An Analysis on Influence Factors and Their Relative Structure of HIDZs’ Innovation Driven Development Based on Project Management Theory

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Abstract. Fourteen main influence factors of HIDZs’ innovation driven development are refined from existing literature published, through applying bibliometrics methods and meta analysis. After that, the relative structure of fourteen main influence factors are studied by using interpretive structural model. The research results show that HIDZs’ innovation driven development is directly influenced by product combination line, product value chain reconstruction, penetration of new business, high level talent introduction, human capital investment, expansion of new markets and discovery of new profit centers; It can be indirectly affected by existing technology integration innovation, industrial structure innovation, industry sector innovation, new product development, new market mechanism; new technology R&D and application of high and new technology can play a fundamental influence role to innovation driven development.

Introduction

High and New Technology Industries Development Zone (HIDZ) is the main bearer for the concentration and fast advancement of high and new technology industries. Since the establishment of the world’s first HIDZ the Silicon Valley in 1951 more and more HIDZs in other nation are built as a strategy to improve their own competitiveness and carve a niche in the market. Britain’s Cambridge, India’s Bangalore, Taiwan’s Xinzhu all constructed HIDZs which prompted a trend in the world. The HIDZs in China are developed against the backdrop of confronting the challenge international new technology revolution, seeing the constant new technology advancement in other countries, and experiencing deepening domestic reform and opening up. Under the guidance of the “ 863 Plan “, the “ Torch Plan”, our State Council authorized China’s first HIDZ—Beijing Pilot Zone of High and New Technology Development. Since that event HIDZs sprang up across the whole country.

The 18th National Congress of the Communist Party of China confirmed the innovation driven technology as the primary strategy in moving the society forward and achieving social and economic transformation. In order to implement fully the strategy the Department of Technology released the Implement Scheme of Innovation Driven Strategies In China’s HIDZs and other documents which further set the innovation driven development as the main task in future HIDZs. Henceforth HIDZs are increasingly becoming the piloting place for China’s innovation driven strategies.

Innovation driven development is a content-oriented development pattern. Based on emerging technology and new knowledge, it restructures the current producing elements and materials and regroups them to achieve sustainable development with high efficiency which breaks the limitation of traditional developing patterns. Therefore the innovation driven development is not a single and one dimension system. It’s a comprehensive system that contains a variety of elements. As for HIDZs they have to take their own influencing factors into consideration when trying to achieve the innovation driven development. And these factors are usually have complicate relations among themselves, making our study in this respect significant.
Literature Review

Bergsman J., Greenston P. And Healy R.(2011) used case study to investigate the innovation driven development process of Silicon Valley in the past 10 years. Based on the S Curve Model Theory in regional development, they concluded that the Silicon Valley is now in the third phase of pioneering. The core influencing factors of its innovation-driven development are market expansion, new profit making points, emerge of new industries or industrial innovation[1]. Hood C.(2012) studied the concentration area of information technology and software technology in Bangalore, India, with the multivariate statistics method to analyze its influencing factors of innovation driven development. The results show that the development of new products and the introduction of talents have significant influences. Specifically with every 12.7% increase in investment for new products development, and every 9.2% increase in the number of talents introduction, the innovation driven development index would increase by 1 percent[2]. Boekholt, Patries and Thuriaux(2012) applied economics in the study of innovation driven development in the aeronautics park of France. They concluded that the establishment of a set of scientific institution has a positive influence on the park’s innovation driven development. Therefore the talents-training system, a new market system, and transformation of innovation to productivity are the main influencing factors[3]. Kenneth J.(2013)[4], Chorle J. and Haggett P.(2015) also hold the same point of view.[5]

The present domestic studies on this topic mostly focus on the influencing factors of HIDS economic development. Guiqin Li (2010) studied the HIDS in Nanjing and built feedback circuits among regional environment, industrial system, financing channels and labor resources with the system dynamic model. She believed that an excellent regional advantages can attract labor and capital to facilitate the development of HIDS, for example Nanjing is located in the Yangtze River Delta has a regional advantage.[6] Xinbao Tian(2013) regarded capital, labor and technology as the three variables of investment function and economic increase as the production function variable. He analyzed the influence of capital, labor and technology on HIDS development and found out that their degree of influence were different, specifically the influence of capital is the biggest, followed by technology and the influence of labor is the smallest.[7]

A look at domestic and foreign literature reveals the weakness of current studies on this topic: (1) In China there are rarely studies on the influencing factors of HIDS innovation driven development. Studies are conducted from the perspective of resources driven development with the conclusion that capital or labor are the significant influencing factors.(2) Among foreign literature although there are some studies which mentioned innovation driven development in HIDS and its influencing factors, such as market expansion, new product development and technology-products transformation system, there is lack of systematic analysis. Against such background in this thesis I will apply bibliometrics to summarize the influencing factors of innovation driven development in HIDS based on previous studies. I also will make a meta-analysis to obtain the major influencing factors and then use interpretative Structural Modeling to clarify mutual relationship among the factors and their role in promoting innovation driven development of HIDS.

Main Influencing Factors In Innovation Driven Development of HIDS

Here I use the bibliometrics to analyze the previously published studies logically and statistically so as to conclude the influencing factors of the innovation driven development in HIDS. According to the bibliometrics I make “HIDS”, “innovation driven” and “influencing factors” the key words and found out 55 academic works from SpringerLink, EBSCOhost, CNKI and Wanfang data. See works cited [1-5]. Through a comprehensive examination from one work to another 19 factors from 5 dimensions are obtained which are (1) Technological dimension: development of new technology, application of high and new technology, technology-productivity transformation system, integrated innovation. (2) Industrial innovation dimension: industrial structure innovation, industrial department innovation, emerging of new industries and upgrading of industrial structure. (3) Products innovation dimension: development of new products, restructuring of products value chain, new products assortment, pervasion of new business. (4) Market innovation dimension: expansion
of new markets, finding of new profit center and establishment of new market system. (5) Talent innovation dimension: introducing of high level personnel, labor resource distribution innovation, more investment in human capital and training system of innovative talents.

Though I have concluded 19 influencing factors, they may not be all approved by most scholars. Therefore meta-analysis is applied\(^9\) to conduct deeper investigation into these factors. First of all I made a coding for the 19 factors according to the frequency they appear in the literature as follows: development of new technology\((C_1)\),application of high and new technology\((C_2)\),integrated innovation\((C_3)\),industrial structure innovation\((C_4)\),industrial department innovation\((C_5)\),development of new products\((C_6)\),restructuring of products value chain\((C_7)\),new products assortment\((C_8)\),pervasion of new business\((C_9)\),expansion of new markets\((C_{10})\),finding of new profit center\((C_{11})\),establishment of new market system\((C_{12})\),introducing of high level personnel\((C_{13})\),human capital investment\((C_{14})\),technology-productivity transformation system\((C_{15})\),training system of innovative talents \((C_{16})\),emerging of new industries \((C_{17})\),upgrading of industrial structure \((C_{18})\),labor resource distribution innovation \((C_{19})\). Then main influencing factors are confirmed according to the frequency the 19 factors appear in the literature (See Figure 1.).

Since the extraction criteria of meta-analysis for main influencing factors is 80% of the total frequency, which means 80% scholars hold these factors to be the main influencing factors, \(C_{15}, C_{16}, C_{17}, C_{18}, C_{19}\) are excluded.. Finally \(C_1, C_2, C_3, C_4, C_5, C_6, C_7, C_8, C_9, C_{10}, C_{11}, C_{12}, C_{13}, C_{14}\) are the main influencing factors in the innovation driven development of HIDS.

![Figure 1. Meta-analysis of HIDS Innovation Driven Development.](image)

**Relation Structure Analysis among the Main Influencing Factors of HIDS Innovation Development**

The influencing factors of the HIDS innovation driven development are extremely complex and they sometimes have mutual effects on one another, forming a complicated hierarchical factor chain. To better analyze their relationship a Interpretive Structural Model, short for ISM\(^{10}\) is constructed to extract the fundamental influencing factors, the middle indirect influencing factors and the surface direct influencing factors respectively.

**Determination of the Mutual Relationship Among Influencing Factors**

To study how the above 14 factors influence the innovation driven development in HIDS, their mutual relationship should first be analyzed. A thorough debating by our research group and a combination of previous studies, the mutual relationship among the factors are finally confirmed. See Table 1. \(C_0\) in the table is the innovation driven development system of HIDS. \(L\) means that the factors in the line have direct effect on the factors in the row. “\(H\)” represents that the factors in the row have effects on those in the line. “\(N\)” means there is no direct relationship between factors in the row and factors in the line. “\(D\)” signifies that factors in the row and factors in the line have effect on each other.
Table 1. Mutual Relationship between Two Factors.

| C_i | C_2 | C_3 | C_4 | C_5 | C_6 | C_7 | C_8 | C_9 | C_10 | C_11 | C_12 | C_13 | C_14 | C_15 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| H   | D   | N   | N   | N   | N   | N   | N   | N   | N    | N    | N    | N    | N    | H    |
| N   | N   | L   | N   | L   | L   | N   | N   | N   | N    | N    | N    | N    | N    | N    |
| N   | H   | N   | X   | N   | N   | H   | N   | N   | H    | N    | N    | H    | N    | N    |
| N   | N   | N   | N   | N   | N   | N   | N   | N   | N    | N    | N    | N    | N    | N    |
| N   | N   | N   | L   | N   | D   | N   | N   | N   | H    | N    | N    | N    | N    | N    |
| L   | N   | N   | N   | N   | N   | N   | N   | N   | N    | N    | N    | N    | N    | N    |
| N   | N   | N   | N   | N   | N   | N   | N   | N   | H    | H    | H    | H    | H    | H    |
| N   | N   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    | H    | H    | H    |
| N   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    | H    | H    | H    |
| N   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    | H    | H    | H    |
| N   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    | H    | H    | H    |
| N   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    | H    | H    | H    |
| N   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    | H    | H    | H    |
| N   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    | H    | H    | H    |
| N   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    | H    | H    | H    |
| N   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    | H    | H    | H    |
| N   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    | H    | H    | H    |

The factors’ relationship matrix is obtained which is E, E is 15 order matrix. The factor definition of E is 

\[ E = \begin{bmatrix}
1 & 0 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 0 & 0 & 0 \\
1 & 1 & 1 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 \\
1 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 0 \\
1 & 1 & 1 & 1 & 1 & 0 & 1 & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 1 \\
1 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 1 & 1 \\
1 & 1 & 1 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0 \\
1 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 1 & 1 \\
0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & 1 & 0 & 1 & 1 & 1 & 1 \\
1 & 0 & 1 & 1 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 1 \\
1 & 0 & 1 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 1 & 1 & 0 \\
1 & 1 & 1 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 1 & 1 & 1 \\
1 & 1 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 0 \\
1 & 1 & 1 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 \\
1 & 1 & 1 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 0 & 1 & 1 & 1 & 0 \\
1 & 1 & 1 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 1 & 0 & 0 & 1 & 0 \\
1 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 \\
1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 
\end{bmatrix} \]

The factors’ relationship matrix is obtained which is \( E \), \( E \) is 15 order matrix. The factor definition of \( E \) is 

\[ e_{ij} = \begin{cases} 
1, \ C_i \text{Directeffect} C_j \\
0, \ C_i \text{Nondirecteffect} C_j 
\end{cases}, \quad (i, j = 0, 1, \cdots, 14), \text{ then} \]

\[ E = \begin{bmatrix}
1 & 0 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 0 & 0 & 0 \\
1 & 1 & 1 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 \\
1 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 0 \\
1 & 1 & 1 & 1 & 1 & 0 & 1 & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 1 \\
1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 \\
1 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 1 & 1 \\
0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & 1 & 0 & 1 & 1 & 1 & 0 \\
1 & 0 & 1 & 0 & 1 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 1 & 1 \\
1 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \\
1 & 1 & 1 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 1 & 1 & 1 \\
1 & 1 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 0 \\
1 & 1 & 1 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 \\
1 & 1 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 0 & 1 & 1 & 1 & 0 & 0 \\
1 & 1 & 1 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 1 & 0 & 0 & 1 & 0 \\
1 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 \\
1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 0 
\end{bmatrix} \]
Division of the Hierarchical Relationship Among The Influencing Factors

From the incidence matrix $E$ the reachable matrix $F = (E + K)^6$ is calculated, in which $K$ is the unit matrix of the 15 order. Using SPSS19.0 the following formula is obtained

$$F = \begin{bmatrix}
0 & 0 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\
1 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 1 & 1 & 0 & 1 & 1 \\
1 & 0 & 1 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 0 & 0 & 1 & 1 & 0 \\
1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 1 \\
0 & 0 & 0 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 0 & 1 \\
1 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 1 & 0 \\
1 & 0 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 1 & 0 & 0 & 1 & 1 \\
0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\
1 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 1 \\
0 & 1 & 1 & 1 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\
1 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 1 \\
1 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 0 & 1 & 1 \\
0 & 1 & 0 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 1 & 1 \\
1 & 0 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 1 & 1 \\
\end{bmatrix}$$

From $F$ the reachable matrix of each influencing factor $U(C_i)$, the antecedents set $V(C_i)$ and the intersection of the antecedents set and the reachable matrix set $U(C_i) \cap V(C_i)$ can be seen in the following table. The data in table 2 leads to the first order node $W_1 = \{0\}$ of the influencing factors.

| $C_i$ | $U(C_i)$ | $V(C_i)$ | $U(C_i) \cap V(C_i)$ |
|-------|----------|----------|---------------------|
| $C_0$ | 0        | 0,12,13  | 0                   |
| $C_1$ | 1,3,4,5,6,12 | 1,4,5,6,12 | 1,4,5,6,12 |
| $C_2$ | 2,3,4,5,6,12 | 2,4,5,6,12 | 2,4,5,6,12 |
| $C_3$ | 3,10,11,14 | 3,10     | 3,10               |
| $C_4$ | 4,11,13 | 4,11     | 4,11               |
| $C_5$ | 5,7,8   | 5,7      | 5,7                |
| $C_6$ | 6,9,14 | 6,9      | 6,9                |
| $C_7$ | 0,7,8,9 | 3,7,8,9  | 7,8,9              |
| $C_8$ | 0,7,8,9 | 2,4,5,7,8,9 | 7,8,9 |
| $C_9$ | 7,8,9,15 | 7,8,9,14 | 7,8,9             |
| $C_{10}$ | 0,10,11 | 2,4,7,10,11 | 10,11 |
| $C_{11}$ | 0,10,11 | 2,5,9,10,11 | 10,11 |
| $C_{12}$ | 7,10,11,12 | 10,11,12 | 10,11,12 |
| $C_{13}$ | 0,13,14 | 0,2,5,13,14 | 0,13,14 |
| $C_{14}$ | 0,13,14 | 0,10,11,13,14 | 0,13,14 |

Erasing number 0 row and number 0 line from $F$ and search the second order node, the second order node of each influencing factor $W_2 = \{7,8,9,10,11,13,14\}$ can be obtained from data in Table 3
Table 3. The second order reachable matrix and the antecedents set of each influencing factor.

| C_i | U(C_i) | V(C_i) | U(C_i) ∩ V(C_i) |
|-----|--------|--------|-----------------|
| C_1 | 1,3,4,5,6,12 | 1,4,5,6,12 | 1,4,5,6,12 |
| C_2 | 2,3,4,5,6,12 | 2,4,5,6,12 | 2,4,5,6,12 |
| C_3 | 3,10,11,14 | 3,10 | 3,10 |
| C_4 | 4,11,13 | 4,11 | 4,11 |
| C_5 | 5,7,8 | 5,7 | 5,7 |
| C_6 | 6,9,14 | 6,9 | 6,9 |
| C_7 | 7,8,9 | 3,7,8,9 | 7,8,9 |
| C_8 | 7,8,9 | 2,4,5,7,8,9 | 7,8,9 |
| C_9 | 7,8,9 | 7,8,9,14 | 7,8,9 |
| C_{10} | 10,11 | 2,4,7,10,11 | 10,11 |
| C_{11} | 10,11 | 2,5,9,10,11 | 10,11 |
| C_{12} | 7,10,11,12 | 10,11,12 | 10,11,12 |
| C_{13} | 13,14 | 2,5,13,14,15 | 13,14 |
| C_{14} | 13,14 | 10,11,13,14,15 | 13,14 |

Similarly erase the 7th to 14th line and the 7th to 14th row from F and search the third order node of each influencing factor, \( W_3 = \{3,4,5,6,12\} \) can be drawn from the data in table 4.

Table 4. The third order reachable matrix and the antecedents set of each influencing factor.

| C_i | U(C_i) | V(C_i) | U(C_i) ∩ V(C_i) |
|-----|--------|--------|-----------------|
| C_1 | 1,3,4,5,6,12 | 1,4,5,6,12 | 1,4,5,6,12 |
| C_2 | 2,3,4,5,6,12 | 2,4,5,6,12 | 2,4,5,6,12 |
| C_3 | 3 | 3 | 3 |
| C_4 | 4 | 4 | 4 |
| C_5 | 5 | 5 | 5 |
| C_6 | 6 | 6 | 6 |
| C_{12} | 12 | 12 | 12 |

Finally the fourth order node of each influencing factor, \( W_4 = \{1,2\} \) is drawn from the data in table 5.

Table 5. The fourth order reachable matrix and the antecedents set of each influencing factor.

| C_i | U(C_i) | V(C_i) | U(C_i) ∩ V(C_i) |
|-----|--------|--------|-----------------|
| C_1 | 1 | 1 | 1 |
| C_2 | 2 | 2 | 2 |

Henceforth an interpretative model is constructed for the main influencing factors of innovation driven development in HIDS, See Figure 2.
A Hierarchical Relationship Analysis Between The Influencing Factors of Each Order

From Figure 2 we can see there are three orders of influencing factors in the innovation driven development of HIDS: the first order influencing factors are restructuring of product value chain ($C_7$), new products assortment line ($C_8$), pervasion of new businesses ($C_9$), expansion of new market ($C_{10}$), founding of new profit center ($C_{11}$), introduction of high-level personnel ($C_{13}$), and human capital investment ($C_{14}$). The second order influencing factors are integrated innovation ($C_3$), industrial structures innovation ($C_4$), industrial department innovation ($C_5$), new product development ($C_6$), establishment of new market system ($C_{12}$). The third order influencing factors are development of new technology ($C_1$) and application of new technology ($C_2$).

(1) Analysis of the first order influencing factors and their relationship with innovation driven development: factors that have direct effect on HIDS innovation driven development are restructuring of product value chain ($C_7$), new products assortment line ($C_8$), pervasion of new businesses ($C_9$), introduction of high-level personnel ($C_{13}$), and human capital investment ($C_{14}$). Among them restructuring of product value chain, new products assortment line and pervasion of new businesses forms a strongly linked relation, demonstrating they have mutual influence. On the other hand, introduction of high-level personnel and human capital investment forms a strongly linked relation, a demonstration of their mutual relationship. HIDS as a concentration area of high tech enterprises it has a leading role in production innovation. It can develop new products through new products assortment line (such as making new energy cars with the combination of energy saving and car manufacturing) and pervasion of new business (like integrating internet with financing to make online financing). It can also restructure new products with high added value using the products value chain (ex: in the past people get low end value by traditional mechanic making and now they can get high end value with equipment designing). Moreover, high level personnel have direct effect on HIDS innovation development since the introducing of high level talents transfers to high productivity, and human capital itself as an important producing factor can also help the advancement of HIDS construction. Enterprises are the cells of HIDS, products are the output of these cells, therefore once each enterpriser discovers and takes over a new market, and once each product finds a new profit center, more contribution are made to the HIDS innovation driven development. Therefore the first order factors are the surface direct influencing factors of the innovation driven development in HIDS.

(2) Analysis of the second order influencing factors and their relationship with innovation driven development and the first order influencing factors respectively: the development of new products has direct effect on the restructuring of product value chain, new product assortment line and the pervasion of new business. Obviously the former is the basis of the latter. The integrated innovation of current technologies, industrial structure innovation and industrial department innovation all have direct effects on the introducing of high level personnel and human capital
investment as these factors can lead to the demand of one important producing factor that is labor especially high end talents with advanced knowledge and technology. The building of a new market system will have direct effect on market expansion and the finding of new profit center. The second order factors exert influence on the innovation driven development of HIDS through the first order factors, in another word the second influencing factors have an indirect effect.

(3) Analysis of the third order factors and their relationship with the second order influencing factors: in the third order factors the development of new technology has a direct effect on the development of new products, and as an innovative activity the former’s vitality exert effect on the efficiency of the innovative achievement of new products. By contrast the application of new technology has a direct influence on the integrated innovation of present technologies. In the dimension of “application” high tech can promote the innovation driven development of HIDS through the innovation and integration of present technologies. Therefore the third order factors are the fundamental influencing factors for the innovation driven development of HIDS. They thus have a profound and far-reaching effect.

Conclusion and Reflection on Related Government Policies

The analysis of the influencing factors for the innovation driven development of HIDS helps us to confirm the significant factors that play crucial roles, it also helps to identify the relationship between and among these factors so as to determine the fundamental factor, middle indirect factors and surface direct factors. As the fundamental influencing factors, the development and application of new technologies are important in advancing the sustainable innovation driven development of HIDS.

Innovation driven development is the only choice for the transformation and development of HIDS against the current international and domestic situations. Study in this thesis leads to the following conclusion that: 1. When leading the innovation driven development, HIDS should also attach importance to technological innovation, industrial innovation, product innovation, market innovation and innovation of using talents so as to systematically integrate each factor to make proper policies. 2. HIDS should bring the fundamental influencing factors of development and application of new technologies into full play, making plausible measures to facilitate technology-to-productivity transfer so as to achieve leapfrog development of HIDS.

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