Development of a Human Resource Management Effectiveness Measurement Model in Taiwan

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ABSTRACT

The objectives of this research were to construct Taiwan's high-tech industry human resource management effectiveness dimensions and the associated evaluation indicator, in order to evaluate Taiwan's current level of ability in this area, and provide a guideline for business. In addition, an organizational innovation model was also constructed to act as a foundation for innovation theory. The research methods being employed included literature review, an in-depth interview and a small group technique. These were used as a first step in constructing a human resource management effectiveness measurement model. Before constructing the human resource management effectiveness measurement model for the present study, a weighted measurement indicator was created through an analytic hierarchy process(AHP). After finishing constructing the human resource management effectiveness model, an empirical study conclude that the most important dimensions to measuring human resource management effectiveness included: technical HRME, strategic HRME, HR professional manager mastery, and HR business manager mastery .

I. ESTABLISHMENT OF HRME MEASUREMENT MODEL

There is broad agreement that firm performance is influenced by the set of HRM practices and that a firm's human capital contributes to the achievement of its business objectives. Recent empirical evidence supports this basic assumption(Schuler & Jackson, 1987; Baird & Meshoulam, 1988; Cutcher-Gershenfeld, 1991; Arthur, 1994; Huselid,1995; Jackson & Schuler, 1995; MacDuffie, 1995; Huselid & Becker, 1996; Huselid, Jackson, Schuler,1997). Through the review and analysis of related HRME literature, it was found that continuous human resource management activity undertaken by high-tech enterprises as the key factor in achieving a competitive edge. In the past, measurement on degree of HRME was usually ascertained through a questionnaire evaluated by subjective indicators or simple weighted indices like turnover ratios, training and development expenditures etc. However, results from this kind of approach varied greatly with the subjective perception of the person who replied to the questionnaire. This was because the relative weighted importance of different dimensions was not considered.

The foundation of the HRME measurement model being developed in the present study is mainly based on the HRME structure factors proposed by Huselid, Jackson & Schuler (1997). The preliminary measurement model was established through a study of the literature, in-depth interview with experts, assessors and subjects, as wall as the use of small group techniques (SGT) to compile the views and opinions of the dimensions and measurement indicator for the HRME of high-tech enterprises. Objective indicators were also included in addition to subjective indicators. The preliminary measurement model was first designed in the form of a questionnaire and sent to the middle and higher management in the human resource departments of 150 manager-related companies, located in the Hsin Chu Science Based Industrial Park and the Nan Tze Industrial District. Two sets of questionnaires were sent to each company, i.e. a total of 300 questionnaires were dispatched, and 209 (70%) valid returns were collected. Base on the results of factor analysis, different dimensions were identified and named accordingly. A total of two system dimensions, five measurement dimensions and twenty secondary dimensions were obtained, thus completing the construction of preliminary measurement model. The dimensions and indicators of the measurement table are shown in Figure 2. On completion of the hierarchical structure for the present study, ten experts who were familiar with HRME studies were consulted to compare the pairing of the dimensions and indicators. They did this through an analytical hierarchy process (AHP) questionnaire, so as to obtain the relative weights of the hierarchy and indicator, for subsequent development of equations to evaluate HRME. The details of the entire construction process are given below:

1. Research process

The flow chart of the present study process is depicted in Figure 1:

2. Measurement model exploration stage

(1)Literature review and analysis

The first stage of the HRME hierarchy and the indicators for high-tech enterprises in Taiwan were constructed through the collection, collation, and analysis, followed by appropriate induction and comparison of related literature results.

(2)In-depth interview and small group technique (SGT)

Following the establishment of the first stage hierarchy and indicators, views and opinions concerning the HRME hierarchical structure and measurement indicator of Taiwan's high-tech enterprises were sought from experts and scholars in order to modify the initial model and set up a more rigorous analytical structure for subsequent study. Ten experts from related area in Taiwan were consulted; five of them were academicians with human resource management as a major research interest, whilst the remaining five were middle to higher management from the human resource departments of high-tech industrial companies. The consultation, carried out at Taipei and Kaohsiung, used in-depth interview and a small group technique. lasted from 2 to 3 hours.

(3)Exploratory factor analysis

A pre-measurement table that contained 34 questions was prepared according to the measurement dimensions and indicators. 300 sets of the table were sent to 150 high-tech companies and 209 valid returns were collected. Using the principal component analysis method and setting an Eigenvalue of greater than 1.0 for selection criteria, common factors were extracted from the returned questionnaires. The common factors were then subjected to orthogonal rotation treatment, using the varimax solution method, so that following rotation, the greatest difference between the maximum and minimum factor loading of the same factor in each question could be obtained to facilitate the identification and naming of common factors. The hierarchy and naming of the final measurement structure obtained after factor analysis is shown in Figure 2.

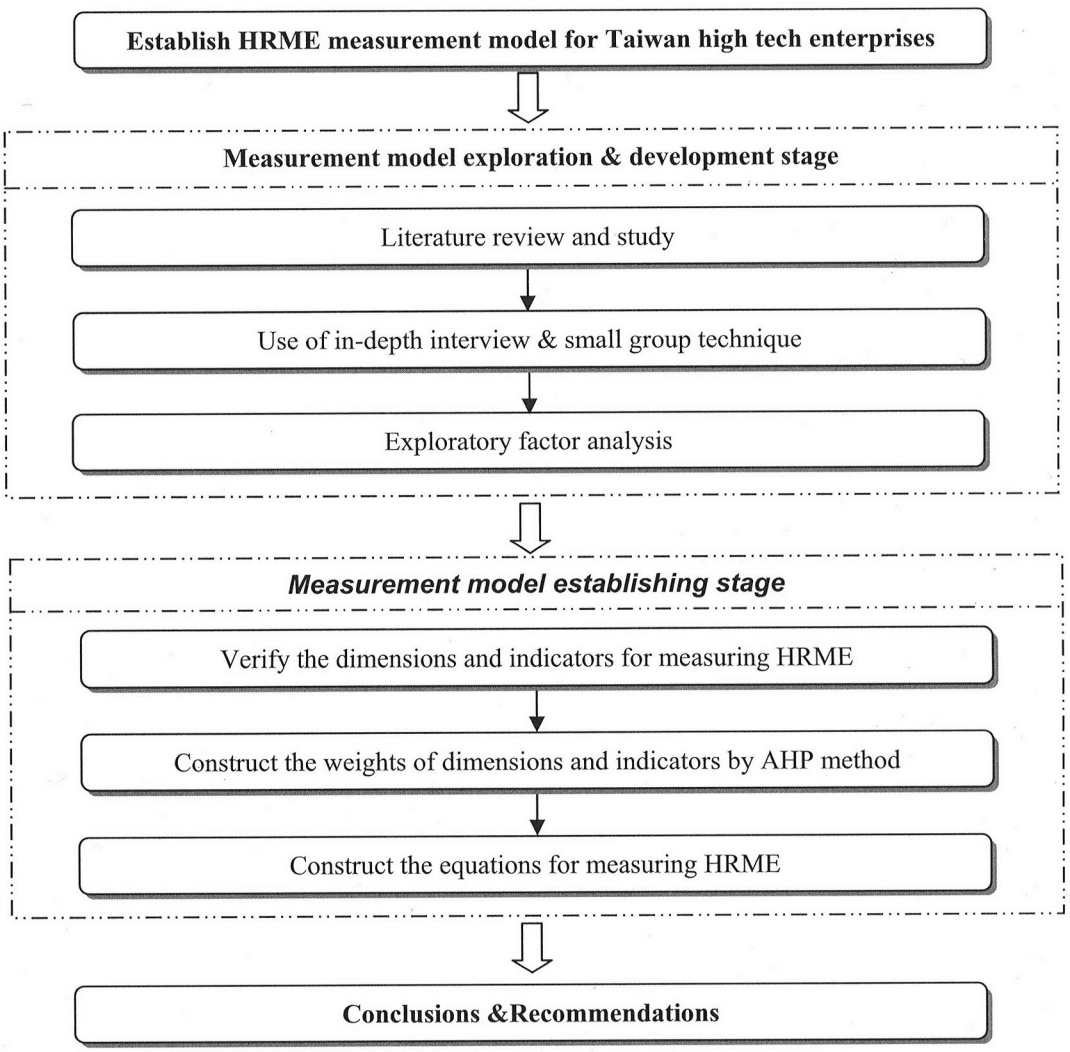

Figure 1. Flow chart for constructing HRME measurement model

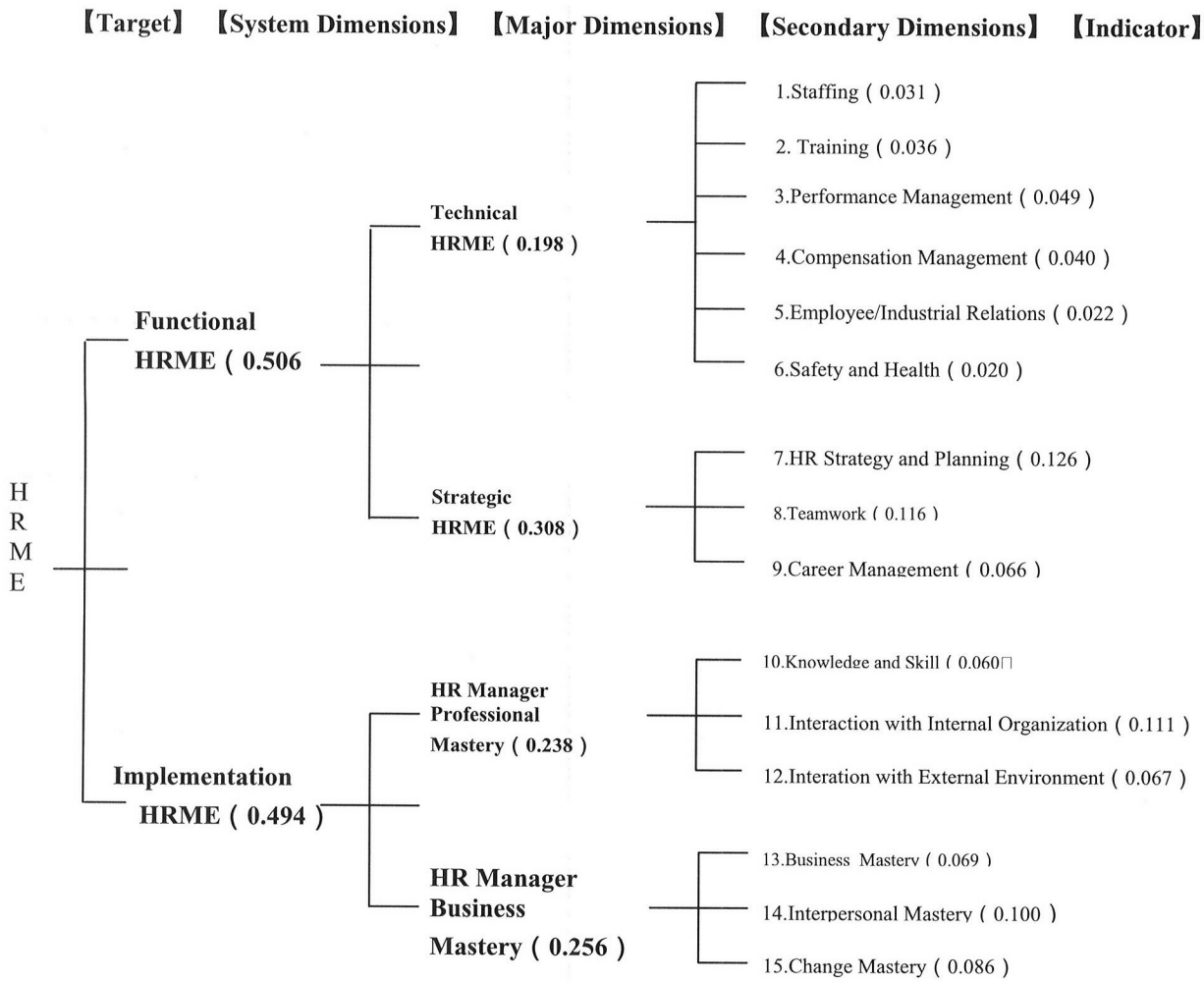

Figure 2. Hierarchical Structure and Indicators being studied

3. MEASUREMENT MODEL CONSTRUCTION STAGE

(1)Dimensions and indicator weight establishment

After compiling the experts' opinion and undertaking exploratory factor analysis, the research hierarchical structure being constructed was found to contain four levels, with Function HRME and Implementation HRME being the system dimensions at one level; Technical HRME , Strategic HRME, HR Manager Professional Mastery, HR Manager Business Mastery, being the four major dimensions at another level; 15 secondary dimensions were in the third level and the remaining level contained 56 indicators (details not shown). In order to verify whether the analytical hierarchy process method obeyed the assumptions, the consistence ratio C.R. was used according to the suggestion of Saaty (1980), with $C.R. \leq 0.1$ indicating that the consistency was at an acceptable level.

According to the ten experts that were consulted, the order of importance of Taiwan's high-tech enterprise HRME system dimension was Function HRME (0.506) and then Implementation HRME (0.494); the ranking of important dimensions was: Strategic HRME (0.308), HR Manager Business Mastery(0.256), HR Manager Professional Mastery(0.238), Technical HRME(0.198). A C.R. value of 0.02 was obtained, indicating the consistency was acceptable. From these results it can be concluded that the display of Strategic HRME, HR Manager Business Mastery, and HR Manager Professional Mastery are the more important dimensions in evaluating the HRME of an enterprise. The most important activities or criteria for these dimensions are HR Strategy and Planning, Interaction with Internal Organization, and Interpersonal Mastery, respectively.

(2)Establishing equations for measuring the HRME of Taiwan's high-tech enterprises

In establishing the dimension and indicator weightings for the HRME of Taiwan's high-tech enterprises, the 56 indicators were normalized to obtain a standardized value (Z). The main purpose of standardization is to eliminate the effects on each indicator due to different units being surveyed. The value of Z was set between 0 and 1. The standardized value of individual secondary dimension was equal to the sum of the products between the standardized value of each indicator within that dimension and its weighting. Likewise, the sum of the products between the standardized value of the secondary dimensions and its weighting yielded the standardized value of a main dimension, whereas the sum of the products between the standardized value of the main dimension and its weighting gave the standardized value of the system. Finally, the sum of the products between the standardized value of each system dimension and its weighting yielded the score for HRME of the enterprise.

After the weightings of the individual indicator and dimensions of different hierarchical layer were obtained by AHP, the HRME measurement model for Taiwan's high-tech enterprises was constructed using a linear combination approach through the above mentioned simple additive weight (SAW) treatment. The detailed algorithm for establishing the model and score calculation is as follows:

$$A_{ijk} = \sum_{l=1}^{n} W_{ijkl} \times Z_{ijkl} \quad \cdots\cdots (1)$$

where Z_{ijkl} : the ijk th secondary dimension, with the standardized value of the l th indicator.
W_{ijkl} : the ijk th secondary dimension, with the relative weight of the l th indicator.
A_{ijk} : score of the ijk th secondary dimension.

$$A_{ij} = \sum_{k=1}^{m} W_{ijk} \times A_{ijk} \quad \cdots\cdots (2)$$

Where Aijk : the ij th major dimension, with standard value of the k th secondary dimension.
Wijk : the ij th major dimension, with the relative weight of the k th secondary dimension.
Aij : score of the ij th major dimension.

$$A_{i} = \sum_{j=1}^{2} W_{ij} \times A_{ij} \quad \cdots\cdots (3)$$

Where Aij : the i th major dimension, with standard value of the j th major dimension.
Wij : the i th major dimension, with the relative weight of the j th major dimension.
Ai : score of the i th system dimension.

$$E = \sum_{i=1}^{2} W_{i} \times A_{i} \quad \cdots\cdots (4)$$

Where Ai : the standard value of the i th system dimension.
Wi : the relative weight of the i th system dimension.
E : HRME score of the high-tech enterprises in Taiwan.

II.CONCLUSION AND RECOMMENDATIONS

1. Conclusion

There are a few differences in the inventory of HRM validity constructed by Huselid, Jackson and Schuler (1997). We are more concerned that scholars and experts in our country focus on the measuring of construction and the indicator of domestic high-tech HRM validity. These differences are not caused by technical problems, but are due to the different national conditions, cultures and enterprise characteristics. Once we had discovered the most important factors, we proceeded with the construction evaluation and the fitness assessment of topics and made some precise additions and deletions. Therefore, the measurement model of HRM validity we constructed is similar, but not identical to the one constructed by Huselid, Jackson and Schuler. Besides, the topics and the language in use are all Taiwan-oriented in their meaning. Compared to other foreign inventories or other edits translated in Chinese, the one the model constructed from this research is much more suitable for our domestic industry, and lowers the bottom line of influences which result from cultural differences.

2. Recommendations

In spite of various measures being used in the present study to make the model more comprehensive, there still remain a number of unresolved difficulties. The following recommendations are made for later studies to facilitate further improvements in the mode:

(1)Construct a more complete measurement model using other methods

This include using a completely different line of thinking through consulting experts from different

industries to take into account the nature and difference between dissimilar industries, as well as also we need to investigate the design of measurement indicators for individual industrial sectors.

(2)Supplement or extend the context and dimensions of the study model

As the present study is orientated toward the measurement of two major dimensions within an enterprise, i.e. Function HRME and Implementation HRME, future studies can perhaps add other concepts. By investigating their interactions with or effects on HRME, the context and dimensions of the study model can be supplemented and extended. This will result in a more refined and rigorous measurement model.

(3)Increase sample size

Although the construction of the present study model was been verified and analyzed by incorporating some local high-tech enterprises during the study, the effectiveness and reliability of the results still need to be confirmed by a larger sample of enterprises into the study.

(4)HRME should be strengthened to improve corporate core capability

The above results showed that for an enterprise, the importance of Function HRME appeared to be greater than Implementation HRME. It must however be stressed that activities of Function HRME and Implementation HRME can mutually promote and have synergistic effects in enhancing the adaptability of an enterprise to environmental changes. Therefore, the present measurement model should be helpful for an enterprise in understanding its current HRME status, providing strategic recommendations, and acting as a guideline for improving HRME activities to better its competitiveness.

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