Shien-Ping Huang¹

A STUDY ON THE EFFECT OF INNOVATIVE MANAGEMENT ON MANAGERIAL PERFORMANCE

Questionnaire survey was applied as the research tool. Having executives and staff of Siliconware Precision Industries Co., Ltd. in Hsinchu Science Park as the research subjects, total 360 questionnaires were distributed. 307 valid questionnaires were retrieved back. Several conclusions are made in this study: 1) innovative management shows significant positive correlation with parts of financial performance in managerial performance; 2) innovative management has remarkably positive correlation with operational performance in managerial performance; 3) innovative management displays notable positive correlation with the parts of behavior performance in managerial performance; 4) the correlation between innovative management and managerial performance has outstanding difference with the moderation of demographic variables. Subsequent research suggestions are proposed for enterprises and further research.

Keywords: innovative management; managerial performance; team learning; organizational commitment; creative work environment.

Шієнь-Пінь Хуанг ВПЛИВ ІННОВАЦІЙНОГО МЕНЕДЖМЕНТУ НА ЕФЕКТИВНІСТЬ УПРАВЛІННЯ

У статті головним інструментом дослідження є опитування, проведене серед керівників та персоналу високотехнологічного підприємства у складі технопарку. Загальна кількість анкет — 360; вірно заповненими повернено 307. За результатами аналізу даних можна зробити наступні висновки: 1) інноваційний менеджмент суттєво позитивно корелює з фінансовими показниками ефективності управління; 2) інноваційний менеджмент суттєво позитивно корелює з операційними показниками ефективності; 3) інноваційний менеджмент суттєво позитивно корелює з поведінковою складовою управління; 4) кореляція між інноваційним менеджментом та ефективним управлінням багато в чому визначається демографічними змінними. Розроблено рекомендації для підприємств та для подальших досліджень.

Ключові слова: інноваційний менеджмент; ефективність управління; навчання у команді; відданість організації; творча середа.

Рис. 1. Табл. 9. Літ. 19.

Шиень-Пинь Хуанг ВЛИЯНИЕ ИННОВАЦИОННОГО МЕНЕДЖМЕНТА НА ЭФФЕКТИВНОСТЬ УПРАВЛЕНИЯ

В статье главным инструментом исследования является опрос, проведенный среди руководителей и персонала высокотехнологичного предприятия в составе технопарка. Общее количество анкет — 360; правильно заполненными возвращены 307. По результатам анализа данных можно сделать следующие выводы: 1) инновационный менеджмент существенно позитивно коррелируется с финансовыми показателями эффективности управления; 2) инновационный менеджмент существенно позитивно коррелируется с операционными показателями эффективности; 3) инновационный

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¹ Director of Department of Business Management, Taipei College of Maritime Technology, Taipei, Taiwan, R.O.C.

менеджмент существенно и позитивно коррелируется с поведенческой составляющей; 4) корреляция между инновационным менеджментом и эффективностью управления во многом определяется демографическими переменными. Разработаны рекомендации для предприятий и для дальнейших исследований.

Ключевые слова: инновационный менеджмент; эффективность управления; обучение в команде; преданность организации; творческая среда.

Introduction. Within the life cycle of an enterprise, it would often face environmental changes that enterprises have to respond. Innovative management therefore becomes a critical issue within the operational strategy at enterprises. To maintain competitive advantages, enterprises are required to innovate continuously. Innovation is an activity which increases energy for resources to create wealth; besides, it can create resources for enterprises. For this reason, innovative management is considered essential for manufacturers and the society. Before knowledge economy times, a company was able to maintain its competitiveness with cost, time or quality. Now enterprises are required to reinforce development and effectively manage their innovative capability in order to maintain competitiveness.

As a result, innovation has become the trend of the time, and none of organizations can avoid it. Facing innovation and developing new business are the means for most enterprises to pursue growth or to pioneer a new battlefield. Nonetheless, any investment exists in risks. A new business might be a way to survive, but it could be the last straw. In any case, the issue of new business is the challenge which cannot be neglected. Innovative management is considered as the nature of new business development, it expects enterprises not to be satisfied with present situation, but dare to attempt several methods. Enterprises with enormous resource capacity and numerous excellent staff could still fail in new business development. An investigation on the enterprises at maturity stage found that when business development and recover the growth. Apparently, innovative management has played a crucial role in managerial performance of such enterprises.

Literature review

I. Innovative management. Frankle (1990) regarded innovation as modifying or inventing a new concept to correspond to present or potential requirements as well as to improve and develop original functions of commercialization. Higgins (1995) considered innovation as the process to invent new things that would present great value for an individual, a group, an organization, an industry, and even a state. Besides, innovation can help enterprises to have relatively lower costs of competitiveness or product processes than others. Innovation therefore is considered as the key to control competitive advantages. Gallouj & Weinstein (1997) defined innovation as the increase of product attributes or promotion of functions. Hill & Jones (1999) indicated that innovation is a new method to produce or manufacture new products by a company, including the increase of products, production management, and organizational structure or strategic development.

Huang (1999) proposed the following dimensions of innovative management: 1) morale management. Effective morale management could ensure smooth opera-

tion of human resource strategy and benefit the development of innovative activities in an organization; 2) organizational commitment. By reinforcing the commitment of staff to an organization (value commitment, effort commitment, and retention commitment), staff would be encouraged and morale would be largely enhanced; 3) management by objectives. With discussions between supervisors and subordinates, individual work objectives are set, the schedule is self-controlled, performance was self-evaluated, and satisfaction by mission completion is offered. Management by objectives is a managerial philosophy and a technique; 4) team learning. Innovative management could encourage staff develop its potential, flexibly operate an organization, as well as combine individual demands and enterprise's objectives; 5) interface management. Effective interface control among R&D, manufacturing, and marketing could improve the R&D quality and speed of new products; 6) creative work environment. Promoting harmony between R&D and marketing departments to have new products rapidly appear at a market with less costs could be the key issue for innovative managers. By synthesizing the above literature, this study applies the dimensions for innovative management as proposed by Huang (1999), including morale management, organizational commitment, management by objectives, team learning, interface management, and creative work environment.

II. Managerial performance. The purpose of new business is to survive at a market and rapidly develop. For the short term, it aims to achieve the predetermined performance with fastest method (Carter et al., 1996). Evaluation of managerial performance at enterprises is complicated, as evaluators could select evaluations and indicators based on the purposes. There are distinct definitions of managerial performance. Lumpkin and Dess (1996) indicated that managerial performance should be evaluated by multiple dimensions. Fenwik & Amine (1979) considered the success of reasonable inspection on enterprise policies depending on the conformity of set purposes. In this case, measures of managerial performance should contain the evaluation conforming to the set purposes, not simply the objective indicators. Platt and Platt (1990) suggested that to analyze the relative financial ratio would present better differentiating competence than original financial ratio. In the research of Murphy et al. (1996) on enterprise performance, it was found that multiple measures are widely applied by scholars and the most popular dimensions are financial efficiency, growth, and profitability.

Chakravarthy (1986) mentioned that having traditional yield rate as the measure of managerial performance could not effectively differentiate managerial performance of a company. The following classifications are proposed as the measures: 1) operational objectives are the operational plans of an enterprise, including the achievements of annual budget, capital increment, merger, factory expansion, and joint venture; 2) productivity refers to the usage of plants and equipment in an organization; 3) profit is the utilization of enterprise resources in an organization; 4) permanent distinctive resource allowes sustainable management and continuous growth of an organization. Li, Tsai, & Chen (1999) proposed the following dimensions of managerial performance: 1) financial performance includes revenue growth, benefit-after-tax growth, and market share; 2) operational performance containes product quality, innovation level, and value-

added ratio; 3) behavior performance refers to employee turnover rate, staff morale, attraction to talented persons, employee productivity, and organizational commitment.

Summing up the above literature, this study applies the dimensions of managerial performance as proposed by Li, Tsai, & Chen (1999): financial performance, operational performance and behavior performance.

III. The correlation between innovative management and managerial performance. Drucker (1995) indicated that innovation is a purposeful and regular activity to create higher added value. Innovation does not necessary involve technology; indeed, it does not require a concrete "thing". For instance, innovation could be in management. Moreover, innovation is a change, which provides opportunities for people to create innovative and unique things. According to Say's definition, innovation is to change the production of resources. On the demand side, innovation is to change value and satisfaction provided by the resource for consumers so as to promote managerial performance of an enterprise. In this case, there is a notable correlation between innovative management and managerial performance.

Huang (1999) indicated that innovation does not merely aim to survive and develop, but to create higher added value for customers and companies. To establish the transfer of standard creation model would be the main purpose of innovation to effectively enhance managerial performance and promote the market value of an enterprise. Obviously, innovative management has remarkably positive effect on managerial performance. Chacke (1988) considered innovation as the key source of competitiveness for high-technology industry as well as an important choice of corporate strategy. He pointed out the significantly positive correlation between innovative management and managerial performance. Streele (1990) regarded innovation as the change of production and introduction that should generate values for customers or enhance the capability of enterprises to survive and increase managerial performance. Consequently, innovative management shows notably positive correlation with managerial performance. Hill & Jones (1998) regarded profit-making as the purpose of establishing enterprises. For this reason, innovative management is a series of activities with proposition and implementation of innovative ideas as well as creation of added value for profit-making. For enterprises, any new idea and newly changed concept and implementation are parts of innovation. Selection and implementation of strategies are high-level management, where the measure of innovative management is the core of managerial performance. Apparently, there is significantly positive correlation between innovative management and managerial performance.

According to the above literature, the following hypotheses are proposed for this study.

H1: Innovative management shows significantly positive correlation with financial performance in managerial performance.

H2: Innovative management displays notably positive correlation with operational performance in managerial performance.

H3: Innovative management has remarkably positive correlation with behavior performance in managerial performance. *IV. Demographic variables.* From the research on innovative management it was found that younger people and the ones with higher education and higher incomes tend to present higher innovative performance (Day & Landon, 1977; Zaichowsky & Liefeld, 1977; Bearden & Mason, 1984). Singh (1990) found that all demographic variables, except age, do not present explanations. More hypotheses are proposed as below.

H4: Gender shows notably moderating effect on the correlation between innovative management and managerial performance.

H5:Age displays remarkably moderating effect on the correlation between innovative management and managerial performance.

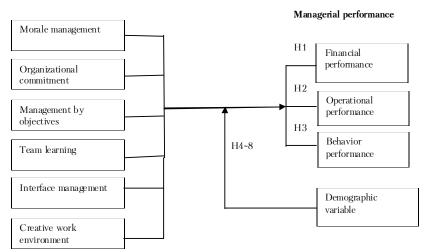
H6:Occupation presents significantly moderating effect on the correlation between innovative management and managerial performance.

H7:Educational background shows notably moderating effect on the correlation between innovative management and managerial performance.

H8: Monthly income has remarkably moderating effect on the correlation between innovative management and managerial performance.

Research method

I. Research framework. Based on domestic and foreign research on the correlation between innovative management and managerial performance, the research framework is proposed. 3 dimensions, including financial performance, operational performance, and behavior performance, in managerial performance are the dependent variables; while 6 dimensions, containing morale management, organizational commitment, management by objectives, team learning, interface management, and creative work environment, in innovative management are the independent variables. The correlations between innovative management and managerial performance are further discussed.



Innovative management

Research framework

ACTUAL PROBLEMS OF ECONOMICS, #6, 2012

II. Research subjects and sampling. With random sampling to distribute and collect questionnaires on-site, Siliconware Precision Industries Co., Ltd. in Hsinchu Science Park was selected as the sample. The company manufactures, processes, buys & sells, and tests various integrated circuit packages and has been the benchmark for international package test. It has the mission of winning customer trust and creating the technologies of the future. Having the executives and the staff of the company as the research subjects, total 360 questionnaires were distributed. Within the retrieved 324 copies, 17 invalid ones were eliminated. Total 307 valid questionnaires were retrieved, with the retrieval rate of 85.3%.

Analyses and discussions

I. Factor analysis of innovative management. Table 1 shows the dimensions of the questionnaire as based on Huang (1999). With factor analyses, 6 dimensions display the reliability Cronbach α as 0.87 (morale management), 0.85 (organizational commitment), 0.87 (management by objectives), 0.89 (team learning), 0.90 (interface management), and 0.86 (creative work environment). With principle factor analysis and oblique rotation, the explained variance is 87.414%.

Factor	Variable	Eigen value	Factor loading	Explained variance (cumulated)	Reliability coefficient
Morale management	IM 01 IM 02 IM 04 IM 03	2.435	0.912 0.876 0.861 0.842	20.785 (20.785)	0.87
Organizational commitment	IM 07 IM 08 IM 05 IM 06	2.014	0.896 0.883 0.837 0.815	18.381 (39.166)	0.85
Management by objectives	IM 11 IM 09 IM 10 IM 12	1.846	$\begin{array}{c} 0.874 \\ 0.870 \\ 0.865 \\ 0.855 \end{array}$	16.458 (55.624)	0.87
Team learning	IM 13 IM 14 IM 15	1.625	0.903 0.892 0.825	12.158 (67.782)	0.89
Interface management	IM 17 IM 16 IM 18	1.433	0.877 0.838 0.832	10.954 (78.736)	0.90
Creative work environment	IM 19 IM 21 IM 20	1.079	0.823 0.807 0.791	8.678 (87.414)	0.86

Table 1. Factor analysis of innovative management

II. Correlation analysis of innovative management and managerial performance. With Pearson correlation analysis, 6 dimensions in innovative management achieve remarkably positive correlation with parts of managerial performance (p<0.05), in which organizational commitment has the highest correlation with managerial performance.

1. Correlation analysis of innovative management and financial performance. With multiple regression analysis to test the hypothesis H1, Table 2 displays that morale management (t = 1.558, p < 0.05), organizational commitment (t = 3.525, p < 0.01),

interface management (t = 1.772, p < 0.05), and creative work environment (t = 2.437, p < 0.01) show outstanding effects on financial performance. H1 is partially agreed.

Predicted variable	Unstandardized coefficient		Standardized coefficient	L. L.
Predicted variable	β estimated value	Standard error	β distribution	t
Intercept	4.284	0.326		6.852
Morale management	1.368	0.148	0.186	1.558*
Organizational commitment	2.882	0.238	0.366	3.525**
Management by objectives	1.254	0.117	0.158	0.168
Team learning	1.468	0.136	0.174	0.631
Interface management	1.681	0.161	0.212	1.772*
Creative work environment	2.033	0.183	0.265	2.437**

Table 2. Multiple regression analysis of the dimensions in innovative management and financial performance in managerial performance

Remark: * stands for p < 0.05, ** for p < 0.01.

2. Correlation analysis of innovative management and operational performance. With multiple regression analysis to test hypothesis H2, Table 3 presents that morale management (t = 3.164, p < 0.01), organizational commitment (t = 2.035, p < 0.01), management by objectives (t = 1.882, p < 0.05), team learning (t = 1.549, p < 0.05), interface management (t = 2.633, p < 0.01), and creative work environment (t = 2.316, p < 0.01) show remarkable effects on operational performance. H2 is agreed.

 Table 3. Multiple regression analysis of the dimensions in innovative

 management and operational performance in managerial performance

Predicted variable	Unstandardized coefficient		Standardized coefficient	t	
Predicted variable	β estimated value	Standard error	β distribution	t	
Intercept	3.924	0.437		7.268	
Morale management	2.153	0.334	0.371	3.164**	
Organizational commitment	1.736	0.186	0.202	2.035**	
Management by objectives	1.849	0.165	0.183	1.882*	
Team learning	1.667	0.143	0.153	1.549*	
Interface management	2.035	0.235	0.276	2.633**	
Creative work environment	1.947	0.219	0.231	2.316**	

Remark: * stands for p < 0.05, ** for p < 0.01.

3. Correlation analysis of innovative management and behavior performance. With multiple regression analysis to test hypothesis H3, Table 4 demonstrates that morale management (t = 1.694, p < 0.05), organizational commitment (t = 2.433, p < 0.01), management by objectives (t = 1.727, p < 0.05), team learning (t = 2.198, p < 0.01) and interface management (t = 1.584, p < 0.05) show significant effects on behavior performance. H3 is partially agreed.

III. Moderating effects of the demographic variables

1. Effect of gender on the relations between innovative management and managerial performance. With analysis of variance, Table 5 displays outstanding differences by gender on the relations of morale management (p < 0.01), management by objectives (p < 0.01), team learning (p < 0.01), interface management (p < 0.05) and creative work environment (p < 0.01) with financial performance; the relations of Morale management (p < 0.01), organizational commitment (p < 0.05), management by objectives (p < 0.01) and creative work environment (p < 0.05) with operational performance; as well as the relations of morale management (p < 0.01), organizational commitment (p < 0.01), management by objectives (p < 0.01), team learning (p < 0.01), and interface management (p < 0.01) with behavior performance. H4 is partially agreed.

Predicted variable	Unstandardized coefficient		Standardized coefficient	t
Predicted variable	β estimated value	Standard error	β distribution	t
Intercept	3.733	0.405		6.544
Morale management	1.624	0.211	0.274	1.694*
Organizational commitment	2.135	0.332	0.361	2.433**
Management by objectives	1.832	0.241	0.298	1.727*
Team learning	2.037	0.287	0.322	2.198**
Interface management	1.562	0.184	0.224	1.584*
Creative work environment	1.314	0.133	0.157	0.924

Table 4. Multiple regression analysis of the dimensions in innovative management and behavior performance in managerial performance

Remark: * stands for p < 0.05, ** for p < 0.01.

 Table 5. Effect of gender on the relation between innovative management

 and managerial performance

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Innovative monogramont	Financial	Operational	Behavior	
Innovative management	performance	performance	performance	
Morale management	p < 0.01	p < 0.01	p < 0.01	
Organizational commitment	p > 0.05	p < 0.05	p < 0.01	
Management by objectives	p < 0.01	p < 0.01	p < 0.01	
Team learning	p < 0.01	p > 0.05	p < 0.01	
Interface management	p < 0.05	p > 0.05	p < 0.01	
Creative work environment	p < 0.01	p < 0.05	p > 0.05	
Hypothesis test	H4 partially agreed			

2. Effect of age on the relation between innovative management and managerial performance. With analysis of variance, Table 6 presents significant differences by age on the relations of management by objectives (p < 0.05), team learning (p < 0.05), interface management (p < 0.01) and creative work environment (p < 0.05) with financial performance; the relations of morale management (p < 0.01), management by objectives (p < 0.01), team learning (p < 0.01), interface management (p < 0.05), and creative work environment (p < 0.01) with operational performance; as well as the relations of morale management (p < 0.01), organizational commitment (p < 0.01), management by objectives (p < 0.01), and interface management (p < 0.01) with behavior performance. H5 is partially agreed.

3. Effect of occupation on the relation between innovative management and managerial performance. With analysis of variance, Table 7 notable differences by accupations on the relations of morale management (p < 0.01), organizational commitment (p < 0.01), management by objectives (p < 0.01) and interface management (p < 0.05) with financial performance; the relations of morale management (p < 0.01), organizational commitment (p < 0.05), team learning (p < 0.01) with operational performance; as well as the relations of morale management (p < 0.05), management by objectives (p < 0.01), interface management (p < 0.05), and creative work environment (p < 0.05) with behavior performance. H6 is partially agreed.

Innovative management	Financial performance	Operational performance	Behavior performance	
Morale management	p > 0.05	p < 0.01	p < 0.01	
Organizational commitment	p > 0.05	p > 0.05	p < 0.01	
Management by objectives	p < 0.05	p < 0.01	p < 0.01	
Team learning	p < 0.05	p < 0.01	p > 0.05	
Interface management	p < 0.01	p < 0.05	p < 0.01	
Creative work environment	p < 0.05	p < 0.01	p > 0.05	
Hypothesis test	H5 partially agreed			

 Table 6. Effect of age on the relation between innovative management

 and managerial performance

Table 7. Effect of occupation on the relation between innovative management
and managerial performance

Innovative management	Financial	Operational	Behavior
minovauve management	performance	performance	performance
Morale management	p < 0.01	p < 0.01	p < 0.05
Organizational commitment	p < 0.01	p < 0.05	p > 0.05
Management by objectives	p < 0.01	p > 0.05	p < 0.01
Team learning	p > 0.05	p < 0.01	p > 0.05
Interface management	p < 0.05	p > 0.05	p < 0.05
Creative work environment	p < 0.05	p > 0.05	p < 0.05
Hypothesis test		H6 partially agreed	

4. Effect of educational background on the relation between innovative management and managerial performance. With analysis of variance, Table 8 shows remarkable difference by education on the relations of morale management (p < 0.01), organizational commitment (p < 0.05), team learning (p < 0.01), interface management (p < 0.01) and creative work environment (p < 0.01) with financial performance; the relations of organizational commitment (p < 0.05), management by objectives (p < 0.01), interface management (p < 0.01) and creative work environment (p < 0.05) with operational performance; as well as the relations of morale management (p < 0.01), management by objectives (p < 0.01), team learning (p < 0.05), interface management (p < 0.01) and creative work environment (p < 0.01) with behavior performance. H7 is partially agreed.

 Table 8. Effect of educational background on the relation between innovative management and managerial performance

Innovative management	Financial	Operational	Behavior
	performance	performance	performance
Morale management	p < 0.01	p > 0.05	p < 0.01
Organizational commitment	p < 0.05	p < 0.05	p > 0.05
Management by objectives	p > 0.05	p < 0.01	p < 0.01
Team learning	p < 0.01	p > 0.05	p < 0.05
Interface management	p < 0.01	p < 0.01	p < 0.01
Creative work environment	p < 0.01	p < 0.05	p < 0.01
Hypothesis test		H7 partially agreed	

5. Effect of monthly income on the relation between innovative management and managerial performance. With analysis of variance, Table 9 presents outstanding differences by monthly income on the relations of morale management (p < 0.01), management by objectives (p < 0.01), interface management (p < 0.01), and creative work environment (p < 0.05) with financial performance; the relations of morale management (p < 0.01), and creative work environment (p < 0.05), management by objectives (p < 0.01), team learning (p < 0.01), and creative work environment (p < 0.01) with operational performance; as well as the relations of morale management (p < 0.01), interface management (p < 0.01) with behavior performance. H8 is partially agreed.

Innovative management	Financial	Operational	Behavior
milovauve management	performance	performance	performance
Morale management	p < 0.01	p < 0.05	p < 0.05
Organizational commitment	p > 0.05	p > 0.05	p < 0.01
Management by objectives	p < 0.01	p < 0.01	p > 0.05
Team learning	p > 0.05	p < 0.01	p < 0.01
Interface management	p < 0.01	p > 0.05	p < 0.01
Creative work environment	p < 0.05	p < 0.01	p > 0.05
Hypothesis test		H8 partially agreed	

 Table 9. Effect of monthly income on the relation between innovative

 management and managerial performance

Conclusions and suggestions. To sum up the data analyses, some suggestions for practical applications of innovative management and managerial performance in enterprises are proposed:

1. Innovative management has significant positive correlation with financial performance in managerial performance. In this case, the factors in the decisions on financial performance change with the economic environment. To continuously enhance financial performance, enterprises are to constantly innovate to adapt to changes in the environment. Financial performance of an enterprise is determined by connection and promotion among technology innovation, management innovation, and system innovation.

2. Innovative management presents remarkably positive correlation with operational performance in managerial performance. Apparently, the success in enterprise management is related to innovative capability. In terms of managerial performance, innovative management would make future profits by increasing market share as well as creating brand new business and new developments. Innovation is the giving of new and larger wealth-creation capability to human and material resources. It is considered that enterprise is "coming to an end with no innovation," and "innovation and entrepreneurship are the key of competitive advantages".

3. Innovative management shows notable positive correlation with behavior performance in managerial performance. Analyzing new technological development in the process of innovative management for effective strategies, the economic scale would be expanded by created values. It would further become the standard platform of the industry as the influence brings values; the enhancement of functions, the reduction of costs, and continuous promotion of competitiveness establish brand awareness; continuous promotion of new products and the increase of functions allow the acquirement of higher values.

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