Development Countermeasures of the Skilled Personnel by Flow in Wuhan
Based on the Manufacturing Industrial Transformation and Upgrade

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Abstract. The key to succeed for the manufacturing industry to be transformed and upgraded is to develop the correspondent skilled personnel. To develop the skilled personnel effectively for the manufacturing industry in Wuhan, besides the education and training, the development by flow is quite a valid way in a short period. So, the paper first studies the related literature to the skilled personnel development, and then analyzes the influence of the industrial transformation and upgrade on developing the skilled personnel. Next, the paper expounds the features of the skilled personnel development under the industrial transformation and upgrade in Wuhan. Finally, some countermeasures and the concerned conclusions in further developing the skilled personnel able to match the industrial transformation and upgrade in Wuhan have been put forward.

1. Introduction

Internationally, the skilled personnel become the source of the most valuable competitive advantage. To capture the skilled personnel and the intelligent capital of the other nation is one of the fundamental features of the current rival. Whether it is in the strong nation or in the weak country, the authorities are adjusting their formulate or regulate their strategy so as to attract and maintain more internationalized skilled personnel, which makes the skilled personnel able to flow internationally more. The main countermeasures include professional immigration, residence permit & offering convenient conditions, and attracting the skilled personnel by the academic exchange and by the scientific and technological cooperation, etc.

Facing the fierce rival to the skilled personnel globally, many countries adopt the strategy of "short, stable and fast" to attract the skilled personnel abroad to develop the science and technology at home. Many scholars have made research on the development and management of the skilled personnel. Jian Sun, Dan Wang put forward some tactics to attract and keep the high-level skilled personnel in the angle of economics[1]. Lili Sun, Xuezhong Chen presented four modes of the skilled personnel agglomeration based on the skilled personnel flow[2]. Yujie Quan, Yongtai Luo said that trust is the foundation to construct the skilled personnel team in the hi-tech firms[3]. Si’an Liu thought that the introduction of the intelligent abroad and the inflow of the skilled personnel are crucial to the developing country[4]. Guangzhou Zhao, Lilong Zhao, Lei Xiong thought that the knowledge management based on the regional innovative system could accelerate the flow, share and application of the knowledge of the various main bodies in the system[5]. Tongchao Lv, Wanming Chen thought that the skilled personnel flow was quite important to the effective arrangement of the skilled personnel[6]. Yong Wang said that the arrangement of the skilled personnel by market was a kind of valid model[7]. All these tactics and research have brought much idea source and enlightenment to my topic discussion.
2. Influence to the Skilled Personnel Flow by the Manufacturing Industrial Transformation and Upgrade

The transformation and upgrade of the manufacturing industry is the basic incentive factor of the skilled personnel flow. The upgrade of the industry depends on the upgrade of the whole industrial chain. The development scale, level and mode of the industrial chain decide the orientation of the skilled personnel flow.

First, the development scale directly determines the demand of the skilled personnel. Too big or too small a skilled personnel team will constrains the development efficiency of the industrial chain. Too big a skilled personnel team will cause a redundancy of the people which may lead to a high personnel cost and reduce the efficiency of the industrial chain while too small a skilled personnel will directly restrain the operational speed of the industrial chain.

Second, the development level of the industrial chain includes technology, resources integration and innovation, etc. The low development level of the industrial chain means a low development platform for the skilled personnel, which may be unable to attract the elite personnel outside the industrial chain or to keep those elite personnel inside the industrial chain. As a result, the whole industrial chain may be eliminated by the market. Therefore, the manufacturing industrial must enlarge the use of the hi-tech in the industrial chain, make efforts to raise its technological level and to enforce its innovation abilities. Also, it should take the whole development of the industrial chain as its target, raise the integration capacity of the different links of the industrial chain so as to get the efficiency of one plus one larger than two for the industrial chain.

Third, the development mode of the industrial chain includes extension, integration and intensive. The extensive mode is based on the cost of a massive consumption of energy and resources and of the environmental pollution. The integrative mode means a course to integrate two or more sub-systems into an organic overall body. It is not a simple add-up of the various sub-systems, but an organic combination based on certain rules aiming at raising the quality and functions of various sub-systems. The intensive development means a re-engineering of various productive elements focusing on the economic and social efficiency. By raising the quality of the operational elements, increasing their technological contents, adjusting their input proportion and combination methods, minimizing the cost and maximizing their input benefits might be realized.

3. Flow Features of the Skilled Personnel under the Transformation and Upgrade of the Manufacturing Industry

During the adjustment of the industrial skilled personnel, it shows a remarkable phenomenon of gradient. The motive of the skilled personnel flow consists of the individual career development and the income level. The former depends on the market demand of the skilled personnel which is the derived demand of the industrial market. So, the individual career development should be identical to the demand of the skilled personnel on the industrial market. The motive to the individual skilled personnel demand in the manufacturing industry comes from its transformation and upgrade. According to the industrial gradient theory, in the early stage of the transformation and upgrade, the industrial innovation is the core of upgrade. High gradient scope with much development potential is still remained in the manufacturing section. As the transformation and upgrade goes, various economic resources for the productive and operational activities will gradually flow to the circulation scope and to the productive service sector. The circulation and the productive service modes are obliged to be innovated. Therefore, with the change of the industrial demand to the skilled personnel, the flow of the skilled personnel will be transferred from the manufacturing section to the productive service section and its mode will be of gradient.
On the other hand, the individual seeks for the high level of income, which makes the skilled personnel flow into the sector with high pay. According to the concerned statistics, at the start of the transformation and upgrade, the average income is distributed between the manufacturing industry and the other relative sectors like finance and logistics, etc is presented as follows (see Table 1):

| Industry                                      | 2010   | 2011   | 2012   | 2013   | 2014   |
|-----------------------------------------------|--------|--------|--------|--------|--------|
| Mining                                        | 44196  | 52230  | 56946  | 60138  | 61677  |
| Manufacturing                                 | 30916  | 36665  | 41650  | 46431  | 51369  |
| Electric, gas, water production and supply     | 47309  | 52723  | 58202  | 67085  | 73339  |
| Transportation, Warehousing and Postal         | 40466  | 47078  | 53391  | 57993  | 63416  |
| Information, Computer service and Software     | 64436  | 70918  | 80510  | 90915  | 100845 |
| Wholesaler and Retailer                       | 33635  | 40654  | 46340  | 50308  | 55838  |
| Finance                                       | 70146  | 81109  | 89743  | 99653  | 108273 |
| Science research, Tech. service and Geological exploration | 56376  | 64252  | 69254  | 76602  | 82259  |

Source: China Statistic Yearly Book 2015, China National Statistic Network

From the above Table, the average wage of the finance, information & software and science & tech. service & geological exploration respectively ranks the first three while that of the manufacturing industry is at the bottom by the end of 2014. Driven by a relatively higher wage, the skilled personnel, especially for those newcomers into the labor market, whose flow cost is not high, will select the industry with a higher wage, because their flow cost is not high. For the existent skilled personnel in the manufacturing industrial chain, their flow cost is high, but in the transformation and upgrade of the whole manufacturing industry, the use of hi-tech and the interact of the people in knowledge and information, etc will make the comprehensive quality of the people able to be raised, the adaptive ability to the labor market will be strengthened and their mobility will become bigger. Although the existent skilled personnel have a higher flow cost, their flow cost can be compensated, compared with the expected high benefits. Therefore, whether for the existent skilled personnel or for the newcomers, it is a rational selection to enter into the industry with a higher pay. Also, it is an inevitable trend of the people's flow as the transformation and upgrade of manufacturing industry goes.

To sum up, analyzed from the manufacturing industrial chain development in the transformation and upgrade, the impetus and intention of the people's flow, the flow has a gradient feature from the productive section to finance, science & technology service, logistics, marketing and information service, etc. This trend will push the process of the manufacturing industrial transformation and upgrade. Only when the service sectors like finance, information, etc in the manufacturing industrial chain reach the international level, can the productive and processing section in the industrial chain be transformed and upgraded from the bottom extensive manufacturing to the top service intensive manufacturing. Then, Wuhan manufacturing can be really integrated into the global industrial chain.

4. Countermeasures to Develop the Skilled Personnel by Flow in the Transformation and Upgrade of the Manufacturing Industry in Wuhan

4.1. Actual Situation to Develop the Manufacturing Industry in Wuhan

After several decades, Wuhan has formed a relatively complete industrial chain system. Nowadays, the manufacturing industrial in Wuhan is experiencing the intensive development stage. It is the essential path for the transformation and upgrade of the manufacturing industry in Wuhan to regroup the various
productive elements, increase their technological content, raise the operational efficiency and the product & service quality and strengthen the use of the hi-tech based on the manufacturing industrial chain. Among various productive elements like funds, building, technology and people, etc, Technology is the importance. To upgrade the technology can't be separated from the innovation of the skilled personnel. So, the skilled personnel are the key. To meet the need of the intensive development of the manufacturing industrial chain, the skilled personnel for the manufacturing industry must undergo an adjustment process of competition, training, flow, selection and elimination. Only this can a whole efficiency and benefits of the manufacturing industrial chain be raised as soon as possible.

4.2. Countermeasures to Develop by Flow the Skilled Personnel under the Transformation and Upgrade of the Manufacturing Industry in Wuhan

According to the actual situation of the manufacturing industry and the experience from the developed countries, the following countermeasures in developing the skilled personnel by flow can be adopted.

First, relatively complete laws and regulations should be formulated in normalizing the labor market, in the medical care and retirement insurance, etc.

Second, set up the correspondent encouragement policy in absorbing and keeping the skilled personnel in the hi-tech and the scared personnel during the transformation and upgrade of the manufacturing industry in Wuhan.

Third, enlarge the investment into the important industrial project, which can create a platform to attract and maintain the elite skilled personnel. In the platform, the skilled personnel can deploy their potential to a large degree.

Fourth, build the link workstation of the skilled personnel such as the skilled personnel center, the hunting agent and so on for the oversea people and among various industries. All these can make a bridge between demand and supply.

Fifth, break through the obstacles that prevent the skilled personnel from free flow among different sectors and regions. These obstacles include census, medical care, children enrollment, retirement, etc.

5. Conclusion

Whether the transformation and upgrade of the manufacturing industry succeeds or not depends on the development of the skilled personnel. The flow of the skilled personnel is an essential path to develop the skilled personnel. To push successfully the transformation and upgrade of the manufacturing industry, various levels of governments must formulate the concerned policy able to attract and keep the skilled personnel. Only this can make the skilled personnel give their full play in the transformation and upgrade of the manufacturing industry.

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