

# The Study of Semiconductor Industry Manager' Management Competence and Training and Development in Taiwan

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**Abstract-** In creating the economic miracle of Taiwan, the business circles have occupied quite important position. There are so many reasons for the business to be successful, besides existing policies and changes in the environment. Most important of all, business just has managerial talent showing great foresight deeply. The high quality human resources management is the way to pursuing high performance and keeping competitive advantage. A competent manager needs long-term train of step in order, to practice and experience. How to prudent and effective select method of training and development (T&D) has been important issue in academy and business.

This study uses relevant documents to discuss, interview, expert opinions and questionnaires, we focus on the discussion of training and development programmed analyze to management competence and T&D demand on industry-academia cooperation process. The main purpose of this study intends to discuss management competence which industries of the semiconductor. And we understand the present situation of the management of the semiconductor in Taiwan and the demand of training and development. Finally, according to the study results, we propose concrete measures supply semiconductor industry T&D, and improve manager' management competence.

**Keyword:** Semiconductor Industry, Management Competence, Training and Development

## INTRODUCTION

IC industry in Taiwan was initiated in 1970's, and it grew up sharply in 2000's, turning Taiwan into Silicon Island, attracting worldwide attention without Hi-Tech foundation within short time. Since 1995, Taiwan has become the fourth IC (Integrated Circuit) producing country in the world. IC industry in Taiwan leads the economies of our country to maturity and strengthens the national competences[ 1].

The semiconductor accounts for 18 manufacturers among them for 100 Taiwanese big Hi-Tech industries in

2004, have already become 25 manufacturers in 2005. Semiconductor has become the leader of the high-tech industry in Taiwan.1000 big manufacturing industry; the number of semiconductor industry will increase from 82 manufacturers to 89 from 2005[2][3]. IC industry in Taiwan leads the economies of our country to maturity and strengthens the national competences.

Recently, high-tech industry substitutes for traditional industry, and has already become exportation of product in Taiwan. High-tech industry is successful in Taiwan, such as good information industry-based, good experience in the Hsin-Chu Science-based Industrial Park, division of labor in China and Southeast Asia, but lack of talent los become a global high-tech industry important issue. The high quality human resources management is the lacy to pursuing high performance and keeping competitive advantage. Reference [4] to utilize AHP analysis semiconductor industry in Taiwan, CEO management competence is the lack becomes a global high-tech industry important issue. The high quality human resources management is the pursuing high performance and keeping competitive advantage.

Reference[5]have suggested In the knowledge economy environment of the change, because science and technology drive global economy and enable receiving employee's engineering, the jobs of human resources expert and management rapidly, besides impelling important information to share, it accords with the challenge of the human resources in the future core competency as the key point. Great manager have management competence in order to change the keen competition with the international market fast in conformity with the environment. It is their key point of the success, what a focal point of operating and setting up the niche efficiently. Only the great manager can deal with various kinds of difficulties and problems make enable enterprise to operate the survival and development in the environment with keen competition effectively.

Their [6] noted that one manager must have plan, long-term train of step and experience not congenital. The high-tech talent that various countries need, invest financial resources of manpower in Human Resource Department in a large amount, in the hope of recruiting to first-class talents and setting up the best staff and training the system, propose

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the training chance that the staff is obtaining the latest knowledge and technology constantly. How select prudent and effective train method is academy, business extremely important subject to go through.

This research expects to set up manager' management competence of the semiconductor industry build constructing amount form to understand which kind of degree management competence should possess, the ones that analyze manager' training need of semiconductor industry training need.

## LITERATURE REVIEW

### *I. Training need and training & development of semiconductor industry*

Semiconductor industry belong to skill-intensive trade, it put into in products and R&D to be huge budge, so on the demands of quality and quantity to personnel very ardent, in the manpower supply and demand structure of the semiconductor industry at present undermanned question, will cause great influence by 2008[7].

In the manpower structure of the semiconductor industry has already supply been fewer demand is not merely Taiwan like this, American university student and high school student do not interest for scientific and technological, the question with undermanned project, will cause great influence by 2008[8].

Environment and different ten years ago that the semiconductor industry of Taiwan. The competition that a lot of enterprises face is global competition is not local. Scientific and technological changes and information collect change of technology, make enterprise is it notice effective strategy action and reaction. The serious shortage of middle-and-high-ranking manpower in Southern Taiwan Science Park at present, More and more manufacturers are garrisoned in the Southern Taiwan Science Park and worsen even more, utilize cooperation between production, learning and research, solve the problem of the talent shortage, especially Master, middle-and-high-ranking working experience talents are scarcer.

To example TSMC in Taiwan need at least 800 people not only the technology; however the talents of management and intelligence proprietary are also very scarce, there are urgent demands from academia resources [7]. Enterprises regard T&D creates value for shareholder; turn the value of T&D into a part in staff's income, in order to attract talents to be stationed.

Such transnational enterprise as IBM, Texas Instrument, Motorola have wages total amount 5-10% in T&D, even if a lot of American big enterprises have already put into staffs training actively, American workers who still have 42%-90% of the different industries need to accept and training could keep up with the speed of development. The optimization in the manpower capital, there must be planning in the capital that enterprises have not stopped, just as ' T&D very expensive, don't T&D more expensive '[7].

### *II. Training and development measures*

Enterprises take different ways to different property and different staffs to select training method. Training divides into the several types in accordance with the nature and purpose and content. There are a lot of training type, divide in accordance with place, targets, and education form. And through by training place to divide into two major types: On the Job, Off the Job [9][10][11][12].

Today, science and technology innovation, information-based and internationalization, only OJT is not enough, must practice Off-JT, in order to develop the technology more professional in more height, in addition the values improve and diversification, promote the laborer's self-development, SD more important that a lot of scholars emphasize[13][14]. Training type to divide into according to scholar's research: OJT, Off-JT, SD [15][16][17].

According to reference [13][14][18][19][20][21]the training method to be summed up and included for the following 25 items: E-Learning, Videotapes/Videodisks, Transactional Analysis, Group Discussion, Lecture, Classroom Programs, Delegation, Job Rotation, Coaching, Peer Training, Vestibule Training, School Education, Devil Training, Business Game, Brain Storming, Multiple Management, Sensitivity Training, Task Force, Under-Study Plan, Case Study, Special Assignment, Study Tour, Experiential Exercises, Role Playing, Study Group.

### *III. Management Competence*

Manage level to include: Top Manager, Middle Manager, and Basic Manager [22][23][24][25][26][27][28].

Manage level to include: Top Manager, Middle Manager, and Basic Manager This research management competence define the management needs competence and the trait Total for, management competence influence organizing performance and create higher additional value, through T&D Change gradually [29][30][31][32].

Management competence could be defined, scholar view statement have difference, can divide four norm measure[33][34][35][36][37][38][39][40][41][42][43][44][45][46][47][48][49][50][51][52].

## METHOD

This research investigation and interview Taiwan' semiconductor industry of 89 large-scale enterprises, take purposive sampling method[3] , in order to visit the five manager of human resources department, and invite 10 experts and scholars to examine the questionnaire, confirm the content of the questionnaire. Post questionnaire 89 position; ask every manufacturer top, middle, basic, and HR manager. Return the 21-semiconductor industry questionnaire. Use Reliability Analysis, Validity Analysis; describing statistics, T-test and One-way ANOVA, Importance-Performance Analysis, such statistical method as IPA, etc. are analyses.

## DISCUSSION AND CONCLUSIONS

I. *Manager of Semiconductor industry should to have following management competence (four factors and 43 items)*

- **Personality factor:** Work Attitude, Responsibility, Resist Compression, Adaptation and Stability, Continue Learning, Attentive and Patience, Person Image, Work Efficiency, Execution, Risky Spirit, Integrity and Trust.
- **Conceptualization factor:** Analyze and Thinking, Confirm and Solving, Management by Objectives, Time Management, Crisis Management, change management, Project Management, Decision making Risk, Strategic Planning, innovate thinking, Global and international, Business Acumen.
- **Interpersonal factor:** Provide Information, Acquire Information, Motivation and Encouragement, Sufficient Authorization, Pressure Management, Conflict Management, Negotiations, Communicate, Team Work, Supervise Control and Feedback.
- **Specialized factor:** Foreign Language, Work Process, Quality management, Safety and Hygiene, Innovation and Development, Computer Software, Computer Systems Analysis, Specialized Terminology, Specialized Knowledge, Market Environment Investigate.

II. *Manager of Semiconductor industry should to have following management competence (Top, Middle, and Basic manager)*

- **Management competence which the Top-manager should possess:** The Human Resources manager thinks, the management competence that the Top-manager should possess is the in order: Conceptualization, Personality, Specialized, and Interpersonal. The Top-manager of self-cognition in order: Personality, Interpersonal, Conceptualization, Specialized
- **Management competence which the Middle-manager should possess:** The Human Resources manager thinks, the management competence that the Middle-manager should possess is the in order: Personality, Interpersonal, Conceptualization, Specialized. The Middle-manager of self-cognition in order: Personality, Conceptualization, Interpersonal, Specialized
- **Management competence which the Basic-manager should possess:** The Human Resources manager thinks the management competence that the Basic-manager should possess is the in order: Personality, Interpersonal, Specialized, and Conceptualization. The Basic-manager of self-cognition in order: Conceptualization, Personality, Specialized, Interpersonal

III. *Importance-Performance Analysis of management competence*

This research adopts [53] Importance-Performance Analysis, IPA, at first between manager' should to have management competence and manager' already to have

management competence of average. Manager' should to have management competence of cross axle (X axle), manager' already to have management competence as axis of ordinates (Y axle). Coordinate axle management could with whom manager should possess and possess already always average, cut axle into one, two, three, four quadrants every average according to 43 items of management competence and draw Importance-Performance Analysis.

### • The Top-manager

The Top-manager that should possess and management average of ability that possesses already, in the coordinate axle, management competence that should possess and already possess is always on average (4.18, 3.71). As Fig. 1 shows:

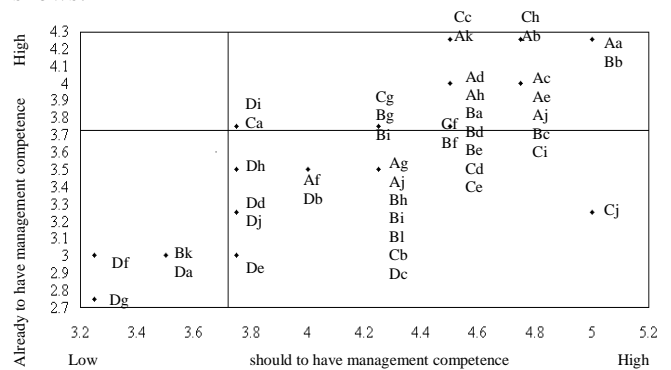


Fig. 1 Importance-Performance Analysis of the Top-manager

No	Management competence	No	Management competence
Aa	Work Attitude	Ba	Analyze and Thinking
Ab	Responsibility	Bb	Confirm and Solving
Ac	Resist Compression	Bc	Management by Objectives
Ad	Adaptation and Stability	Bd	Time Management
Ae	Continue learning	Be	Crisis Management
Af	Attentive and Patience	Bf	Change Management
Ag	Person Image	Bg	Project Management
Ah	Work Efficiency	Bh	Decision Making risk
Ai	Execution	Bi	Strategic Planning
Aj	Risky Spirit	Bj	Innovate Thinking
Ak	Integrity and Trust	Bk	Global and International
		Bl	Business Acumen
No	Management competence	No	Management competence
Ca	Provide Information	Da	Foreign Language
Cb	Acquire Information	Db	Work Process
Cc	Motivation and Encouragement	Dc	Quality management
Cd	Sufficient Authorization	Dd	Safety and Hygiene
Ce	Pressure Management	De	Innovation and Development
Cf	Conflict Management	Df	Computer Software
Cg	Negotiations	Dg	Computer Systems Analysis
Ch	Communicate Management	Dh	Specialized Terminology
Ci	Team Work	Di	Specialized Knowledge
Cj	Supervise Control and Feedback	Dj	Market environment Investigate

The first quadrant represented: Work Attitude, Responsibility. Resist Compression, Adaptation and Stability, Continue learning, Work Efficiency, Execution, integrity and trust, analyze and thinking, Confirm and Solving, Management by Objectives, Time Management, Crisis Management, change management, Project Management, Decision-making risk, Strategic Planning, Provide Information, motivation and encouragement, Pressure management, Conflict management, Negotiations, Communicate, Team Work.

The second quadrant represented : none

The third quadrant represented: Foreign Language, Computer Software, and Computer Systems Analysis.

The four quadrant represented: Attentive and Patience, Person Image, Work Efficiency, Execution, Risky Spirit, Global and International, Business Acumen, Acquire Information, Supervise Control and Feedback, Work Process, Quality Management, Safety and Hygiene, Innovation and Development, Specialized Terminology, Market environment investigate.

• **The-Middle manager**

The Middle-manager that should possess and management average of ability that possesses already, in the coordinate axle, management competence that should possess and already possess is always on average (4.16 , 3.59). As Fig. 2 shows:

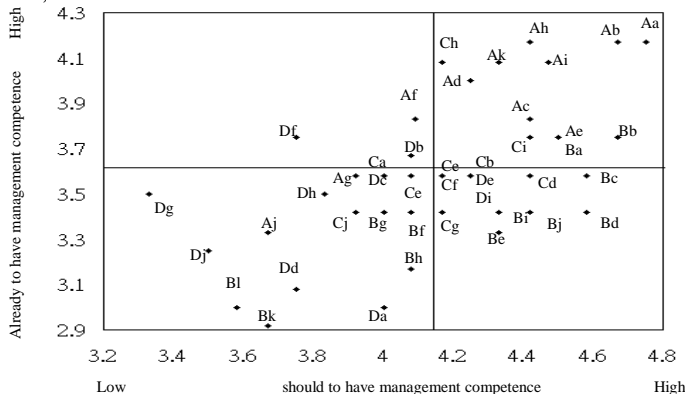


Fig. 2 Importance-Performance Analysis of the Middle-manager

The first quadrant represented: Work Attitude, Responsibility. Resist Compression, Adaptation and Stability, Continue Learning, Work Efficiency, Execution, Risky Spirit, Integrity and Trust, Analyze and Thinking, Confirm and Solving, Communicate, Team Work.

The second quadrant represented: Attentive and Patience, Work Process, Computer Software.

The third quadrant represented: Person Image, Risky Spirit, Change Management, Project Management, Decision Making Risk, Global and International, Business Acumen, Provide Information, Pressure Management, Supervise Control and Feedback, Foreign Language, Quality Management, Safety and hygiene, Specialized Terminology, Market Environment Investigate.

The fourth quadrant represented: Management by Objectives, Time Management, Crisis Management, Strategic Planning, Innovate Thinking, Provide Information, Motivation and Encouragement, Sufficient authorization, Conflict Management, Negotiations, Innovation and Development, Specialized Knowledge.

• **The Basic-manager**

The Middle-manager that should possess and management average of ability that possesses already, in the coordinate axle, management competence that should possess and already possess is always on average (4.53 , 3.67). As Fig. 3 shows:

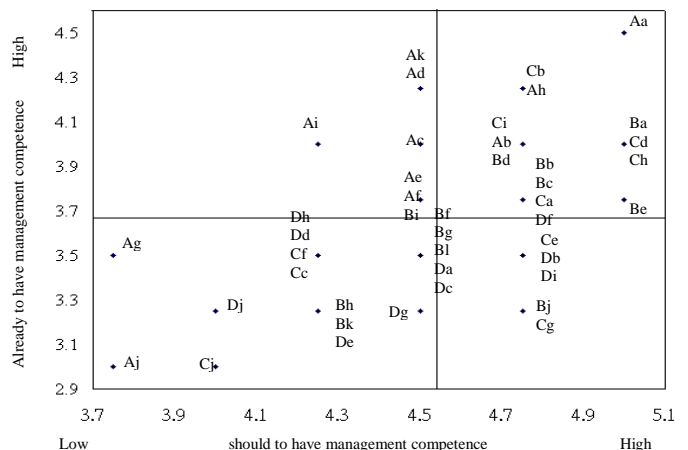


Fig. 3 Importance-Performance Analysis of the Basic-manager

The first quadrant represented: Work Attitude, Responsibility, Work Efficiency, Analyze and Thinking, Confirm and Solving, Management by Objectives, Time Management, Crisis Management, Provide Information, Acquire Information, Sufficient Authorization, Communicate, Team Work, and Computer Software.

The second quadrant represented: Resist Compression, Adaptation and Stability, Continue Learning, Attentive and Patience, Execution, Integrity and Trust, Strategic Planning.

The third quadrant represented: Person Image, Risky Spirit, Change Management, Project Management, Decision Making Risk, Global and International, Business Acumen, Motivation and Encouragement, Conflict management, Supervise Control and Feedback, Foreign Language, Quality Management, Safety and Hygiene, Innovation and Development, Computer Systems Analysis, Specialized Terminology, Market Environment Investigate.

The fourth quadrants represented: Innovate Thinking, Pressure Management, Negotiations, Work Process, and Specialized Knowledge.

IV. Semiconductor Industry has used and manager has accepted training method:

- **The training method that the Top-manager has accept includes:** E-Learning, Videotapes/Videodisks, Transactional Analysis, Group Discussion, Lecture, Classroom Programs, Delegation, Job Rotation, Coaching, Peer Training, School Education, Business Game, Brain Storming, Multiple Management, Sensitivity Training, Task Force, Under-Study Plan, Case Study, Experiential Exercises, Role Playing, Study Group.
- **The training method that the Middle-manager has accepted includes:** E-Learning, Videotapes/Videodisks, Transactional Analysis, Group Discussion, Lecture, Classroom Programs, Delegation, Job Rotation, Coaching, Peer Training, Task Force, Special Assignment, Study Tour, Study Group.
- **The training method that the Basic-manager has accepted includes:** E-Learning, Videotapes/Videodisks,

Group Discussion, Lecture, Classroom Programs, Delegation, Job Rotation, Coaching, Peer Training, Vestibule Training, School Education, Business Game, Brain Storming, Multiple Management, Task Force, Under-Study Plan, Case Study, Special Assignment, Study Tour, Experiential Exercises, Role Playing, Study Group

#### V. Method type that T&D

This research retrieves the questionnaire, the training type to classify the On-the-job training, Off-the-job, Self-Development:

- **On-the-job training (OJT):** E-Learning, Videotapes/Videodisks, Group Discussion, Lecture, Classroom Programs, Delegation, Job Rotation, Coaching, Peer Training, Brain Storming, Multiple Management, Task Force, Under-Study Plan, Special Assignment, Study Tour.
- **Off-the-job training (OFF-JT):** Lecture, Classroom Programs, Vestibule Training, Business Game, Tour, Experiential

But using Self-Development of type is low.

The Personality is the competence that a semiconductor industry should possess, especially under the competition of Hi-Tech industry, outside except Work Attitude, Responsibility, Resist Compression become the indispensable terms factor. So, there are persons will enter the semiconductor industry that should adapt to stabilizing and resisting the pressing the environmental things, do a good job of the personal psychology and adjust shorter environment in the face of the life cycle of Hi-Tech industry.

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