,694 suggestions from their employees and the companies implemented 322,618 (32.37%) suggestions. These implemented suggestions have saved the companies nearly $2 billion, i.e., each suggestion on the average, has saved the company $6,199. In turn, as rewards, the companies have paid out $194 million (Tuzzolino, 1991).

Here arises one question: How does the company select the superior suggestions from the pool of suggestions that are to be implemented? Naturally, these suggestions are expected to be of high quality. Jim Canada, the former manager of American Air line's employee suggestion program says, "We are talking about quality suggestions, not just relocating the wastebasket" (cited in Tuzzolino (1991), page 38). How to identify the quality suggestions? The judges of the Whitmore Manufacturing Company's suggestion program use the following criteria: benefits, feasibility, applicability, effect on others, continuity, completeness, originality, and effort (Mangan, 1992). It may be noted that one suggestion may excel on a specific criterion, but may perform poorly on others. So, overall which suggestion has the maximum potential? In the existing literature, there is no clear answer. In the present paper we have proposed to apply

the Analytic Hierarchy Process (AHP) to evaluate all the suggestions. After the evaluation exercise, we will obtain the ranking of all the suggestions. From the ranking, it will be easy to select the superior suggestions. In the following section, we provide a brief account of AHP.

3. Research Methodology

A simple questionnaire was designed to collect suggestions from the students of a public university in Malaysia, called University A. The questionnaire consisted of three parts.

Part 1: Personal information – the students were asked to provide the following information: faculty, department, level of study, nationality, and gender.

Part 2: In this part, the students were asked to write down their suggestions. Specifically, it was mentioned that, "This is the most important part of this questionnaire. You are requested to provide your suggestions to continually improve the services provided by the ID." The space provided was deemed enough to write down about 10 suggestions using only few words per suggestion.

Part 3: This part was included to know the students' feedback regarding the effectiveness of the present policy of the suggestion system adopted in the whole university. It is to be noted that the university has provided many suggestion boxes that are located at various places in the campus. The students were asked to answer the question: "Do you think that the present policy at the university regarding the suggestion system, i.e., placing suggestion boxes has been effective?" They were required to answer by checking either 'yes' or 'no' box. If 'no', then they were asked to provide the reasons.

Students from six faculties were contacted to collect data. These are faculty of Arts, Faculty of Management, Faculty of Architecture, Faculty of Engineering, Faculty of Laws, and Faculty of Information and Communication Technology. Altogether, 841 students were contacted from these six faculties. All the students were contacted personally inside the ongoing classes. The lecturers teaching at the time were requested to provide about 15 minutes time for the purpose of conducting this data collection exercise.

Table 1 shows the personal information of all the respondents. As it is shown under level of study, we concentrated more on 3rd and 4th year students, as they are relatively more matured and by that time they have enough interaction with the ID. The data also show that 12.25 per cent of respondents are international students. Further majority of the students are female students. This is not unexpected as female students in most of the public universities in Malaysia has already outnumbered their male counter part.

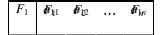**Table 1: Respondents' personal information**

Variable	Levels of variable			Frequency	Per cent
Gender	Male			334	39.71
	Female			507	60.29
		Total		841	100.0
Nationality	Malaysian			738	87.75
	International			103	12.25
		Total		841	100.0
Faculty	Arts			232	27.60
	Management			126	14.99
	Architecture			99	11.77
	Engineering			109	12.96
	Laws			175	20.81
	Information and Communication Technology			100	11.89
		Total		841	100.0
Year of study	1st Year			30	3.56
	2nd Year			149	18.72
	3rd Year			292	34.72
	4th Year			347	41.26
	5th Year			21	2.50
		Total		841	100.0

Altogether exactly 150 suggestions were obtained from 841 students. The suggestions which have higher frequency are straight away recommended for implementation. All the remaining suggestions are evaluated by the Analytic Hierarchy Process (AHP). As it has been mentioned in the Introduction and Literature Review sections that subsystem has been powerful tool to save organizations' operating costs, thereby improving productivity. Every year organizations receive numerous suggestions from their employees. However, In the literature, we do not find any systematic procedure to screen all the suggestions an single out the most potential ones. To the best of our knowledge, this is the first attempt to propose AHP as a systematic technique to evaluate suggestions and obtain the good ones for implementation. In the flowing, we provide a brief description of AHP.

4. The Analytic Hierarchy Process

The Analytic Hierarchy Process (AHP) was introduced by Thomas L. Saaty in 1977 through his classic paper which appeared in Journal of Mathematical Psychology (Saaty, 1977). Since its introduction, AHP has traversed a long way. There have been many methodological developments as well as several variants of the method (Arbel, 1989; Boender et al., 1989; Islam et al., 1997).

The basic purpose of using AHP is to select the best alternative from a number of available alternatives. Usually, this is done on the basis of a number of criteria. AHP uses two types of measurement scales: relative and absolute. In relative measurement, a pairwise comparison matrix (PCM) is formed for all the factors (criteria, alternatives, etc.). The form of a PCM is the following:

$$F_1 \mid a_{11} \quad a_{12} \quad \ldots \quad a_{1n}$$

$$\mathbf{A} = \begin{array}{c|cccc} F_2 & a_{21} & a_{22} & \ldots & a_{2n} \\ \ldots & \ldots & \ldots & \ldots & \ldots \\ F_n & a_{n1} & a_{n2} & \ldots & a_{nn} \end{array}$$

where F_i's are the factors (meaning either criteria or alternatives whose weights are to be determined), $a_{ij} = w_i / w_j$, for all i, j, (i, j = 1, 2, …, n) and $w = (w_1, w_2, …, w_n)^T$ is the underlying weight vector for the n factors. Each entry a_{ij} of **A** is the answer of a typical question, "between the two factors F_i and F_j, which one is more dominant (or preferable or important) and what is the degree of this dominance?" The answers are usually given verbally, like F_1 is weakly (or strongly) more dominant over F_j. Later, these verbal qualitative phrases (weakly or strongly more) are quantified by means of the (1/9-9) ratio-scale (Saaty, 1977). For example, if F_1 is strongly more dominant over F_2, then $a_{12} = 5$. The interpretation of all the numerical judgments of the (1/9-9) scale is given in Table 2.

Table 2: Scale of relative measurement of AHP

Numerical Values	Definition
1	Equally important or preferred
3	Slightly more important or preferred
5	Strongly more important or preferred
7	Very strongly more important or preferred
9	Extremely more important or preferred
2, 4, 6, 8	Intermediate values to reflect strength of comparison
Reciprocals	Used to reflect strength of dominance or preference of the second alternative as compared to the first one

The weights w_i's of the n factors are determined by solving the following system of linear simultaneous equations:

$$w_i = \frac{1}{\lambda_{max}} \sum_{j=1}^{n} a_{ij} w_j, \quad i = 1, 2, …, n$$

where λ_{max} is the largest eigenvalue of **A**. For uniqueness, we normalize the set of weights such that $\sum_{i=1}^{n} w_i = 1$.

An excellent reference for applications of relative measurement is Saaty and Forman (1992). This book provides brief accounts of applications of relative measurement in numerous areas including Accounting, Architecture, Education, Finance, Information System, Marketing, Resource Allocation, Sports and Transportation.

Although, relative measurement of AHP is much more widely used compared to absolute measurement, however, there are some occasions, where absolute measurement has advantage over relative measurement. This is particularly true where established standards are available with which an alternative is to be compared. Since the paper uses absolute measurement procedure of AHP, in the following, various steps of absolute measurement are described briefly:

Step 1: Calculate the weights of the decision criteria by the relative measurement of AHP, i.e., construct the PCM for all the criteria and compute the normalized principle eigenvector of the matrix. This vector gives the weights of the criteria.

Step 2: Divide each criterion into several intensities or ratings. Set priorities on the intensities by comparing them pairwise under each criterion. Multiply these priorities by the priority of the parent criterion.

Step 3: Pick one alternative at a time and judge its intensity under each criterion. Add the global priorities of the intensities (i.e., the priorities of the intensities multiplied by the weight of the criterion concerned) for each alternative. Repeat the process for all the alternatives.

The above absolute measurement procedure has been applied in a number of areas, e.g., students admission (Saaty, 1991), finding most livable cities (Saaty, 1986), performance evaluation of players (Islam, 2003). In the present paper, we have proposed to apply absolute measurement procedure to evaluate suggestions.

5. Data Analysis

As it has been mentioned in the previous section that we have collected exactly 150 suggestions from 841 students belonging to six faculties. As expected, the suggestions pertain to varieties of services provided by the Division. Based upon the contents, all suggestions, all suggestions categorized into 10 groups, which are: (1) Staff related, (2) Counter related, (3) Registration and Add/Drop process related, (4) Examination schedule related, (5) Fine related, (6) Information related, (7) Examination slip related, (8) Study plan related, (9) Results related, and (10) Others. All the suggestions belonging to 10 groups are shown in Appendix 1. We observe that most frequent suggestions are related to mainly two areas: Registration and Add/Drop Process (37 suggestions) and staff related (25 suggestions). Further, miscellaneous category "Others" consists of also 37 different suggestions.

5.1 Combining Almost Similar Suggestions

Some suggestions have been combined because they almost have similar meanings. For example, suggestion number 67, which says that: 'Improve the on-line registration process' has been combined with the suggestion says 'Update the on-line registration'. Also, suggestion number 9 which says: 'All the staff of ID must take some seminar or other courses related to ethics in their services to the students'. This suggestion has been combined with some other suggestion having almost the same meaning e.g., 'Must train the staff of ID to improve their work'.

5.2 Rewriting Suggestions

Some suggestions have been rewritten because originally their meanings were not clear and they were written in a way that was difficult to understand, for example, suggestion number 74 originally was: 'Enhance the management in setting the exams schedule and make sure that no clashes in the exams'. This suggestion has been rewritten to: 'Develop proper exams schedule and make sure that no clashes exist in the exams'. Also, suggestion number 100 originally was: 'Give students brief directions to simplify the solving of their problems'. This suggestion has been rewritten to: 'Give students enough guidelines to solve their problems'.

5.3 Correcting Grammatical Mistakes

Some suggestions were grammatically wrong, but we have rewritten them. For example suggestion number 40 was: 'Making the process easily like students don't have to wait long time especially in the early semester'. This suggestion has been rewritten as: 'Make the process easy. Students don't have to wait for long time especially in the beginning of the semester'. Also, suggestion number 94 was: 'ID should find a proper ways to inform students about the latest information and changes in ID policies'. This suggestion has been corrected and rewritten to: 'ID should find proper ways to inform students about the latest information and changes in ID policies'.

6. Evaluating Suggestions

Obviously, not all suggestions received same frequency. Some of the suggestions in the pool have received considerably higher frequencies compared to the rest. The suggestions that have received frequencies more than 10 are not evaluated by the AHP, rather they are straight away recommended for implementation. These suggestions, 22 in number, are shown in Table 3. We observe that following 4 suggestions whose frequencies are more than 50:

- The staff must keep smiling and be friendly even tough they are tired and treat students politely
- Provide more staff in the counter
- Improve the computer system during the registration period
- Offer students with much bigger office and counter to entertain many students every day

The following three suggestions are also noteworthy:

- Don't prolong the time of service.
- Should have numbering system in the counter like that in banks.
- All the staff of ID must attend some seminar or other courses related to ethics in their services to the students

Table 3: Suggestions with frequency more than 10

No.	Suggestion	Freq.	Group
1	The staff must keep smiling and friendly even though they are tired and treat students politely	294	Staff
2	Provide more staff in the counter	175	Counter
3	Try to improve the computer system during the registration period	94	Reg. Add/Drop
4	Offer students with much bigger office and counter as well to entertain hundreds of students every day	66	Counter
5	Don't prolong the time of the service	44	Staff
6	Should have numbering system in the counter like that in banks	39	Counter
7	All the staff of ID must take some seminar or other courses related to ethic in their services to the students	36	Staff
8	Must fix somebody to entertain students at the count r because many times we come and wait them for long time	23	Staff
9	Reduce or remove the amount of fine for withdrawal or drop of the	23	Fine

	subjects		
10	Try to serve all students equally	20	Staff
11	Their attitude is so bad. Hope if they change their attitude	17	Staff
12	Increase add/drop period	17	Reg. Add/Drop
13	No more than one paper of final exam should be on the same day	16	Exam Schedule
14	Staff must be more responsible and should not be ignorant to students as they usually do	15	Staff
15	Please set officers on the counter who are good in speaking English	15	Staff
16	ID should improve their services specially on the day of the registration	15	Reg. Add/Drop
17	ID should be more open to hear form students and try to fulfill their needs or at least try to hear what students trying to say	13	Staff
18	Enhance the communication between staff and students	13	Staff
19	Results of each semester should be shown through on-line system	12	Results
20	Hope if they know every thing about the department	11	Staff
21	Improve the on-line registration process	11	Reg. Add/Drop
22	Provide final exam schedule via on-line	11	Exam Schedule

All the reaming 128 suggestions have been evaluated by the absolute measurement procedure of AHP. From the literature, we identified five criteria for evaluation exercise: Time, Cost, effectiveness,, Feasibility, and Resistance to change. However, in consultation with the Dean of ID, we ultimately considered only three criteria for evaluation. According to him, money is not a factor for implementation of any of the suggestions obtained, so, cost was not considered in evaluation. Further, he mentioned that there will be no resistance from any sector to implement any suggestion. The relative weights of the three criteria (feasibility, effectiveness, and time) considered in the evaluation exercise, are determined using relative measurement procedure of AHP. The pairwise comparison matrix (PCM) and the weights are shown in Table 4.

Table 4: Pairwise Comparison Matrix for the Criteria

	Feasibility	Effectiveness	Time	Weight*
Feasibility	1	1	3	0.429
Effectiveness	1	1	3	0.429
Time	1/3	1/3	1	0.143

*Calculated using Expert Choice.

Pairwise comparison matrices on criteria ratings:

Each of the three criteria has been divided into five ratings. These are discussed below.

Time: How much time is required to obtain the benefit after implementing the suggestion.
Ratings: weeks (excellent), less than 3 months (good), 3-6 months (average), 6-12 months (poor), more than 1 year (very poor).

Feasibility: To what extent the suggestion can be implemented at ID.
Ratings: highly feasible (excellent), feasible (good), moderately feasible (average), not feasible (poor), not at all feasible (very poor).

Effectiveness: How effective the suggestion be in improving the services of ID.
Ratings: very effective (excellent), effective (good), moderately effective (average), not effective (poor), not at all effective (very poor).

The common pairwise comparison matrix of the five ratings for all the three criteria are shown in Table 5.

Table 5: Pairwise comparison matrix for all the five ratings

	Excellent	Good	Average	Poor	Very poor	Weight
Excellent	1	3	5	6	7	0.494
Good	1/3	1	3	5	7	0.268
Average	1/5	1/3	1	3	5	0.133
Poor	1/6	1/5	1/3	1	3	0.067
Very poor	1/7	1/7	1/5	1/3	1	0.037

Inconsistency Ratio = 0.07

Both the PCMs shown in Table 4 and Table 5 are developed in consultation with the Dean of ID. In fact, all the judgments were provided by him, we merely asked the pairwise comparison questions to extract the judgments.

After obtaining the local weights of the ratings, we need to determine their global weights, As described in Step 2 of the absolute measurement procedure, global weights of the ratings are determined upon multiplying the local weights by the weight of the corresponding criterion. Table 6 shows the global weights of all the ratings under various criteria.

Table 6: Global weights of the ratings under various criteria

Criteria	Intensities of Rating	Local Score	Global Score
Feasibility	Highly feasible	0.494	0.212
(0.429)	Feasible	0.268	0.115
	Moderately feasible	0.133	0.057
	Not feasible	0.067	0.029
	Not at all feasible	0.037	0.016
Effectiveness	Very effective	0.494	0.212
(0.429)	Effective	0.268	0.115
	Moderately effective	0.133	0.057
	Not effective	0.067	0.029
	Not at all effective	0.037	0.016
Time	Weeks	0.494	0.071
(0.143)	Less than 3 months	0.268	0.038
	3-6 months	0.133	0.019
	6-12 months	0.067	0.010
	More than a year	0.037	0.005

Following Step 3 of the evaluation procedure, all the suggestions were evaluated. Once again the Dean was involved in the phase of AHP application. At the end of the evaluation exercise, some suggestions were obtained higher total scores compared to the rest. The suggestions with weight more than 0.400 (shown in Table 7) were forwarded to the ID for implementation along with the suggestions, mentioned before, that received frequency more than 10.

Table 7: Suggestions that received total weight more than 0.400

| No | Suggestions | Category | Freq. | Evaluation | | | |
				Effectiveness	Feasibility	Time	Total
1	Staff must improve their commitment to students	Staff	1	0.212	0.212	0.01	0.434
2	Provide more staff during the period of collecting confirmation slips	Staff	2	0.212	0.212	0.038	0.462
3	Staff break starts early and finishes after 2 pm, please be punctual	Staff	3	0.212	0.212	0.071	0.495
4	ID staff should come on time and leave on time...not coming late and leaving early	Staff	8	0.212	0.212	0.038	0.462
5	Have staff from ID in each department to make it easier for students to refer during add/drop period	Staff	5	0.212	0.212	0.038	0.462
6	Telephone calls should be answered quickly because it takes long time before they answer our calls	Staff	1	0.212	0.212	0.071	0.495
7	The counter of ID should be in each department, this will be easier for students to raise their problems	Counter	4	0.212	0.212	0.019	0.443
8	At the time of 'Add and Drop' the staff of ID should be more than one in order to settle student's problems quickly	Reg.	9	0.212	0.212	0.038	0.462
9	Give the priority to final year students	Reg.	2	0.212	0.212	0.038	0.462
10	Make sure that subjects are not closed because we had faced many problems about section closed or subject not offered	Reg.	1	0.212	0.212	0.019	0.443
11	Arrange the registration process year by year, not all levels together at the same time	Reg.	3	0.212	0.212	0.038	0.462
12	The final exams schedule should be mentioned together with the registration time, so students can register and know their final exams schedule in advance	Exam	7	0.212	0.212	0.019	0.443
13	All announcements should be provided on-line (internet)	Info.	1	0.212	0.212	0.038	0.462
14	Have an on-line comments and complaints systems	Others	4	0.212	0.212	0.019	0.443

15	For partial transcript, please make it available in only one day; no need to wait for three days	Others	7	0.212	0.212	0.019	0.443
16	Make a link with Finance Division, if a student applies for study leave, Finance Division charges him for the semester	Others	3	0.212	0.212	0.019	0.443

6.1 Discussion on the Important Suggestions

Overall, we observe that most of the suggestions that have received higher frequency/weight are related to the Division's staff. Therefore, there is an urgent need to look into the matter. The tangible actions that can be done to address the suggestions are the following:

Provide customer satisfaction training – this is specially true for the staff who are at the counter. Most of the complaints in service organizations are generated due to the indifferent attitude of the counter personnel.

Students have suggested to place knowledgeable staff at the counter. Many time part time staff are placed at the counter and they cannot respond to the queries of the students. Therefore, experienced, full-time employees should be given the responsibilities to handle students at the counter. Make sure that there is always someone at the counter.

One hundred and seventy five students suggested to provide more staff in the counter to reduce the time of the service and many students asked to provide them much bigger office and counter because they complain that most the time the office size is unable to accommodate large number of students specially during registration and add/drop periods. This problem can be reduced by implementing suggestions of other students like using numbering systems as used in Banks which reduce the number of students waiting inside the office and can regulate and manage students based on first come-first served basis. On the other hand, 94 students suggested to upgrade the computer system. However, in the university, the computer resources are managed by the Information Technology Unit. Therefore, ID needs to seek help from the IT uinit to look into what actually they can do to improve the IT system.

7. Conclusions

This paper proposes to use absolute measurement procedure of AHP for evaluating employee suggestions. The procedure is thorough, simple and easily implementable. For larger number of suggestions, Expert Choice software can be used for evaluation. After the evaluation exercise, we obtain the ranking of all the suggestions. From this ranking, the decision maker can easily select the potential suggestions for implementation. The exercise has been demonstrated through a case study on a public university in Malaysia. The procedure can be easily extended to any other organization. Furthermore, the procedure is equally applicable for customers' suggestion program across organizations. It is expected that the proposed procedure will enhance the rigor of employee/customer suggestion system and it will continue to be an excellent tool in managing quality.

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