

# The Readiness of Human Resource Management for Industrial Business Sector towards Industrial 4.0 in Thailand

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## Abstract

The objectives of this research are; 1) to study the readiness of the industrial business sector towards the 4.0 industry in Thailand, and 2) to propose the approaches for the preparation of human resources of the industrial business sector towards the 4.0 industry in Thailand. This is qualitative research conducted by the in-depth interview. The informants consist of 1 industry council member, 5 members of each innovation-driven industrial group or the executives of industrial business in each industrial group, and 1 academician. The data used in the study is collected from the primary data which is the interview and the secondary data which is relevant documents and researches in order to obtain the issues of preparation of human resource management of the industrial business sector towards the 4.0 industry. The research results reveal that 1) the groups of industrial business sector towards the 4.0 industry in Thailand are ready to change and are in the operating process; for example, the organization's strategy to support changes in all aspects following the 4.0 industry's driving strategies of the Federation of Thai Industries, the adoption of advanced technology and information technology to the production and marketing process, 2) the approaches in preparing for the readiness in human resources in terms of human resource planning requires the reduction in the number of human resources, and the selection of the organizations which focus on other options such as outsourcing, independent occupations, job rotation, etc. The required employee's capacity is the ability to manage, diversity in working, speed in working, English proficiency, management of technology and information systems, cultivation of positive attitude to work, human resource development which is the training in the organizations, e-learning, and the maintenance which is to set the salary base higher than the market, awards to increase the efficiency and innovation causing the employees to have fun in working, balance between work and personal life, family-style management that the executives in the industrial groups can apply the results to plan and prepare for human resource management.

**Keywords:** Preparation, Human Resource Management, 4.0 Industry

## Background and Significance of Study

Nowadays, Thailand is experiencing the environment and contexts of changes such as the economic liberalization and challenges of new technologies together with the economic, social, and environment situations such as problems of productivity and competitiveness, etc. At present, Thailand is having more stability in politics enhancing the development of the country from various changes. With the consideration of such problems, the government stipulates the strategies to deal with and find the solutions to the problems in the National Economic and Social Development Plan No. 12 (B.E.2560 - B.E.2564) which is the master plan for the development of Thailand. Such plan is in accordance with the strategies of Thai 4.0 industrial development. The government has announced the "Thailand 4.0" strategy to transform large economic structure into innovation-driven economy to lead the country to the true prosperousness, stability, and sustainability. It is expected that Thailand will move

forward to become the developed country in the next 20 years. It is a very big picture both in Thai society and in the world to be involved in all aspects of living.

However, in the image of industry for the first stage, the Thailand 1.0 model was used to drive the country with agriculture. Later, when Thailand entered the era of industry, the Thailand 2.0 model was used to focus on the development of light industry followed by the use of Thailand 3.0 model focusing on heavy industry development. The Thailand 4.0 model requires the changes in the economic structure from previously driven by the development of industrial efficiency to the Innovation Drive Economy (Suvit, 2015). The development strategy of the Thai industry 4.0 for the period of 20 years (B.E.2560 - B.E.2579) must be driven for the changes in the 3 major dimensions; 1) to change from the commodity products to innovative products, 2) to change from the industry-driven country to be driven by technology, creativity, and innovation, and 3) to shift from the focus on product manufacturing to the service sector more (Ministry of industry, 2015). Therefore, Thailand needs to prepare for such changes in accordance with the context in Thailand (Sheehan, 2014).

In terms of industry, the industrial revolution towards the 4.0 era is the continuation of lean manufacturing to "cyber-physical production" making the future industry be the manufacturing with the focus on the fast-paced production and delivery of digital content. This will result in cost savings both from less labor and less loss from human error. Most of Thailand's industrial exports are concentrated in the industrial sector. Most of the labor force is "SME" and remains at the 2.5-3.0 industry level consistent to the new technology and intelligent machinery which have to be entered. Each business industry is different in terms of capabilities and opportunities to access capital and limitations of human resources.

In the near future, the workers will be directly affected from the lost professions to the new careers to replace such as Big Data, artificial intelligence (AI), robots, etc., Machines can learn to automate tasks more intelligently called "machine learning" which enabling the man tasks made by human with difficulty and time-consuming to be replaced with technology that can be used as same as human does. It also tends to be faster and better. The job position is expected to reach 35% of all jobs. It is risky that the automatic system will replace within 20 years from now on (Soontorn, 2016). The changes occurring in every industry need to promote the use of digital economic and smart industry as well as the introduction of automated technology and robots coming into the operation. The important thing that the executives should consider first is the human resources management which is directly related to the changing nature with the introduction of modern systems and tools. The workers also need to adapt and develop the ability to survive in the new work society. Therefore, what all executives should know about the whole organization is how to live, what factors are involved, and how to drive the organization to match what is going to happen. Thus, the organization must be prepared in the human resources.

As mentioned in the 4.0 industry change, the industry must focus on human resource management for greater productivity as well as in accordance with the changes of working of the workers in all groups. This can encourage the changes in the working conditions to provide the competitive advantage to the industry or to be able to survive. The researcher is interested in studying the preparation of human resources management in the industrial sector towards the 4.0 industry in Thailand as a result of changes in the operating system of industrial enterprises. This includes the needs for employee performance by using the missions of human resource management to explain the research results. This can make the business use the information to plan, prepare, and manage their human resources in order to move towards the 4.0 industry.

### **Research questions**

- 1) Does the industrial business sector have the readiness to enter the 4.0 industry in Thailand or not?
- 2) How should the industrial business sector prepare for the human resources of the industrial business sector towards the 4.0 industry in Thailand?

### **Research objectives**

The objectives of this research are; 1) to study the readiness of the industrial business sector towards the 4.0 industry in Thailand, and 2) to propose the approaches for the preparation of human resources of the industrial business sector towards the 4.0 industry in Thailand.

### **Research Methodologies**

This research is qualitative research. The main target of this research is the executives of industrial businesses who are members of the Federation of Industry that are changing the industry to the 4.0 industry. The researcher has selected the target group in the research not based on the principle of probability. The Purposive Sampling is used in this research. The informants consist of 1 committee of Federation of Industry, committee of each industry group driven by innovation classifying the industrial group into 5 groups; (1) food, agricultural and biotechnology, (2) public health, health care and medical technology, (3) group of smart devices, robots, and electronic-controlled mechanical system, (4) digital group, Device-Connected Internet Technology, Artificial Intelligence, and embedded technology, and (5) creative industry group, high-value cultural and service capital. The informants are the committees of each industry group or the executives of the large companies being the members of such industry group totaling 5 persons and 1 academician. The limitation of the sample selection is based on the industry group that is driven by the innovation into 5 groups. The business members of the industry must be from the large business with the readiness and prompting to change the industrial business and the group of executives who are willing to give information because of the company's policy not covering every industrial business.

Primary qualitative data measurement is the interview using the in-depth interview tools. The interview is the informal interviews and semi-structured interviews about the current state of the industry, human resource demands in the 4.0 industry, and human resource management readiness trend. The secondary data sources are documents and journals from the Federation of Industry, information from the interview, academic texts, internet media, related researchers, etc. The researcher conducts the interview to collect the data by submitting the interview letters to interviewees. Then, the data obtained from the interviews is analyzed on the operational issues related to the missions of human resource management to find the way for the preparation.

The data analysis used in this research is qualitative research, in-depth interview, and Analytic Introduction to obtain the data to conclude based on the theories in order to get the issues related to Human Resource Management describing the academic papers and the literature review including the research result conclusion.

### **Related Literatures**

#### **Preparation of Thai 4.0 industry**

4.0 industry and Thailand 4.0 have the accordance in the future industry starting from the support of Germany in declaring the policy of industry enforcement in the National Development Plan (2013-2033) whereas Thailand 4.0 is part of the 20-year national strategies (B.E.2560 - 2579) being the framework and directions for the economic and industrial development corresponding with the changes of the world in the 2 following decades. However, under the plan of moving towards the new industry, several countries define

different approaches starting from the enforcement of 4.0 industry policy of Germany (2013-2033). USA defines the directions of the country towards being “NATION OF MAKERS” having the White House to enforce the policy of being the leader in technology and future factory. UK which is leaving the EU declares the “design of innovation” policy. China declares the policy of new age industry “made in China 2025” to enhance China to be in the 1<sup>st</sup> rank of economic leader of the world in the next decade. Moreover, South Korea enhances the “creative economy” policy. India focuses on being the world factory with the “made in India” policy and the development country 2020 policy has been stipulated by Malaysia several years ago. Meanwhile, the 3<sup>rd</sup> economic revolution started from the Eastern Seaboard Development Project of Laem Chabang Deep sea port and map ta phut, “eastern seaboard” project, resulting in the occurrence of serial industry. It is considered the Golden Age of foreign investment and the golden age of export taking 25 years from 1991 to 2016. Until the era of competition in the export industry of Thailand began to decline and retreat since 2007 and began clearly during the last 4 years (2013-2016) that the export continually declined and the economic growth of Thailand was ranked lowest of ASEAN. However, for Thailand in the next two decades, the industry still plays the important role in driving the economy of the country (Ministry of industry, 2015).

Business sector is preparing to enter the new 4.0 industry in the following areas:

- 1) Entering the new industry is the long-term business vision related to the operators - executives - business sector - industry in large - medium - small sizes which have to assess the competitiveness. However, as the idea of 4.0 industry comes from the Western and developed countries, it should not raise too much fright. In each age of change, it takes time so that the adaptation of the operators and industrial sector has the delays or intervals of adaptation involving planning to correspond with the business.
- 2) The import of new technologies is not fixed. The advanced technologies come from the developed countries that own the patents. The truth is that the Thai industry is the new technology user, not the developer and the producer. Therefore, the acquisition of new technologies is a matter of import and / or foreign parent companies also see the benefits of investing in Thailand. They have to know how to choose high-cost technology to suit the industry and market.
- 3) The organizational restructuring must be in line with each of the transition periods. The new industry and Thailand 4.0 will enhance the competitiveness of both industry and service sectors. The changes cannot be overnight. The key issues are related to organizational changes both enhancing the strengths and solving the weaknesses in order to remain competitive at each moment of changes.
- 4) The right technologies must be chosen at the right time. The adaptation is to the era of smart industry and business geography which will change radically. Under the composition of the economy in 2033, it involves the long-term adaptation of business in large, medium or small enterprises or micro enterprises. They have to be prepared by conducting the plan in accordance with the 20-year national strategy which must be converted to "Business Strategies" for the new technology change from the past in each era.
- 5) Human development is the backbone of the future economy. The first industrial revolution in 1784 was the passing of human and animal labor into steam engines. It is expected that the world will transform into the fourth industrial revolution completely in 2033. The smart machines under the control of intelligent robots include the digital society connected to the internet of things (IOT) system. All are human inventions. Thus, the future world requires people who are operators, executives, as well as smart workers. The development of people may not be integrated. The time and place must be divided appropriately. For example, in the long term, the reform may be required for all curriculums of learning from primary to high

school and university. It has to start from the production of staffs and teachers who are intelligent to convey the genius to the new generations.

### **Human Resource management concepts**

Human resources work is one task that the organizations need to engage in activities that involve people in the organizations. Due to the ever-changing business environment, the organizations need to find new ways to manage their business. In order to develop more effective management practices, the management must seek the human resources management practices of various organizations. The ability to deal with changes has made the organizations more ready to work all the time resulting in greater human resource management. Human Resources department is an organizational support unit that drives success as the operation in the organizations must involve almost all human resources. This makes human resources be the driving force of the organizations effectively and efficiently (Ivancevich, 2010). The missions in human resource management consist of 5 key tasks as follows:

1) Recruitment and selection of employees are the first important missions of human resource management to involve people in human resource planning by recruiting and selecting qualified employees for the job requirements of the organizations. Recruitment of employees is a process of finding and motivating people who are able to apply for employment with the organizations. This process starts when the persons are contacted and ends when they are recruited to work with the organizations. As a result, the results of the recruitment process are the jobseekers who will be selected to work. For employee selection, it is the process of considering and selecting the most knowledgeable, talented and most suitable people from the selected group.

2) Human Resources Development is the mission that people involving in human resource work altogether to build knowledge and understanding of work from the beginning to work and create additional knowledge for employees. The employee development is a systematic process of the organizations to promote, support and improve knowledge, skills and capabilities of the employees including the growth, mentality and personality which will result in efficient operations and better quality of life. The development of the personnel can be done in various ways such as orientation, training, human resources development, professional development, etc.

3) Stimulating and motivating employees are the missions that relevant persons in human resources should altogether create the process to encourage the employees to be enthusiastic and dedicated to work physically and mentally. This is very important for the success of the organizations. The employee motivation strategy can be done in various forms such as the management of remunerations and welfares, rewarding, and fair evaluation on the performance.

4) Employee retention is the mission to perform various tasks to make employees happy in working with the safety management of work, employee's health promotion, and good arrangement of communication system in the organizations.

5) Termination of employment is the mission to end the relationship between the organization and employees from various reasons such as retirement, resignation, or termination of employment, etc. Therefore, the organizations must have the appropriate means and decision to terminate employment which should be in the ethical and moral framework.

Human resource management is the process related to employees in the organizations for the organizations to be effective and efficient in employing and to be able to manage the ability of human resources in the organizations in various areas to achieve the objectives of the organizations defined by the activities such as human resource management planning, recruitment and selection, human resource development, employee retention, etc. This is the

responsibilities of relevant persons in human resources to drive the activities to provide human resource management system in accordance with the organization's policy.

## Research Results

1) The readiness of industry business sector towards 4.0 industry in Thailand where industry groups are ready to change has few limitations on economic growth due to the economic slowdown from the political instability. However, the industry can expand in foreign countries. The industry changes may take time because of the large organizational structure, shortage of labor, higher wages, relatively low skilled labor, and lack of expertise. The industry business is changing their businesses as appropriate (Sheehan, 2014). For example, the organization's strategy to support changes in all aspects of the 4. industry's driven strategy under the "Thailand 4.0 model" of the Federation of Industry states that it is necessary for industrial restructuring from the previous "comparative advantage" to "competitive advantage" in order to change the economic structure from "adding value" to the industrial economic structure of "value creation" based on the advantages of the "labor" dimension in Thailand and industrialization with knowledge management, innovation and modern technology. The industry need to restructure the organizations to become smaller with the use of modern technologies and advanced information technology in the manufacturing and marketing process such as artificial intelligence, robotics, etc. Industry 4.0 has the remarkable feature in the all-dimensional linkage of production systems to information communication technology for developing the industry. The article presents the sources and principles, approaches for preparation, samples of technologies related to Industry 4.0 such as Internet of Things, Cloud Computing, smart factories, smart machines, independent robots, smart employees, and new materials.

Technology in the 4.0 industrial age is one of the options to help the Thai food industry to upgrade from the labor-intensive industry to semi-automatic production which possibly starts from production lines that are constrained in the human labor such as the production lines with Conveyor, inventory management, inventory management, production lines requiring high standards and high accuracy. Particularly, the food industry needs to consider the cleanliness, safety, and free of contamination from direct contact with food. The use of automation system or robots in the production process is the approach that can be carried out in advance of fully automatic production. The Flexible manufacturing system (FMS) in the future can support the technological changes to respond to the needs for products of the consumers which are more diverse and complex.

The problem of the industry in preparing is the investment budget because it requires a lot of investment. The structure of the organization which is large makes the changes require time. The problems of labor shortage, errors in employee's working, and performance of employees are not consistent with organizational needs (Chitlada, 2016).

2) Preparation towards the 4.0 Thailand era on human resources can be done by developing the strategies to attract potential people to work, developing critical skills especially about digital, creating new functions in work. These are also consistent with the vision of the changing world direction of work in the 4<sup>th</sup> Industrial Revolution age (Jarawat & Vorapop, 2017). The National Economic and Social Development No. 12 on the strengthening and development of human capital is to pave the foundation for the development of people completely together with the development of Thai people in all ages to be good persons with good health, morality, discipline, good consciousness for the society and public, knowledge, skills, and ability to adapt to the rapid changes. The educational institutes must make the graduates meet the needs of the organizations with the morality, curiosity to knowledge, and competences in the field of information technology (Buranadechachai, 2015). The curriculum should be adjusted appropriately with more association to the cooperative education.

This can help developing high quality human capital. The industry should have the approaches in preparing for human resources. In terms of human resource planning, there must be the reduction in the number of human resource use and the competences as demanded by the organizations, for example, be able to really work, having experiences and visions, having IT competences (Soontorn, 2016). The organizations must focus on other options of recruitment such as outsourcing, self-employment, turnover, etc. Human resource development focuses on empowering employees on knowledge, skills, abilities and specific characteristics in the operation. (Thamachaichusak, 2015). Human resource development should determine the required competencies of employees such as diverse working, speed of working, English proficiency, cultivation of good working attitude, having the visions in working (Wattthanabut, 1974). In human resource development, it should be tailored to the needs of the companies, development accredited internationally to accelerate mobility (Manpower Group, 2016) using E-learning model, organizational training, etc. Creating the motivation of work can be done by promoting good attitude towards skilled works. The work should be created to make the employees happy in working with the balance between work and personal life and family-style management. The organizations should be motivated by promoting the potential employees to receive the scholarships both locally and internationally with a special focus on IT (Soontorn, 2016). This can make the employees look modern and it motivates all employees to change.

The results of the interview on the informants can be concluded that for the human resource development trends in the industry business sector towards Industry 4.0 in Thailand, the industry requires highly skilled workers who are able to perform the operation immediately as the human resources environment in the industry, the working group lacks the in-depth work skills. Five informants provide the information that most of the employees have superficial knowledge due to the inadequate learning system. The details had to be developed at the organizational and national level. The labor force which is demanded is the labor force graduating in engineering. However, these labors have no interest in working in the industry. The work of the human resources industry is regulated by the state agencies in the regulation of employment and the adjustment of minimum wage. The main problems are the concepts and attitudes of most employees nowadays that do not want to develop themselves. They have low responsibilities, are not tolerated to work with the organizations, soon resign, use their thoughts as a base for decision making, and do not consider the common interests.

**Table 1** Human resource demands

<b>Human resource management</b>		<b>Trends</b>
<b>Human resource planning</b>	Occurring environment	Reducing number, labor shortage, changing works, Gen Y, Z as the main force, cultural diversity
<b>Competences</b>	Knowledge	Technologies (in marketing and production) English
	Skills and versatilities	Speed in working, in-depth management skills
	Attitudes and others	Open mind to accept changes Open mind to be developed
<b>Recruitment and selection</b>	Recruitment options	Outsourcing, freelancing, rotation, short-term employment of aliens or foreigners, cooperative education with structured selection system
<b>Development</b>	Training	E-Learning, in-house training, short-term training on specialized skills, training rooms

**Table 1 (Con.)**

<b>Human resource management</b>		<b>Trends</b>
	Development	Opportunity to promote work in the line and change the line.
<b>Retention</b>	Money	Rewarding to enhance efficiency and innovation. Salary is higher than the market for 30%
	Non-money	Fun work, balance between work and life, family-style management, opportunity to show potential

### Research Recommendations

- 1) In human resource planning, the organizations must be restructured to set the policy in reducing the number of human resource use. The ability of the employees should be determined to be able to manage their works, to use the technology and information systems, to work diversely, to quickly work, to be proficient in English, to use in recruiting, and to develop the employees.
- 2) In the recruitment and selection, it should focus on the recruitment to really get the right persons suiting the works. The recruitment should be structured. Other alternatives should be used such as outsourcing, freelancing, work rotation, etc.
- 3) In human resource development, it is in-house training, short-term training specializing in E-Learning skills, learning room. In terms of major developments, the organizations must raise the positive attitude in working to the employees of GEN Y, Z to understand the diversity of cultures and working standards. Moreover, the organizations need to create the opportunities of work promotion through the work lines and allow the employees to change work lines.
- 4) In the retention, rewarding for increasing the efficiency and innovation and salary higher than the market can attract potential people into the organization. The organizations must motivate to work by making employees have fun in working. The balance of work, personal life, and family-style management
- 5) Human resources preparation for the industry sector to enter the 4.0 industry must begin with the focus on employees, both executives and employees in the agencies by leveraging knowledge to drive growth of business and develop the employees to be creative as well as being the capable persons with specialized skills. Before being replaced by artificial intelligence (AI), everyone must learn to be ready with the ability to adapt to the 4.0 era. The connection with business network linked to the changes should start gradually and should be learned from the top management to lower level employees. The private organizations must develop the potential of employees to adapt to the rapidly changing technology and must not forget to instill ethical values in working for employees at all levels.
- 6) In creating the engagement, the good development must come from all parties in cooperation. The public and private sectors should cooperate in driving towards the 4.0 industry. There should be the clear policy of support. The development should be done throughout the entire organization. The executives and the employees must collaborate in managing the organizations well. Everyone should think that we are part of the company advancement at every level. We should participate, have the understanding, and share the same goal as well as evaluating the competences of the employees in the organizations in order to be prepared for the new changes and to be in the same direction.

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