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## **A Study of the Influence of Organizational Knowledge Ability and Knowledge Absorptive Capacity on Organization Performance in Taiwan's Hi-Tech Enterprises**

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**Abstract:** In recent years, business operation tends to be internationalized and the production cost increases day by day, the technology promotion of Taiwan's hi-tech enterprises met its bottleneck; lots of industries have introduced Knowledge Management (KM) and emphasized the knowledge absorptive capacity of the employees to promote the organizational business performance under this competition environment. This research studied the influence of organizational knowledge ability and knowledge absorptive capacity on organization performance in Taiwan's hi-tech enterprises. The research found that: the industry with strong organizational knowledge ability has positive influence on organization performance; the industry with strong organizational knowledge ability has positive influence on knowledge absorptive capacity and the industry with strong knowledge absorptive capacity has positive influence on organization performance. Therefore, the organizational knowledge ability and knowledge absorption capacity of Taiwan's high-tech enterprises have positive influence on the promotion of their organization performance.

**Key words:** Organizational knowledge ability, knowledge absorptive capacity, organization performance

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### **INTRODUCTION**

Since 1990s, organizational knowledge ability has become one of the sources for the enterprise to keep its competitive advantages and the enterprise managed organizational knowledge assets to promote the business performance and to strengthen the enterprise's competitive power. With the technological improvement, Taiwan's Hi-tech enterprises have become one of the bases for global manufacturing development, therefore how to speedily introduce new products to the market, how to use Knowledge Management (KM) mechanism and how to promote the organization performance have become the management emphasis. Therefore, this research studied the relations of organizational knowledge ability, knowledge absorptive capacity and organization performance. The main purposes of this study are as follows: Study the influence of organizational knowledge ability on knowledge absorptive capacity; discuss the influence of organizational knowledge ability on organization performance and discuss the influence of knowledge absorptive capacity on organization performance. The followings are mainly to explore

domestic and foreign scholars' review of related literatures of this research and briefly reorganize the data as the theoretical base when this research observes Taiwan's high-tech industry.

### **THEORETICAL BASE REVIEW**

O'Dell and Grayson (1998) pointed out that knowledge management referred to the organization managed knowledge by sustainability analysis and cooperation and it would transfer the knowledge to the employee which need to improve their technique at proper time so that the employee could reach the organizational objective at maximum efficiency, organization performance could also be improved. Ruggles (1998) indicated that knowledge management emphasized using the learnt knowledge effectively and creating new knowledge by knowledge innovation; the sustainable knowledge innovation was the source to keep the sustainable competitive advantage of the enterprise. Nonaka (1994) suggested that knowledge could be converted by programming power of internalization, externalization, consolidation and socialization bases on its implicit and

explicit character. Therefore, organizational knowledge ability included the fundamental ability (structure, culture and technology) as well as the programming power (internalization, externalization, consolidation and socialization) of knowledge; the organizational knowledge ability would be stated below:

- **Culture ability:** Davenport and Prusak (1998), Davenport and Klahr (1998) and Davenport *et al.* (1998) pointed out that the hardest part for the enterprise to conduct effective knowledge management was the organizational culture; once the organizational culture was formed, the enterprise could manage the knowledge effectively. Leonard (1995) pointed out that the most important factor of corporate culture is the corporation prospects, it could help the organization member set clearer organization object and the employee could generate the sense of participation and then would contribute to the company prospects. Enterprise value decided the necessary knowledge form and type.
- **Structure ability:** organization structure would contribute to the sustainable share of knowledge for next department when different departments shared their knowledge, therefore the design of organization structure should be elastic, which could promote the share of knowledge. Sanchez and Mahoney (1996) suggested that the systematic organization design could help reduce the coordination cost and adaptation cost.
- **Technology ability:** Teece (1998) pointed out that technology ability was a significant factor for the organization to conduct knowledge management, it could move the social capital and integrate the scattered knowledge by the combination of information and by the communication system.
- **Internalization ability:** Nonaka and Takeuchi (1995) pointed out that knowledge could be created by the interaction of the implicit and explicit knowledge; this procedure was one spiral course, therefore it was called Knowledge Spiral. Internalization was to translate the explicit knowledge into implicit knowledge, during this procedure, the explicit knowledge could be attached to the movement and actual practices so that the knowledge required by the organization member could be the repetitive experience of the other members.

- **Externalization ability:** Nonaka and Konno (1998) pointed out externalization was to express the implicit knowledge so that this knowledge could be understood by the other; externalization included culture, concept and some other notions to express implicit knowledge.
- **Consolidation ability:** Nonaka (1994) pointed out that consolidation was to merge several explicit knowledge and convert them to more complex explicit knowledge. The procedure of consolidation knowledge belonged to colony level, it would use the totaling technology of knowledge to actualize the merge. Therefore, this research suggested that the consolidation ability of the organization has obvious influence on organization performance.
- **Socialization ability:** Nonaka (1994) indicated that socialization was the process that the organization members shared the implicit knowledge, which was actualized by holding some activities rather than word. Hedlund (1994) indicated that socialization process played an important role in the knowledge conversion among different individuals and groups.

Knowledge management was a group of clearly defined procedures or methods, it was used to dig out and manage the kernel knowledge of different tasks, it could be used to confirm the new product or strategy and to strengthen human resource management and to reach the enterprise's target. Nonaka and Takeuchi (1995) put forward that knowledge was created by the interactions between the implicit and explicit knowledge, it could be learnt from the knowledge conversion pattern that the creation of organizational knowledge was created by the sustainable interactions between the implicit and explicit knowledge. Holtshouse (1998) suggested that knowledge was a kind of flow concept, that is to say, the knowledge supplier and demander could use knowledge to communicate. Nonaka *et al.* (2000) suggested that the interpersonal sharing or that between different groups was the start for next knowledge spiral for either the knowledge creation or innovation. Hendriks (1999) suggested that knowledge sharing would be formed by the knowledge transfer between knowledge owner and demander, any individual could have dual identifications, he could be both the knowledge owner and demander, but the knowledge owner and demander would have different motivations during knowledge sharing. Davenport *et al.* (1996) found out from the successful cases of knowledge management that the KMS constructed by the enterprise should include: knowledge base about talent skill, on-line

assist inquiring system; and the successful knowledge management must be actualized by the interaction of man and technology. Davenport *et al.* (1996) indicated that knowledge management was to gather information and transfer the information to any demander. All the activities that would effectively promote the knowledge asset value of the organization, such as the acquisition, creation, storage and sharing of knowledge were called knowledge management. Clark and Fujimoto (1991) suggested that the integration of knowledge management needed comprehensive Cross-Function integration ability, while the new product development strategy also needed comprehensive knowledge integration to be actualized. Teece *et al.* (1997) emphasized the significance of knowledge integration in knowledge management domain. Harrison and Samaon (2002) suggested that many companies began to treat innovation as the key factor to form competitive advantage; knowledge would be a key factor for sustainable innovation. In the past 10 years, innovation became an important topic (Liao, 2003; Liao *et al.*, 2004).

Lots of documentation on innovation had pointed out the prominent influence of absorption power on innovation (Cohen and Levinthal, 1990; Knudsen and Roman, 2004). Van den Hooff and de Van Weenen (2004) suggested that knowledge sharing could be divided into knowledge giving and knowledge gathering: Lee (2001) suggested knowledge sharing was the activity that any individual, community or organization transfer or disperse knowledge to others; Ryu *et al.* (2003) suggested knowledge sharing was the transfer conducts that the people in the organization gained knowledge from the others. Lee (2001) discovered from an empirical research on knowledge sharing conducts and outsourcing of organization information system that knowledge management was the main factor to forecast whether the enterprise outsourcing activity would succeed. Hong *et al.* (2004) proved that there was a notable positive relation between knowledge management and R and D of new product innovation. Van den Hooff and de Van Weenen (2004) indicated that the knowledge sharing of the organization could be classified into knowledge giving and knowledge gathering, two forms. After analyzing the above documentations, this research treated the structure ability, culture ability, technology ability, internalization ability, externalization ability, consolidation ability and socialization ability, these 7 functions as the main aspects of organizational knowledge ability.

Cohen and Levinthal (1990) first put forward the absorption concept and defined it as: absorption power was an evaluation, assimilation and the usage of the

external new information to form commercialization ability. This concept was cherished by the scholars of high-tech management, international commerce and strategy management (George *et al.*, 2001; Minbaeva *et al.*, 2003; Lenox and King, 2004). Zahra and George (2002) put forward that absorption power was formed by the potential ability and realization ability. Minbaeva *et al.* (2003) suggested that the learning ability and motivation of the employee would be essential for their absorption power. The experiments of Minbaeva *et al.* (2003) showed that the specified human resource management activity had positive influence on the development of absorption power. Lenox and King (2004) promoted that the supervisor should directly provide information to the deputy of the organization on the study of absorption power development, which might promote the enterprise absorption power. Zahra and George (2002) indicated that most former verification researches on absorption power and innovation showed these two factors had positive relations; these two could cooperate with each other to generate competitive advantage. The research of Knudsen and Roman (2004) showed that absorption power was an important factor to predict organization innovation ability. Minbaeva *et al.* (2003) proposed the absorption power concept and they have proved the notable positive relation between absorption power and innovation ability, Knudsen and Roman (2004) discussed the influence of absorption power on predicting the innovation ability of the organization in their empirical research on the role of absorption power. Nieto and Quevedo (2005) pointed out that knowledge absorptive capacity could determine the innovation ability and performance of the enterprise. After analyzing the above documentations, this research treated the learning ability and motivation of the employee as the main aspects for knowledge absorptive capacity.

Gold *et al.* (2001) indicated that the target for the enterprise to implement knowledge management was to promote organization performance, to strengthen enterprise competitive power so that the enterprise could survive in the changing environment. Therefore if the knowledge management ability of the enterprise was better, then its organizational efficiency would also be better, the research on organization performance could be analyzed by the knowledge satisfaction degree of the employee. The knowledge satisfaction degree included: the satisfaction degree of the employee when they improved their work by their knowledge, the satisfaction degree of the employee for the effective usage of the knowledge in their department, the satisfaction degree of the employee on the required management knowledge, the satisfaction degree of the employee on the knowledge

used in the task, the satisfaction degree of the employee on the knowledge management of their department, the satisfaction degree of the employee on the knowledge sharing in the department, the satisfaction degree of the employee on using their knowledge to improve department efficiency, the satisfaction degree of the employee on the whole organization performance, the satisfaction degree of the employee on various tasks of the organization, the satisfaction degree of the employee on the cross-department knowledge sharing, the satisfaction degree of the employee on the performance of the organizational object to make quick response to market changes, the satisfaction degree of the employee on the departmental coordination ability, the satisfaction degree of the employee on the whole organizational knowledge management. Van De Ven and Ferry (1980) indicated that the traditional finance performance was the most commonly used organization performance index for the researchers. Keegan *et al.* (1989) pointed out that most traditional performance evaluating system depended on the financial information, as financial reporting, to evaluate the performances of relevant departments. This research treated the knowledge satisfaction degree of the employee and finance performance as the evaluating factors for organization performance.

Bleicher and Paul (1983) indicated that hi-tech enterprises were the capital and technology intensive industry, which emphasized the specialized knowledge and the cultivation of research development and science and technology talents. Gould and Keeble (1984) suggested that the proportion of the research and development expenses, the technology innovation speed and the proportion of research development staff should worked as the indexes to judge hi-tech enterprises. Shanklin and Ryans (1984) suggested that the enterprise must have powerful science and technology basis, the new technology could weed out the present technology speedily and the application of new technique could construct and change the market demand, this could be called high-tech. Chiu (2002) and Liu and Tsai (2007) pointed out that the characters of hi-tech enterprises should include: resource intensive, high technology level and short product life cycle. After analyzing the above documentations, this research divided Taiwan's hi-tech enterprises into: (1) integrated circuit industry; (2) computer and supporting industry; (3) communication industry; (4) optoelectronics industry; (5) precision machinery industry and (6) bio-technology.

## RESEARCH TECHNIQUE

**Research structure:** This research discussed the relevance of the organizational knowledge ability, knowledge absorptive capacity and organization performance. The research structure was shown in Fig. 1.

**Research hypotheses:** This research has made the following hypotheses based on the above research:

**Hypotheses H<sub>1</sub>:** The stronger enterprise organizational knowledge ability would have stronger influence on organization performance.

H<sub>1,1</sub> : The stronger enterprise culture ability would form a stronger positive correlation with the organization performance.

H<sub>1,2</sub> : The stronger structure ability would form a notable positive correlation with the organization performance.

H<sub>1,3</sub> : The stronger enterprise technology ability would form a notable positive correlation with the organization performance.

H<sub>1,4</sub> : The stronger enterprise internalization ability would form a notable positive correlation with the organization performance.

H<sub>1,5</sub> : The stronger enterprise externalization ability would form a notable positive correlation with the organization performance.

H<sub>1,6</sub> : The stronger enterprise consolidation ability would form a notable positive correlation with the organization performance.

H<sub>1,7</sub> : The stronger enterprise socialization ability would form a notable positive correlation with the organization performance.

**Hypotheses H<sub>2</sub>:** The stronger enterprise organizational knowledge ability would form a notable positive correlation with the knowledge absorptive capacity of the enterprise.

H<sub>2,1</sub> : The stronger enterprise culture ability would form a notable positive correlation with the knowledge absorptive capacity.

H<sub>2,2</sub> : The stronger enterprise structure ability would form a notable positive correlation with its knowledge absorptive capacity.

H<sub>2,3</sub> : The stronger enterprise technology ability would form a notable positive correlation with its knowledge absorptive capacity.

H<sub>2,4</sub> : The stronger enterprise internalization ability would form a notable positive correlation with its knowledge absorptive capacity.

H<sub>2,5</sub> : The stronger enterprise externalization ability would form a notable positive correlation with its knowledge absorptive capacity.

H<sub>2,6</sub> : The stronger enterprise consolidation ability would form a notable positive correlation with its knowledge absorptive capacity.

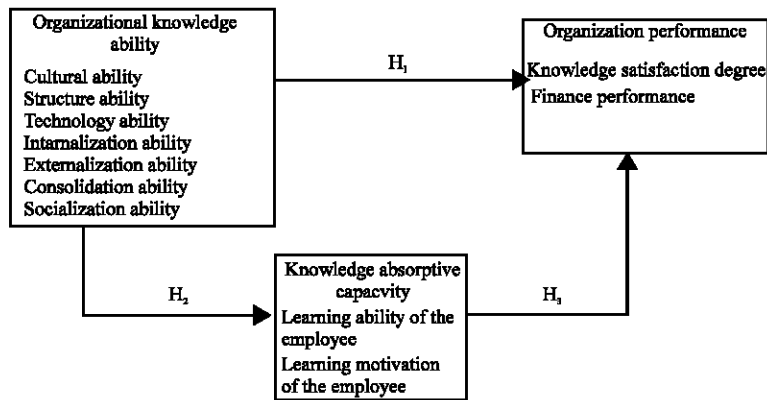


Fig. 1: Research framework

$H_{2.7}$  : The stronger enterprise socialization ability would form a notable positive correlation with its knowledge absorptive capacity.

**Hypotheses  $H_3$ :** The stronger enterprise organizational knowledge ability would form a notable positive correlation with its organization performance.

$H_{3.1}$  : The stronger learning ability of the enterprise employee would form a notable positive correlation with the enterprise's organization performance.

$H_{3.2}$  : The stronger learning motivation of the enterprise employee would form a notable positive correlation with the enterprise's organization performance.

**Research objects:** This research treated the high-tech manufacturers of Taiwan as the study object and it took the integrated circuit industry, information software industry, computer and its supporting industry, communication industry, optoelectronics industry and gathered the relevant data in questionnaire method. The filler of the questionnaire should have a comprehensive knowledge on the knowledge management, business operation and organization performance, company manager, senior product design staff and senior knowledge management director were the main subject investigated to improve the validity of the questionnaire. This research sent out 800 pieces of questionnaire in July 2007 and it has received 175 pieces and 150 of them were effective, the effective recovery rate was 18.75%.

**Questionnaire design and evaluation:** The questionnaire of this research was divided into four parts; the first three parts were evaluated by Likert-Scale. The first part: organizational knowledge ability, it mainly contained the following seven evaluating items designed for this questionnaire: (1) culture ability, (2) structure ability, (3) technology ability (4) internalization ability, (5) externalization ability, (6) consolidation ability and (7) socialization ability. The second part: knowledge

absorptive capacity, which mainly included: (1) the learning ability of the employee and (2) the learning motivation of the employee. The third part: organization performance mainly included the evaluating projects of knowledge satisfaction degree designed for the questionnaire. The fourth part: gathering the basic data relevant to the industry character, the corporate capital, volume of business and number of employee.

**Data analysis method:** This research used close type questionnaire structure, it designed the questionnaire after gathering and analyzing the documents and it also used SPSS 12.0 for Windows, the statistical software to analyze the data. Then it used the following statistical methods to analyze the research, the Cronbach's  $\alpha$  reliability analysis, t-test, multiple-regression-analysis, etc. The questionnaire objects of this questionnaire are the experts of Taiwan's hi-tech enterprises and this questionnaire was designed after collecting and analyzing the documentations and its content and wording were modified after the preliminary examination, therefore the result of this questionnaire was trustworthy. For the scores filled in the blanks, this research has calculated the Cronbach's  $\alpha$  coefficient of each item within each aspect and it also verified the reliability of each item. The larger Cronbach's  $\alpha$  value showed that this factor has a larger correlation with the other items and it has higher internal consistency. Scholar Nunnally (1978) suggested that in the basic researches if the reliability reached 0.7, then it was acceptable. The reliabilities of this research were all above 0.7, therefore it was trustworthy in the reliability aspect, the internal consistency of the items within this research was good.

## RESEARCH RESULT ANALYSIS

**The reliability, validity and verification analysis of all the aspects:** This research has analyzed the t-test, reliability, validity and verification of the organizational knowledge

**Table 1: The reliability, validity and verification analysis of all the aspects**

Items	Aspects	Cronbach's $\alpha$	GFI	AGFI	RMR	CR	t-value
Organizational knowledge ability	Culture ability	0.89				0.66	13.83~18.89
	Structure ability	0.87				0.65	13.11~18.14
	Technology ability	0.86				0.69	15.12~18.43
	Internalization ability	0.91	0.96	0.85	0.03	0.60	13.22~19.05
	Externalization ability	0.84				0.65	13.83~18.90
	Consolidation ability	0.85				0.66	13.14~18.24
	Socialization ability	0.88				0.67	13.29~19.10
Knowledge absorptive capacity	Learning ability	0.88	0.95	0.93	0.04	0.76	15.18~18.56
	Learning motivation	0.87				0.89	12.36~18.88
Organization performance	Knowledge satisfaction degree	0.86	0.96	0.87	0.03	0.84	16.99~19.88
	Finance performance	0.89					

ability, knowledge absorptive capacity and organization performance to understand the fitness of the scale under measurement pattern, the result was shown in Table 1. For the reliability, the Cronbach's  $\alpha$  values of all the aspects were higher than 0.7, the Composite Reliability (CR) were all higher than 0.6, which met scholar requirement of Bagozzi and Yi (1988), the CR value should be larger than 0.6; for the fitness index, GFI and AGFI were between 0.95~0.96 and 0.85~0.93, respectively, while RMR were all lower than 0.05, this showed that the questionnaire scale had fine consistency. For the validity, the t-values of all the items of different aspects were all above 2, this showed that it had fine convergence validity.

**Relationship between organizational knowledge ability and organization performance:** The general mean value and the t-test of organization performance showed that the different aspects of the organizational knowledge ability had notable influence on the organization performance as shown in Table 2, among which, culture ability ( $p = 0.006$ ), structure ability ( $p = 0.007$ ), technology ability ( $p = 0.004$ ), internalization ability ( $p = 0.002$ ), externalization ability ( $p = 0.001$ ), consolidation ability ( $p = 0.002$ ), socialization ability ( $p = 0.001$ ) were all significant, hypotheses  $H_{1,1}$ ,  $H_{1,1-1}$ ,  $H_{1,1-2}$ ,  $H_{1,1-3}$ ,  $H_{1,1-4}$ ,  $H_{1,1-5}$ ,  $H_{1,1-6}$  and  $H_{1,1-7}$  were proved.

**Relationship between organizational knowledge ability and knowledge absorptive capacity:** The different aspects of organizational knowledge ability all showed significant influence on the culture ability ( $p = 0.001$ ), structure ability ( $p = 0.002$ ), technology ability ( $p = 0.000$ ), internalization ability ( $p = 0.003$ ), externalization ability ( $p = 0.004$ ), consolidation ability ( $p = 0.002$ ), socialization ability ( $p = 0.003$ ) of knowledge absorptive capacity, as shown in Table 3. Hypotheses  $H_{2,1}$ ,  $H_{2,1-1}$ ,  $H_{2,2-2}$ ,  $H_{2,2-3}$ ,  $H_{2,2-4}$ ,  $H_{2,2-5}$ ,  $H_{2,2-6}$ ,  $H_{2,2-7}$  were proved.

**Relationship between knowledge absorptive capacity and organization performance:** All the aspects of knowledge absorptive capacity all shown significant influence on the

**Table 2: T-test of organization performance made by organizational knowledge ability**

Organizational knowledge ability	Organization performance	
	t-value	p-value
Culture ability	1.568	0.006***
Structure ability	0.397	0.007***
Technology ability	1.738	0.004***
Internalization ability	1.313	0.002***
Externalization ability	1.325	0.001***
Consolidation ability	1.415	0.002***
Socialization ability	1.566	0.001***

\*\*\*Represented  $p < 0.01$

**Table 3: T-test on the organizational knowledge ability and knowledge absorptive capacity**

Organizational knowledge ability	Knowledge absorptive capacity	
	t-value	p-value
Culture ability	2.149	0.001***
Structure ability	1.824	0.002***
Technology ability	2.470	0.000***
Internalization ability	2.863	0.003***
Externalization ability	2.481	0.004***
Consolidation ability	2.762	0.002***
Socialization ability	2.145	0.003***

\*\*\*Represented  $p < 0.01$

**Table 4: T-test on knowledge absorptive capacity and organization performance**

Knowledge absorptive capacity	Organization performance	
	t-value	p-value
Learning ability of the employee	-3.322	0.001***
Learning motivation of the employee	0.000	0.003***

\*\*\*Represented  $p < 0.01$

employee learning ability ( $p = 0.001$ ) and their learning motivation ( $p = 0.003$ ) of organization performance, as shown in Table 4. Hypotheses  $H_{3,1}$ ,  $H_{3,1-1}$ ,  $H_{3,2}$  were proved.

**Relevance analysis:** The result of Table 5 showed that part of the mean values of organizational knowledge ability were between 3.87~3.97; that of absorption power were between 3.87~3.89 and that of organization performance were 3.87. Generally speaking, when the average score of organizational knowledge ability was higher, then the knowledge management ability of the subject investigated would have better performance. Then for the analysis relevant to different phases: first, Table 5

Table 5: Matrix to study of the correlation coefficient of variables

Aspect	Average value	Standard deviation	1	2	3	4	5	6	7	8	9	10	11
Culture ability	3.96	0.56	(0.89)										
Structure ability	3.95	0.52	0.73	(0.87)									
Technology ability	3.93	0.63	0.38	0.33	(0.86)								
Internalization ability	3.97	0.62	0.36	0.35	0.61	(0.91)							
Externalization ability	3.89	0.73	0.37	0.36	0.62	0.51	(0.84)						
Consolidation ability	3.87	0.74	0.35	0.33	0.66	0.50	0.51	(0.85)					
Socialization ability	3.97	0.69	0.34	0.35	0.68	0.51	0.62	0.66	(0.88)				
Learning ability (employee)	3.89	0.67	0.35	0.36	0.61	0.55	0.63	0.63	0.66	(0.88)			
Learning motivation (employee)	3.87	0.64	0.38	0.38	0.60	0.53	0.65	0.65	0.63	0.61	(0.87)		
Knowledge satisfactory degree	3.87	0.62	0.39	0.33	0.63	0.54	0.63	0.63	0.67	0.62	0.91	(0.86)	
Finance performance	3.87	0.61	0.39	0.34	0.64	0.55	0.64	0.63	0.66	0.61	0.91	0.90	(0.89)

p<0.05, ( ) part were the Cronbach's  $\alpha$  coefficients of different aspects

showed that the organizational knowledge ability aspect formed positive relevance relations with all the aspects of organization performance, this meant that the when the employee performed the knowledge management conducts more frequently, then they would generate larger influence on the organization performance. Secondly, the two aspects of knowledge absorptive capacity all formed notable positive correlation relation with the organization performance aspect, which represented that the higher knowledge absorptive capacity of the employee would be more likely to influence organization performance. Although the relevance analysis method could be used to make a generalized judgment, this research also used linear structuring equation to study the research structure in order to understand the relation among the phases.

**Multiple-regression-analysis on organizational knowledge ability, knowledge absorptive capacity and organization performance:** Multiple-regression-analysis was the application of simple correlation, which was mainly used to understand the linear relation between one group of predication phases and one criterion variable, the multiple-regression-analysis of this research was shown in Table 6 and 7. The data of Table 6 and 7 showed that the B-value,  $\beta$ -value and t-value of all the hypotheses all reached the positive significance level. The  $\beta$ -value in pattern one (Table 6) were 0.182, 0.239, 0.146, 0.328, 0.323, 0.312 and 0.325, its pattern was  $y_1 = 0.328x_1 + 0.236x_2 + 0.158x_3 + 0.288x_4 + 0.276x_5 + 0.289x_6 + 0.278x_7 + e_1$ , this all showed positive prominent relation, the Adjusted R was 0.798, the interpretation ability of all the variables were very high. The  $\beta$ -value of pattern two (Table 7) were 0.186, 0.628, respectively, its pattern was  $y_2 = 0.127x_8 + 0.606x_9 + e_2$ , (among which, the learning ability of the employee was  $x_8$  and the learning motivation of them was  $x_9$ ), they all showed positive prominent relation, Adjusted R was 0.788, this meant that the interpretation

Table 6: Multiple-regression-analysis on organizational knowledge ability and organization performance

Variables	Pattern one			
	B	Std. E	$\beta$	t-value
Culture ability ( $x_1$ )	0.328	0.109	0.182	1.307
Structure ability ( $x_2$ )	0.236	0.126	0.239	1.932
Technology ability ( $x_3$ )	0.158	0.108	0.146	1.032
Internalization ability ( $x_4$ )	0.288	0.102	0.328	2.835
Externalization ability ( $x_5$ )	0.276	0.101	0.323	2.735
Consolidation ability ( $x_6$ )	0.289	0.103	0.312	2.833
Socialization ability ( $x_7$ )	0.278	0.105	0.325	2.935
Adjusted R	0.798			

Table 7: Multiple-regression-analysis on knowledge absorptive capacity and organization performance

Variables	Pattern two			
	B	Std. E	$\beta$	t-value
Learning ability of the employee ( $x_8$ )	0.127	0.079	0.186	1.581
Learning motivation of the employee ( $x_9$ )	0.606	0.082	0.628	7.382
Adjusted R	0.788			

Table 8: Fitness Index of the hypotheses model and competitive model

Model	GFI	NFI	CFI	RMR	RMSEA
Partial medium pattern	0.92	0.91	0.93	0.05	0.03
Complete medium pattern	0.99	0.98	0.94	0.06	0.01

ability of all the variables was very high. Therefore the relevance of organizational knowledge ability, knowledge absorptive capacity and organization performance were all verified.

**LISREL pattern analysis:** The scholars have mentioned many indexes and evaluation standards to judge whether the whole model was suitable, Bagozzi and Yi (1988) pointed out that:  $GFI > 0.9$ ,  $NFI > 0.9$ ,  $CFI > 0.9$ ,  $RMR > 0.05$ ,  $RMSEA < 0.05$  could work as the reference index for the fitness value of the model. This research wanted to discuss the relations of different aspects and the research structure was constructed by first-order pattern, as shown in Table 8 (partial medium pattern). The fitness degree of the indexes have all reached the norms proclaimed by the above scholars, while as a matter of fact, one group of



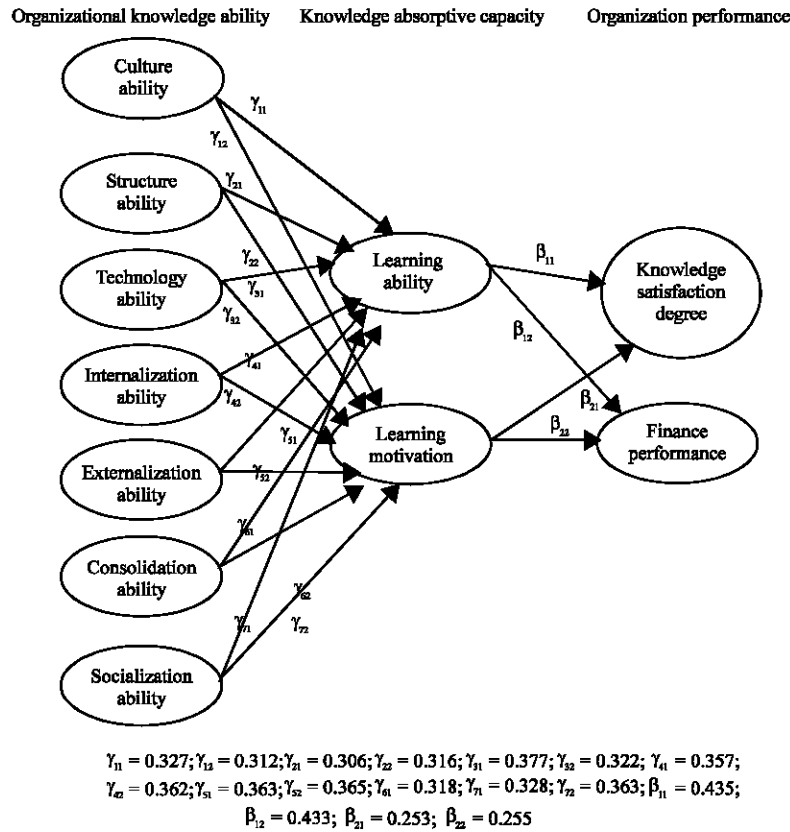


Fig. 2: Path of optimal pattern (complete medium pattern)

research data could have many fitness patterns, one fitness could not guarantee that it was the optimal one. This research used the competitive mode and compared the hypotheses pattern with two competitive patterns, the complete medium and direct effect, the result showed that complete medium pattern was the optimal path and the optimal path relation of the aspects was shown in Fig. 2.

**RESULT VERIFICATION**

**Influence of organizational knowledge ability and knowledge absorptive capacity:** The organizational knowledge ability had significant influence on the learning ability and motivation of the employee, as shown in Fig. 2. This meant that the frequency knowledge communications among the employee and their colleagues would help to elevate their learning ability and motivation. This research suggested that if the employee shared their knowledge with their colleagues with that demand actively, the correlation technique or work ability of the recipient could be improved since the employee are willingly to give their knowledge to the ones that need

this information most. In addition, if the organization could form the culture or fashion of knowledge donation among the colleagues, then employee might also be influenced by this climate for learning, then the learning motivation was promoted. Therefore hypotheses H<sub>2</sub> was supported.

**Influence of knowledge absorptive capacity and organization performance:** The learning ability of the employee had significant influence on the knowledge satisfaction degree of the organization performance, as shown in Fig. 2; ( $\beta_{11} = 0.435, \beta_{12} = 0.433$ ), that is to say, if the enterprise employee could have higher learning ability, then the enterprise would better knowledge satisfaction degree and finance performance. Secondly, the learning motivation of the employee would also had significant influence on the knowledge satisfaction degree and finance performance of the organization performance ( $\beta_{21} = 0.253, \beta_{22} = 0.255$ ), that is, if the employee of the enterprise could have higher learning motivation, then the enterprise would better performance in the knowledge satisfaction degree and culture innovation, therefore hypotheses H<sub>3</sub> was proved.

## CONCLUSIONS AND MANAGEMENT IMPLICATIONS

**Conclusions:** This research took organizational knowledge ability, knowledge absorptive capacity and organization performance as its three aspects and it conducted the empirical research on the relevance of the organizational knowledge ability, knowledge absorptive capacity and organization performance of Taiwan's hi-tech enterprises by statistical analysis, it developed the theory pattern of the relation by studying the theories and literatures and used the questionnaire to study the hi-tech enterprises of Taiwan. The research result showed that there were positive substantive influence among organizational knowledge ability, knowledge absorptive capacity and organization performance, that is, the research hypotheses of the higher knowledge management ability, the better knowledge absorptive capacity, then the better organization performance was proved by the statistic method. Therefore the enterprise should pay more attention to the internal knowledge management ability and knowledge absorptive capacity to promote its organization performance for survival and the sustainable development.

- **Organizational knowledge ability and organization performance:** The research result showed that if the employee were willing to share their skill and knowledge with the employee with that demand effectively, then the enterprise innovation ability could be elevated, therefore, the employee should work on the sharing of knowledge management; the organization performance had direct influence on the enterprise operating management.
- **Knowledge absorptive capacity and organization performance:** The research result showed that the knowledge absorptive capacity of the employee had significant influence on the organization performance in the developing process of the enterprise and it had notable positive influence on predicting organization performance.
- **Organizational knowledge ability and organization performance:** The research result showed that the knowledge management ability of the enterprise would contribute to the development of its knowledge absorptive capacity and would help the organization to absorb the external knowledge and use it to help its own development and to create the foundation for the sustainable competitive advantage of the enterprise.

- The organization performance of Taiwan's hi-tech enterprises was influenced by the structure ability, culture ability, technology ability, internalization ability, externalization ability, consolidation ability and socialization ability of the organizational knowledge and the organization performance referred to the systems, organization specification, company policy and administration flow, it would further influence the knowledge satisfaction degree of the employee and the increase of the finance performance and organization performance.

**Management implications:** The research result proved the causal relation between the introducing of knowledge management into Taiwan's hi-tech enterprises and the promotion of organization performance. According to the research data, this research has sorted out the meaning of management, which was:

- **On the organizational knowledge ability:** The research result showed that the organizational knowledge ability of the enterprise could contribute to the promotion of its knowledge absorptive capacity, therefore, the enterprise should encourage the employee to work on the knowledge management and knowledge sharing mechanism to promote its competitive power.
- **On the knowledge absorptive capacity:** The research result showed that the knowledge absorptive capacity could influence the organization performance; the enterprise should encourage its employee to contribute his technology and knowledge to the organization and to create higher enterprise value.
- **On the relation of organizational knowledge ability, knowledge absorptive capacity and organization performance:** The knowledge donation and the knowledge management ability and knowledge absorptive capacity of the enterprise could stimulate the enterprise employee to work harder by the initiative knowledge and technology sharing among the employees, this could improve the sustainable innovation of the enterprise and promote the business performance of the organization. The knowledge donation and knowledge management among the employee of Taiwan's hi-tech enterprises could contribute to the prosperous development of Taiwan's hi-tech enterprises, the manager of Taiwan's hi-tech enterprises should encourage its employee to share their knowledge actively by

guidance or reward system to promote the knowledge absorptive capacity of the employee, then this could promote the organization performance of Taiwan's hi-tech enterprises effectively.

## REFERENCES

- Bagozzi, R.P. and Y. Yi, 1998. On the evaluation of structure equation models. *Acad. Mar. Sci.*, 16 (1): 76-94.
- Bleicher, F. and H. Paul, 1983. Managerial Framework for Innovation Responses in High-Tech Organization. *Bus. Horizons*, pp: 69-78.
- Chiu, C.B., 2002. The Management of Fabrication Plant Building up for TFT-LCD and IC Industry, Taiwan.
- Clark, K.B. and T. Fujimoto, 1991. Product Development Performance: Strategy, Organization and Management in the World Auto Industry. Harvard Bus. School Press, Boston, Mass.
- Cohen, W.M. and D.A. Levinthal, 1990. Absorptive capacity: A new perspective on learning and innovation. *Admin. Sci. Q.*, 35: 1128-1152.
- Davenport, T.H., S.L. Jarvenpaa and M.C. Beers, 1996. Improving knowledge work process. *Sloan Manage. Rev.*, 37: 53-65.
- Davenport, T.H., D. De Long and M.C. Beers, 1998. Successful knowledge management projects. *Sloan Manage. Rev.*, 39 (2): 43-57.
- Davenport, T.H. and L. Prusak, 1998. Knowledge Codification and Coordination in Working Knowledge: How Organization Manages What They Know? Boston, Mass: Harvard Bus. School Press, pp: 68-87.
- Davenport, T.H. and P. Klahr, 1998. Managing customer support knowledge. *California Manage. Rev.*, 40 (3): 195-208.
- George, G., A.S. Zahra, K.K. Wheatley and R. Khan, 2001. The effects of portfolio characteristics and absorptive capacity on performance a study of biotechnology firms. *J. High Technol. Manage. Res.*, 12: 205-226.
- Gold, A.H., A. Malhotra and A.H. Segars, 2001. Knowledge management: An organizational capabilities perspective. *J. Manage. Inform. Syst.*, 18 (1): 185-214.
- Gould, A. and D. Keeble, 1984. New firms and rural industrialization in East Anglia. *Regional Stud.*, 18 (3): 189-201.
- Harrison, N. and D. Samaon, 2002. Technology Management: Text and International Cases. McGraw-Hill, New York.
- Hedlund, G., 1994. A Model of knowledge management and the N-Form corporation. *Strategic Manage. J.*, 15: 73-90.
- Hendriks, P., 1999. Why share Knowledge? The influence of ICT on motivation for knowledge sharing. *Knowledge Process Manage.*, 6 (2): 91-100.
- Holtshouse, D., 1998. Knowledge research issues. *California Manage. Rev.*, 43 (3): 277-280.
- Hong, P., W.J. Doll, A.Y. Nahm and X. Li, 2004. Knowledge sharing in integrated product development. *Eur. J. Innov. Manage.*, 7 (2): 102-112.
- Keegan, D.P., R.G. Eiler and C.R. Jones, 1989. Are your performance measures obsolete? *Manage. Account.*, pp: 45-50.
- Knudsen, H.K. and P.M. Roman, 2004. Modeling the use of innovations in private treatment organizations: The role of absorptive capacity. *J. Substance Abuse Treatment*, 26: 353-361.
- Lee, J.N., 2001. The impact of knowledge sharing, organizational capacity and partnership quality on IS outsourcing success. *Inform. Manage.*, 38: 323-335.
- Lenox, M. and A. King, 2004. Prospects for developing absorptive capacity through internal information provision. *Strategic Manage. J.*, 25: 331-345.
- Leonard, D., 1995. Wellsprings of Knowledge: Building and Sustaining the Source of Innovation. Boston: Harvard Bus. School Press.
- Liao, S.H., 2003. Knowledge management technologies and applications: A literature review from 1995 to 2002. *Exp. Syst. Appl.*, 25 (2): 155-164.
- Liao, S.H., J.C. Chang, S.C. Cheng and C.M. Kuo, 2004. Employee relationship and knowledge sharing: A case study of a Taiwanese finance and securities firm. *Knowledge Manage. Res. Practice*, 2: 24-34.
- Liu, P.L. and C.H. Tsai, 2007. The Influences of R and D management capacity and design/manufacturing integration mechanisms on new product development performance in Taiwan's high-tech industries. *J. Applied Sci.*, 7 (23): 3628-3638.
- Minbaeva, D., T. Pedersen, I. Bjorkman, C.F. Fey and H.J. Park, 2003. MNC knowledge transfer, subsidiary absorptive capacity and HRM. *Int. J. Bus. Stud.*, 34: 586-599.
- Nieto, M. and P. Quevedo, 2005. Absorptive capacity, technological opportunity, knowledge spillovers and innovative effort. *Technovation*, 25: 1141-1157.
- Nonaka, I., 1994. A dynamic theory of organizational knowledge creation. *Org. Sci.*, 5 (10): 14-37.
- Nonaka, I. and H. Takeuchi, 1995. The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation. Oxford University Press, New York.
- Nonaka I. and N. Konno, 1998. The Concept of Ba: Building a foundation for knowledge creation. *California Manage. Rev.*, 40 (3): 40-54.

- Nonaka, I., R. Toyama and N. Konno, 2000. SECI, 13a and leadership: A unified model of dynamic knowledge creation. *Long Range Plann.*, 33: 5-34.
- Nunnally, J.C., 1978. *Psychometric Theory*. 2nd Edn. McGraw-Hill, New York.
- O'Dell, C. and C. Grayson, 1998. If only we knew what we know: Identification and transfer of internal best practices. *California Manage. Rev.*, 40 (3): 154-174.
- Ruggles, R., 1998. The state of notion: Knowledge management in practice. *California Manage. Rev.*, 40 (3): 80-89.
- Ryu, S., S.H. Ho and I. Han, 2003. Knowledge sharing behavior of physicians in hospitals. *Exp. Syst. Appl.*, 25: 113-122.
- Sanchez, R. and J.T. Mahoney, 1996. Modularity, flexibility and knowledge management in product and organization design. *Strategic Manage. J.*, 17: 63-76.
- Shanklin, W.L. and K.J. Ryans, 1984. Organizing for high-tech marketing. *Harvard Bus. Rev.*, 62 (6): 164-171.
- Teece, D.J., G. Pisano and A. Shuen, 1997. Dynamic capabilities and strategic management. *Strategic Manage. J.*, 18 (7): 509-533.
- Teece, D.J., 1998. Capturing value from knowledge assets: The new economy, markets for know-how and intangible assets. *California Manage. Rev.*, 40 (3): 55-79.
- Van De Ven and D.L. Ferry, 1980. *Measuring and Assessing Organizations*. John Wiley and Sons, NY.
- Van den Hooff, B. and F.L. de Van Weenen, 2004. Committed to share: Commitment and CMC use as antecedents of knowledge sharing. *Knowledge Process Manage.*, 11 (1): 13-24.
- Zahra, A.S. and G. George, 2002. Absorptive capacity: A review, reconceptualization and extension. *Acad. Manage. Rev.*, 27 (2): 185-203.