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Value-Based Performance Excellence Model: Case Studies at Malaysian Technical Universities

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Abstract: This article discussed the case studies of performance excellence model at Technical Higher Education Institution (HEI) in Malaysia. The model integrates core values as performance indicators in six performance criteria i.e. leadership, culture, productivity focus, employee focus, stakeholder focus and performance results. 400 questionnaires were distributed to all technical universities and resulted 240 questionnaires being returned. Multivariate statistical analysis through Structural Equation Modeling (SEM) was used to analyse the model by using *Maximum Likelihood* (ML) estimation and yielded an adequate fit statistics for normed chi-square = 2.578, CFI = 0.916, TLI= 0.909 and RMSEA = 0.086. In addition, Bayesian estimation was further employed to cross-validate and support the modeling result obtained from ML estimation. The Bayesian SEM indicated that the results produced from ML estimation is almost similar and acceptable. In conclusion, the Performance Excellence Model for Malaysian Technical Universities is admissible as it has been empirically tested. This performance excellence model could be used for HEI especially the technical universities to empower intangibles performance measurement through value-based indicators.

Key words: Bayesian estimation, core values, performance criteria, value-based performance excellence model.

INTRODUCTION

In many organizations, the things that are measured are considered important while the things not measured are generally considered of less importance (Neely *et al*., 1996). Previously, performance measurement focused on measuring tangible things like return on investment (ROI), cash flow, increase in revenue and profit. Recently, the attention and focus have changed towards measuring the intangibles as part and parcel of performance measurement in the organisation. This includes quality, customer satisfaction, safety and values. In view of this, organisations realised the importance of integrating both the financial and non-financial performance indicators for total organisational excellence (Mokhtar *et al*., 2003b); particularly in Higher Education Instituion (HEI) as universities are also competing to each other in terms of research, publication, endownment etc.

This research is a part of a larger study of Value-Based Total Performance Excellence Measurement (VBTPEM) (Mokhtar *et al*., 2003b); that are conducted at HEI in Malaysia that concentrate on 6 performance criteria as mentioned previously and named as Value-based Performance Excellence Model for HEI. Therefore, this study would gauge the instruments developed through hypothesised measurement model of Value-based Performance Excellence Model for HEI by using Structural Equation Modeling (SEM). Specifically, the objective of the study is to (a) evaluate the value-based performance excellence model in technical universities in Malaysia using by using Structural Equation Modeling (SEM) through *Maximum Likelihood* estimation and (b) further enhanced through cross-validation by using Bayesian estimation as a comparative analysis.

Many Business Excellence Models seemed not to focus on the effect of performance rather on quality only (Mokhtar *et al*., 2003b; Nooreha *et al*., 2001; Fazli, 2004; Arawati, 2000). Therefore, TPEM model was developed in 2001 by Nooreha *et al*., (2001) and empirically tested by Fazli (2004) in a business environment. As an extension of the previous model, core values are said to be the driver in an organisation so as to withstand and excel the rapidly changing and competetive market. Following this, core values are attached and embedded in all criterias as in the Total Performace Excellence Model in Figure 1. Values have been given a considerable attention particularly in the field of leadership (Russel, 2001). It is undoubtedly that values are defined differently to individuals and in organisation. However, common values that are apostle and common must be

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exerted and embraced by staff in the organisation.

Factors of leadership, cultures, productivity, employees, stakeholders and performance results are interrelated and crucial to any organisations. Many studies focused on these criterias signifying its importance (Mokhtar *et al*., 2003b). Nowadays, intangibles performance indicators has become apparent in organisational performance measurement (Mokhtar *et al*., 2008; Ab Hamid 2010a). This implied that the sole measurement process on tangibles criteria is no longer standing alone but has to be compelemented. Therefore, this study intended to measure the intangibles parts of performance through values indicators that embeds the 6 performance indicators of leadership, cultures, productivity, employees, stakeholders and performance results in organisation especially Higher Education Institution (HEI). Obviously, there exists gap in measuring all of those indicators in terms of intangibles aspect (Mokhtar *et al*., 2003b; Nooreha *et al*., 2001; Fazli, 2004); and in this study it focused on the core values that underpin the criterias.

Currie (2009) emphasized that leaders should reflect the values inherent in the organization through their attitudes and behaviors; as the leaders spearhead the organisation wheel. Factor of leadership mostly affect any organization. Following this, core values have to be ingrained through value-based leadership (Mokhtar *et al*., 2003b) as this is significant in its realisation (Abdus Sattar 2010). To measure the leadership values, we have identified 6 core values namely *truthfulness*, *trustworthiness*, *sincerity*, *sense of direction*, *commitment* and *competency* as intangible performance indicators (Ab Hamid *et al*., 2010b).

Next, organisational culture is also an important element (Matin *et al*., 2009; Pettigrew, 1979; Schein, 1990; Schein, 2004); for organisational excellence. It moulds the organisational characteristics that portrays each member of staff in the organsiation. Youngblood (2000) emphasized that even an organisational culture overshadows the leadership for organisational success. This is also supported by Zaini (2009) that is culture becomes a crucial factor in HEI due to the university is respected due for its cultural and academic environment that stimulates the mind, intellectual testing, test the creativity and knowledge-friendly and not solely for the academic programs offered. Thus, we have identified 6 core values as intangible performance indicators for cultures to be practised in HEI such as *citizenship*, *consultation*, *caring*, *trust*, *respect* and *quality* (Ab Hamid 2011).

Productivity is also an important criteria for measuring the organisational effectiveness. Basically, productivity can be defined as a measure of the amount of output obtained from a certain amount of input (Mokhtar *et al*., 2003b; Kapyla *et al*., 2010; Baines, 1997b; Sahay, 2005; Johnston and Jones, 2004) and simply said as the optimum use of various organisational resources in order to achieve the desired outcome. Baines (1997a) reiterated that factors that affect productivity index should be understood; and therefore 6 core values for measuring the productivityy in HEI are *efficiency*, *collectiveness*, *non-exploitative*, *economy of scale*, *frugality* and *timeliness* (Ab Hamid *et al*., 2010c).

Burke and Hsieh (2006) mentioned that it is important to focus on employees on how to motivate and reward them in order to enhance motivation and performance. Mokhtar *et al*. (2003a) defines employee as the focus of the initiative to make employees think positively towards the organization and getting the work done. Therefore, in order to empower value-based employee criteria we derived the core values of employees that consist of *fairness*, *consultative*, *mutual trust*, *acknowledgement*, *altruism* and *empowerment*.

Next, the performance criteria is the stakeholder stakeholder relationship which has become an asset which lever their values through relationship that would lead to wealth creation in the organisations (Philips, 2006). He added that relationships that have value can optimise the long-term shareholder values. Therefore, the following are the core values that are meant for shareholders values of organisational excellence especially in HEI i.e. *respectfulness*, *non-discriminatory*, *mutual interest*, *responsiveness*, *social responsibility* and *interdependence*. In most studies, it is found that non-financial metrics can be successful in enhancing organisational performance that leads to the 6 core values for performance results values as follows i.e. *profitability*, *noble values*, *intellectual capital*, *market value*, *stakeholder satisfaction* and *reputation*. The following diagram is the conceptual framework of the hypothesised Value-Based Performance Excellence Model for Higher Education Institution (HEI).

Methodology:

Based on the previous studies as in (Mokhtar *et al*., 2003b; Nooreha *et al*., 2001; and Fazli (2004) an instrument was developed (partially adopted and adapted). There were 36 core values that have been identified and established in the previous research with Institute of Islamic Understanding of Malaysia (IKIM) in the business environment. Nevertheless, few core values were replaced in order to suit with the HEI environment. In total, there are 72 items developed (each core values corresponds to 2 items) and would be averaged leaving 36 items for analysis.

The indication used is in terms of visibility of the core values whether they exist or not in the university environment through 11-point Likert scale which means that '0' as an indication for 'not visible' and '10' as the 'most visible'. The respondents need to answer all 6 performance criteria which are *leadership values*, *culture values*, *productivity values*, *employee values*, *stakeholder values* and *performance results values*.

The questionnaires were distributed with the assistance of Ministry of Higher Education, Malaysia to the respective technical universities. The universities are Universiti Malaysia Pahang (UMP), Universiti Tun Hussein Onn Malaysia (UTHM), Universiti Teknikal Malaysia Melaka (UTeM) and Universiti Malaysia Perlis (UniMAP). A letter of support from the Ministry is issued to all universities involved through their respective Registry to formalise the distribution process of the questionnaire.

400 questionnaires were distributed to the registrar of each university and is responsible for administration of the questionnaire in terms of distribution and collection process. The respondents must meet the requirements as set forth by the Ministry such as Malaysian and permanent staff are considered and involved Grade 41 (in terms of professional qualification) and above. In addition, minimum of 2 years of service experience is a must in the respective university. It took about 3 months for data collection process. SPSS and AMOS software version 18.0 are used for the purpose of data entry and modeling procedure respectively.

RESULTS AND DISCUSSIONS

As a result, 240 questionnaires were returned and this accounted for 60% of response rates which are satisfactorily. The data were coded and saved into Predictive Analysis SoftWare (PASW) version 18.0 (previously known as *Statistical Package for Social Sciences* (SPSS)). At first, the data were explored in terms of detection of outliers in the dataset. Outliers in dataset were deleted using Mahalanobis distance ($\chi^2 = 67.99$, $df = 36$ at $p = 0.001$) leaving 212 data sets valid for modeling analysis.

The skewness and kurtosis distribution were explored and within the acceptable limits of normality assumption. This can also lead to a conclusion of multivariate normality assumption if univariate normality assumption is met (Kline 2011). Also, the reseacher indentified the Mardia multivariate kurtosis coefficient was 276.09 and was within the acceptable threshold value of $p\ (p + 2) = 1368$, where p is the number of observed variables which was 36. Thus, *maximum likelihood* (ML) estimation technique is appropriate to be used as the estimation technique in SEM.

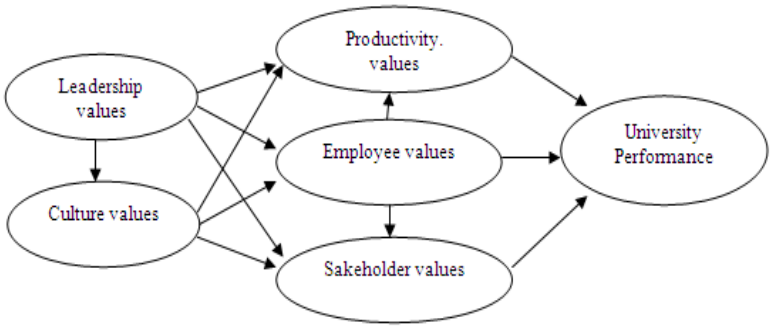

Fig. 1: Full-fledged SEM on Value-Based Performance Excellence Model for Malaysian Technical Universites Network (MTUN).

The fit indices of the hypothesised SEM model in Figure 3 revealed the ($df = 582$), p-value = 0.000, Normed chi-square = 2.578, CFI = 0.916, TLI = 0.909 and RMSEA = 0.086 (as summarised in Table 1). The statistics means to test the consistency of the hypothesised model with the empirical data. It determines if the nonzero in the residual matrix could have occurred simply due to chance. However, this kind of fit statistics are sample size-dependent. As the number of sample size increases, the tendency of the chi-square test to become significant becomes apparent (Hair *et al*., 2010; Byrne, 2010).

Therefore, another way to interpret this result is by dividing the chi-square value with its degree of freedom that produced the normed chi-square statistics. The value of below than 5 could be regarded as within acceptable fit. Next, the index of CFI and TLI is the incremental fit indices that indicates the improvement in fit of the hypothesised model over a baseline model. The cut-score for these fit statistics are greater than or equal to 0.90 that indicate good-fitting model.

The value of RMSEA marks insignificant discrepancies between the observed covariance and implied matrices and thereby supporting the degree of fit (Mohamad Sahari, 2001). It includes correction for model complexity that approximates the discrepancy that could be expected in the population. This means that it estimates the lack of fit of the hypothesised model to the population covariance matrix. This implied that if a RMSEA value of zero indicates the best fit approximation of the population covariance matrix, while higher values iof RMSEA signify poor fit. All of these fit statistics exceeded the recommended threshold values of normed chi-square < 5, CFI and TLI > 0.90, RMSEA < 0.08 except for the significant p-value.

However, the link between Employee Focus to University Performance that should be investigated further. However, it could be concluded that all the other loadings/weightages are significant at 0.05 level. In short, this VBPEM for Malaysian Institution of Higher Learning (IHL) is statistically valid or empirically validated using statistical multivariate modeling technique i.e. SEM and further enhanced with the validation using Bayesian Estimation SEM.

Bayesian estimation as suggested by Arbucke (2009) and Byrne (2010) worth-doing to cross-validate the results from *Maximum Likelihood* (ML) estimation. Given that the sample size in this study (208 respondents) considerably small, therefore, the reseacher may opt for Bayesian SEM in order to verify the modeling results through ML estimation. Byrne (2010) argued that *Maximum Likelihood* (ML) estimation of Likert-scale items produces negligible effects of non-normal non-continuous data whenever each variable/item has at least 5 categories of response and large sample size. However, severe effects of non-normal non-continuous data occur whenever each variable has 4 or less categories of responses and small sample size which is less than 200. Under this condition, this study could only use 191 questionnaire for analysis and therefore, Bayesion estimation is recommended for re-affirming the previously conducted CFA in section 4.1. The Bayesian CFA analysis was conducted in AMOS software to estimate the unstandardised weights produced by this analysis with the unstandardised loading obtained in the CFA using Maximum Likelihood procedure. The results of the comparative analysis is shown in Table 1.

Table 1: Comparative Analysis (Maximum Likelihood (ML) and Bayesian Estimation).

Loadings	ML	Bayesian
Leadersh. values > culture values	0.991	1.016
Leadersh. values > prod. values	0.068	0.085
Leadersh. values > employ. values	0.273	0.274
Leadersh. values > s/holder values	0.119	0.132
Culture values > prod. values	0.196	0.197
Culture values > employ. values	0.816	0.820
Culture values > s/holder values	0.149	0.148
Prod. values > Univ. Perf. values	0.570	0.582
Employ. values > prod. values	0.544	0.541
Employ. values > s/holder values	0.576	0.580
Employ. values >Univ. Perf. values	-0.085	-0.089
S/holder values >Univ. Perf. values	0.236	0.256

From the results, not much difference exist between the loadings generated from ML estimation and Bayesian estimation. This gives evidence that the path coefficient in the structural model or in the full-fledged SEM using ML estimation in this study is acceptable and reliable albeit the small sample size. And this VBPEM model for IHL is further empirically validated with Bayesian estimation.

Conclusions:

Simply said, the model of Value-Based Performance Excellence Model for Higher Education Institution (HEI) that was tested in Malaysian Technical Universities is vaid and admissible. The model consists of a six-factor structure construct which used core values as the performance indicators to measure the current university performance intangibly based on the perceptions of the staff. The objectives of this article have been achieved, firstly to get the adequate support for the model through goodness-of-fit statistics through *Maximum Likelihood* estimation. Furthermore, the result is enhanced by using Bayesian estimation to cross-validate the model against the results revealed by ML estimation.

In conclusion, based on the fit statistics, the implication of this model implied that it does not prove that the model is correct but rather it provides evidence that the model fits the data reasonably well and there is no proof that the hypothesised Value-Based Performance Excellence Model is incorrect. Therefore, we can simply say that the HEI must possess the core values as specified in the model in order to bring the university for accelerated excellence as the respondents responses are influenced by the six-factor of performance criteria and the structural linkages in the model.

Also, this instrument could be used for other HEIs in assessing their performance intangibly through core values given that the model is valid and reliable. Future research may re-examine this model ar other universities in Malaysia. The generalisation is possible to Malaysian Technical Universites only and this model could be the used by Malaysian Technical Universities Network (MTUN) to embark on intangible performance measurement for total performance excellence.

Henceforth, this performance excellence model is of great importance towards getting into the total performance endeavour as urged and emphasized by the Prime Minister of Malaysia. Through this, we are not only promoting our own measurement model but also suggesting a more salient and profound way of measuring the performance.

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