The influence of the stakeholders’ perspective for the performance measurement in local authorities

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Abstract. This research constructs a performance evaluation of the influence of stakeholders’ perspective on the performance measurement in the local authorities. The stakeholders’ perspective has been proven as one of the main factors that influence higher rating on the performance measurement in many public organizations including the local authorities. However, very little attention has been paid towards the attributes of the stakeholders’ perspective that affecting the performance measurement in the local authorities. This research focused on the elements that contribute on the stakeholders’ perspective from the Balanced Scorecard’s perspective and Multi-Criteria Decision Making tool namely Analytic Network Process (ANP) to acquire the priorities of the attributes for the stakeholders’ perspective. The attributes were used as the performance indicator for performance measurement in the local authorities. There were eight (8) attributes that have been measured in order to acquire the priorities of the attributes in affecting the performance measurement under the stakeholders’ perspective (customer, customer retention, new customer acquisition, customer profitability, community support, employees, management and service providers). From this result, it will provide the management of the local authorities to improve the performance of the local authorities which are meaningful for managerial and improvement purpose in the service delivery towards the public.

1. Introduction
Performance measurement had been discussed by many researchers that has led to the importance of determining the best performance measures. However, performance measurement in local authorities in Malaysia is still in infancy. Public organization such as local authorities are facing pressures for change which require the local authorities to be more efficient in order to provide better services to the public. According to Myeda et al. [1] the literature in performance measurement system in Malaysia especially in facilities management is still limited even though performance measurement is one of important element in increasing the productivity of employees in the local authorities as well as increasing the level of customer satisfaction. In Malaysia, there are 149 local authorities including city council, municipal, and district council [2].

Performance measurement in facilities management is very important especially in the local authorities. Therefore, a study has been made to obtain reliable performance measures that can improve the performance of facilities management in the Malaysian local authorities. There are need to measure the performance of facilities management in the local authorities due to the need of obtaining the level
of past performance, the level of current performance, the level of the local authorities wants to achieve, the approach in order to achieve the level of required performance and how the level of set target has been achieved [3]. Furthermore, according to Rahmat and Nawawi [4], there are many issues occurred in the Malaysian local authorities as it provides services and facilities to the public such as operational issues, transparency, poor services, not proactive in improving public services, cleanliness issue, provision of public facilities, the efficiency of service deliveries, poor financial planning, accountability, poor management and environment and safety issues.

Therefore, the purpose of this study is to obtain a set of reliable performance measures using Balanced Scorecard (BSC) as the base of the model. In this paper, only the sub-criteria for the stakeholders’ dimension will be discussed. Saaty [5] had argued that the need of identifying and understanding the level of expectations of the stakeholders in the local authorities are important in order to deliver more effective services.

Facilities management involves various stakeholders including the internal and external stakeholders and processes that need a holistic performance measures. Stakeholders have been studied in many research studies including performance measurement [6 - 9], strategic performance management [7] and decision making [10]. However, these studies have not identified the priority of performance measurement criteria under the stakeholders’ dimension in order to achieve higher performance level. Therefore, it is essential to identify the effective performance measures for the stakeholders in the local authorities. In this study, the performance measures for stakeholders’ perspective for facilities management in the local authorities has been measured using Analytic Network Process (ANP) developed by Saaty [11].

The ANP helps in solving the decision problems among the interdependent criteria within the structure. In the ANP, the structure of the criteria will be not in the hierarchy structure that will show in linear flow but it will appear as a network structure with different cycles to connect its clusters of criteria and the loops that connect the cluster [12]. In the ANP, the pairwise comparisons are used same as in the AHP. The 1-9 scales are used to obtain the level of importance of the criteria and measurement indicators chosen for the BSC. Table 1 shows the fundamental scale of using the absolute numbers developed by Saaty [11].

Table 1. Fundamental scale of ANP.

| Intensity of importance | Definition                      | Explanation                                                                 |
|------------------------|---------------------------------|-----------------------------------------------------------------------------|
| 1                      | Equal importance                | Two objectives that contribute equally towards the objective chosen         |
| 2                      | Weak                            | Based on the experience and judgment, the preferences of criteria is slightly favour on one activity over another |
| 3                      | Moderate importance             | Based on the experience and judgment, the preferences of criteria is strongly favour on one activity over another |
| 4                      | Moderate plus                   | One criteria is preferred very strongly over other criteria (very dominance) |
| 5                      | Strong importance               | The evidence favouring one criteria over another is of the highest possible order of affirmation |
Reciprocals of above activity

If activity \( i \) has one of the above nonzero numbers assigned to it when compared with activity \( j \), then \( j \) has the reciprocal value when compared with \( i \).

A reasonable assumption

Rationals

If consistency were to be forced by obtaining \( n \) numerical values to span the matrix.

The scale was used to pair-wise comparison in the stakeholders’ dimension. The respondents were asked to answer the questionnaire based on the scale in order to gain a supermatrix values.

2. The stakeholders’ performance criteria

The key dimensions of the service in the local authorities are performance measures for stakeholders’ dimension which are summarized in table 2. The selected performance measures were chosen after a thorough literature search and consultation with local authorities’ representatives. The selected performance indicators had to meet the following criteria, most of which are standard requirements. First, indicators needed to be easy to interpret, to maximize the probability that they would be used by local authorities’ management, officers, and members.

Table 2. Key performance measures for stakeholders’ dimension.

| Code | Criteria            | Explanation                                                                 |
|------|---------------------|-----------------------------------------------------------------------------|
| S1   | Customer satisfaction | Measures on how well the local authorities is doing according to the satisfaction level of the users |
| S2   | Customer retention   | Measurement of customers’ loyalty in local authorities                      |
| S3   | New customer acquisition | Measurement of the number of new customers that are using the local authorities services |
| S4   | Customer profitability | Newly acquired customers for more profitable tax collection                  |
| S5   | Community support Employees | Measurement of how well the service and the facility are accepted by the community |
| S6   | Management           | Measurement of how the employees in local authorities are perceived to be more effective in delivering services |
| S7   | Service Providers    | Measurement of how the outsourcing service providers are perceived to be more efficient and effective in providing services |

3. ANP methodology

Although many studies about performance measurement have been applied in ANP, considering facilities management needs to have a method beyond the hierarchical relations. The hierarchy network can demonstrate the linear top-down connection and interdependence relations in each criteria and sub criteria. Therefore, the ANP is able to find the best strategy. In order to obtain the performance measures in the stakeholders’ criterion, an ANP methodology was carried out.

3.1 Respondents

For the purpose of this study, prioritisation of indicators for performance measures in facilities management for Malaysian local authorities which the respondents consist of officers from four departments in the local authorities mainly from the valuation and property department, engineering department, human resource department, and financial department. The respondents were chosen from officer and assistant officer which directly involved in managing facilities in the local authorities and
making decision for facilities management. The reason on the selection of respondents from these departments was based on the high influences in FM as well as the selection of performance measures for the BSC in FM due to their experience, knowledge and working skills. Furthermore, the data gathering process will be more reliable due to the involvement of direct person in charge in the local authorities.

The respondents consist of 105 officers and assistant officers from 44 local authorities; 10 city councils and 34 municipalities. The District councils are excluded from the population sample as their functions and purposes are geared specifically towards the infrastructure facility and public utility rather than services at city councils and municipal[13].

3.2 Process of ANP approach

The structure of analyse the BSC using ANP approach are shown as below [14, 15]:

**Step 1.** Design a questionnaire survey for collecting responses from the respondents. The questionnaire used in this research involved pairwise comparison of measures on a nine-point scale based on the AHP method with one criteria was extremely more important than the other and one point will be awarded if the two elements were equally important.

**Step 2.** In the next step involves the pairwise comparison in the pairwise comparison matrix. The pairwise comparison considers the impact of each element on others. The pairwise comparison was obtained by computing the matrices using Super Decisions software.

**Step 3.** Calculated the eigenvector of priorities for testing the consistency ratio (CR). According to [11], if the CR was less than 0.1, it can be considering as acceptable value.

**Step 4.** The other steps are forming super matrix and calculating the weights. Its elements are derived from pairwise comparison. The super matrix consisting of N clusters is presented as follows.

**Step 5.** After calculating the weights of the measures, the priority of the performance criteria can be selected based on the results. The aggregation of the individual judgements will be carried out by means of the geometric mean [16].

4. Findings

After a set of questionnaire has been set up, the questionnaire was distributed among the officers and assistant officers in the local authorities. The respondents were asked to pair-wise the criteria of the stakeholder’s dimension according to the importance of each criterion. After a pair-wise was made, a pair-wise comparison has been made. Table 3 shows the pairwise comparison of stakeholders’ dimension.

| Stakeholders dimension | S1  | S2  | S3  | S4  | S5  | S6  | S7  | S8  | CR  |
|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| S1                     | 1   | 1/4 | 1/6 | 1/4 | 1/8 | 1/4 | 1/5 | 1/5 |     |
| S2                     | 4   | 1   | 1/2 | 1/6 | 1/5 | 1/6 | 1/2 | 1/3 |     |
| S3                     | 6   | 2   | 1   | 1/4 | 1   | 5   | 5   | 4   |     |
| S4                     | 4   | 6   | 1/4 | 1   | 1/5 | 1/6 | 1/5 | 6   |     |
| S5                     | 8   | 5   | 1/3 | 5   | 1   | 3   | 4   | 5   | 0.09|
| S6                     | 5   | 6   | 1/5 | 6   | 1/3 | 1   | 1/7 | 4   |     |
| S7                     | 5   | 2   | 1/5 | 5   | 1/4 | 1   | 1   | 7   |     |
| S8                     | 5   | 3   | 1/4 | 1/6 | 1/5 | 1/4 | 1/7 | 1   |     |
During the evaluating process, the issue of consistency of the pair-wise comparisons may occur. Therefore, to check this consistency, the consistency ratio (CR) was calculated as equations (1) and (2):

\[
CR = \frac{CI}{RI}
\]

whereby:

\[
CI = \frac{\lambda_{\text{max}} - n}{n-1}
\]

in which \(CI\) is the Consistency Index, \(RI\) is the Random Index and \(n\) is the size of the matrix. A CR value less than 0.10 can be acceptable [11,17]. In this analysis, the result has a CR value of 0.09 that can be acceptable.

After a pair-wise comparison of elements on the same layer with respect of other elements in the same category were conducted, the geometric mean values were computed for synthesizing the results. The geometric mean values had been conducted in order to obtain the combines comparisons of the results among the respondents.

Table 4 shows the priorities on the stakeholders’ measurement criteria based on the supermatrix.

| Name                        | Priorities   | Ranking |
|-----------------------------|--------------|---------|
| S1 Customer satisfaction    | 0.010661     | 2       |
| S2 Customer retention       | 0.005072     | 6       |
| S3 New customer acquisition | 0.002425     | 8       |
| S4 Customer profitability   | 0.006043     | 5       |
| S5 Community support        | 0.00855      | 3       |
| S6 Employees                | 0.004399     | 7       |
| S7 Management               | 0.020805     | 1       |
| S8 service providers        | 0.006216     | 4       |

From table 4, it shows that Management is ranked in the first rank among the stakeholders’ measurement criteria. Most of the respondents agree that management gives more opportunity for improvement in services and facilities in the local authorities. Followed by customer satisfaction in the second rank and community support in the third rank. From this table, it shows that decision from the management in the local authorities based on the policy from the government can heavily affected the whole operation of the local authorities especially in FM. Customer satisfaction also plays an important role in the performance measures as the local authorities provides services and public facilities to the users. While community support can affect the level of performance in the local authorities if the public can support the provision of the facilities by ensuring the facilities are in a good condition while using it.

5. Discussion

From the results, it indicates that Management plays an important role under the stakeholders’ dimension. This due to as a stakeholder, they must be able to make decision as well as able to influence others including the organization and the employees especially in managing over resources, technical skill and be able to access to the people who can finish the required tasks. The top management has
legitimate power because it can control resources, cost control and managing employees. Furthermore, the management are supported by the federal government.

Followed by customer satisfaction in the second rank indicates that customer also plays an important role in determining the performance of the local services in delivering services providing public facilities. If the customer is not satisfied with the service delivery by the local government, the performance of the local authorities will have to upgrade in order to be more effective in delivering services.

In the third rank is community support which requires the community to contribute to the local authorities by paying the taxes in order for the local authorities to provide more efficient service delivery and better facilities to the customer. This is important as the taxes paid by the customer determine the financial management by the local authorities to be more stable and cost control can be managed.

6. Conclusion
Performance measures for stakeholders’ dimension of facilities management for Malaysian local authorities is one of the most important processes that must systematically considered from the decision maker especially in the local authorities. For this reason, performance measures for the stakeholders’ dimension is evaluated using the integrated of BSC and ANP method. This paper identified the problem of selecting performance measures for facilities management in Malaysian local authorities especially in the stakeholders’ dimension. An ANP model was subsequently designed based on the BSC perspectives to incorporate the judgements of respondents using the identified measures. This performance measures were applied by 105 respondents from the local authorities to select the most priority and suitable performance measures under the stakeholders’ perspective.

From the results, management is the most priority measure for performance measures under the stakeholders’ perspective followed by customer satisfaction and community support in the third rank. In this paper, performance measures were considered as a multi-criteria decision problem and an integrated BSC and ANP was used. An overview of the performance measurement criteria of stakeholders’ dimension for facilities management in Malaysian local authorities also has been obtained. By using the ANP for the stakeholders’ performance criteria, the priorities of each criterion can be obtained and therefore the performance in the local authorities can be improved.

Another important finding is that the proposed criteria is more reflecting with the importance of each criterion that affected the stakeholders’ dimension for facilities management in the local authorities.

This paper can be extended to other dimensions in the BSC for improvement of facilities management in the local authorities.

7. References

[1] Myeda N E, Zaid S M, Sulaiman R and Mahyuddin N 2014 The implementation of performance measurement system (PMS): Malaysian facilities management (FM) industry Building Surveying, Facilities Management and Eng. Conf. (BSFMEC 2014) vol. 15 (Paris: MATEC Web of Conferences) 01014

[2] Portal OSC (One Stop Center) 2019 Number by State and Local Authorities Status Retrieved on April, 20 2019 from http://www.epbt.gov.my/osc/

[3] Lebas M J 1995 Performance measurement and performance management. International Journal of Production Economics 41 23-35

[4] Rahmat N and Nawawi A H 2017 Facilities management in Malaysian local authorities: identifying current issues The Social Sciences 12(5) 755-761

[5] Saaty L T 1999 Fundamentals of the analytic network process The International Symposium on the Analytic Hierarchy Process (Kobe, Japan) pp 12–14

[6] Wisniewski M and Steward D 2004 Performance measurement for stakeholders International Journal of Public Sector Management 17(3) 222-233
[7] Kloot L and Martin J 2000 Strategic performance management: a balanced approach to performance management issues in local government *Management Accounting Research* **11** 231-251

[8] Hildebrand R 2007 *Measuring and managing performance in local government: a literature review* Local Government Institute Working Paper Series May 2007 (Victoria: School of Public Administration University of Victoria) pp 1-68

[9] Harrison J A, Rouse P and Viliers C J D 2012 Accountability and performance measurement: a stakeholder perspective *JCC The Business and Economic Research Journal* **5**(2) 243-258

[10] Gomes R and Gomes L 2008 Who is supposed to be regarded as a stakeholder for public organizations in developing countries? *Public Management Review* **10**(2) 263-275

[11] Saaty L T 2005a *Analytic hierarchy process* *Encyclopedia of Biostatistics 1* (New York: John Wiley & Sons, Ltd)

[12] State Council Meeting for Local Government (MNKT) 60th On 3rd Of June 2008 Retrieved on April 21, 2019 from http://jkt.kpkt.gov.my/en/SUK%26PBT/PBT/KategoriPBT

[13] Saaty L T 2005b *Theory and applications of the analytic network process* (Pittsburgh: RWS Publications)

[14] Lin C T 2018 A decision-making model for evaluating and selecting suppliers for the sustainable operation and development of enterprises in the aerospace industry *Sustainability* **10** 735

[15] Saaty T L 2001 *Decision making with dependence and feedback: the analytic network process* (Pittsburgh: RWS Publications) pp 37

[16] Saaty L T 2013 *Analytic network process* *Encyclopedia of Operations Research and Management Science* (United States: Springer US) pp 64-72

[17] Saaty L T 1980 *The analytic hierarchy process* (New York: McGraw-Hill)