

# The Effect of Knowledge Economy and Internal Marketing on Job Satisfaction in Taiwan's IT Industry

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## ABSTRACT

*Although the successful experience of science parks has promoted the industrial, technological, and economic developments in Taiwan, it is indeed a fact that the high-tech industries have been serving as a tool for foreign industries. Therefore, it is necessary to improve the competence of the domestic high-tech industries. In addition, due to high-tech industries' characteristics of short life-span and innovation emphasis, high-tech enterprises have to pay attention to the issues relevant to internal marketing and knowledge management. Moreover, at present, a lot of countries all over the world regard information technology and biotechnology as the top cutting-edge technologies leading human progress and developments; in Taiwan, information technology is also seen as the most important high-tech industry. Consequently, taking the information technology, or IT, industry in the science parks in Taiwan as the research object, this study investigates the correlation between internal marketing and knowledge management.*

*First of all, in-depth interviews with high-ranking executives from the IT industry were conducted in this study to understand the present situation of the promotion of internal marketing and knowledge management in the enterprises. Secondly, relevant literature was consulted to develop scales for internal marketing, job satisfaction, and knowledge sharing, and relevant scholars and experts, including executives and employees, were invited to amend the scale items in order to ensure the feasibility of the scales. Finally, employees were surveyed by questionnaires to verify the conceptual framework of this study and the feasibility of each hypothesis.*

*In this study, employee questionnaires were delivered to 150 companies willing to cooperate. Totally, 2000 employee questionnaires were delivered in succession from October, 2008 to the end of February, 2009, in which 920 questionnaires in total were retrieved, and 812 of them were valid. Through Correlation Analysis and LISREL, it is found that internal marketing and job satisfaction are significantly, positively correlated, and so are job satisfaction and knowledge sharing. In particular, job satisfaction and colleague relation, one of its dimensions, are the most correlated to network sharing.*

**Keywords:** *Job Satisfaction, Knowledge Economy, Knowledge Sharing, Internal Marketing*

## RESEARCH BACKGROUND AND PURPOSES

According to the data of the Department of Statistics, Ministry of Finance, in December, 2008, industrial products are 252.95 billion US dollars, accounting for 98.9% of the total value of exports (Department of Statistics, Ministry of Finance, June, 2009). Meanwhile, the report of the Topology Research Institute (TRi) indicates that information category, in which the major application products include NB and Netbook, accounts for 34.8% of GDP. Based on the estimation of TRI, the annual shipments of Netbook in 2009 will be approximately 27 million units, and the IC market relevant to PC/NB will be about 52 billion US dollars, accounting for approximately 25.2% of the overall IC industry revenue. Consequently, high-tech industries are the important industries driving the economic lifeline of Taiwan.

Rogers (1991) deems that high-tech industries indicate the industries with the features possessing numerous scientists or engineers, swift industry growing speed, high ratio of research and development expenses in turnover, and the products targeting at the global market. Chang (1989) also argues that high-tech industries indicate the industries in which the products of the industries are short in lifespan, their functions change as long as critical technology breakthroughs happen, the markets or customers are diversified, the products are complicated, and following technology developments, new market demands can be developed. Although opinions about the definition of high-tech industry are

widely divided, the common features are, generally, intensive in technology, short in product lifespan, prompt in change. According to statistics, at present, the high-tech industries in the Hsinchu Science Park and the Southern Taiwan Science Park can be divided into six spheres, including semiconductor, computer peripherals, communications, opto-electronics, precision machinery, and biotechnology, and there are totally 301 firms. The science parks are not only the major centers of the domestic high-tech enterprises but also very internationally prestigious.

Although the developments of our high-tech industries are approved and attention-getting, they still aim at Original Equipment Manufacturing; or OEM. In the past, high-tech enterprises focused on improving manufacturing technologies, assuring of the product quality, and prompt deliveries. However, since international situations have become unstable in recent years, in which, for instance, the global economic downturn and the epidemic situation of N1H1 have also influenced the export of our high-tech products, it is necessary for our high-tech enterprises, by means of developing marketing capability, establishing the consciousness of customer service, and cultivating as well as managing professional knowledge, to change from Original Equipment Manufacturing; or OEM, to Own Branding and Manufacturing; or OBM, in order to free themselves from serving as a tool for others and advance the competitive predominance.

A lot of factors influence whether customers are satisfied or not, and frontline employees who have direct contact with customers even play a more critical role. The gradually growing attention of employee satisfaction has made internal marketing come with the tide of fashion. The earliest concept of internal marketing has been found in the literature of service marketing. Gronroos (1981) advocates that internal marketing indicates a set of management concepts and activities regarding employees as the internal customers of an enterprise as well as work as internal products, and it values employees' needs and intends to increase customer satisfaction and maintain the relation with customers through the establishment of employee satisfaction. Kotler (2008) also argues that sellers attract external customers' consumption through traditional marketing mixes and strategies, regard the employees as the internal customers, advance the concept of internal marketing, and effectively train and inspire the frontline employees having direct contact with customers and other employees providing supporting service in order to collectively create customer satisfaction and improve business performance. In other words, internal marketing is, based on employees' needs, to properly apply marketing concepts and techniques to effectively obtain, develop, inspire, and maintain customer-conscious and spontaneous employees and to further establish a long-term and satisfying relationship with customers through creating employee satisfaction.

The coming of the knowledge economy era urges industries and academies to value the issues related to knowledge management. Knowledge flow is one kind of management strategy helping a business through acquiring, creating, circulating, transforming, applying, and accumulating various knowledge or information relevant to markets, technologies, and competitors to maintain or enhance its long-term competency. Efficient knowledge management can assist an enterprise in speedily, accurately mastering and predicting market pulsation, obtaining worthy information which then becomes the new knowledge of the organization through transformation and communication, and stimulating the organization members to innovate and learn. Consequently, in the 21<sup>st</sup> century, enterprises' key to success lies in possessing a fine mechanism of knowledge management. For high-tech industries with short life-span, which value innovation and R&D, namely research and development, knowledge technology is the crucial factor for them to improve the competitive competency and management performance.

Since the personnel structure of high-tech industries is exceptional, besides emphasizing improvement in R&D as well as manufacturing technology, it is indeed an important management issue to effectively inspire and train knowledge employees' consciousness and behaviors on customer service and to provide the jobs meeting employees' needs to fulfill the satisfaction and further advance customer satisfaction. The emphases of internal marketing are to regard employees as the internal customers and to take satisfying their needs as an important business. When employees are satisfied with their work, and they thus make a commitment to and have recognition of the organization, not only will customer service be influenced but also an innovative culture which spontaneously seeks profit for the organization will be formed. Furthermore, the knowledge management procedures and performances will be influenced. Therefore, people are the most important asset of an organization. Meanwhile, how to properly apply the mechanisms of internal marketing and knowledge management to transform the personal knowledge of the knowledge workers in an

organization into the overall wisdom and actions of the organization as well as to enhance the employees' consciousness in customer service and organization recognition is the critical factor for an organization to maintain competency and advance management performance, and it is also the management issue that relevant scholars and enterprises need to pay attention urgently nowadays.

Although the successful experience of science parks have driven the industrial, technological, and economic developments in Taiwan, it is indeed a fact that the high-tech industries have been serving as a tool for foreign industries. Thus, it is necessary to improve the competence of the domestic high-tech industries. In addition, due to their characteristics of short life-span and innovation emphasis, high-tech enterprises have to pay attention to the issues related to internal marketing and knowledge management. Moreover, at present, a lot of countries all over the world regard information technology, biotechnology, and green industries as the top cutting-edge technologies leading human progress and developments; in Taiwan, information technology is also seen as the most important high-tech industry. Consequently, taking the information technology, or IT, industry in the science parks in Taiwan as the research object, this study investigated the correlation between internal marketing and knowledge management.

Therefore, the major purposes of this study are as follows:

1. Establishing the significant elements and dimensions of internal marketing and developing an internal marketing scale.
2. Investigating the current propagating situation of internal marketing and knowledge management in high-tech industry.
3. Researching the influence of internal marketing on job satisfaction and knowledge sharing.

## LITERATURE REVIEW

### Internal Marketing

In early stages, the essential presupposition of internal marketing regards employees as internal customers and the work as the products provided to the internal customers, in which the most representative scholars are Gronroos (1981) and Berry (1981). Gronroos (1981) is the earliest scholar defining the concept of internal marketing. He advocates that internal marketing is a management concept and activity regarding employees as the internal customers of a business and the work as the internal products, the purpose of which enables the employees to generate higher satisfaction and further makes the business develop into a customer attractive or market oriented firm. Berry (1981) deems that internal marketing applies the philosophy and practice of marketing to the employees inside an enterprise, and work products satisfying internal customers' needs and desires are provided to hire and maintain the employees with the most service consciousness. Dennis (1995) argues that internal marketing is a strategic management philosophy which attracts, develops, inspires, and maintains outstanding employees by providing work products satisfying employees' needs.

Furthermore, the concept of internal marketing starts to gradually develop towards employees' customer-oriented behaviors. For example, Piercy & Morgan (1991) argues that marketing techniques should be applied to the internal market of a company to simulate the employees to generate service consciousness and customer-oriented behaviors. Gronroos(1994) also redefines internal marketing and contends that internal marketing indicates that, through enthusiastic, simultaneous, akin-to-marketing-actions, integrated, and harmony methods, an organization urges the internal market composed of employees to establish service consciousness and customer orientation. Moreover, there are also scholars employing the viewpoint of human resource management, or HRM, to define internal marketing, in which the scholars include Joseph (1996) as well as Cooper & Cronin (2000). According to Joseph (1996), internal marketing is an application of marketing and human resource management, and it integrates with the theories, techniques, and principles of human resource management to inspire, mobilize, recruit, and manage all the employees in an organization in order to continuously improve the method to serve the internal and external customers. According to Cooper & Cronin (2000), internal marketing indicates that an organization is devoted to training and encouraging employees to stimulate them to provide better service.

In the late evolution stage of the internal marketing concept, a lot of scholars employ the viewpoint of internal exchange to explain internal marketing. Bak et al. (1994) argue that internal marketing is to effectively establish the

exchange relationship between an organization and the employees in order for the organization to obtain the success in the external market. This study compiles the conceptual evolution of internal marketing, constructs the definition in terms of human resource management, and deems that internal marketing means integrating marketing concepts with human resource management functions and properly applying marketing concepts and techniques to efficiently acquire, develop, inspire, and maintain customer-conscious and spontaneous employees and then to establish the long-term and satisfactory relationship with customers by means of the creation of employee satisfaction.

Since the concept of internal marketing is gradually valued, many scholars start to explore the content and dimensions of internal marketing. First of all, the perspective of human resource management is used by scholars to explain the dimensions of internal marketing. Based on the definition of internal marketing and the perspective on advancing service culture, Gronroos (1990) brings up seven typical internal marketing activities, including 1. training: developing service strategies and beneficial employee attitude and enhancing their techniques of communication, sales, and service; 2. administrative support as well as internal interaction and communication: encouraging employees to participate in decision making, establishing an open atmosphere of internal communication, and advancing formal and informal information circulation and feedbacks; 3. massive internal communication and information support: providing employees information and tools, such as service handbook, which are necessary for employees to serve customers; 4. personnel and administrative tools as well as human resource management: developing various human resource management schemes beneficial for the organization to obtain good employees, such as recruitment, inspiration, and career planning; 5. massive external communication: negotiating and establishing employees' collectively recognition of the service strategies and goals of the organization and reducing the potential influence of external information on them; 6. market research: discovering employees' needs and desires through the research on internal (employee) and external markets; 7. market segmentation: providing different human resource management schemes according to different employee needs, such as employment, training, and inspiration. Although Gronroos has not brought up more specific measuring content aiming at the seven internal marketing activities, following researchers accordingly develop scales by themselves and investigate the correlations between internal marketing and other variables. For instance, Huang (1999) takes the life insurance industry in Taiwan as the research target. Based on the seven internal marketing activities by Gronroos, she develops by herself 72 items, and, through factor analysis, she induces 14 factors, including external communication, customer service orientation, tool support, career development assistance, management support, information support, strategy participation, market research, market segmentation, human resource activity, internal communication, training, and inspiration, and proves that internal marketing and management performance are positively correlated.

Collins & Payne (1991) contend that marketing mix elements, including product and service, channel, and promotion and price, should be combined with human resource management functions. For example, if product and service are applied to the functions of human resource management, they indicate personnel service, courses, schemes, etc. Tung, Lin, and Huang (1998) accordingly develop the relation map of internal marketing and human resource management. Based on the planning procedures of marketing, including the trend of marketing environment, analyzing market opportunities and threats, analyzing competition, marketing objective development, target market selection, market analysis, competitive position determination, marketing mix determination, and marketing budget preparation, they establish the internal marketing matrix to illustrate the concept integrating marketing concepts and techniques with human resource management functions, and they also deem that by means of internal marketing practice, human resource management functions can improve an enterprise's service quality and the employees' satisfaction and commitment toward the organization as well as urge the organization to succeed in change and learning.

In addition, a lot of domestic researchers employ the perspective of marketing process to explain the dimensions of internal marketing. For example, targeting at nursing staff and in light of marketing processes, such as the comprehension on market and competitive environment, the decision of target market segmentation, and the development of marketing mix, Huang (1998) brings up eight internal marketing dimensions, including internal market analysis, internal market segmentation, product, price, channel, communication, physical equipment, and participant, and verifies the correlation between internal marketing and employees' commitment toward organization. Liang (1999) takes the hotel industry as the research object, brings up six internal marketing dimensions, including regular and

continuous collection and analysis on market information, market segmentation, product, price, promotion and channel, and internal marketing activity management, and proves that internal marketing and employees' customer-oriented behaviors are positively correlated.

Although the internal marketing dimensions developed according to marketing processes are more thorough, the problems of overlaps, blur, and difficulties in distinguishing are easy to be generated in practical applications and the development of measuring items. Furthermore, even though, according to the definition and content of internal marketing, other scholars bring up other internal marketing dimensions on after another, in which George & Gronroos (1989), for instance, address management support, training, internal communication, personnel management, and external activity, they are not as thorough as Gronroos (1990). Consequently, by referring to the seven internal marketing dimensions by Gronroos (1990), the scale by Foreman & Money (1995), which is used to measure three internal marketing activities, including development, vision, and recompense, the internal marketing definition based on human resource management, it is advocated in this study that internal marketing variables include six dimensions, namely market research, research segmentation, communication, vision, development, and recompense.

Internal marketing is, based on employee needs, to properly apply marketing concepts and techniques to efficiently obtain, develop, inspire, and maintain customer-conscious and spontaneous employees and then establish a long-term and satisfactory relationship with customers through the creation of employee satisfaction. The presupposition of internal marketing thus lies in creating the satisfaction of internal customers. Many studies also confirm that the practice of internal marketing helps increase employees' job satisfaction (e.g. Tansuhaj et al., 1991; Rafiq & Ahmed, 2000; Conduit & Mavondo, 2001; Hwang & Chi, 2005) and further improves the performance of an organization. Therefore, the first hypothesis is addressed in this study: internal marketing positively influences job satisfaction.

### **Knowledge Sharing**

According to Sarvary (1999), knowledge management is one kind of commercial process, a process that a business creates, uses, communicates, accumulates organizational knowledge, and the process includes the organizational learning stage in which a company acquires knowledge or information, the knowledge generating stage in which the company transforms unprocessed information into the information that can be used to solve company management problems, and the knowledge expansion stage in which all the company members can obtain and employ organizational knowledge. The major purpose of knowledge management is to change information into valuable and problem-solvable knowledge or wisdom and to save the time and resources necessary for repeatedly obtaining and creating knowledge through the processes of communication and accumulation.

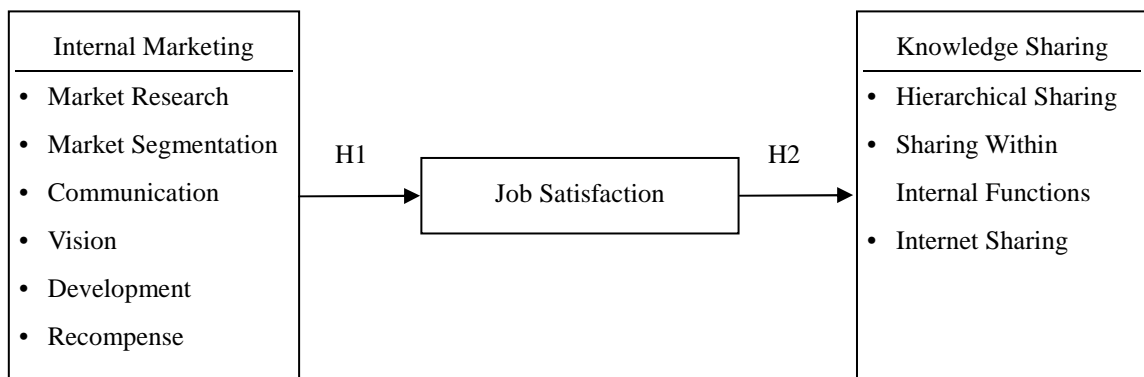
Based on knowledge management processes, a lot of scholars explore the elements of knowledge management and the correlations with other research variables. For example, Wu (1996) argues that when an organization accumulates knowledge, it can employ knowledge extraction, diffusion, institutionalization, etc.; taking high-tech industries as the research object, Hsieh (2001) divides knowledge management into the procedures of knowledge acquirement, creation, diffusion, accumulation, etc., investigates the correlations with product innovation and management performances, and discovers that knowledge acquirement and accumulation significantly influence management performances, such as marketing/market performance, and overall performance while knowledge creation and accumulation significantly influence product innovation, which indicates different knowledge management procedures generate different influences on organization innovation and management performances. Taking information hardware industry as the research object, Liu (2000) also separates knowledge management into knowledge acquirement, accumulation, diffusion, and creation, investigates the correlations with knowledge management performances, such as the satisfactory degrees of knowledge acquirement, accumulation, etc., and discovers the correlations between knowledge management procedures and performances will be influenced by knowledge management features and organizational cultures.

Knowledge management processes are considerably complicated, and plenty of factors may affect each of them. The investigation may lack details or specifics if it aims at the entire knowledge management. Meanwhile, scholars also deem that the practice of internal marketing can effectively advance the collaborative and information communication

behaviors between employees (David, 2003) because they feel the respect from the organization, they are satisfied with their work, and they are thus more willing to have the behaviors beneficial for the organization, such as knowledge sharing, which meets the exchange perspective of internal marketing. David (2003) addresses that knowledge sharing includes three categories: hierarchical sharing, sharing within internal functions, network sharing. Hierarchical sharing is a professional-oriented knowledge sharing category, in which professional knowledge is shared through formal hierarchical channels, usually top-down, but this kind of sharing is restricted to organizational rules. Sharing within internal functions is one kind of market-oriented knowledge sharing category, which usually indicates the sharing between the internal suppliers and the internal customers in the organization value chain, and which is frequently limited to employees' lack of customer consciousness and their self-defensive attitudes. Network sharing is one kind of employee-oriented knowledge sharing category, in which employees often share the knowledge through spontaneity and internal communities because they would like to satisfy their own social and economic benefits. Consequently, network sharing can be seen as the most spontaneous category for employees to share knowledge, and it is not confined to organizational class or directions. Hence, the second hypothesis in this study is addressed: job satisfaction positively influences employee's knowledge sharing behaviors.

## RESEARCH METHODOLOGY

The promotion of internal marketing aims at establishing the fine relationship between executives and employees, enhancing employee satisfaction, and thus creating customer satisfaction. For high-tech enterprises whose life span is short, and which value innovation and R&D, internal marketing, which may stimulate employees' consciousness of customer service and commitment as well as recognition for the organization, and organization knowledge, which may encourage employees to communicate and share the personal professional knowledge and further develop it into value and competency, are gradually valued by relevant scholars and enterprises. However, the domestic studies relevant to internal marketing have not been conscientious and careful enough and have aimed more at investigating service industries; there is a lack of the research on the correlation between internal marketing and knowledge sharing; the industries face a fast changing competitive environment and a particular talent structure, so the establishment of internal marketing concepts is even more important. Nevertheless, high-tech industries' unique industrial characteristics and the factors of the competitive environments may influence enterprises' planning of internal marketing strategies. Consequently, in light of the compilation and investigations of related literature, a conceptual framework is constructed in this study to explain the correlations between internal marketing elements, job satisfaction, and knowledge sharing (as indicated in Figure 1).



**Figure 1: Conceptual Framework**

According to the conceptual framework, this study first interviews in-depth the high-ranking executives from the IT industry in the domestic science parks to comprehend the current situation of the promotion of internal marketing and knowledge management in the enterprises. Moreover, to relevant literature is referred in order to develop scales for

internal marketing, job satisfaction, and knowledge sharing, and related experts, including scholars, executives, and employees are invited to revise the items to assure the feasibility of the scales. Finally, employees are surveyed by means of questionnaire to verify the feasibility of the conceptual framework and each hypothesis in this study.

The questionnaire of this study is mainly divided into four parts. The first part is internal marketing elements. The seven internal marketing dimensions by Gronroos (1990) and the internal marketing scale developed by Foreman & Money (1995) are employed in the research to develop a scale with 24 items, in which the Likert Five Point Scale is used, and the interviewees are required to fill in their perceptions (strongly agree – strongly disagree) and satisfaction degree (very satisfied – very dissatisfied) of the items for the six internal marketing elements, namely market research, market segmentation, communication, vision, development, and recompense. The second part is job satisfaction, in which the Job Satisfaction Survey, JSS, developed by Spector (1985) is employed to develop nine items, the Likert Five Point Scale is used, and the interviewees are required to fill in their satisfaction degree (very satisfied – very dissatisfied) of the items, including salary, promotion, management style and relation, welfare, reward, operation process, colleague relation, job description, and communication. The third part is knowledge sharing, in which the definition of the three knowledge sharing categories brought up by David (2003), namely hierarchical sharing, sharing within internal functions, and network sharing are consulted to develop a scale with nine items, the Likert Five Point Scale is used, and the interviewees are required to fill in their personal perceptions (strongly agree – strongly disagree). The last part is basic company information and personal data, including the interviewed company’s size and founding time, or age, and the employee’s sex, age, education, occupation, income, residential region, etc.

The analysis in this study is principally conducted by means of SPSS for Windows. Cronbach’s  $\alpha$  is first employed to verify the questionnaire reliability of this study and accordingly amend the questionnaire moderately. Second, frequency analyses, such as frequency distribution and percentage, are used to understand the characteristics of the retrieved samples and the interviewees’ responses in each research variable. Finally, through Pearson Correlation Analysis and LISREL, the correlations between internal marketing, job satisfaction and knowledge sharing are tested to verify the feasibility of the framework and hypotheses in this study.

## RESEARCH RESULT

### Sample Description

The IT industries in the domestic science parks are divided into semiconductor, opto-electronics, computer peripherals, communications, etc. According to the directory information on the website of the science parks, there are 301 IT enterprises in the domestic science parks by 2009. In addition, after contact and eliminating the firms without products in the market or formal operation, including those under construction, relocating, and shutdown factories, the total samples of this study are 301 firms. The firm number of each industry and the cooperative firm number are listed in Table 1.

**Table 1: Researched Firms**

industry	total firms	cooperative firms	ratio of cooperative firms
semiconductor	129	72	55.8%
opto-electronics	88	28	31.8%
communications	53	32	60.4%
computer peripherals	31	21	67.7%
sum	301	153	50.8%

In order to confirm the validity of the research result, all the IT firms (301 firms) which normally operate in the parks are surveyed. The firms whose high-ranking executives are abroad, whose company policies are not open to the outside world, and which are not willing to help with the questionnaire survey are taken out; ten copies of the employee questionnaire are actually delivered to the 153 cooperative firms, 1530 copies of the employee questionnaire in total. If the questionnaires are not returned in twenty days after they arrived each firm, the interviewers will further contact the firms not yet returning them by phone, and if the questionnaires are lost or in shortage, new copies will be sent again.

The questionnaires are sent in succession since October, 2008, and the retrieval is completed in the end of March, 2009, the questionnaire survey period five months in total. After twice of retrieval phone calls and resending questionnaires, 920 copies are retrieved totally, and after eliminating the questionnaires with too many unanswered items and without personal data, 873 valid questionnaires are retrieved (the valid retrieval ratio is 57.1%).

In this investigation, for the sex of the interviewed employees, males and females are equal in ratio; the age is mainly between 25-30 years old (53.2%), the second 31-35 years old (28.4%); the educational background is principally graduate institute or college (respectively 39% and 30%), and people with the educational background above junior college are approximately 20%, which indicates the high education level of the employees in the enterprises in the science parks. More than half of the interviewed employees in the present company have the seniority between 5-8 years, indicating their understanding of the company affairs. The employees' average monthly income is NT\$40,000-NT\$55,000 (40%), and the positions of the interviewed employees are half administrative and half technological.

### **Research Variables Description**

There were 24 items in the original internal marketing scale. After the discussion with experts and the elimination of the items with improper wording, there are 20 items left in the scale. Through factor analysis, six factors are extracted and respectively named 'market research' ( $\alpha=.79$ ), 'market segmentation' ( $\alpha=.83$ ), 'communication' ( $\alpha=.73$ ), 'vision' ( $\alpha=.80$ ), 'development' ( $\alpha=.75$ ), and 'recompense' ( $\alpha=.92$ ), the reliability values of which all meet the judging principles of Cronbach (1951), which indicates that this scale reaches appropriate internal consistency. Furthermore, what the interviewed employees agree the most (4.12) and feel satisfied (3.29) are the communication actions between company and employee, but they are most dissatisfied with that the company would like to understand the employees' opinions or let them understand its developing vision. Meanwhile, the employees also recognize (3.82) and feel satisfied with (3.38) that the company obtains customer and market information through various channels and methods.

After the discussion with experts, the job satisfaction scale, formerly with nine items, still keeps the original nine items only modified in wording. Through factor analysis, three factors are extracted and respectively named 'salary' ( $\alpha=.85$ ), 'working situation' ( $\alpha=.78$ ), and 'colleague relation' ( $\alpha=.73$ ), the reliability values of which all meet the judging principles of Cronbach (1951), which indicates that this scale reaches appropriate internal consistency. Among them, the interviewed employees are most satisfied with working situation (3.79) and less satisfied with salary (2.84).

After the discussion with experts, the knowledge sharing scale, formerly with nine items, still keeps the original nine items only modified in wording, too. Through factor analysis, three factors are extracted and respectively named 'hierarchical sharing' ( $\alpha=.77$ ), 'sharing within internal functions' ( $\alpha=.82$ ), and 'network sharing' ( $\alpha=.81$ ), the reliability values of which all meet the judging principles of Cronbach (1951), which indicates that this scale reaches appropriate internal consistency. Among them, the interviewed employees think that the opportunity of 'hierarchical sharing' is the highest (3.9), the second 'sharing within internal functions' (2.8). However, there is not significant difference between the recognition of 'sharing within internal functions' and that of 'network sharing' ( $p=.21$ ).

### **Correlation Analysis and Test**

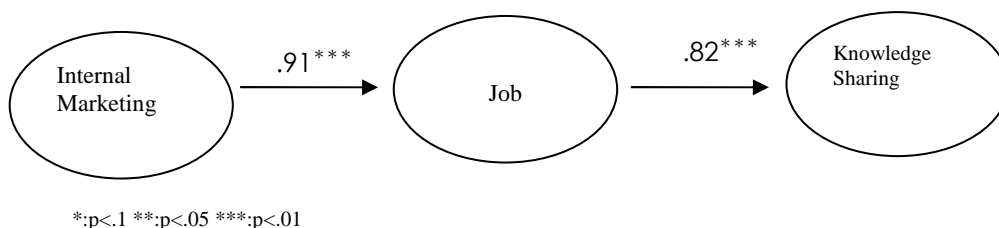
Through correlation analysis, it is found that except that there is not significant correlation ( $p>.1$ ) between 'market segmentation' of internal marketing and 'working situation' and 'colleague relation' of job satisfaction, internal marketing and each of its dimensions (market research, market segmentation, communication, vision, development, and recompense) are all significantly, positively correlated to job satisfaction and each of its dimensions (salary, working situation, and colleague relation) ( $r=.55-.80$ ,  $p<.01$ ), that is, the higher employees' perception of the internal marketing actions of an organization is, the more helpful it is to increase employees' job satisfaction. The result supports the first hypothesis: internal marketing positively influences job satisfaction.

It is found that job satisfaction and each of its dimensions (salary, working situation, and colleague relation) are significantly, positively correlated ( $r=.72-.92$ ,  $p<.05$ ) to knowledge sharing and each of its dimensions (hierarchical sharing, sharing within internal functions, and network sharing). In particular, job satisfaction and one of its dimensions, namely colleague relation, are the most correlated to network sharing ( $r=.92$ ,  $p<.01$ ), that is to say, the higher job

satisfaction employees possess, the more willing they are to communicate and share knowledge. The result supports the second hypothesis: job satisfaction positively influences employee's knowledge sharing behaviors.

#### I. Structural Equation Model Analysis

LISREL is used in this study to investigate the correlations between internal marketing, job satisfaction, and knowledge sharing. In light of the result, the research model is well fit (GFI=0.95 · CFI=0.92), and the correlation between internal marketing and job satisfaction ( $p<.01$ ) as well as that between job satisfaction and knowledge sharing ( $p<.01$ ) are both significant. The hypotheses and models are also supported.



**Figure 2: Verification for Hypothesis Models: LISREL**

### CONCLUSION

Targeting at the IT industry in the science parks in Taiwan, a questionnaire survey is conducted in this study to investigate the correlations between internal marketing, job satisfaction, and knowledge sharing. According to the result, for internal marketing actions, the interviewed employees are the most satisfied with that the organization obtains market information and communicates with the employees through various channels and methods, but they deem that the organization has not made enough effort to depict them employees the vision and the future developing direction, whose influence on condensing employee common consensus, loyalty, and sense of belonging can be seen as negative. In addition, for knowledge sharing model, the interviewees generally express that the organization shares information by mostly hierarchical sharing and less sharing within internal functions or network sharing. Hierarchical sharing is suitable for top-down message releasing and professional knowledge communicating, but since there are frequently restrictions resulted from levels and work norms in the process, it is less beneficial for informal messages or the interaction between employees. On the contrary, network sharing indicates that based on social or economic benefits, employees share knowledge, which is more spontaneous, so organizations ought to stimulate employees' spontaneous knowledge sharing behaviors through various management practice, such as work design, process reengineering, and inspiration.

Furthermore, through statistical analysis, it is found in this study that internal marketing positively influences job satisfaction, and job satisfaction is helpful for employees to generate knowledge sharing behaviors. In particular, colleague relation, a dimension of job satisfaction, is the most influential for network sharing, the most spontaneous knowledge sharing, and this indicates that administrators should pay attention to the cultivation of the fine relation between employees in order to stimulate them to share knowledge voluntarily. Finally, although the correlation between internal marketing and knowledge sharing has not been proved in this study, some scholars deem that knowledge sharing types will be affected by internal marketing (David, 2003). For example, the more high-ranking executives support internal marketing, the more possible hierarchical sharing will be urged to occur; when employees face simple customer problems, it is only necessary to conduct knowledge sharing within internal functions, but when the problems they face are difficult to solve or complicated, it is necessary to conduct hierarchical sharing in order to obtain higher-level information or professional knowledge. However, whether problems are difficult or easy, the employees in an organization which values the communication between them conduct network sharing to share knowledge on ordinary days, which not only updates information but also holds together the relation between employees (social benefit). Consequently, it is suggested that the following researchers may further investigate the influence of each dimension of internal marketing on different knowledge sharing models to discover the inspiring factors which may stimulate employees' behaviors in spontaneous knowledge sharing (network sharing).

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