

# STUDY ON HUMAN CAPITAL OF DISPATCHED WORKERS IN HIGH-TECH INDUSTRY - EVIDENCE FROM TAIWAN

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## Abstract

From perspective of scholars, experts, dispatched work agencies and supervisors of enterprises which need dispatched workers, this study divides dispatched workers into core and non-core dispatched workers and probes into the difference of human capital of these two types of workers from dimensions and indicators. Regarding four dimensions of human capital, this study demonstrates that high-tech industry pays more attention on capability, affection & motive and uniqueness of core dispatched workers. As to indicators of dimensions of human capital, there are still significant differences between core and non-core dispatched workers. This study completely aims to probe into high-tech industry, human capital and dispatched workers. The results and contributions of this study offer academia, enterprises which need dispatched workers, dispatched work agencies, and dispatched workers.

**Keywords:** Human Capital, High-Tech Industry, Taiwan, Dispatched Workers

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## 1. Introduction

Since the rise of behavioral science in 1930s, studies in the field of management have discussed manpower in organizations and suggested that humans are the most important assets in organizations. Prominent manpower is the corporate competitive advantage (Lu and Gao, 2011; Zula and Chermack, 2008). High-tech industry is capital, technique and manpower intensive industry. In industry which relies on professional knowledge and technique, manpower in enterprises is more important. Manpower with professional knowledge and capability are the source of corporate core competitiveness. Manpower is the most important asset in firms and key factor to maintain the leading position (Chowdhury, 2010; Christian, 2010; Lawler, 2009; Xian, Colwell and Ma, 2010). In organizations, value creation must rely on appropriate manpower. Creation and maintenance of human capital is important infrastructure of enterprises. Without human capital, advanced devices and techniques in organizations are in vain. Thus, how to correctly and effectively control human capital in organizations is an important issue (Mithas and Krishnan, 2008).

Global financial crisis since 2008 has influenced the whole labor market. Due to the depression and fluctuation of demand, enterprises

tend to collapse without contingent capability (Vandenberg, 2010). Thus, with change of industrial structure and dramatic fluctuation of business, enterprises must reorganize the organizations and personnel. They flexibly adjust manpower and also continuously upgrade R&D and techniques. They pay attention to long-term manpower development in order to maintain core competitiveness. Thus, non-typical employment is raised again. In early times, market of dispatched workers mostly had administration personnel and basic labor. With the change of industrial structure and upgrading of quality of dispatched manpower, more and more enterprises provide core jobs of the organizations. Nowadays, trend of dispatched manpower has influenced traditional manpower market. In high-tech industry, the scope expands from basic workers to professional engineers with high-level techniques and management decision makers. According to statistics of "investigation on manpower use" by Directorate General of Budget, Accounting and Statistics, Executive Yuan, in 2011, in Taiwan, there were about 720,000 temporary or dispatched employees and they were 7% of total employees. Based on "investigation on operation of labor dispatching" of Council of Labor Affairs, Executive Yuan in 2005, there were only 130,000 dispatched workers. In five years, dispatched workers increase by five times.

Scope and depth of the issue on human capital can be different according to regions, nationalities and industries (Schiemann, 2006; Tadic, 2010). Regarding high-tech industry, it is in changeable environment and its characteristics include technical precision, intensive capital, high risk, rapid growth of industry and short life cycle of products (Gomez-Arias and Monterroso, 2007; Hughes and Morgan, 2007; McDade, Oliva, and Thomas, 2010; Nabmisan, 2002). Concern of personnel cost and flexible use of manpower enhances the development of dispatched manpower in high-tech field. Among clients of dispatching companies in Taiwan, high-tech industry is the most (50%) and the following are manufacturing industry (38.9%), finance and insurance industry (36.1%) and industrial and commercial service industry (22.2%). Technology enterprises in Taiwan, including TSMC, UMC and AUO and international enterprises, such as IBM, HP and Philip, have regularly adopted short-term dispatched manpower. According to “use of dispatched labor and operation of labor dispatching of enterprises in industrial, commercial and service industries” of Directorate General of Budget, Accounting and Statistics, Executive Yuan in 2011, in semiconductor manufacturing industry, 15.8% enterprises used dispatched labor. Thus, dispatching has become the trend of flexible manpower use planning in high-tech industry. It is necessary to analyze and probe into dispatched manpower in high-tech industry.

Although use scope and attributes of dispatched manpower are expanding in different countries, there are few academic research findings. Past literatures mostly focused on dispatched manpower in organizational behavior and neglected the concept and measurement of human capital of dispatched manpower (Amuedo-Dorantes, Malo, 2008; Camerman, Cropanzano, and Vandenberghe, 2007; Cuyper and Witte, 2007; Davis-Blake and Broschak, 2003; Wiens-Tuers, 2001). Technology changes rapidly and competition of global market is severe. Output created by high-tech industry in Taiwan is enormous and it grows year by year (Lien et al., 2007). High-tech industry in Taiwan gradually stands out in global economic stage. Development of high-tech industry becomes the main success factor of economy in Taiwan. Nowadays, in order to respond to change of global business, dispatched manpower is adopted in high-tech industry. In the industry which values manpower, how does it use dispatched manpower? It will be the main content explored by this study.

With the insufficiency of past research and current practical trend (Biggs, Burchell, and Millmore, 2006; Foote, 2004; Koh and Yer, 2000; Netland, 2006; Schmidt and Thommes, 2007), this study aims to probe into high-tech industry, human capital and dispatched manpower. Through data

collection and empirical analysis of high-tech industry in Taiwan, this study attempts to find the characteristics and importance of human capital of dispatched employees of different positions in high-tech industry. From perspectives of experts and business supervisors, this study indicates the framework of human capital indicators of “core” and “non-core” dispatched workers as reference for the following academic studies and practice of management. Generally speaking, the reorganization and analysis of this study will help integrated use of high-tech industry in strategy of human resource management. It serves as reference for enterprises to select dispatched manpower and for dispatched workers to upgrade and enhance human capital. It will result in win-win state among enterprises, dispatched workers and dispatched work agencies.

## 2. Literature and background

### 2.1 High-tech industry

Until now, high-tech industry is defined differently. It is generally divided into “quantitative indicative definition” and “qualitative conceptual definition”. Quantitative indicative definition means to measure high-tech industry by figures of R&D or labor. Qualitative conceptual definition means to measure by industrial characteristics of high-tech industry, such as value of R&D and innovation and high risk. According to definitions and characteristics of high-tech industry, the industrial scope is broad (Barrientos et al., 2011; Rothaermel and Deeds, 2006; Siqueira and Bruton, 2010; Styles and Genua, 2008; Tsai and Lin, 2005; Tu, 2010). Based on the description in investment manual of science park of Hsinchu science park administration in Taiwan, high-tech industry includes 1) integrated circuit industry; 2) computer peripheral device industry; 3) communication industry; 4) optoelectronics industry; 5) precision machinery industry; 6) biotechnology industry. In addition, Industrial Development Bureau, Ministry of Economic Affairs, Executive Yuan judges high-tech industry by “two high”, high additional value and high degree of intensive technique, “two significant”, significant market potential and significant industrial correlation and “two low”, two energy use and low pollution principle. This study adopts industrial classification of new important strategic industry announced by Industrial Development Bureau, Ministry of Economic Affairs and investment manual of Hsinchu Science Park and treats industries of integrated circuit, optoelectronics, electronics, computer system, computer related devices and components, communication and network, biotechnology and medicine, precision machinery in Taiwan as the research scope.

Characteristics of high-tech industry include rapid market change, short life cycle of products, dramatic change of work techniques, high employee turnover rate, fluctuant organizations and intensive capital, technique and knowledge. Besides, it is influenced by technical push and market demand pull (Audretsch and Elston, 2006; Filatotchev, Liu, Buck, and Wright, 2009; Gill and Lei, 2009; Narasimhan, Rajiv, and Dutta, 2006; Peterson, Walumbwa, Byron, and Myrowitz, 2009).

Nowadays, global economic and trading environment is unstable. Continuous drive of industrial development will be the base to stabilize economic and trading growth of different countries (Barrientos, Gereffi, and Rossi, 2012; Perugini and Pompei, 2009). The vigorous development of high-tech industry has significantly influenced economic growth of Taiwan (Lau, Yiu, Yenug, and Lu, 2008; Lin, Cheng, and Liu, 2009). However, with the change of international environment, currently, high-tech industry in Taiwan encounters the deficits, the crisis of lower competitiveness, depression and layoff of employees. They suffer from the unprecedented difficulties in human resource management. How to maintain manpower value and save manpower cost becomes an important issue.

## 2.2 Human capital

Schultz, the laureate of the Nobel Economics Prize (1960) suggested that skills and knowledge of employees in enterprises can enhance productivity and they are assets of enterprises. Employees can provide organizational value by their personal potential resources (Hsu, 2007; Jackson, 2013; Rowley and Redding, 2012). Stewart (1997) suggested that human capital means the capability of individuals to solve problems and it is the source of innovation and renewal. Edvinsson & Malone (1997) indicated that human capital combines knowledge, skills, innovation, control of individual tasks and corporate value and culture. Based on the views of scholars (Dess & Picken, 1999; Dzinkowski, 2000; Jackson, 2007; Pedrini, 2007; Syed, 2008), this study suggests that human capital refers to individuals' capabilities, knowledge, skill and experience and it can lead to competitive advantages and enhance organizational value of enterprises.

Regarding human capital, Lepak & Snell (1999) divided human capital into four quadrants: employee value is cross axle. To the right, the value is higher. It means the involvement of high-value manpower can create corporate competitive advantages. Employees' uniqueness is longitudinal axle. To the top, uniqueness is higher. Employees' uniqueness means the corporate advantage which cannot be imitated and formulated. Among four quadrants, the first quadrant includes manpower

with high value and high uniqueness. It is core human capital which should be invested and concerned. The following scholars (Azam and Ahmed, 2010; Brooking, 1996; Davenport, 1999; Edvinsson and Malone, 1997; Grossman, 2000; Robinson, 2009; Roos, Roos, Dragonetti, and Edvinsson, 1998; Sveiby, 1998; Wright and McMahan, 2011) proposed different kinds of measurement models for the concern of research issues. Based on characteristics of measurement models of human capital proposed by the scholars, Han et al., (2008) generalized them into five dimensions: capability, affection, motive, personality trait and health. Human capital of capability mostly is based on capacity related to jobs, including professional knowledge, skills, capability, experience, creativity, etc. Human capital of affection means employees' efforts and affection to organizations and jobs. Human capital of motive includes employees' work motive, jobs, attitude toward life, work value, work beliefs, etc. Human capital of personality traits refers to personality traits cultivated by inborn conditions and acquired environment, including integrity, responsibility, optimism, resistance to pressure, etc. Human capital of health refers to employees' physical health.

Regarding the measurement of human capital, based on model of Han et al., (2008), this study includes uniqueness of Lepak and Snell (1999) to form six research dimensions: capability, affection, motive, personality trait, health and uniqueness.

## 2.3 Dispatched workers

Manpower dispatching is non-traditional employment (Rodriguez-Gutierrez, 2007). The dispatched work agency recruit, select and employ dispatched labor. The purpose is to provide labor to enterprises which need dispatched workers. During the period of employment, dispatched workers are directed by the enterprises and offer labor (Berton, Devicienti, and Pacelli, 2011; Jong et al., 2009). They receive salaries and welfare from the dispatched work agency. In 1990s, with global depression, the industries encountered international competitive pressure. In order to immediately respond to changeable market, human resources and personnel affair cost should be modified. Flexible use of dispatched manpower became one of the measures at the time to enhance competitiveness of enterprises (Koene and Riemsdijk, 2005; Kirk and Belovics, 2008; Matias-Reche, Garcia-Morales, and Rueda-Manzanares, 2008). Currently, due to the impact of global financial storm, the enterprises must, again, adopt flexible and temporary manpower dispatching system in order to save enormous personnel affair cost. Therefore, in recent years, demand for core, long-term and full-time labor reduces and workers

of irregular work contracts increase. Flexible jobs keep increasing (Boyce and Ryan, 2007).

Based on the development of dispatching industry of different countries in the past 20 years, causes of the rise of labor dispatching include (1) change of industrial structure; (2) change of labor population structure; (3) flexible strategies of enterprises; (4) change of supply and demand of market (Barbieri, 2008; Biggs, 2006; Graaf-Zijl and Berkhout, 2007; Finegold and Levenson, 2005; Fordu and MacKenzie, 2008; Kjeldstad and Nymoan, 2012). In recent years, due to long-term depression, enterprises in the world have gone up the past lifelong employment and turned to flexible labor in order to lower corporate cost. According to development of labor dispatching industry in Japan, Europe and US, currently, diversity of labor has become the trend.

In order to survive, enterprises seek flexible sustainable operational strategies. Besides, manpower work values in Y generation break through the lifelong and fixed tradition. With the significant change of labor and capital, there is common demand and it results in generality of labor dispatching system. Noticeably, regarding dispatched employees, Forrier and Sels (2003) found that most of dispatched employees have the intention to invest themselves and they expect the appropriate training provided by dispatched work agencies and enterprises which need dispatched workers in order to enhance human capital and capability of sustainable employment. Thus, since modern dispatched employees aim to "accumulate personal human capital", this study treat dispatched employees as subjects and from perspective of enterprises which need dispatched workers, it probes into the value of dispatched employees' human capital.

From perspective of sociology, the jobs can be generally divided into "white-collar level" and "blue-collar level". Nowadays, with flexible strategy use of human resources, it can be based on manpower structure of "Shamrock Organization". Shamrock organizations have an organizational structure with three distinct parts. The first part, or leaf, represents the core staff of the organization. They are likely to be highly trained professionals who form the senior manager. The second leaf consists of the contractual fringe and may include individuals who once worked for the organization but now supply services to it. These individuals operate within broad guidelines set down by the organization but have a high degree of flexibility and discretionary powers. The third leaf describes the consultancy (professional/high-tech). These workers are sufficiently close enough to the organization to feel a degree of commitment to it, ensuring they maintain a high standard of work.

In the time suggested by Handy (1990), dispatching was not popular. Currently, from the

perspective of flexible use of manpower and current use of dispatched workers in high-tech industry, dispatched workers' jobs turn from basic and regular works to professional jobs with diverse skills. Therefore, in formal questionnaire of this study, dispatched manpower of high-tech industry is divided into core and non-core manpower.

### 3. Methodology

#### 3.1 Research framework and design

There are few articles which combine "high-tech industry", "human capital" and "dispatched worker". This study aims to combine the three issues and treat high-tech industry in Taiwan as subjects to suggest the key indicators and dimensions of human capital of "core" and "non-core" dispatched workers. The original research framework is shown in Figure 1.

From perspective of scholars, experts, dispatching companies and supervisors of enterprises which need dispatched workers, this study probes into human capital of dispatched workers of high-tech industry. According to practical use of current industry, this study divides dispatched workers into core dispatched workers and non-core dispatched workers and probes into the difference of human capital of these two types of workers from "dimensions" and "indicators". Design of this study is shown below:

1. Collection of related literatures: this study collects literatures related to high-tech industry and human capital. According to past scholars' related research, the research develops questionnaire items suitable for this study.

2. Design of expert questionnaire: according to data collected, this study designs expert questionnaire.

3. Sending and revision of expert questionnaire: this study distributes expert questionnaire and invites related scholars and experts to select the indicators and provide opinions.

4. Accomplishment of formal questionnaire: according to indicators selected by scholars and experts and suggestions, formal questionnaire is designed.

5. Distribution, reorganization and analysis of formal questionnaire: in order to increase effective response rate of questionnaire, before distributing formal questionnaires, the researcher contacts the subjects by telephone in advance to make sure that the subjects have the intention. Questionnaire subjects are human resource supervisors of enterprises which need dispatched workers. Questionnaires are distributed by mails and personal visits in the enterprises. A total of 164 questionnaires are retrieved. After eliminating

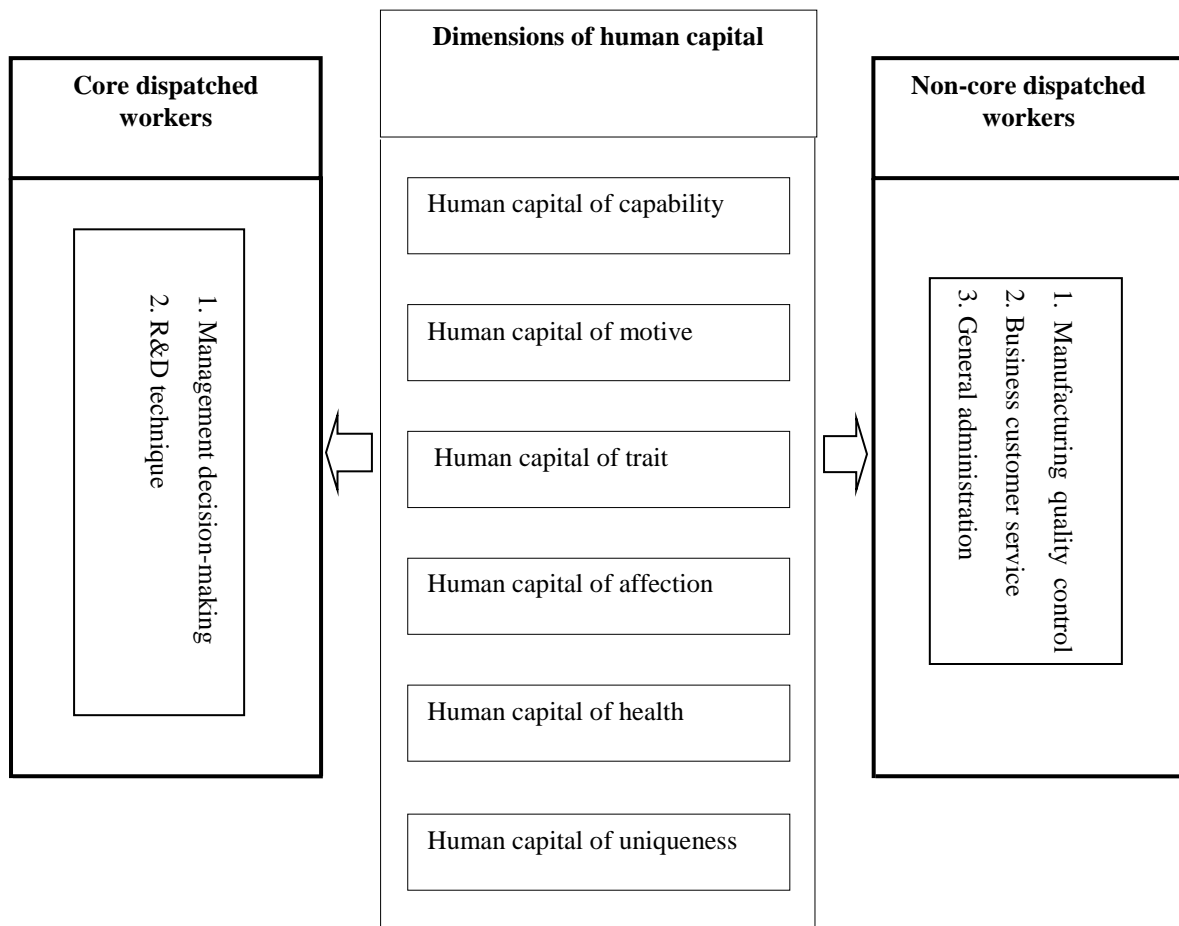
invalid questionnaires, the researcher obtains 152 valid questionnaires.

### 3.2 Expert questionnaires

By literature review, this study developed the draft of expert questionnaire. Human capital includes six dimensions include 41 indicators.

**Capability:** human capital of capability is mostly based on job-related capacity. The dimension measures the importance of dispatched workers' knowledge, skills and experience for the enterprises which need dispatched workers.

Figure 1. Original research framework



**Affection:** human capital of affection means employees' efforts and affection toward organizations and works. The dimension measures importance of dispatched workers' work commitment, organizational commitment and cohesion for the enterprises which need dispatched workers.

**Motive:** The dimension measures importance of dispatched workers' work motive, attitude toward work and life, work value and work beliefs for the enterprises which need dispatched workers.

**Personality trait:** the dimension refers to personality trait cultivated by inborn conditions and acquired environment. The dimension mainly measures importance of dispatched worker' integrity, responsibility, optimism and resistance to pressure for the enterprises which need dispatched workers.

**Health:** The dimension measures importance of dispatched workers' physical and psychological health for the enterprises which need dispatched workers.

**Uniqueness:** The dimension measures importance of imitation and replacement of dispatched workers' skills and capabilities for the enterprises which need dispatched workers.

As to design of questionnaire, this study adopted the design of Lawshe (1975). The importance is divided into "important", "normal" and "unimportant". Lawshe (1975) suggested that when more than half of the experts think that the item is "important", it means the item has certain degree of content validity. This study screens items by "importance" selected by half of the experts suggested by Lawshe (1975) in order to obtain the experts' consistent opinions. 15 experts and

scholars participate in the questionnaire, including 6 professors in academia, 7 dispatching industries and 2 high-tech industries.

After the return of expert questionnaires, by statistical result, this study generalized 6 dimensions, including 27 indicators: 6 indicators of capability, 4 indicators of affection, 5 indicators of motive, 4 indicators of personality trait, 4 indicators of health and 4 indicators of uniqueness as those in formal questionnaire.

### **3.3 Formal questionnaires**

After the formation of formal questionnaires, the researcher distributed them to supervisors of human resource department in high-tech industries which employed dispatched workers, including industries of integrated circuit, optoelectronics, electronics, computer system, communication and network, computer related devices and components, biotechnology and medicine and precision machinery. The enterprises were those in Hsinchu Science Park and Tainan Science Park. After experts' review, indicators of questionnaire, upon interval design of Likert 7-point scale, are divided into three parts:

Part 1: enterprises' use of dispatching: it aims to probe into current distribution of dispatched workers in high-tech industry. According to dispatched workers' positions in high-tech industry, there are five categories, as shown below:

1. Management decision-making: they are responsible for use of resources, decision making and obtainment of competitive advantage and profits for enterprises, such as consultants, high and medium rank supervisors, etc.

2. R&D technique: they include professional personnel with engineer background, such as system engineers, manufacturing R&D engineers, software development engineers, program designers, technique analysis managers, analysts of laboratories, IC designers, etc.

3. Manufacturing quality control: they are mainly in charge of standard business of production line, quality examination and test, such as production business operators, assembly technicians, quality control testing personnel, and logistics maintenance personnel, etc.

4. Business customer service: they are the personnel who frequently contact with external customers, including face-to-face or communication contact, such as market investigation personnel, planning marketing personnel, salespersons, customer service personnel, etc.

5. General administration: it refers to general affairs, administration and data processing, such as procurement and warehouse management personnel, legal auditing personnel, financial and

accounting personnel, administrative secretaries, general affair personnel, data processors, etc.

Part 2: core and non-core dispatched workers: management decision making and R&D technique in Part 1 are defined as core dispatched workers. Manufacturing quality control, business customer service and general administration are defined as non-core dispatched workers. The subjects are invited to select the importance degrees of human capital indicators of 6 dimensions regarding core and non-core dispatched workers in order to show the important human capital indicators for core and non-core dispatched workers in high-tech industry and the possible significant difference.

Part 3: basic information of subjects and subject enterprises: it includes industrial types, foundation years, number of employees of enterprise and the subjects' working years and positions.

## **4. Results**

### **4.1 Internal consistencies**

In the formal questionnaire, capability, affection, motive, personality trait, health and uniqueness are classified according to related literatures and practical experience. After the return of formal questionnaires, this study conducted factor analysis on dimensions of questionnaire and extracted and renamed four dimensions. They are capability, affection & motive, trait & health, and uniqueness. There are 5 indicators of capability and variance explained is 75.436%. Cronbach  $\alpha$  is 0.917. There are 9 indicators of affection & motive and variance explained is 67.466%. Cronbach  $\alpha$  is 0.938. There are 9 indicators of trait & health and variance explained is 72.387%. Cronbach  $\alpha$  is 0.952. There are 4 indicators of uniqueness and variance explained is 91.256%. Cronbach  $\alpha$  is 0.968.

### **4.2 Descriptive analyses**

The basic information of formal questionnaire includes industrial type, foundation years of enterprise, number of employees, and subjects' working years. Distribution of basic information of questionnaire is shown in Table 1.

Industrial type: regarding all samples in this study, the subjects are mostly in industries of integrated circuit and electronics (39%). Foundation years of enterprise: regarding all samples of this study, the subject enterprises' years of foundation are mostly in 6~10 years and 11~15 years (49.7%). Number of employees: regarding all samples of this study, the subject enterprises mostly have employees less than 1000 (44.4%). Subjects' working years: regarding all samples in this study, subjects' working years are mostly 4~6 years (35.3%).

**Table 1.** Distribution of basic information of formal questionnaire

Type	Item	Sample	Percentage
Industry	integrated circuit	30	19.6%
	optoelectronics	22	14.4%
	electronics	30	19.6%
	computer system	8	5.2%
	communication and network	10	6.5%
	computer related devices and components	16	10.5%
	biotechnology and medicine	10	6.5%
	precision machinery	10	6.5%
	other	16	10.5%
Foundation years	under 5	28	18.3%
	6-10	46	30.1%
	11-15	30	19.6%
	12-20	14	9.2%
	21-25	14	9.2%
	26-30	6	3.9%
	above 31	14	9.2%
Number of employees	Under 1000	68	44.4%
	1001-2000	28	18.3%
	2001-3000	12	7.8%
	3001-4000	12	7.8%
	4001-5000	18	11.8%
	5001-6000	4	2.6%
	above 6000	10	6.5%
Working years	1-3	26	17.0%
	4-6	54	35.3%
	7-9	24	15.7%
	10-12	28	18.3%
	13-15	8	5.2%
	Above 16	12	7.8%

According to Table 2, in five categories, management decision-making, R&D technique, manufacturing quality control, business customer service and general administration, in practice, in high-tech industry, currently, general administration uses dispatched workers the most (27.1%) and the following is manufacturing quality control (25.7%).

However, management decision-making and R&D technique are 25.7%. It means that high-tech industry has the intention to provide core jobs to dispatched workers.

**Table 2.** Distribution of dispatched works in high-tech industry

Item	Position	Sample	Percentage
Core dispatched worker	management decision-making	28	10.0%
	R&D technique	44	15.7%
Non-core dispatched worker	manufacturing quality control	72	25.7%
	customer service	60	21.4%
	general administration	76	27.1%

**Table 3.** Human capital indicators of core and non-core dispatched workers

Dimensions / Indicators	Core	Non-core
<b>Capability</b>		
1. Annual training hours received by the employee of the capacity	5.68	4.08
2. Number of job-related certificates owned by the employee of the capacity	5.28	3.88
3. Annual training cost of the employee of the capacity	5.45	3.84
4. Professional working years of the employee of the capacity	5.93	3.95
5. Educational level of the employee of capacity	6.05	3.92
<b>Affection and motive</b>		
6. Social ability of the employee of capacity	5.17	4.25
7. Identification with the organization of the employee of capacity	5.59	5.00
8. The employee of capacity believes and accepts corporate target value	5.76	5.09
9. Intention of the employee of capacity to highly devote to the organization	5.88	5.08
10. Cohesion of the employee of capacity	5.82	5.04
11. Acceptance of the employee of capacity regarding salaries	5.57	5.03
12. Work competence of the employee of capacity	5.91	5.11
13. Sense of responsibility of the employee of capacity	5.92	5.21
14. Learning of the employee of capacity from others at work	5.58	4.88
<b>Trait and health</b>		
15. Morale of the employee of capacity	5.57	5.08
16. Relationship and communication with the employee of capacity	5.32	5.26
17. Message exchange of the employee of capacity with others	5.22	5.16
18. Activeness of the employee of capacity	5.42	5.28
19. Cooperation of the employee of capacity with others	5.36	5.32
20. Emotional stability of the employee of capacity	5.34	5.29
21. Energy of the employee of capacity	5.00	5.20
22. Days of presence of the employee of capacity	4.89	5.37
23. Physical health of the employee of capacity	5.21	5.38
<b>Uniqueness</b>		
24. Discrimination of technical specialty of the employee of capacity from other companies	5.82	4.05
25. Is it easy to imitate the technical specialty of the employee of capacity?	5.78	3.96
26. Is it easy to recruit such technician in labor market?	5.70	3.74
27. Can the employee of capacity be easily replaced by other capacities?	5.79	3.83

#### 4.3 Analysis of human capital indicators of core and non-core dispatched workers

According to Table 3, when enterprises hire dispatched workers for core works such as management decision-making or R&D technique,

they pay the most attention on “educational level” and “professional working years” in the dimension of capability, regarding their human capital. Means are 6.05 and 5.93. Thus, when high-tech industry evaluates core dispatched workers’ capabilities, they treat educational level and professional working years as the most important indicators. As



to the dimension of affection and motive, “responsible for works” and “competence” are the most important indicators. Means are 5.92 and 5.91 which are higher than other indicators. Thus, in the dimension, enterprises care about employees’ devotion to fulfillment of works. As to the dimension of personality trait and health, means of “morale” and “activeness” are the highest (5.57 and 5.42). As to the dimension of uniqueness, “discrimination of technical specialty from other companies” is the most important and mean is 5.82. It means that when selecting dispatched workers as core positions, in order to maintain competitive advantage for enterprises, enterprises care about employees’ technical specialty.

When enterprises measure human capital of non-core dispatched workers, they tend to overlook “competence”. Among the indicators, only the mean of “training hours” 4.08 is higher, suggesting that when high-tech companies employ dispatched workers for job functions of quality control, customer service or general administration, they pay attention to the training hours of the worker concerning their duties. The companies concern about the proper practical training and competence of the employees, and whether they could be familiar with the jobs immediately. It is different from the indicators of educational level and professional seniority for core dispatched workers. In the dimension of affection and motivation, the means of responsibility and competence are the highest (5.21 and 5.11). This is similar to core dispatched workers. In the dimension of personality trait and health, the means of physical health and number of days of presence are the highest (5.38

and 5.37). This suggests that companies concern about the physical strength and regular daily presence of non-core dispatched workers in order to avoid the delay of business or production. In the dimension of uniqueness, it is not commonly concerned. The mean of discrimination of technical specialty from other companies is higher; however, the mean is only 4.05.

#### 4.4 Analysis of human capital dimensions of core and non-core dispatched workers

By t test of independent samples, this study tries to find if high-tech industry has significantly different values on dimension of human capital of core and non-core dispatched workers. According to Table 4, means of core dispatched workers’ capability, affection & motive and uniqueness are higher than non-core dispatched workers. The difference is significant (capability  $t=11.334$ ,  $p<0.01$ ; affection and motive  $t=5.271$ ,  $p<0.01$ ; uniqueness  $t=10.216$ ,  $p<0.01$ ). Thus, regarding human capital dimensions of dispatched workers, high-tech industry pays more attention on “capability”, “affection & motive” and “uniqueness” of core dispatched workers than non-core dispatched workers.

As to “trait & health”, although mean of non-core dispatched workers is higher than core dispatched workers, the difference is not significant ( $t=-0.003$ ,  $p>0.1$ ). Thus, enterprises do not have significantly different value on “trait & health” of non-core and core dispatched workers.

**Table 4.** T test of human capital dimension of core and non-core dispatched workers

Dimensions		Mean	Standard deviation	T value	P value
Capability	Core	5.6789	0.987	11.334	0.000***
	Non-core	3.9342	0.909		
Affection and motive	Core	5.6889	0.747	5.271	0.000***
	Non-core	4.9658	0.935		
Trait and health	Core	5.2588	0.991	-0.003	0.997
	Non-core	5.2593	0.966		
Uniqueness	Core	5.7697	0.891	10.216	0.000***
	Non-core	3.8947	1.329		

\* $p<0.1$  \*\* $p<0.05$  \*\*\* $p<0.01$

## 5. Conclusions and contributions

### 5.1 Conclusions

In recent years, since Taiwan encounters economic depression and rapid change of industrial structure, in order to lower labor cost and increase flexibility of employment, enterprises develop two kinds of dispatching employment. One is core employees and the other is non-core employees. The former is

important resources of corporate core knowledge and skills (Lepak and Snell, 1999). The latter is “non-core jobs” and “peripheral jobs” which can be easily replaced. In Taiwan, dispatching system is not mature. Thus, dispatched employees are usually incompetent. The key is that dispatched work agency cannot precisely control human capital of dispatched employees needed by the enterprises. Besides, dispatched workers who will be dispatched do not recognize their own value, characteristics

and suitable jobs. Thus, from “dimensions” and “indicators”, this study probes into core and non-core dispatched employees’ human capital.

Global use of dispatched workers is increasing year by year. Among the clients of dispatched work agencies in Taiwan, high-tech industries are the most. Thus, this study treats high-tech industries in Taiwan as subjects and the purpose is to find importance of dispatched workers’ human capital indicators for high-tech industries. In practice, according to identity and function, dispatched workers are mainly divided into “core dispatched workers” and “non-core dispatched workers”. Thus, this study further probes into the importance of these two types of dispatched workers’ human capital indicators and the significant difference. By reorganization of great amount of literatures, experts’ review and field study in enterprises as well as descriptive statistical analysis, variance analysis, t test of independent samples, this study obtains result of empirical analysis and intends to benefit academia, enterprises which need dispatched workers, dispatched work agencies and dispatched workers who will enter dispatching system. The research findings are as follows:

Regarding four dimensions of human capital, this study demonstrates that high-tech industry pays more attention on capability, affection & motive and uniqueness of core dispatched workers. It means that when selecting dispatched workers for core positions such as management decision-making or R&D technique, in order to match overall strategic operation, enterprises must value dispatched employees’ professional capability and performance. Dispatched employees’ identification with the beliefs of enterprises which need dispatched workers is also important. When dispatched employees identify with the said beliefs and have intention to contribute their intelligence and specialty, they can thoroughly fulfill their value. In addition, dispatched employees’ technical specialty must be different from other companies in order to create competitive advantages for enterprises. As to trait & health, although it is more important for non-core dispatched workers than core dispatched workers, the difference is not significant.

As to indicators of dimensions of human capital, regarding capability, enterprises significantly pay attention to core dispatched workers’ educational level and professional working years. They value non-core dispatched workers’ training hours received. Thus, when high-tech industry selects or evaluates dispatched workers’ abilities, they focus on core employees’ educational level and professional skills and non-core employees’ training hours of practice.

As to affection & motive, responsibility and competence are the most important indicators of core or non-core dispatched workers. Therefore,

regarding different kinds of capacities, enterprises which need dispatched workers are careful about employees’ precision and devotion to work.

As to trait & health, enterprises value core dispatched workers’ morale and activeness and non-core dispatched workers’ physical health and days of presence. The reason can be that high-tech industry has unstable demands. Non-core dispatched workers (such as production workers or salespersons) often have to work overtime to meet the sudden great number of orders of enterprises. Thus, enterprises are carefully about their “physical health” and “days of “presences” to go to work regularly and energetically. Thus, they will not influence the schedule of goods shipping.

As to uniqueness, although enterprises value core and non-core dispatched workers’ “discrimination of technical specialty from other companies”, according to means, core dispatched workers are much higher than non-core dispatched workers. Thus, regarding the indicator, core dispatched workers’ unique specialties and skills are much more effective for enterprises than non-core dispatched workers.

## 5.2 Contributions

Social background of development of labor dispatching refers to knowledge economy and flexible manpower demand. It is new manpower flow in the era of knowledge. With knowledge economy conditions, high-tech industry tends to use dispatched workers. According to empirical results, the results and contributions of this study are shown below.

Academic contribution: the following scholars and research institutions can adopt these dimensions and indicators constructed by this study as the reference to measure and manage dispatched workers’ human capital. Adopting of dispatched manpower helps enterprises avoid labor risk, lower management cost and increase flexibility of employment. However, currently, there are few literatures on dispatched workers’ human capital in high-tech industry and it lacks precise empirical research. Reorganization of this study will supplement the gap of literatures.

Contribution to enterprises which need dispatched workers: indicators and dimensions of dispatched workers’ human capital constructed by this study can serve as reference for high-tech industry to select or evaluate the dispatched workers. With the increase of demand for “labor diversity” and “corporate trimming”, in Taiwan, many enterprises start flexibly increasing competitiveness by labor dispatching. Finding of this study allows high-tech enterprises to measure their dispatched workers’ human capital value or serves as criterion to compare with colleagues. Enterprises can follow and control key indicators

constructed by this study. For instance, capability, affection & motive and uniqueness are important human capital which core dispatched workers should have. For human resource department of enterprises, "it is best to use without cultivating the talents" and they prefer "useful manpower" than "owning manpower". By recognizing human capital at different positions, they can recruit competent and suitable dispatched employees and lower personnel affair cost.

Contribution to dispatched work agencies: the finding serves as reference for dispatched work agencies to consultation related to high-tech industry for dispatched workers. Before cultivating or assigning dispatched workers to high-tech industry, dispatched work agencies can treat the finding of this study as reference to establish related guidance procedure, orientation training or position planning in order to enhance dispatching efficiency and dispatched workers' competence. Human resource management is the most direct factor of human capital. Dispatched work agencies can provide proper education and training according to human capital needed by enterprises which require dispatched workers in order to continuously accumulate dispatched employees' human capital and capability to move among these enterprises for sustainable employment.

Contribution to dispatched workers: dispatched workers' human capital indicators established by this study can serve as reference for dispatched workers to accumulate human capital and increase personal value. For common people, there are two reasons to enter dispatching industry: one is to accumulate personal human capital and the other is to satisfy personal flexible work demand. According to empirical results, enterprises which need dispatched workers value different kinds of human capital of different positions. Besides in-depth analysis of personal traits, dispatched employees should recognize core and non-core dispatched employees' key human capital indicators in order to accumulate proper human capital value by appropriate learning and cultivation to successfully enter workplace and reinforce conditions and capabilities to change jobs in the future.

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