APPENDIX C

THE GAP → AHP TRANSFER ALGORITHM

The algorithm begins with the weight allocation to all PCs based on the pair-wise comparison technique of AHP. The five points of PC are structured in the form of a matrix for pair-wise comparison, as depicted in Table C.1 by considering the least point PC (e.g. PC1) as more important (in terms of problem identification) compared to the higher point PC (e.g. PC5). Therefore, to simplify, the logic for this consideration is PC1>PC2>PC3>PC4>PC5.

Table C.1: Pair-wise Comparisons for Problem Category

	PC 1	PC 2	PC 3	PC 4	PC 5
PC 1	1	2	3	4	5
PC 2	1/2	1	3/2	4/2	5/2
PC 3	1/3	2/3	1	4/3	5/3
PC 4	1/4	2/4	3/4	1	5/4
PC 5	1/5	2/5	3/5	4/5	1

Based on Table 3.3 (in Chapter 3) and its corresponding Table C.1, the relative weighting scale for the PCs is calculated. The value of weight for each PC is calculated by dividing the highest point of PC by the corresponding PC value. For example, the weight for PC1 is 5, where 5 is the highest point and PC1 has a point value of 1, thus 5 / 1 = 5 (the real logic behind this calculation is that PC1 is assumed to be five times more important than PC5), and for PC2, the weight is 2.5 (since PC2 is two and a half times (2½) more important compared to PC5 or 5 / 2 = 2.5). Therefore, the logic of this process can be simplified as follows:

N = highest value of category (e.g. in this case, 5 is highest value)

x = value of category (e.g. PC1 has a value of 1)

W (weight) = N/x

In Table C.2, the comparative weight for every PC is displayed where the PC5 is a baseline in this weighting process or in a neutral position that it is not really a good point or a bad point.

Table C.2: Comparative Weight of Problem Category

Category	Explanation	Weight
Problem Category 1 (PC1)	This indicates a serious problem which should and can be resolved in the short-term, and the resolution of the problem is quite likely to provide real short-term benefits	5
Problem Category 2 (PC2)	This indicates a serious problem which is likely to have pre-requisites, and is thus better dealt with as part of an appropriate and logical improvement and implementation plan	2.5
Problem Category 3 (PC3)	This is not a serious problem, but can be dealt with now. If resolved, it is likely to yield short-term benefits	1.67
Problem Category 4 (PC4)	This is not a serious problem. Although it could be dealt with now, it is unlikely to yield short-term benefits. Therefore, it should only be dealt with if it is a pre-requisite for other things	1.25
Problem Category 5 (PC5)	This is not really a Good or Problem Category it self; the questions associated with this category are primarily asked to identify certain situations in the environment which, upon subsequent probing by succeeding questions, may well reveal problems	1.0

The next step in this algorithm, is translating the PC weight into the nine-points scale of intensity of importance [Saaty (2001)]. The process of transferring begins by calculating the differences between total of the least point PC (PC1) in one component (A) and the total of the higher point PC (PC5) in another component (B), by assuming there are 100% points belonging to PC1 in component A, and 100% points belonging to PC5 in component B. The difference between each PC in both components is multiplied with the weight of PC to calculate the Performance Score. Finally, the total Performance Score for

the Problem Category is calculated and its value is equal to 400 points. This process is depicted in the following Table C.3.

Table C.3: Performance Score of Problem Category

PC (1)	Weight of PC (2)	Component A (%) (3)	Component B (%) (4)	Difference of A and B (5)=(3)-(4)	Performance Score (6)=(5)*(2)
1	5	100	0	100	500
2	2.5	0	0	0	0
3	1.67	0	0	0	0
4	1.25	0	0	0	0
5	1.0	0	100	-100	-100
TOTAL		100	100		400

Since the intensity of importance has a scale of nine points, the interval between each point can be calculated by dividing the total performance score (400) by the scale of intensity of importance (8); in mathematical form, this calculation is:

Interval = Total performance score / Scale of intensity of importance

= 400 / 8

= 50

Therefore, the lowest performance score for Scale 1 in intensity of importance is equal to 0, while the highest performance score for Scale 9 in intensity of importance is equal to 400, with performance interval between each scale equal to 50. The comparative performance scores for the intensity of importance are shown in Table 3.6.