

## **SYSTEMATIC ASSESSMENT MODEL FOR SUSTAINABILITY REPORTING IN THE MALAYSIA CONTEXT**

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### **ABSTRACT**

Sustainability assessment is gaining interests and increasingly recognized as a powerful and important tool to measure the performance of sustainability in a company or industry. Nowadays, there are many existing tools that the users can use for sustainable development. There are various initiatives exists on tools for sustainable development, though most of the tools focused on environmental, economy and social aspects. Using the Green Project Management (GPM) P5 concept that suggests the firms not only needs to engage in mainly 3Ps principle: planet, profit, people responsible behaviors, but also, product and process need to be included in the practices. This study will introduce a new mathematical model for assessing the level of sustainability practice in the company. Based on multiple case studies, involving in-depth interviews with senior directors, feedback from experts, and previous engineering report, a framework is proposed with the aims to obtain the respective data from the feedbacks and to develop a new mathematical model for reducing the variation. Lastly, to develop a matrix for a systematic sustainability assessment model for sustainability reporting. This study is expected to provide a guideline to the company to assimilate the sustainability assessment in their respective development stage.

**Keywords:** Sustainability development, Sustainability reporting, Sustainability assessment

### **INTRODUCTION**

Sustainability is a notion that needs to be addressed not only at the policy level but also in business context: many companies have included sustainability in their mission, also driven by an increasing demand for sustainable products by more aware consumers. (Zamagni.A et al., 2013). Sustainable development has always been an important central point for all decision makers in any organizations. Sustainable development has been defined in many ways, but the most

frequently quoted definition is from Our Common Future, also known as the Brundtland Report in 1987: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Kapor, P et al., 2015). Sustainability seems to be agreeable proposal because of its meeting points among environmental concerns, manufacturing, and product design activities (Rusinko et al., 2007). Over the years, the number of sustainability indicators and their use in decision-making has greatly increased (Hak et al., 2012). However, the existing sustainability evaluation still do not integrate a nature-economic-society aspect, some of these tools are focused on just one or two dimension(s) of sustainability, product sustainability perspective (Ghadimi, P. et al., 2012), environmental aspect (Bjørn, A. et al., 2016; C. Strazza et al., 2015). Moreover, some others focused on all three dimensions (Chong, Y. T et al., 2016; Scandellius, C. et al, 2016; Hugé, J. et al., 2013), but there is a same gap in all of these methods which is limited attempts at bringing Green Project Management (GPM) P5 method to use in sustainability practices. Besides that, no research has been attempted from the viewpoint of focusing on sustainable parameters toward achieving a more systematic assessment model which can contribute to sustainability reporting.

Encouraged by Bursa Malaysia, sustainability view can be referring as crucial point to a successful business in this present-day. Every companies in the auspices of Bursa Malaysia also required to embed the sustainability concept as a vanguard of their business. Besides, each company also need to provide a sustainability report as a requirement of Bursa Malaysia Securities Berhad. Nowadays, every single company that under the auspices of BURSA Malaysia is required to yield the sustainability reporting. Hence, a systematic sustainable assessment is designed in the advancing of sustainability reporting for promoting sustainability practices. Most of the companies in Malaysia have implemented green practice in their organization management. However, the green practice only emphasizes the environmental aspect, and that causes other important aspects within the company seem to have overlooked. Thus, GPM P5 standard is introduced as one of the sustainability assessment approach to measure the sustainability practices performance thoroughly by considering not only the main 3Ps aspects; planet, people, profit, but also process and product.

The general objective of this research is to propose a mathematical model for accessing sustainability practice in a company by using P5 integration matrix. This study will aid the company to determine their level of sustainability compliance in their development and to be documented in their sustainability report.

## METHODOLOGY

The general framework of the approach is as depicted in Figure 1.

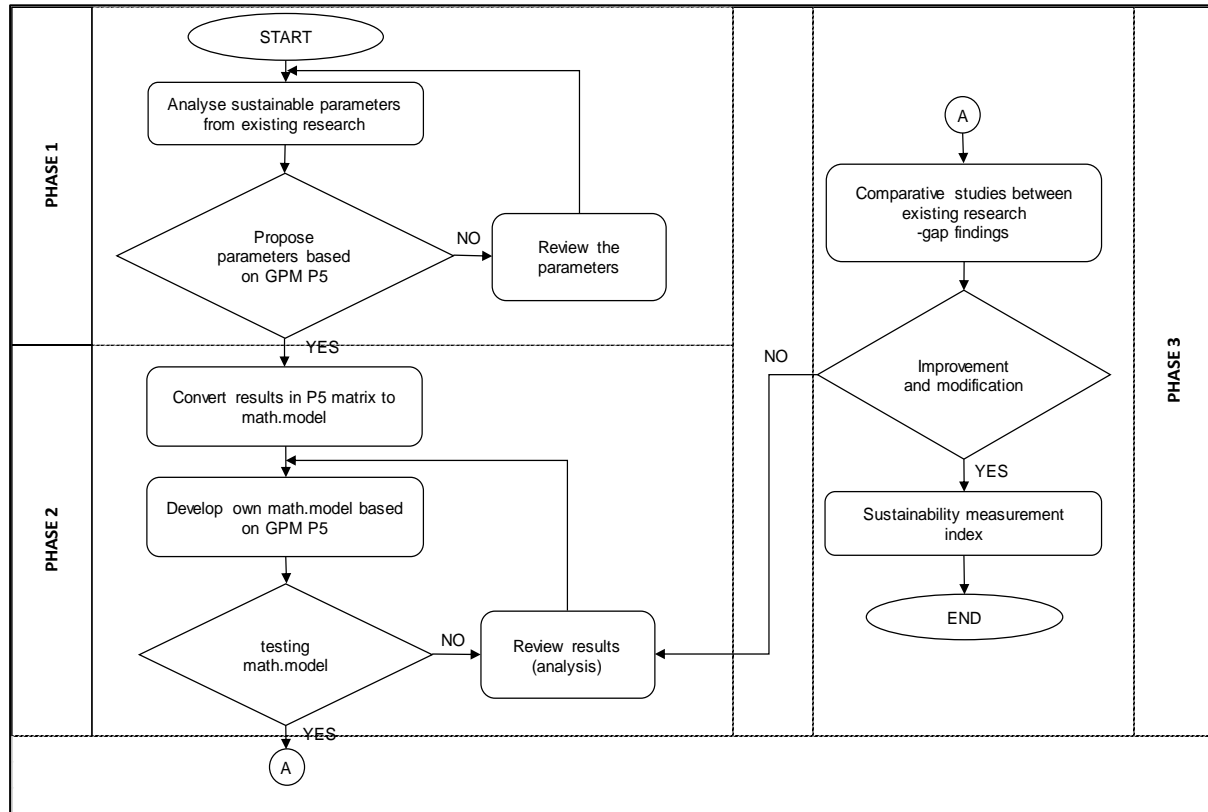


Figure 1: General framework of proposed approach

The concept of P5 Integration matrix will conclude all major sustainability standard refer to the Triple Bottom Line of sustainability: people (society), profit (financial), and planet (environment), whereas another two are process and product [3]. The proposed method followed during this project is shown in Figure 1. The research analogy behind this project is that how an organization can move toward sustainable practicing using a GPM P5 method for producing a better sustainability reporting. With this methodology, a systematic sustainable assessment for organizations that want to improve their sustainability reporting and ultimately implementing of sustainable practicing is provided.

The proposed research has six steps as follows:

- Step 1: Data sources – case company, existing research
- Step 2: Criteria selection – Weighing criteria
- Step 3: Data collection – analysis
- Step 4: Mathematical model evaluation (based on GPM P5 standard)
- Step 5: Calculating current sustainability index
- Step 6: Calculating improved sustainability index

## Sampling / Data sources

In this section, the studies from the existing research is done to analyse the frequently used parameters in sustainable assessment and the tools used to measure the sustainability. Furthermore, the details about the case company, product, data collection, and sustainability assessment are presented. The case study will be conducted in any company in Malaysia.

## Criteria selection – weighing criteria.

The scale between +3 – -3 was developed to ease the respondents’ group for rating the evaluation criteria, which initially selected by the design engineers based on technical documents and the results of a prior survey.

Table 1: Scale of “weighting criteria” as stated from GPM P5 checklist

Numerical rating	Description
3	Negative Impact High
2	Negative Impact Medium
1	Negative Impact Low
0	Neutral
-1	Positive Impact Low
-2	Positive Impact Medium
-3	Positive Impact High

**Data collection – analysis.** In this case study, owner of the company, chief executive officer, general manager and a system manager were selected as the expert decision makers. The will be an act as a field study including in-depth interviews with selected experts. The experts’ opinions are used for providing a sufficient data to fulfil the research objectives.

Figure 1 - 4 shows the initial result concluded from the data analysis that have been done. The graph consists of people, planet and profit that based on process and product from manufacturing operation system field. The data from the graph is already been calculated using min formula in the excel.

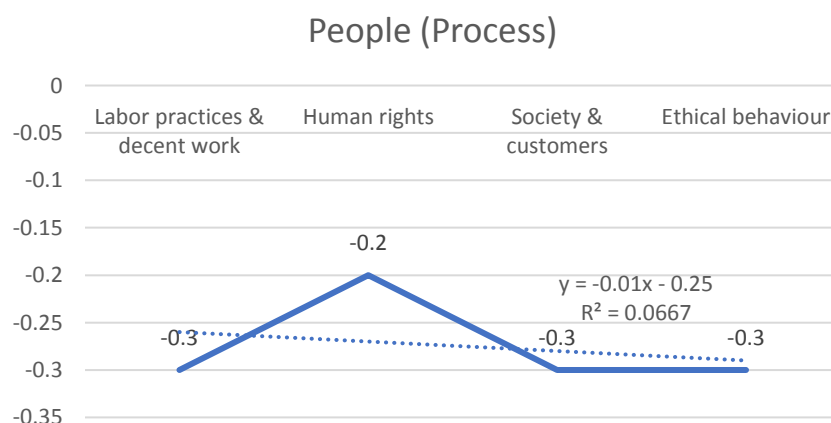


Figure 1: Min value for people based process criteria

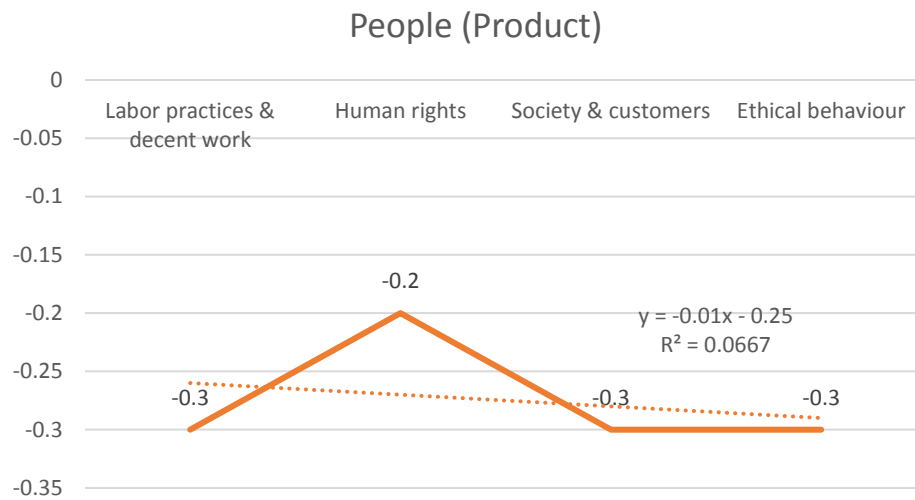


Figure 2: Min value for people based product criteria

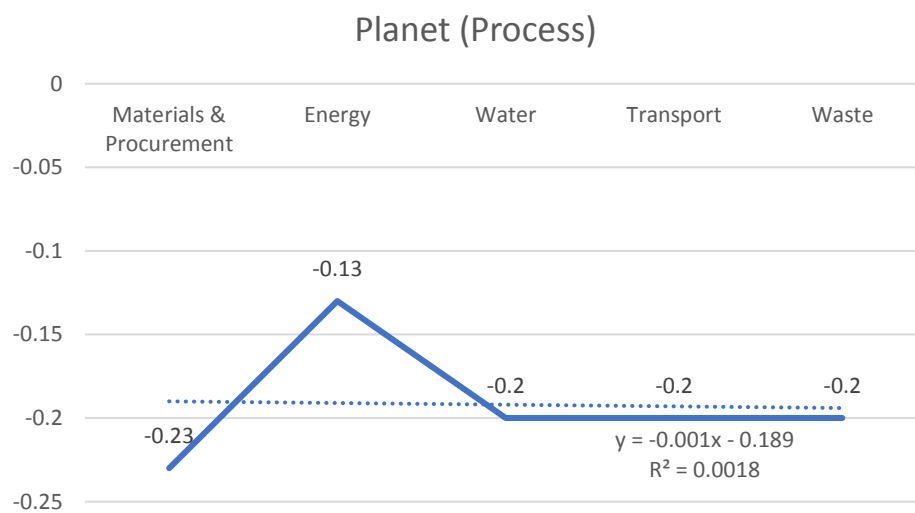


Figure 3: Min value for planet based process criteria

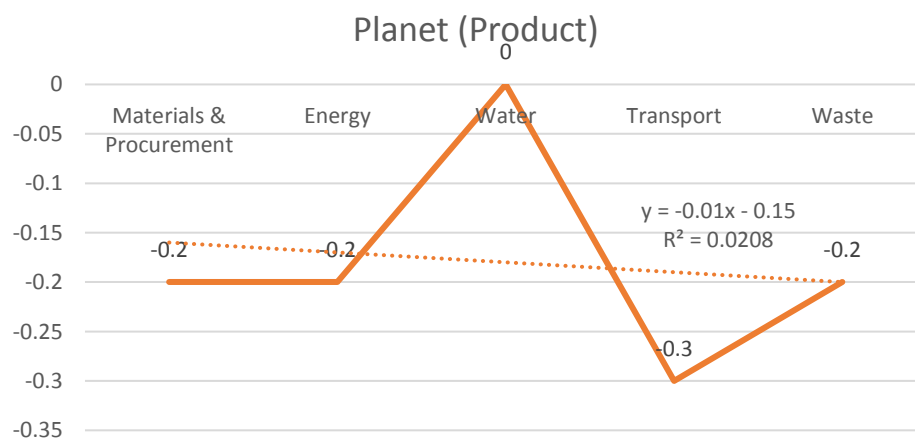


Figure 4: Min value for planet based product criteria

For the profit, both result from process and product show there is no vary between the data obtained where it's showed us that the level of compliance for this aspect is same for each company.

### Mathematical Model Evaluation

In this step, a new mathematical model that based on P5 Integration is involved in assessing the input data. All crisp data that are gathered in step 3 are transformed and normalize using grey decision table. By principle, there is a point of neutral sustainability for every measured aspect of a system. In the measurement of sustainability, there is a tipping point where a system is either sustainable or unsustainable. When the balance of sustainability is tipped at this neutral point, the aspect of the system that is measured will be considered as either unsustainable or sustainable, depending on the direction of the tipping. The measurement scale of sustainability  $s$  with respect to the neutral point is as defined below.

$$s(x): \begin{cases} s(x) > 0 \text{ if sustainable} \\ s(x) = 0 \text{ if neutral sustainability} \\ s(x) < 0 \text{ if unsustainable} \end{cases} \quad (1)$$

The equation 1 will be used as one of the reference in order to measure the sustainability in the system.

### Calculating Current Sustainability Index

This step is about the calculation of total current sustainability index which is the aggregate value of the five sustainability elements'; people, profit, planet, process, and product. The following Equation 1 and 3 is used to obtain the current value sustainability index.

$$I_j = \sum_i W_{ij} I_{ij} \quad (2)$$

where,

$I_j$  = score of  $j$ th sustainability element,

$W_{ij}$  = weight of  $i$ th sub sustainability element of  $j$ th sustainability element,

$I_{ij}$  = score of  $i$ th sub sustainability element of  $j$ th sustainability element,

$i = 1, \dots, n$  index of sub sustainability elements,

$j = 1, \dots, m$  index of sustainability elements.

$$I_{sustainability} = \sum_j W_j I_j \quad (3)$$

where,

$I_j$  = score of  $j$ th sustainability element,

$W_j$  = weight of  $j$ th sustainability element,

$I_{sustainability}$  = total sustainability index.

## Calculating Improved Sustainability Index

This section covers applying the decisions which are made in the previous step into the selected parameters, reassessing the analysis in the perspective of sustainability and obtaining new total sustainability index.

## CONCLUSION

This study is expected to ease any organizations including an engineer or project managers in producing a better sustainability reporting based on GPM P5 integration without neglecting the major pillar of sustainability standard.

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