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The Guidelines for Human Capital Development in the Industrial Businesses Sector to Enhance Competitiveness

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Abstract

The development of human capital in the industrial business sector promotes entrepreneurs to enhance their competitiveness and contribute to sustainable economic growth. The study's objective is to investigate the guidelines for human capital development in the industrial business sector to enhance competitiveness and develop a structural equation model. Qualitative research was conducted through in-depth interviews and group discussions. Quantitative research was conducted through a survey of 500 entrepreneurs. This research utilized descriptive, inferential, and multivariate statistics.The research findings regarding the guidelines for human capital development in the industrial business sector with the highest average importance were ranked as follows: Organizational Change ($\bar{X}$= 4.13, S.D. = 0.45), Knowledge Management ($\bar{X}$ = 4.13, S.D. = 0.47), Technology Management ($\bar{X}$ = 4.13, S.D. = 0.50), and Monitoring and Evaluation ($\bar{X}$ = 4.12). The hypothesis testing results indicated that medium-sized and large organizations do not differ significantly in terms of their importance strategies.

Keywords: *Human Capital, Structural Equation Model, Industrial Business.*

Introduction

In the Thai industrial business sector today, human capital plays a pivotal role in driving success and resilience for every organization. Human capital has the potential to generate more success compared to other forms of capital; however, organizations must develop human capital efficiently. The results of human capital development include positive organizational changes, enhanced competitiveness in the market, innovation and new technologies, and systematic knowledge management within the organization. When many organizations undergo development, it ultimately contributes to the overall economic well-being of the country.The Thai society is entering an aging society, leading to a shortage of experienced and skilled workforce in industrial businesses. Apart from this, the economic society is facing the issue of declining human capital quality, as evidenced by the United Nations Development Programme (UNDP, 2020) study on Thailand's human development. It found that Thailand is currently grappling with the problem of low labor productivity or the quality of human capital. High-quality human capital represents only a small portion of the total labor force and is concentrated at the lower productivity level. The Economic and Business Research Center of Siam Commercial Bank (2020) pointed out that without an improvement in human capital quality, it may take up to 30 years to escape the middle-income trap. In addition to the declining quality of human capital, several other obstacles to economic development

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include a decreasing Thai workforce, low birth rates, declining mortality rates, and Thailand's transition into a full-fledged aging society. The deteriorating human capital quality is expected to have a slowing impact on economic growth rates. Given these problems, the research team concurs that it is essential to study approaches for resolving them in order to benefit the overall economy.

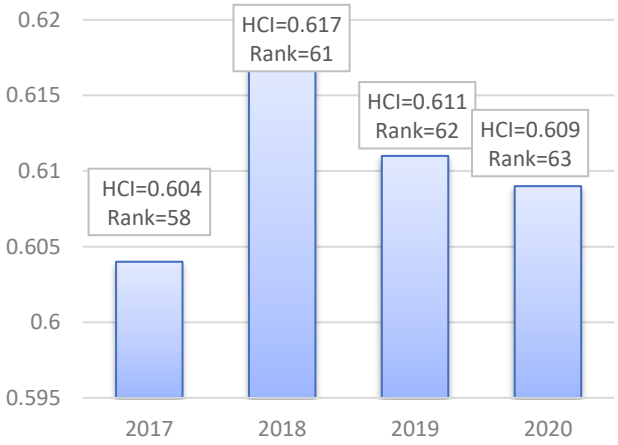

Figure 1 Global Indexes and Rankings on Human Development in Thailand (UNDP, 2020)

The research, titled 'The Guidelines for Human Capital Development in the Industrial Business Sector to Enhance Competitiveness,' investigates labor productivity and strategies for human capital development within Thailand's industrial business sector to enhance competitiveness, leading to sustainable economic growth.

Research Objective

1. To study the structure and characteristics of human resource management in the industrial business sector.

2. To study the components of the guidelines for human capital development in the industrial businesses sector to enhance competitiveness.

3. To develop a structural equation model for the guidelines for human capital development in the industrial businesses sector to enhance competitiveness.

Literature Review

Investing in human capital helps mitigate the problem of labor shortages in the industrial sector. It enhances the efficiency and strength of the industry, while also reducing the economic damage caused by the loss of skilled labor. (Bryl, L. 2017) There are various forms of human capital development, such as providing training and professional skill development, supporting education, offering internships, and organizing programs to assess and improve technological and computer capabilities. These initiatives enable organizational personnel to work effectively and efficiently. Additionally, investing in human capital promotes collaborative and high-performing team work. Organizations with a high number of efficient and effective personnel have a significant competitive advantage. Therefore, internal staff are a crucial component that organizations must continually and appropriately invest in and develop, in alignment with their management strategies. (Deloitte, 2019) In order to work effectively for an organization, essential skills that are crucial for continuous performance include cognitive abilities and complex problem-solving skills.These are key attributes of high-quality labor or human capital that industrial organizations desire.(Aulbur, CJ, & Bigghe, 2016) Human Capital refers to the various abilities that are either innate or acquired through accumulation and learning. Its value

increases with appropriate investment.(Schultz,1981) Investing in people involves managing learning and expenditures to develop skills for enhancing employee capabilities. The return on investment for the organization is the outcome experienced by the developed personnel. The amount of money spent on improving the quality of personnel is an investment to yield returns in the form of skills acquired through learning, thereby enhancing work performance and efficiency. (Wechyanon, 2008) Human capital has 5 types: 1) Intellectual capital, which refers to knowledge and external experience. 2) Social capital, meaning the willingness to collaborate. 3) Emotional capital, pertaining to the awareness of one's own needs. 4) Relationship capital, which is the connections between personnel both within and outside the organization. And 5) Knowledge capital, meaning the body of knowledge within an organization. Developing personnel in an organization through the concept of human capital development creates competitive advantages and immunity against various external impacts affecting the organization. (Crook et al., 2011) Investing in human resources leads to the sustainable enhancement of organizational capabilities and competitive advantages. In studying the development of human capital in industrial business organizations, it relates to research in Organizational Change. This is a process where the organization undergoes structural changes, such as in the operational processes of human resources, management policies, and organizational culture, as well as the work environment. (Boonstra, J. J. 2018) A study on the dynamics of organizational change and learning: processes and activities in the learning organization found that change and learning in an organization are interrelated processes that positively impact organizational development. The sharing of knowledge and collaborative learning among personnel are key tools in organizational change, preparing the organization to handle business risks in line with the research on 'Organizational Evolution: A Metamorphosis Model of Convergence and Reorientation'. (Tushman ,2018) Research studying organizational changes leading to business growth found that every process in business development results from a mix of diverse strategies, all emanating from the capabilities of human resources. Operational adjustments are made in response to environmental conditions, with organizational changes reflecting the process of adaptation to both the environment and market shifts. The process of gathering knowledge from personnel in an organization with work experience involves creating a body of knowledge, knowledge storage, knowledge diffusion, and knowledge application. This aligns with the study of the relationship between knowledge management capabilities and the innovation efficiency of an organization. (Zhou, Li & Wang, 2020) The study of the relationship between knowledge management capabilities and the innovation efficiency of an organization found that knowledge management skills have a significant impact on an organization's innovation efficiency and are a factor affecting future organizational development. Furthermore, it is also found that the use of technology and communication in knowledge management processes impacts the innovation efficiency of the organization.(Lee & Kim,2017) The effects of technology management capability on innovation performance" found that the ability to manage technology has a positive impact on an organization's innovation efficiency. This means that organizations with the capability to manage technology or leverage technology in their business operations are more likely to create highly efficient new innovations compared to their competitors. Technology management is indeed crucial for the development of personnel and fostering innovation within organizations in the current era. It is the same as research in the field of social media. (Luo& Zhou2019) It has been found that social media can stimulate innovation within an organization, and the impact of using online social media is positively correlated with the development of organizational innovation. An organization that fosters a conducive working environment for appropriate communication technology usage tends to experience increased innovation development. Additionally, the organization can efficiently leverage new-age technologies for monitoring and evaluating employee performance. his study is related to researching the impact of tracking and evaluating project outcomes. (Belle,2018) The Impact of Monitoring and Evaluation on Project Success: It has been found that effective monitoring and evaluation have an impact on the success of projects. The research findings

indicate that an effective monitoring and evaluation process has an impact on the success of projects. The ability to track work processes and assess the performance of personnel quickly and accurately allows for the early identification of issues, enabling timely problem resolution. Therefore, an efficient monitoring and evaluation process contributes to the success factors of a project.

Hypotheses

H1 :Organizational Change directly influences Knowledge Management (Boonstra, J. J., 2018)

H2 : Organizational Change directly influences Monitoring and Evaluation (Armenakis, A. A., 2019)

H3 : Organizational Change directly influences Technology Management

(Lee, S. H., & Kim, J. Y., 2017)

H4 :Knowledge Management directly influences Monitoring and Evaluation (Srihabut, Jariyapoom and Roopsing, 2021)

H5 : Monitoring and Evaluation directly influences Technology Management (Su, Z.,& Kong,W. 2018)

H6 :The level of importance of The Guidelines for Human Capital Development in The Industrial Businesses Sector to Enhance Competitiveness does not differ significantly when categorized by business size. Senangkanikorn N., Khumlaitong, N., Thongnium, W., & Ingadapa, N. (2020).

Research Methodology

This mixed-methodology research consists of three parts. First, the researchers started with qualitative research using in-depth interview techniques, followed by quantitative and qualitative research using focus group techniques to confirm the accuracy of the structural equation modelling of strategic guides to strengthen global competitive advantage in ceramic industry. Finally, the research methodology is presented in steps covering the population and sample groups of the research, research instruments, data collection, and statistical data analysis.

Population and Sample

For the qualitative research using an in-depth interview analysis, the population for the present study comprised nine experts selected using purposive sampling (Gabaldón-Estevan et al., 2018). For the quantitative research, the population for the present study comprised 500 industry entrepreneurs from medium-sized and large-scale industrial organizations. (The researchers determined the sample group size, and the criteria for a factor analysis or structural equation modelling were used, which specified that a good sample size was more than 500 samples (Klein, 2018; Nakata et al., 2020). Multistage sampling (Klein, 2018) was employed. The first step was dividing the medium-sized and large-scale industrial organizations. Then, the lottery method of probability sampling was used. Every population, therefore, had the opportunity to be represented in the sample group. The qualitative research used a group discussion experts, relying on 11 qualified individuals selected using a purposive sampling method.

Research Instrument

The research instruments in the present study were categorised into two types based on their characteristics. The research instrument for qualitative research was a structured in-depth interview, whereas the instrument for quantitative research was a questionnaire. The Index of Item-Objective Congruence was used to check the compatibility between

the questions and study objectives. A trial was performed with 30 participants with characteristics similar to the present study population. The data were analysed by calculating the discrimination values of the questionnaire scores for each checklist question, including the standard deviation. The correlation, reliability, and Cronbach's alpha values were calculated for the estimated rating scale questions (Wadsworth, 2020) using the SPSS: Statistical Package for Social Sciences for Windows. For the present study, the discrimination and reliability values of the questionnaire were 0.47–2.60 and 0.98, respectively. The research instrument for the qualitative research with the focus group interviews was a conversation recording form.

Data collection tecniques

The qualitative research data were drawn from in-depth interviews with industrial experts and transcribed word-by-word from audio recordings. Questionnaires from medium and large businesses were collected for verification for the quantitative research. They were coded and recorded on computers for further statistical analysis. The experts' conversation recording forms were transcribed for the qualitative research using focus group interview techniques (Silpcharu, 2020).

Statistics for data analysis

For the qualitative research, content analysis was conducted to analyse data from the in-depth interviews. For the quantitative research in this study, descriptive, inference, and multivariate statistics were analysed using the SPSS (Jiamwattanapong et al., 2023).and Analysis of Moment Structure (AMOS) programs. The structural equation model was analysed for the related statistics data and the research hypothesis testing interpretation regarding inference and multivariate statistics. The adaptation of latent variables was performed by modifying an observed variable to align with the empirical evidence by the criteria, using a variable from a five-point rating scale question from the data collected by the researchers. First, the researchers modified the model by considering the modification index value. Then, the model was recalculated until the structural equation model was complete and aligned with the empirical evidence. There were four values in the assessment of congruence of the data-model fit. These measures were CMIN-ρ (the chi-square p-value) > 0.05, CMIN/DF (the relative chi-square value) < 2.00, the goodness of fit index > 0.90, and the root mean square error of approximation value < 0.08 (Arbuckle, 2016).

Results

Elements of the guidelines for human capital development in the industrial businesses sector to enhance competitiveness.

According to objective no. 1, which was to study the elements of the guidelines for human capital development in the industrial businesses sector to enhance competitiveness, the qualitative research through in-depth interviews with experts was divided into four element strategies. These strategies were (1) Technology Management, (2) Knowledge Management, (3) Organizational Change, and (4)Monitoring and Evaluation. The analytical results of the importance levels of these four elements are presented inTable 1.

Table 1 Overall means and standard deviations of importance levels

Elements of strategic guides to strengthen global competitive advantage in ceramic industry	$\overline{X}$	S.D.	Importance levels
Overall	4.13	0.43	high
1. Technology Management	4.13	0.50	high

2. Knowledge Management	4.13	0.47	high
3. Organizational Change	4.13	0.45	high
4. Monitoring and Evaluation	4.12	0.51	high

Table 1 presents the analysis of the importance of the guidelines for human capital development in the industrial businesses sector to enhance competitiveness and indicates an overall high level of importance ($\overline{X}$ = 4.13). In addition, the importance of each strategy was also at a high level. The mean score for each strategy was as follows: Technology Management ($\overline{X}$ = 4.13, S.D. = 0.50), Knowledge Management ($\overline{X}$ = 4.13, S.D. = 0.47), Organizational Change ($\overline{X}$ = 4.13, S.D. = 0.45), and Monitoring and Evaluation ($\overline{X}$ = 4.12).

Structural equation modelling analysis

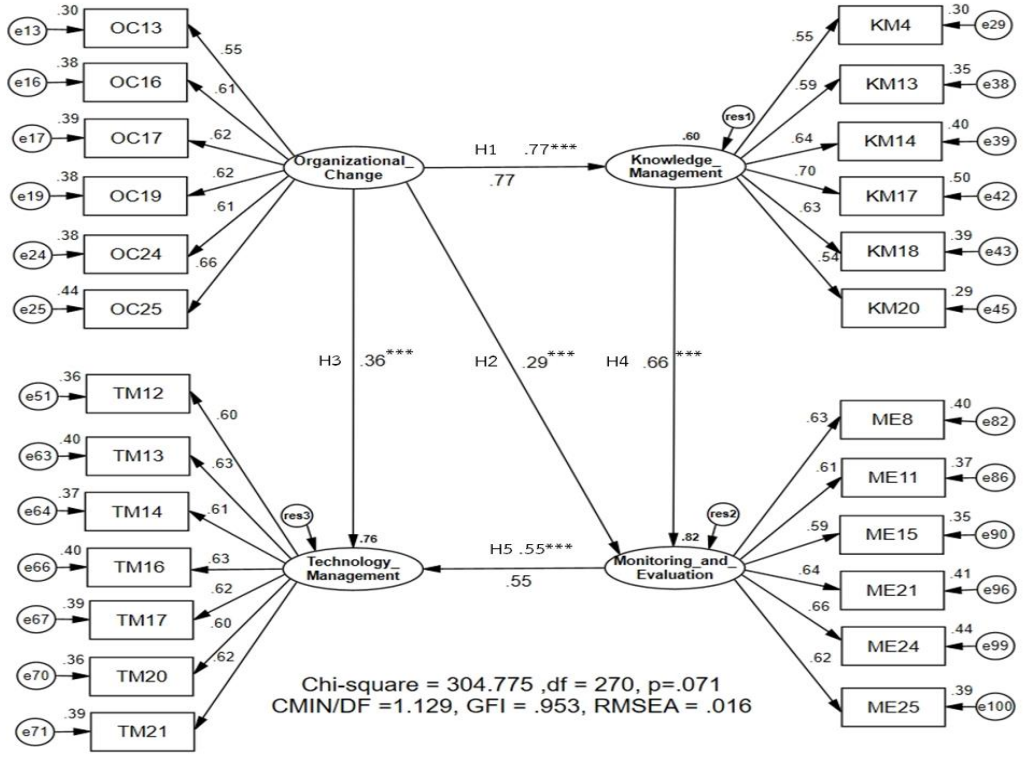

Figure 1 The structural equation model in the standardised estimate mode after modification

The structural equation model for the guidelines for human capital development in the industrial businesses sector to enhance competitiveness, following model refinement, comprises 4 latent variables. These include 1 exogenous latent variable, which is the component related to Organizational Change, and 3 endogenous latent variables, namely Knowledge Management, Technology Management, and Monitoring and Evaluation. The Organizational Change component directly influences Knowledge Management, Monitoring and Evaluation, and Technology Management components. The Knowledge Management component directly influences the Monitoring and Evaluation component. The Monitoring and Evaluation component directly influences the Technology Management component.

The Organizational Change component consists of 6 observed variables, ranked in descending order of their standardized regression weights, as follows: Providing clear guidelines for employee

development aligned with the organization's goals by establishing an Independent Development Plan (OC25).Fostering a culture that fosters positive relationships among employees at all levels and departments by promoting collaborative activities (OC17).Implementing a knowledge development system for human resources to enhance professionalism (OC19).Having a recruitment and selection process that brings in talented individuals whose abilities align with the organization's mission (OC16).Continuously strategizing human resource development to align with changes (OC24).And establishing competencies for every job position and conducting clear job performance assessments (OC13).

The Knowledge Management component comprises 6 observed variables, ranked in descending order of their standardized regression weights, as follows:Continuous development of employee knowledge and skills in work practices and technology (KM17).Promoting the development of a mindset among employees (KM14).Encouraging employees to learn and apply lessons from past shortcomings to improve their work (KM18).Providing training to develop specialized skills for employees (KM13).Collaborating with industry networks to organize knowledge exchange activities for developing the potential and new knowledge for employees (KM04).And implementing a rewards system for employees who create innovation or new knowledge (KM20).

The Monitoring and Evaluation component consists of 6 observed variables, ranked in descending order of their standardized regression weights, as follows: Conducting regular surveys to assess the needs and satisfaction of employees regarding the benefits they receive from the organization each year (ME24).Giving importance to feedback data from employees across all departments to address their opinions and suggestions for problem-solving (ME21).Utilizing the performance evaluation results of employees who fall below the set standards to consider ways for improvement (ME08).Monitoring the success of operations based on key kerformance indicators (KPIs) (ME25).Implementing a system to track the exchange of knowledge and work experience of employees at all levels and across all departments (ME11).And having a system to provide individualized feedback on work performance to employees (ME15).

The Technology Management component consists of 7 observed variables, ranked in descending order of their standardized regression weights, as follows:Developing new knowledge and skills for continuous use in the production process (TM16).Exchanging and learning about the use of new technologies related to the organization's mission (TM13).Developing organizational communication channel platforms for employees to receive and transmit information throughout the organization (TM21).Allocating time for employees in the organization to think creatively and develop new production technology (TM17).Utilizing up-to-date computer technology in the employees' work processing systems (TM14).Promoting research work to develop new knowledge, products, or work methods (TM12).Recruiting personnel with expertise in modern technologies to collaborate and innovate within the organization (TM20).

Discussion and Conclusion

The important issues derived from the research results on the guidelines for human capital development in the industrial business sector to enhance competitiveness are as follows:

The results of the analysis of guidelines for human capital development in the industrial business sector to enhance competitiveness using qualitative research through in-depth interviews with experts revealed that it was possible to categorize the components into four elements, namely Organizational Change, Knowledge Management, Technology Management, and Monitoring and Evaluation. This research did not study small-scale industrial businesses as small industrial organizations in Thailand still lack clear guidelines for human capital development. The researcher intends to conduct a study on this matter in the future.

The structure and characteristics of human resource management in the industrial

business sector revealed that 1) The most common method for developing organizational knowledge among human resources is by sending employees to attend conferences, training sessions, and seminars with external organizations. 2) Human resource development in the field of knowledge management emphasizes the importance of sharing experiences among employees within the organization. 3) Organizations prioritize factors related to raw materials, machinery, and manufacturing technology in production. 4) The characteristics of the workforce in the industrial organizations in Thailand are predominantly thai labor. 5) Most organizations emphasize that their employees must have knowledge about the organization's products. 6) Employees who receive training to develop knowledge and skills for job performance are mostly operational-level personnel. 7) Developing the potential of employees to apply new-age technology mostly involves training methods. 8) Most organizations provide training to employees 3-5 times per year. 9) Improving customer service focuses on ensuring that employees understand their roles in customer service. 10) Budgets to drive organizations are primarily allocated to manufacturing technology. 11) Organizations primarily allocate budgets for human resource management to enhance capabilities in manufacturing technology through training. 12) Organizations support research and development of knowledge and workforce potential. 13) External factors influencing human capital in organizations include the impact of social environmental factors. 14) Internal factors influencing human capital in organizations include the compensation received. 15) The development of human capital in organizations is guided by methods of monitoring and evaluating job performance. 16) The characteristics that organizations seek in their employees include a sense of responsibility for their tasks. 17) Employee skill development is primarily achieved through Classroom Training.18) Methods for rewarding, praising, or promoting well-performing employees often involve salary increases based on performance evaluations. 19) Guidelines for developing human capital in organizations to adapt to the digital age often involve collaborative learning between management and employees. 20) The challenge that affects human resource management is the mismatch between compensation and economic conditions.

The level of importance of the components of the guidelines for human capital development in the industrial businesses sector to enhance competitiveness is generally found to be highly significant. When analyzing the importance levels in each dimension, they can be ranked from high to low as follows: organizational change, knowledge nanagement, technology management, and monitoring and evaluation. Each dimension is of high importance.

In comparing the importance levels of components categorized by business organization size, we tested the differences between the means of two independent groups using a t-test. The results indicated no statistically significant difference at the 0.05 significance level, when categorized by organization size. Similarly, in analyzing the differences in the importance levels of human capital development guidelines in industrial businesses, aimed at enhancing competitiveness and categorized by the size of the organizations, no statistically significant differences were found at the 0.05 level. Moreover, a detailed item-by-item comparison also revealed no statistically significant differences at the 0.05 level.

The results of hypothesis testing to analyze the causal influence of latent variables in the structural equation model of the guidelines for human capital development in the industrial businesses sector to enhance competitiveness with a total of 5 hypotheses, were found to be consistent with the initially established are as follows: 1) H1: The Organizational Change component has a statistically significant direct influence on the Knowledge Management component at a level of significance of 0.001. 2) H2: The Organizational Change component has a statistically significant direct influence on the Monitoring and Evaluation component at a level of significance of 0.001. 3) H3: The Organizational Change component has a statistically significant direct influence on the Technology Management component at a level of significance of 0.001. 4) H4: The Knowledge Management component has a statistically significant direct influence on the Monitoring and Evaluation component at a level of significance of 0.001. 5) H5: The Monitoring and Evaluation component has a statistically significant direct influence on the Technology Management

component at a level of significance of 0.001.

The overall influence analysis of the latent variables within the structural equation model of human capital development guidelines in the industrial business to enhance competitiveness, after model refinement, revealed that the maximum overall influence is found in the organizational change component's influence on the monitoring and evaluation component, with a standardized regression weight of 0.80 (0.29 + 0.51). This result is primarily due to 1) the direct influence of the organizational change component on the monitoring and evaluation component with a standardized regression weight of 0.29 and 2) the indirect influence of the knowledge management component, with a standardized regression weight of 0.77, on the monitoring and evaluation component with a standardized regression weight of 0.66. when combined, these values result in a weight of 0.51 (0.77 x 0.66 = 0.51).

The qualitative research, utilizing focus group discussions with 11 experts, unanimously endorsed a model for the guidelines for human capital development in the industrial businesses sector to enhance competitiveness. The research findings emphasize the importance of human capital development, focusing on intellectual, social, and emotional aspects. Investment in education and training, fostering a culture of knowledge sharing, and the development of technological skills are essential. Moreover, the transformation of management attitudes and state support for human capital development are crucial for strengthening and sustaining the Thai industrial sector.

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