INTERNAL CAPABILITIES, EXTERNAL LINKAGES, AND ORGANIZATIONAL PERFORMANCE: A STUDY ON TECHNOLOGY-BASED KOREAN VENTURES

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ABSTRACT

This study examined the influence of internal capabilities and organizational linkages to external entities on firm performance by using data from 143 technology-based young Korean enterprises. Internal capabilities were operationalized by entrepreneurial orientation, technological capabilities and financial resources invested. External linkages were captured by partnership-based linkages and sponsorship-based ones. Partnership- based linkages were measured by strategic alliance with other firms, participation in venture associations, and collaboration with universities or research institutes. Sponsorship-based linkages consisted of financial and non-financial support from venture capitalists, commercial banks and the Korean government. Sales volume and competitiveness of products/services indicated organizational performance. Regression results showed that technological capabilities and financial resources are important predictors of organizational performance. Among external linkages, alliance with other firms and venture capital companies significantly enhances organizational performance. Several interaction terms have very significant influence on performance. Implications and directions for future research were discussed.

INTRODUCTION

As an agent of creative destruction, technology-based young firms are one of the engines of economic development and wealth creation (Schumpeter, 1934). Technology-based young firms create new jobs (Birley, 1986) and foster technological innovations (Tushman & Anderson, 1986). However, these young firms are very prone to failure as "liability of newness" arguments suggested (Stinchcombe, 1965). As a result, scholars, policy-makers, and entrepreneurs are very concerned with factors that contribute to the success of technology-based young firms. This paper examines the influence of firm internal capabilities and firm's linkages to external entities on the organizational performance of technology-based young firms.

What determines organizational performance is a perennial research question for organizational scholars. Many different perspectives have been developed to explain performance differential among firms. Several perspectives such as industrial organization (e.g., Caves, 1984) and population ecology (Hannan & Freeman, 1985) have emphasized industry or environmental conditions and ignored intra-industry performance differential among firms. By contrast, other perspectives have underscored the characteristics and activities of organizations rather than environmental conditions and explained intra-industry performance differential. Among those perspectives, two perspectives are very contrasting.

First, resource-based view of the firm (RBV hereafter) emphasizes firm idiosyncratic resources (e.g., Barney, 1991; Penrose, 1959; Wernerfelt, 1984). RBV regards the firm as a bundle of resources and suggests that characteristics of firm resources significantly affect the firm's competitive advantage (Barney, 1986, 1991; Penrose, 1959; Peteraf, 1993; Wernerfelt, 1984). Firms of which resources are valuable, scarce, imperfectly tradable, and hard to imitate can have a sustainable advantage over competitors (Barney, 1986; Dierickx & Cool, 1989; Peteraf, 1993; Reed & DeFllippi, 1990). The firm resources investigated before include human resource, technological resource, financial resource, organizational culture, managerial capabilities, etc (Barney, 1986; Hall, 1991, 1993; Prahalad & Hamel, 1990).

Second, social capital theory suggests that social capital of organizations is a very important antecedent of organizational performance (Leenders & Gabbay, 1999). Recently, Organizations as an open system should mobilize external resources to produce products/services and should have ability to attract and retain customers (Burt, 1992; Pennings & Lee, 1999; Pennings, Lee, & Witteloostuijn, 1998; Uzzi, 1995). Firm's ability to mobilize extramural resources and to attract customers is influenced by the quality of a firm's linkages to external entities, because social relations mediate economic transactions and confer organizational legitimacy (Granovetter, 1985). While RBV has focused on resources or capabilities accumulated inside the firm, social capital theory has underscored a firm's relational characteristics with external entities.

Drawing on the two perspectives, this paper examines the influence of internal capabilities and linkages to external entities on organizational performance in the context of technology-based young Korean enterprises. Additionally, this study investigates the joint effects of internal capabilities and linkages to external entities on organizational performance. We used survey data from 143 firms that were producing computer software, electric and

electronic products, and biotechnological products.

This study can contribute not only to field of management and organization and but to entrepreneurs. The current state of theory on technology-based young firms is in its own infancy. Theoretically, this study can test empirical validity of RVB and social capital theory on competitive advantage and can identify key success factors of venture business. More important contribution is that this study combines the two theoretical perspectives. Few studies have combined the two research streams, and to our knowledge no study has examined the joint effects of internal resources and linkages to external entities on organizational performance. Practically, this study can provide managerial implications to entrepreneurs in technology-based industries. Results of this study can suggest what kinds of internal capabilities entrepreneurs should accumulate and what kinds of external linkages entrepreneurs should develop.

THEORY AND HYPOTHESES

Internal Capabilities and Organizational Performance

What are the crucial internal capabilities that determine the performance of technology-based young firms? Several investigators have emphasized the attributes of entrepreneurs such as entrepreneurial attitude, education, work experience, and start-up experience as key success factors (e.g., Cooper & Bruno, 1977; Kazanjian, 1988; Miller, 1983; Mintzberg & Waters, 1987; Van de Ven, Hudson, & Schroder, 1984). By contrast, several papers such as Eisenhardt and Bourgeois (1988), Eisenhardt and Schoonhoven (1990), Goodstein and O'Reilly (1988), and Roure and Maidique (1986) have demonstrated that the attributes of top management team such as team size, joint work experience and heterogeneity in functional backgrounds of founding members were also important predictors of venture success.

Recently, several scholars have extended the antecedents of technology-based venture's success to the characteristics of organization as a whole. These characteristics include founding strategy (Romanelli, 1989), the degree of technical innovation within the core technology of the firm (Boeker, 1989; Maidique & Patch, 1982), the amount of financial expenditure after foundation (Schoonhoven et al., 1990). This paper examines the attributes of organization as a whole while controlling for founder's attributes and environmental conditions.

Review on literature of RVB and entrepreneurship combined with interviews with top executives of our sample firms suggest three important kinds of internal capabilities that significantly influence the performance of technology-based young organizations. They are entrepreneurial orientation, technological capabilities, and financial resources invested. Definitions of these variables and their relationship with organizational performance are provided as follows.

Entrepreneurial orientation. Entrepreneurs usually found a new venture to create a new market niche with new products/services or to substitute established players with better quality, cheaper price, etc. The creative destruction process calls for entrepreneurs to invest a great deal of resources in innovation (Kao, 1995; Schumpeter, 1934, 1947). Technology-based young organizations are not likely to succeed without the investment in innovation. Without

innovation, young organizations have to rely on traditional ways of doing business; traditional products/services, traditional distribution channels, usually higher price than established players. Head-to-head competition with established players is highly likely to lead the failure of new organizations due to the deficiency of many critical resources such as scale, legitimacy, network ties with resource holders such as supplies and customers, etc. As a result, new organizations should differentiate themselves from established players by introducing innovations.

To generate innovations, entrepreneurs of technology-based young organizations should run the organization entrepreneurially (Covin & Slevin, 1991; Zahra, 1993). The term "entrepreneurial orientation (EO hereafter)" can capture the organizational processes, methods, and styles that firms use to act entrepreneurially (Lumpkin & Dess, 1996; Miller, 1983). It has been studied as a key determinant of the performance of new ventures in entrepreneurship literatures (e.g., Lumpkin & Dess, 1996). We adopted three dimensions of EO suggested by Miller (1983); innovativeness, risk-taking propensity, and proactiveness. Numerous studies have adopted or extended the conceptualization in new venture investigation (e.g., Covin & Slevin, 1989; Ginsberg, 1985; Lumpkin & Dess, 1996; Morris & Paul, 1987; Schafer, 1990). Innovativeness reflects a firm's propensity to engage in and support new ideas, experimentation, novelty, and creative processes that may result in new products, services, new market, and manufacturing processes (Lumpkin & Dess, 1996). Risk-taking propensity of a firm is its willingness to make large and risky resource commitments (Miller, 1983). Finally, proactiveness refers to how a firm relates to market opportunities through active market research and introduction of new products/services ahead of competitors (Lumpkin & Dess, 1996; Miller & Friesen, 1978). This discussion provides following hypothesis.

Hypothesis 1: The level of entrepreneurial orientation is positively associated with organizational performance.

Technological capabilities. Technology-based young organizations usually were established to enter the existing market niches or create new market niches by developing and utilizing new technologies. Not surprisingly, technological capabilities have been regarded as a critical success factor that determines the performance not only of technology-based organizations (e.g., Bettis & Hitt, 1995; Henderson & Clark, 1990; Tushman & Anderson, 1986) but also of technology-based new ventures (Chandler & Hanks, 1994; Dollinger, 1995; Shrader & Simon, 1997). Technological capabilities are defined as technological knowledge, technical expertise or know-how generated by R&D (Dollinger, 1995). Especially, patents and utility models patents and designs, which are protected by patent laws and thus can be used exclusively, allow new ventures to create new products, identify market opportunities, and differentiate themselves from competitors. Technological capabilities of young organizations that are not protected by laws are very vulnerable to be imitated by competitors, especially by large established competitors. Large firms can absorb the unprotected technologies of young organizations by scouting the key technicians or researchers with a lure of thick compensation that young organizations cannot afford to provide. Patent laws cannot protect several kinds of competitiveness enhancing technological capabilities. One of them is quality control capability. Absent of other signaling indicators for product quality, quality assurances provided by domestic and international institutions enhance organizational performance by letting potential customers know the technological capabilities of new ventures.

This discussion leads us to following hypothesis.

Hypothesis 2: Technological capabilities a new venture built is positively associated with organizational performance.

Financial resources. Financial resources that a new venture invested before are very important predictor of venture performance (Dollinger, 1995; Schoonhoven et al., 1990; Shrader & Simon, 1997). Schoonhoven et al. (1990) argued that the amount of capital a new venture has expended before would increase the speed with which first products reach market. Technology-based young organizations usually invest all available financial capital during early development stage. However, they usually run short of financial resources that should be invested for technology development, market research and advertising, because they typically are less able to mobilize financial resources from external entities from banks than more established companies are. Young firms endowed with a large amount of capital have many advantages. They can invest more to develop products, advertise, research market, and hire experts whose capabilities are necessary for organizational success. Other things being equal, young firms that invested more in R&D, advertising, and market research are more likely to perform better in the future. This discussion leads us to following hypothesis.

Hypothesis 3: The amount of financial resource that a venture invested before is positively associated with organizational performance.

Linkages to External Entities and Organizational Performance

Organizations, either established larger ones or new start-ups, does not have sufficient resources needed and thus has to exchange the resources with organizational environment (Pfeffer & Salancik, 1978). Especially new start-ups that usually are established only with ideas and thus are deficient of many resources should mobilize resources from external environment. In mobilizing external resources, linkages to external entities play very important role. It is because economic actions are embedded within larger organizational networks, which not only facilitate some types of actions but also constrain actor's choices and actions transcending pure cost-benefit analysis (Granovetter, 1985). Dollinger (1985) found that financially successful entrepreneurs were particularly active in networking with business people and regulators. Hansen (1995) also found that entrepreneurial networks are positively associated with organizational growth. Networks are vital to perceive opportunities, test ideas, and garner resources to create new enterprise (Aldrich & Zimmer, 1986).

The networks among organizations have been investigated as a key factor that influences organizational actions and performance. Recently suggested term "corporate social capital" captures this effect of social networks on organizational performance (e.g., Pennings et al., 1998). Corporate social capital can be defined as "the set of resources, tangible or virtual, that accrue to a corporate player through the player's social relationships, facilitating the attainment of goals (Gabbay & Leenders, 1999: 3)."

We differentiated partnership-based linkages from sponsorship-based linkages. Partnership-based linkages are cooperative and bilateral relationships in the sense that participants in the relationship give-and-take resources for a considerable time span. Sponsorship-based linkages are unilateral relationships in the sense that external entities

provide unilateral supports to a new venture without receiving explicit rewards. Both kinds of linkages can enable a firm to mobilize resources needed for input transformation and sell the output (Baum & Oliver, 1991; Eisenhardt & Schoonhoven, 1996).

Partnership-based linkages. Partnership-based linkages to external entities can be defined as cooperative or collaborative relationships with environmental constituents (Baum & Oliver, 1991; Dollinger, 1989). Literature review and interviews with top executives of our sample firms suggest that three kinds of partnership-based linkages are crucial to enhance the performance of technology-based young organizations. They are linkages to (1) resource supplying organization including venture capitalists and consuming organizations, (2) other technology-based young organizations, and (3) universities and research institutes. Strategic alliance is used as an instrument to have a long-term relationship with suppliers and customers. Participation in venture associations and informal entrepreneurs' network help a firm to establish relationship with other young organizations. Formal R&D contracting-out provides linkages to universities and research institutes.

Strategic alliances with suppliers and customers provide a great advantage to young firms. Strategic alliance can signal enhanced legitimacy for firms (Baum & Oliver, 1991; Eisenhardt & Schoonhoven, 1996), provide opportunities for gaining new competence (Hagedoorn, 1993; Hennart, 1991), and offer specific knowledge-based resources such as manufacturing or customer information (Hamel et al., 1989; Teece, 1987). Alliance can also help firms to gain market power (Hagedoorn, 1993), move more quickly into new markets and technologies, and create option for future investment (Eisenhardt & Schoonhoven, 1996). Through strategic alliances, a firm can secure stable sources of resource supplies and sales of products/services. New ventures usually have a great difficulty in securing suppliers and customers who are questioning the long-term survival of the venture. Suppliers are reluctant to transact with a new venture especially when the transaction requires transaction-specific investments, because the investments are not likely to be recovered. Customers are also reluctant to buy products/services of new ventures, because they suspect the quality and performance of products/services produced by new ventures, and worry about repair services and value of warranty in cases of the venture's failure. Several studies have illustrated the benefit of having strong relationship with others for a venture success. For instance, Uzzi (1996) showed that strong ties with suppliers, which are very similar to strategic alliance, enhance the survival chance of new ventures.

Equity investment of venture capital companies into a new venture not only provides financial resources and management know-how but also enhances legitimacy. Since venture capital companies that invested in a new venture have a strong incentive to make the venture succeed, they provide management related know-how and refer potent professionals who can help the venture. Potential suppliers, buyers, investors and employees face a great deal of uncertainty in deciding whether they transact with the new venture or not. The equity participation of venture capital companies signals to those suspecting entities that the new venture has a high chance of success. The legitimacy and lowered perceived uncertainty enable a new venture to mobilize external resources with better terms.

By participating in venture associations and informal entrepreneurs' networks, entrepreneurs can obtain valuable information about management of venture business, new

market trends and opportunities, and potential cooperators (Pennings & Harianto, 1992). Noria (1992) linked interpersonal contacts within Route 128 business community to implications for cooperative action among firms. The networks also help entrepreneurs find right professionals such as lawyers, accountants, and venture capitalists who can help the ventures, since networks can function as powerful referring networks. The reference will be more valuable when it has a solid ground to believe the referee because of two reasons. First, information transferred through trustworthy relations is more credible and interpretable because the identity of actors and the intensity of their social ties are as important as the information itself (Uzzi, 1996). Second, the network functions as a social control mechanism, because the network diffuse information about economic actors, and the fear of reputation loss resulting from opportunistic behavior deters firms linked to the network from behaving opportunistically against each other (Raub & Weesie, 1990). Noria (1992) linked interpersonal contacts within Route 128 business community to implications for cooperative action among firms. In addition to direct interpersonal contact, status and reputation also enhance the likelihood of cooperation (Podolny, 1994) These qualities signal the skill and trustworthiness of potential partners and so facilitate cooperation, particularly when there is high uncertainty (Eisenhardt & Schoonhoven, 1996).

The collaboration with universities and research institutes provides a means of developing technological knowledge, which cannot be developed by a new venture alone (Mapes, 1967). Universities also provide consulting assistance to a new venture and opportunities for continuing education for professional employees (Cooper, 1973). In the long run, the collaboration can enable new venture to recruit researchers with high caliber who will not join the venture otherwise. In the collaboration process, professors and researchers are personally acquainted with the venture and thus recommend their students/fellow young researchers to join the venture. In addition, graduate students who participate in the projects can get to know about the venture and its technology and are likely to join as key members of the venture when they believe the success potential of the venture. Interviews with the founders of successful technology-based Korean ventures also indicate that they actively used the collaboration with universities and research institutes for developing technology in the short tem and for hiring high-quality employees. These discussions lead us to following hypothesis.

Hypothesis 4: The partnership-based linkages to other firms, venture capital companies, venture associations, and universities/research institutes are positively associated with organizational performance.

Sponsorship-based linkages. Sponsorship-based linkages of an organization are unilateral relationships in the sense that external entities provide supports to the organization without receiving explicit rewards. Young organizations that are supported by powerful institutes have a great advantage (Flynn, 1993). The linkages increase the amount of external resources available to a new venture, providing the opportunity for organizational growth. Reducing the potentially adverse effects that arise during vulnerable early stage of the organization (Stinchcombe, 1965), the linkages protect the new ventures from environmental threats (Hall, 1982; Miner, Amburgey, & Sterns, 1990). Young organizations can mobilize resources from those institutes free of charge or with better terms. The sponsorship of those institutes also enhances the social legitimacy and status of a new venture (Baum & Oliver,

1992; Podolny, 1993). The enhanced legitimacy and status enable a new venture to mobilize resources from other entities that are critical for venture success.

In the context of technology-based young Korean organizations, the Korean government has initiated creating a richer and more nurturing environment conductive to birth and survival of technology-based ventures. The government itself nominated several technology-based ventures as promising ones and provided research funding for technology development to those ventures. The Korean government has established a variety of promising small enterprise nomination programs. When selected as a promising small enterprise by government, a venture can obtain a developmental fund from the government and social legitimacy.

The Korean government also encouraged powerful financial institutions to provide more supports to technology-based ventures. Several commercial banks in Korea have established the promising small enterprise nomination programs. When selected as a promising small enterprise by a bank, a new venture can borrow money with an interest rate lower than market rate and also get social legitimacy. These discussions lead us to following hypothesis.

Hypothesis 5: The sponsorship-based linkages to venture capital, commercial banks, and government agencies will increase organizational performance.

Interactions. Above hypotheses suggest that internal capabilities and linkages to external entities individually influence organizational performance. While internal capabilities indicate organization's ability to transform inputs into outputs efficiently, corporate social capital - organization's linkages to external entities - determines ability to mobilize inputs needed for transformation and to dispose outputs (Burt, 1992). Internal capabilities help a firm to build social capital, since a firm with a higher level of distinctive capabilities is more likely to be selected as an alliance partner by other firms (Chung, Singh, & Lee, 1999). Corporate social capital also facilitates the accumulation of internal capabilities, because other firms linked to the focal firm offer access to valuable information, resources, and economic opportunities that are necessary for the accumulation of internal capabilities (Knoke, 1999).

Organization of which transformation capabilities are much greater than capabilities for garnering inputs and disposing outputs cannot fully utilize its transformation capabilities, since it has a difficulty in mobilizing necessary inputs from environment and in disposing outputs at a reasonable price. When the quality and performance of the outputs and the value of transformation capabilities can be accurately measured without substantial cost, external entities can rely on the measurement in deciding if they will transact with the focal firm. When the measurement is not easy as in the case of the output of technology-based young organizations, even a firm with a high level of transformation capabilities is not able to acquire extramural resources. It is because external entities face a great deal of uncertain in assessing the value of transformation capabilities and potential outputs.

Organization of which capabilities for garnering inputs and disposing outputs are much greater than transformation capabilities cannot acquire the inputs and dispose outputs in the long run. Social relations in which exchange between actors are not reciprocal for a long time

are likely to be broken, since one actor unilaterally sacrifices itself for the other for a long time (Chung, Singh, & Lee, 1999; Gouldner, 1960; Levi-Strauss, 1957). External entity that has exchange relations with a focal firm lacking transformation capabilities does not have strong incentive to maintain its relationship for a long time. In sum, organizations that keep the balance between internal capabilities and social capital can fully utilize them and thus can perform well. These discussions lead us to the following hypothesis.

Hypothesis 6. Internal capabilities and linkages to external entities will have positive interaction effect on organizational performance.

METHODS

Sample and Procedures

Population of our study is technology-intensive young Korean firms. We sampled firms from those firms that were enrolled as a venture company in Korean Small & Medium Business Administration. At the end of 1998, 2043 firms were enrolled. Among them, 1012 firms were producing computer software, electric and electronic products, and biotechnological products. We sent questionnaire to all of the 1012 firms. 175 firms (19 % response rate) responded to the questionnaire. To reduce unobserved heterogeneity, we deleted 19 firms that were founded by a joint venture of large Korean conglomerates or founded before 1983. We also deleted 13 additional responding firms due to missing information. As a result, we used data from 143 firms.

The data collection procedures are as follows. First, we interviewed top executives and upper echelon managers of 50 firms to find key variables that affect the performance of our sample firms. We also pretested our questionnaire by using 11 firms in December 1998. All of the questions in the final questionnaire asked factual (not perceptual) information. Most of prior empirical studies that measure entrepreneurial orientation use the several items with Likert 5 Scales. But this subjective measurement could have some problems (Chandler & Chandler, 1994; Jennings & Lumpkin, 1989). We sent the questionnaire to the CEO or founding members. These individuals were chosen because of their extensive knowledge of their firm's organizational characteristics. Considering smallness of our sample firms and their newness, they were very likely to have correct information. Also questioning factual information rather than perceptual information would enhance the accuracy of our data. The key informant method has been commonly used in organizational research when secondary archival data were not available (Hansen & Wernerfelt, 1993). 102 firms indicated that their top execute responded the questionnaire. Remaining 46 firms pointed out that top echelon managers filled out the questionnaire. The respondents were followed by phone calls to clarify any incomplete data.

Measurement of Internal Capabilities

We measured internal capabilities by three indicators; entrepreneurial orientation, technological resources, and financial resource invested.

Entrepreneurial orientation. Following suggestions of Miller (1983), Covin and Slevin (1991), and Stevenson and Jallio (1990), we measured entrepreneurial orientation by three

indicators: innovativeness, risk-taking propensity, and proactiveness. As Lumpkin and Dess (1996) suggested, we measured innovative activities as the number R&D employees divided by the total number of employees in 1997. We measured risk-taking propensity by two indicators; (1) the number of risk-taking R&D projects divided by total number of R&D projects in 1997 and (2) R&D expenditure per risk-taking R&D project (total risk-taking R&D expenditure / the total number of risk-taking projects in 1997). We treated a project for developing a brand new product as least in Korean industry as a risk-taking R&D project. Proactiveness were captured by three index by the ratio of market research costs to sales volume, the ratio of advertising expense to sales volume, and the ratio of the number of sales employees to total number of employees. Reliability test by using factor analysis suggested the deletion of proactiveness indicators. To create a single composite indicator for entrepreneurial orientation, we standardized an indicator of innovativeness and two indicators of risk-taking propensity by using mean and standard deviation of the corresponding indicator and added the three standardized scores.

Technological capabilities. We measured technological capabilities by three indicators; (1) the number of technologies developed by themselves, including the number of patents and patents submitted, (2) the number of utility model patents and designs that were registered to the Korean Patents Administration, and (3) the number of foreign and domestic quality assurance marks acquired. We standardized each of the indicators by using the mean and standard deviation of corresponding indicator and added them up to create a single indicator. Prior studies have used the number of patents (e.g., Miller & Shamise, 1996) or subjective indicators (e.g., Chandler & Hanks, 1994) to measure technological capabilities. Since the average age of our sample firms are 3 years and acquiring a patent usually takes three or more years, we could not use the number of patents only.

Financial resources invested**.** We measured financial resources invested by the amount of total R&D investment, advertising and market research investment in 1997. Schoonhoven et al. (1990) measured financial resources invested with monthly average of total costs and expenses accrued after organizational founding. The logic is that organizational performance largely depends on the amount of financial resource invested during the previous years.

Measurement of Linkages to External Entities

We differentiated linkages to external entities into two kinds. First, partnership-based linkage is more explicit and reciprocal relationship with external entities. Second, sponsorship-based linkage is a kind of uni-directional relationship. External entities provide unconditional support or long-term investment.

Partnership-based linkages. We measured partnership-based linkages by three indicators. The first indicator is the number of other firms with which a focal firm has a strategic alliance for marketing or technology development. The second is the number of formal associations for entrepreneurs and informal entrepreneur's network that a focal firm participates in. The third is the number of collaborating R&D projects and technology exchange programs with universities or research institutes.

Sponsorship-based linkages. We measured sponsorship-based linkages by three

indicators. The first indicator is the number of venture capital firms that invested equity in the focal firm. The second is measured by two index; (1) the number of cases in which financial institutes named the focal firm as a promising small enterprise, and (2) the number of financial institutes from which the focal firm received a loan with a below market interest rate during 1997. We standardized each of the two indicators by using the mean and standard deviation of corresponding one and added them up to create a single indicator. The third is measured by two index; (1) the number of cases in which Korean central or local governments named the focal firm as a promising small enterprise, and (2) the number of government research projects that the focal firm executed alone or with other organizations during 1997. We standardized each of the two indicators by using the mean and standard deviation of corresponding one and added them up to create a single indicator.

Measurement of Organizational Performance

How can we measure the performance of technology-based young enterprises? Profitability such as ROI (return-on-investment) may not be an appropriate performance indicator for those firms, because many of them are usually in the stage of product development (Hart, 1995). In addition, it is very difficult to gather accurate accounting data, since many of those firms did not establish an accurate formal accounting system yet. We could not use the speed of shipping first product for revenues after foundation (Schoonhoven et al, 1990), organizational growth (Eisenhardt and Schoonhoven, 1990) or organizational survival (Brüderl, Preisendörfer, & Ziegler, 1992), since we did not have firm level data from the founding. After interviewing top managers of our sample firms and considering prior studies on technology-based young enterprises, we selected two indicators; sales volume and the competitiveness of products/services.

Sales volume. Sales volume is the amount of sales during 1998. Entrepreneurs are very interested in sales volume and it is not sensitive to accounting methods that the focal firm adopted (Chandler & Hanks, 1994).

Competitiveness of products/services. We developed the second measure to reflect the fact that entrepreneurs usually found new firms with the objectives of outcompeting or replacing existing companies or creating a new market niche. To measure the competitiveness of products/services, we asked five questions about the competitiveness of products/services that the focal firm sold in 1998; (1) the number of products/services of which performance or quality was improved in 1998, (2) the number of products/services of which production cost competitiveness was enhanced in 1998, (3) the number of products/services that created a new market niche in 1998, (4) the number of products/services that penetrated established market successfully in 1998, and (5) the number of products/services that substituted significantly import from foreign countries in 1998. We divided the five numbers by the total number of products/services that the focal firm was selling, and then we computed the average of the five ratios. The average ratio indicates the percentage of products/services that had or improved competitiveness. Since the ratio itself does not inform us financial contribution to the focal firm, we multiplied the ratio and sales volume. Sales volume data for each of products/services with competitiveness would be more desirable, but we could not gather those data. Therefore, we estimated the sales volume from products/services with competitiveness. The measurement error would produce less significant coefficients for

independent variables, and likely to generate conservative bias in interpreting results.

Control variables

We controlled for variables that may affect performance indicators. Controlled variables include firm size measured by the total number of employees in 1997. We controlled for the average growth rate of market that the focal firm participated in during 1997 and the number of competing firms in 1997, since they can indicate environmental munificence (Chandler & Hanks, 1994; Schoonhoven et al. 1990). Also controlled is the length of founder's industry experience that would have positive effects on organizational performance (Brüderl, Preisendörfer, & Ziegler, 1992). We also controlled for organizational age that is the number of years elapsed after founding since it would positively influence performance as "liability of newness" arguments suggest (Stinchcombe, 1965).

Analysis

We employed ordinary least squares (OLS) regression to analyze the data. As we already mentioned in measurement section, we lagged the effect of independent variables at least one year. Two dependent variables were the organizational performance in 1998, while independent variables were either 'stock' indicators at the end of 1997 or 'flow' indicators before the end of 1997. We selected the length of lagging effect on the basis of interviews with top executives. The lagged dependent variable model would be a more rigorous test of the effects of firm characteristics on firm performance (Mosakovski, 1993).

In order to test the additive effects of internal capabilities, external linkages, and the interaction between internal capabilities and external linkages, we ran four different models for each dependent variable. The first model with only control variables is a benchmark against which to test the effects of internal capability on organizational performance. The second model has both control variables and internal capabilities in order to test positive global effects of complementarity in comparison to the first model. The third adds external linkages to the second model. The last model is a full model that includes control variables, internal capabilities, external linkages and interaction terms. It tests the additive effects of interaction terms on alliance formation relative to the third model.

RESULTS

Table 1 provides the means, standard deviations, and correlations of all variables. Positive and significant correlations between internal capability indicators and social capital indicators suggest that internal capabilities can help the development of social capital and vise versa. Also notable are positive and significant correlations among social capital indicators. Table 2 and 3 reports the results of four regression models explaining sales volume and competitiveness of services/products respectively.

Insert Table 1 about Here

Global tests. We conducted a series of global tests comparing successive models by using incremental F-test, as shown in the bottom of Table 2 and 3. The first global test indicates that Model II, which includes internal capabilities, as well as control variables,

explains the sales volume and the competitiveness of services/products significantly better than Model I, which has control variables only ($p < .001$). Also, the second global test indicates that Model III, which uses external linkages, explains the dependent variables significantly better than Model II ($p < .001$). The final global test shows that addition of interaction terms significantly improves explaining power of the model ($p < .001$). These global tests indicate that we have to consider internal capabilities, external linkages, and their interaction terms together to explain the performance of technology-based young organizations better.

Insert Table 2 about Here

Insert Table 3 about Here

Internal capabilities. We can test each of the hypotheses on the basis of the Model IV results. Hypothesis 1 suggests that internal capabilities of organization is positively associated with organizational performance. As the hypothesis predicts, financial resources invested positively influence both indicators of organizational performance. Entrepreneurial orientation does not have any significant effect on the dependent variables in Model IV. Contrary to the hypothesis, technological capabilities significantly decrease both indicators of organizational performance in Model IV. While the variable has significant and positive effect on the dependent variables in the other models, the positive coefficient becomes negative one when we introduce interaction terms in Model IV. Hypothesis 1 is not supported.

External Links. Hypothesis 2 suggests that linkages to external entities is positively associated with organizational performance. As the hypothesis predicts, linkages to other enterprises and venture capital companies have positive and significant influence on both indicators of organizational performance. Contrary to the hypothesis, linkages to commercial banks significantly decrease both indicators of the dependent variables. Linkages to government significantly decrease sales volume but significantly increase product competitiveness. Linkages to universities/research institutes do not have any effect on sales volume but have significantly negative effect on product competitiveness.

Interactions. The effect of interaction terms are mixed in general. Several interaction terms have positive influence on organizational performance, while other terms have negative influence on the dependent variables.

DISCUSSION AND CONCLUSIONS

This study provides several theoretical and practical implications for researchers and managers who are concerned with technology-based young organizations. First of all, this study showed the importance of financial capital invested and technological capabilities. Financial resources invested are as important as technological resources in determining organizational performance in the context of technology-based young organizations. The venture managers have to accumulate technological capabilities and to accurately assess market opportunities for venture success.

Second, the results of this study showed that linkages to external entities are very important for venture success as social capital theory suggested. Among various linkages, strategic alliances with venture capital companies, suppliers and customers are critical for

venture success. Sponsorship-based relationships are not so important for enhancing organizational performance.

Third, this study showed that there are very strong interaction effects of internal capabilities and linkages to external entities. The result suggested that organizations should simultaneously develop internal capabilities and social capital.

The weakness in the present study provide some suggestions for future research. First, this study focused on the formal inter-organizational relationships. Future research needs to consider informal inter-organizational relationships or social network such as entrepreneur's and founding team's personal networks (Dubini & Aldrich, 1991; Ostggard & Birley, 1994). The study of analyzing both of them could reveal the dynamics of external resource mobilization through social networks and furnish comprehensive results about external resource mobilizing of capabilities.

Second, future research can examine conditions under which the interaction effects of internal capabilities and corporate social capital are more prevalent. We claimed that difficulty in evaluating the outputs of a firm and the firm itself increases the strength of interaction effects. The results of this study showed that the interaction effects are very strong in the current setting, but did not showed that they are not strong in other less uncertain conditions.

Third, we could not use longitudinal methodology due to limitations in collecting data. Future research can collect data from the founding of sample firms and investigate other kinds of performance indicators such as survival, growth rate, and time interval between founding and the shipment of first commercial product for generating revenue.

REFERENCES

Aldrich, H. E., & Zimmer, E. R. 1986, Entrepreneurship through social network, In D. L. Sexton & R. W. Smilor (Eds.) ***The art and science of entrepreneurship:*** 3-24 Cambridge, MA: Ballinger Publishing.

Aldrich, H. E. 1979. ***Organizations and Environment.*** Englewood Cliffs, N.J.: Prentice-Hall.

Amit, R., & Schmaker, P. J. 1993. Strategic assets and organizational rent. ***Strategic Management Journal,*** 14: 33-46.

Astley, W. G., & Van de Ven, A. 1983. Central perspectives and debates in organization theory. ***Administrative Science Quarterly,*** 28: 245-273.

Astley, W. G. 1984. Toward an appreciation of collective strategy. ***Academy of Management Review,*** 9: 536-535.

Barney, J. B. 1986a. Organizational culture: Can it be a source of sustained competitive advantage? ***Academy of Management Review***, 29(2): 656-665.

Barney, J. 1986b. Strategic factor markets: Expectation, luck, and business strategy. ***Management Science***, October: 1231-1241.

Baum, J. A. C., & Oliver, C. 1991. Institutional linkages and organizational mortality. ***Administrative Science Quarterly***, 36(2): 187-219.

Birley, S. 1985. The role of networks in the entrepreneurial process. ***Journal of Business Venturing***, 1: 107-117.

Bogaert, I., Martens, R., & Van Cauwenbergh, A. 1994. Strategy as a situational puzzle: The fit of components. In Hamel, G., & Heene, A. (Ed.), ***Competence-Based Competition***: 57-74. New York: John Wiley & Sons.

Bollinger, L., Katherine Hope, & James M. Utterback 1983. A review of literature and hypotheses on new technology-based firms. ***Research Policy***, 12(1): 1-14.

Brush, C. G., & Chaganti, R. 1997. Cooperative strategies in non-high-tech new ventures: An exploratory study. ***Entrepreneurship Theory and Practice***, Winter: 37-54.

Cable, D. M., & Shane, S. 1997. A prisoner's dilemma approach to entrepreneur-venture capitalist relationship. ***Academy of Management Review***, 22(1): 142-177.

Castanias, R. P., & Helfat, C. E. 1991. Managerial resources and rents. ***Journal of Management,*** 17: 155-171.

Castrogiovanni, G. J. 1991. Environmental munificence: A theoretical assessment. ***Academy of Management Review***, 16: 542-565.

Chandler, G. N., & Hanks, S. H. 1994a. Founder competence, the environment and venture performance. ***Entrepreneurship: Theory and Practice***, 18(3): 77-90.

Chandler, G. N., & Hanks, S. H. 1994b. Market attractiveness, resource-based capabilities, venture strategies and venture performance. ***Journal of Business Venturing***, 9(4): 331-350.

Conner, K. 1991. A historical comparison of resource-based theory and five schools of thought within industrial organization economics: Do we have a new theory of the firm? ***Journal of Management***, 17: 121-154.

Covin, J., & Slevin, D. P. 1986. The development and testing of an organizational-level entrepreneurship scale. In B. A. Kirchoff, W. A. Long, W. E. McMillan, K H. Vesper, & W. E. Wetzel (Eds.), ***Frontier of Entrepreneurship Research***: 628-639. Wellesley, MA: Babson College.

Covin, J. G., & Slevin, D. P. 1989. Strategic management of small firms in hostile and benign environments. ***Strategic Management Journal***, 10: 75-87.

Covin, J. G. & Slevin, D. P. 1991. A conceptual model of entrepreneurship as firm behavior. ***Entrepreneurship: Theory and Practice,*** 16(1): 7-24.

Delery, & Doty, D. H. 1996. Modes of theorizing in strategic human resource management: Tests of universalistic, contingency, and configurational performance predictions. ***Academy of Management Journal***, 9(4): 802-836.

Dierickx, I., & Cool, K. 1989. Asset stock accumulation and sustainability of competitive advantage. ***Management Science***, 35: 1504-1511.

Dollinger, M. J., & Peggy, A. G. 1992. Inter organizational and collective strategies in small firms: Environmental effects and performance. ***Journal of Management***, 18(4): 695-716.

Dollinger, M. J. 1995. ***Entrepreneurship: Strategies and resources***. Boston: Irwin.

Dubini, P. & Aldrich, H. E. 1991. Personal and extended networks are central to entrepreneurial process. ***Journal of Business Venturing***, 6(5): 305-313.

Eisenhardt, K. M., & Schoonhoven, C. B. 1990. Organizational growth: Linking founding team strategy, environment and growth among U.S. semiconductor ventures, 1978-1988. ***Administrative Science Quarterly***, 35(3): 504-530.

Eisenhardt, K. M., & Schoonhoven, C. B. 1996. Resource-based view of strategic alliance formation: strategic and social effects in entrepreneurial firms. ***Organization Science***, 7(2): 136-150.

Flood, P. C., Fong, C, M, Smith, K. G., O'Regan, P., Moore, S., & Morley, M. 1997. Top management teams and pioneering: A resource-based view. ***The International Journal of Human Resource Management***, 8(3): 291-306.

Flynn, D. M. 1993. Sponsorship and the survival of new organizations. ***Journal of Small Business Management***, 31: 51-63.

Granovetter, M. 1992. Problems of explanation in economic sociology. In Nohria & R. Eccles (Eds.), ***Networks and organization***: 25-56. Boston, MA: Harvard Business School Press.

Grant, R M. 1991. A resource-based theory of competitive advantage: Implications for strategy formulation. ***California Management Review***, Spring: 114-135.

Hakansson, H., & Johnson, J. 1993. The network as a governance structure. In Grabher, G. (Ed.), ***The embedded firm, the socio-economics of industrial network***: 78-105. London: Routledge.

Hall, R. 1991. The contribution of intangible resources to business success. ***Journal of General Management***, 16(4): 41-52.

Hall, R. 1993. The strategic analysis of intangible resource. ***Strategic Management Journal***, 13: 135-144.

Hamel, G. 1994. The concept of core competence. In Hamel, G., & Heene, A. (Eds.), ***Competence-based competition***: 11-33. New York: John Wiley & Sons.

Hart, M. M. 1995. ***Founding resource choices***. Harvard University, DBA Degree.

Herron, L., Sapienza, H. J., & Smith, D. S. 1992. Entrepreneurship theory from an interdisciplinary perspective: Volume ? ***. Entrepreneurship Theory and Practice***, Spring: 5-11

Hofer, C. W., & Sandberg, W. R. 1987. Improving new venture performance: Some guidelines for success. ***American Journal of Small Business***, 12(1): 11-26.

Itami, H. 1987. ***Mobilizingi invisible assets***. Cambridge, MA: Harvard Business Press.

Jennings, D. F., & Lumpkin, J. R. 1989. Functioning modeling corporate entrepreneurship: An empirical integrative analysis. ***Journal of Management,*** 15(3): 485-503.

Jennings, D. F. 1994. ***Multiple perspectives of entrepreneurship: Text, Readings and Cases***. Cincinnati Ohio: South Western Publishing Co..

Kao, Raymond W. Y. 1995. ***Entrepreneurship: A wealth-creation and value-adding process***. New York: Prentice-Hall.

Kirzner, I. M. 1983. Entrepreneurs and the entrepreneurial function: A commentary. In Ronen J. (Ed.), ***Entrepreneurship***: 281-290. Lexington Books, Lexington, Mass.

Larson, A. 1992. Network dyads in entrepreneurial settings: A study of the governance of exchange process. ***Administrative Science Quarterly***, 37: 76-104.

Lenz, R. T. 1980. Strategic capability: A concept and framework for analysis. ***Academy of Management Review***, 5(2): 225-234.

Lumpkin, G. T., & Dess, G. G. 1996. Clarifying the entrepreneurial orientation construct and linking it performance. ***Academy of Management Review,*** 2(1): 135-172.

Mahoney, J., & Pandian, J. R. 1992. The resource-based view within the conversation of strategic management. ***Strategic Management Journal***, 13: 363-380.

Mahoney, J. T. 1995. The management of resources and the resource of management," ***Journal of Business Research***, 33: 91-101.

Miller & Shamise 1996. The resource-based view of the firm in two environments: The Hollywood Film Studios from 1936 to 1965. ***Academy of Management Journal***, 39(3): 519-44.

Miner, A., Amburgey, J., & Sterns, T. 1990. Interorganizational linkages and population dynamics: Buffering and transformational shields. ***Administrative Science Quarterly,*** 35: 685-713

Morris, M. H., Davis, D. L. & Allen, J. W. 1994. Fostering corporate entrepreneurship: Cross-cultural comparisons of the importance of individualism versus collectivism. ***Journal of International Business Studies***, 25(1): 65-90.

Mosakoswski, E. 1993. A resource-based perspective on the dynamic strategy-performance relationship: An empirical examination of the focus and differentiation strategies in entrepreneurial firms. ***Journal of Management***, 19(4): 819-839.

Naman, J. L., & Slevin, D. P. 1993. Entrepreneurship and the concept of fit: A model and empirical tests**.** ***Sloan Management Journal***, 14: 137-153.

Ostggard, T. A. & Birley, S. 1994. Personal networks and firm competitive strategy: A strategic or coincidental match? ***Journal of Business Venturing***, 9(4): 281-305.

Pennings, J .M. 1982. Commentary / elaboration: Elaboration on entrepreneur and his environment. In Kent, C. A., Sexton, D. L., & Vesper, K. H. (Eds.), ***Encyclopedia of Entrepreneurship***: 307-315. Englewood Cliffs, NJ: Prentice-Hall.

Pennings, J. M., & Harianto, F. 1992. Technological networking and innovation implementation. ***Organization Science***, 3(3): 356-382.

Pennings, J. M., Lee, K., & Witteloostuijn, A. 1998. Human capital, social capital, and firm dissolution. ***Academy of Management Journal***, l.4(4): 425-440.

Penrose, E. T. 1959. ***The growth of the firm.*** New York: M. E. Sharpe, Inc..

Peteraf, M. A. 1993. The cornerstones of competitive advantage: A resource-based view. ***Strategic Management Journal***, 14: 179-192. .

Pfeffer, J., & Salancik, G. R. 1978. ***The external control of organizations: A resource dependence perspective***. New York: Harper & Row, Pub..

Prahalad, C. K. & Hamel, G. 1990. The core competencies of the corporation. ***Harvard Business Review***, May-June: 79-91.

Reed, R., & DeFllippi, R. J. 1990. Causal ambiguity, barriers to imitation, and sustainable competitive advantage. ***Academy of Management Review***, 15: 88-102.

Romanelli, E. 1989. Environments and strategies of organization start-ups: Effects on early survival. ***Administrative Science Quarterly***, 34(3): 369-388.

Ronen, J. 1988. Individual entrepreneurship and corporate entrepreneurship: A tentative synthesis. ***Entrepreneurship, Innovation and Economic Growth***, 2: 243-267.

Rumelt, R. P. 1984. Toward a strategic theory of the firm. In R. Lamb(Ed.), ***Competitive Strategic Management***: 556-570. Prentice Hall, Englewood Cliffs, MD.

Sandberg, W. R., & Hofer, C. W. 1987. Improving new venture performance: The role of strategy, industry structure and the entrepreneur. ***Journal of Business Venturing***, 2: 5-28.

Schoonhoven, C. B., Eisenhardt, K. M., & Lyman, K. 1990. Speeding products in market: Waiting time to first product introducing in new firms. ***Administrative Science Quarterly,*** 35(1): 177-208.

Schuler, R. D. 1986. Fostering and facilitating entrepreneurship in organizations: Implications for organization structure and human resource management practice. ***Human Resource Management***, 25(4): 607-629.

Schumpeter, J. A. 1934. ***The theory of economic development.*** Cambridge, MA: Harvard University Press.

Schumpeter, J. A. 1942, ***Capitalism, socialism and democracy.*** NY: Harper & Brothers.

Schumpeter, J. A. 1947. The creative response in economic history. ***Journal of Economic History,*** 7: 149-159.

Shrader, R. C. & Simon, M. 1997. Corporate versus independent new ventures: Resource, strategy and performance differences. ***Journal of Business Venturing***, 12: 47-66.

Specht, P. H. 1993. Munificence and carrying capacity of the environment and organization formation. ***Entrepreneurship: Theory and Practice***, 17(2): 77-87.

Stapford, J. M. & Baden-Fuller C. W. F. 1994. Creating corporate entrepreneurship. ***Strategic Management Journal,*** 15(7): 521-537.

Starr, Jennifer Ann. 1996. Resource parsimony, resource cooptation and habitual

entrepreneurs: New concepts for entrepreneurship theory and research. University of Pennsylvania, Ph.D. Dissertation.

Stevenson, H. H., & Jarillo, J. C. 1990. "A paradigm of entrepreneurship: entrepreneurial management. ***Strategic Management Journal***, Special Issue, 11: 17-27.

Stinchcombe, A. L. 1965. Social structure and organizations. In James G. March (Ed.), ***Handbook of Organizations***: 142-193. Chicago: Rand Mcnally.

Timmons, J. A., & Bygrave, W. D. 1986. Venture capital's role in financing innovation for economic growth. ***Journal of Business Venturing***, 1(2): 161-176.

Tjosvold, D., & Weicker, D. C. 1993. Cooperative and competitive networking by entrepreneurs: A critical incident study. ***Journal of Small Business Management***, Jan.: 11-21.

Van de Ven, A. H., R. Hudson & D. M. Schroder 1984. Designing new business startups entrepreneurial, organizational, and ecological considerations. ***Journal of Management,*** 10(1): 87-107.

Wernerfelt, B. 1984. A resource-based view of the firm. ***Strategic Management Journal***,: 171-180.

Zahra, S. A., & Covin, J. G. 1995. Contextual influences on the corporate entrepreneurship performance relationship: A longitudinal analysis. ***Journal of Business Venturing***, 19: 43-58.

Zahra, S. A. 1991. Predictors and financial outcomes of corporate entrepreneurship: An explanatory study. ***Journal of Business Venturing***, 6: 259-285.

Zahra, S. A. 1993. A conceptual model of entrepreneurship as firm behavior: A critique and extension. ***Entrepreneurship: Theory and Practice***, Summer: 5-21.

Table 1

Descriptive Statistics and Correlation Matrix (N=143)

Note : $p < .05$ if $|r| > .13$

Variables	Mean	S.D.	1	2	3	3-1)	3-2)	3-3)	4.	5.	6.	7.	8.	9.	10.	11	12	13	14	15
1. Sales Volume in 1998	42.4118	103.5793																		
2. Product Competitiveness in 1998	15.5392	43.8540	.69																	
3. Entrepreneurial Orientation of the firm	0.0727	0.4763	.05	.21																
1) Innovativeness	41.4083	23.3601	-.12	.03	.72															
2) Risk-taking	0.0675	0.6281	.30	.28	.43	-.17														
3) Proactiveness	0.0336	0.9630	-.16	-.10	.20	.27	-.07													
4. Technological resource	-0.052	0.6209	.49	.52	.00	-.10	.21	-.07												
5. Financial resource	569.60	1287.93	.91	.53	.07	-.03	.21	-.09	.36											
6. Linkages to other enterprise	3.0070	5.3214	.01	-.03	-.06	.04	-.21	-.05	.00	-.00										
7. Linkages to venture networks	0.9580	1.1313	.06	.16	.05	.07	-.08	-.02	.18	.54	.11									
8. Linkages to universities	1.9021	1.9548	.12	.15	.01	.09	-.14	.15	.35	.07	.33	.20								
9. Linkages to venture capital	0.4965	1.1313	.71	.55	.07	.03	-.04	-.14	.35	.66	-.01	.18	.16							
10. Linkages to financial institutes	-0.0295	0.8267	.31	.36	-.12	-.11	-.10	-.05	.43	.21	.03	.23	.16	.35						
11. Linkages to government	-0.0257	0.9344	.32	.33	-.10	-.06	-.14	-.10	.49	.27	.07	.34	.13	.39	.62					
12. Organizational size	30.7692	43.6321	.78	.40	-.16	-.30	.12	-.18	.44	.73	-.02	.07	-.00	.64	.50	.54				
13. Organizational age	4.5944	3.3802	.34	.17	-.22	-.35	.06	-.14	.35	.23	.06	.09	.05	.25	.27	.28	.46			
14. Entrepreneur's experience	14.4406	7.2991	.09	.08	-.04	-.06	.01	.14	.18	.08	.01	-.06	.11	.05	.10	.17	.16	.36		
15. Market growth rate	89.2132	265.5017	.03	.06	.27	.25	.02	.82	.04	.02	-.07	-.05	.15	-.03	-.01	-.07	-.05	-.08	.18	
16. Number of competitors	10.3038	17.4774	.14	.06	.05	.17	.02	-.09	.00	.14	.03	-.02	-.06	.13	.09	.10	.11	.04	.13	.04

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TABLE 2
Results of OLS Models : Sales Volume in 1998 (N = 143)

Variables	Model I	Model II	Model III	Model IV
Intercept	-10.473	-4.456	-8.166	-18.512
	(12.837)	(7.805)	(9.098)	(7.109)
Organizational size	1.870***	.424***	.455***	.544***
	(.142)	(.123)	(.145)	(.118)
Organizational age	-.127	2.087*	1.791	.103
	(1.953)	(1.148)	(1.125)	(.815)
Entrepreneur's experience	-.689	-.644	-.490	-.154
	(.830)	(.473)	(.466)	(.322)
Market growth rate	.0292	.0839	.0674	.0406
	(.021)	(.012)	(.012)	(.009)
Number of competitors	.319	.112	.114	.115
	(.318)	(.182)	(.178)	(.123)
Entrepreneurial orientation		7.114	5.597	.894
		(7.232)	(7.101)	(5.002)
Technological capabilities		24.694***	28.632***	-40.976***
		(5.753)	(6.447)	(10.527)
Financial resource		.0568***	.0509***	0.0737***
		(.004)	(.004)	(.007)
Linkage to other enterprise			.351	2.042***
			(.618)	(.572)
Linkage to venture networks			-1.926	2.307
			(2.955)	(2.265)
Linkage to universities			.293	1.613
			(1.887)	(1.649)
Linkage to venture capital			11.534***	10.585***
			(3.912)	(3.011)
Linkage to financial institutes			3.254	-11.600**
			(5.007)	(4.514)
Linkage to government			-12.270***	-6.965*
			(4.830)	(4.058)
Technological resource x Linkage to other enterprise				10.963***
				(1.401)
Financial resource x Linkage to other enterprise				-0.0056***
				(.002)
Technological resource x Linkage to venture networks				18.382***
				(2.719)
Financial resource x Linkage to financial institutes				.0421***
				(.006)
Technological resource x Linkage to government				-39.250***
				(5.110)
Financial resource x Linkage to universities				-.0112***
				(.002)
Technological resource x Linkage to venture capital				20.073***
				(5.037)
Adj. R2	.605	.872	.881	.946
Incremental F-test		80.284***	2.655***	114.585***

Note: Standard errors are in parentheses.
* p < .10; ** p < .05; *** p <.01

TABLE 3
Results of OLS Models : Product Competitiveness in 1998 (N = 143)

Variables	Model I	Model II	Model III	Model IV
Intercept	1.649	10.011	15.288	1.735
	(8.040)	(7.085)	(8.098)	(3.813)
Organizational size	.410***	-.0513	-.324**	.119*
	(.089)	(.112)	(.129)	(.063)
Organizational age	-.267	-.0794	-.0395	-.152
	(1.223)	(1.042)	(1.002)	(.428)
Entrepreneur's experience	.0807	0.0014	.149	-.0245
	(.520)	(.430)	(.415)	(.170)
Market growth rate	.0129	-.0015	.0024	.0032
	(.013)	(.011)	(.011)	(.005)
Number of competitors	.0170	.0119	-.0927	.135**
	(.199)	(.165)	(.158)	(.065)
Entrepreneurial orientation		15.811**	11.966*	1.972
		(6.565)	(6.321)	(2.652)
Technological capabilities		28.301***	25.627***	-6.221*
		(5.222)	(5.738)	(3.278)
Financial Resource		.0141***	.0132***	.0124***
		(.003)	(.004)	(.004)
Linkage to other enterprise			.0674	1.108***
			(.550)	(.350)
Linkage to venture networks			.360	.702
			(2.631)	(1.184)
Linkage to universities			-2.284	-3.149***
			(1.680)	(.863)
Linkage to venture capital			12.136***	3.443**
			(3.482)	(1.605)
Linkage to financial institutes			10.406**	-5.559**
			(4.457)	(2.405)
Linkage to government			.121	4.723*
			(4.299)	(2.814)
Financial resource x Linkage to universities				.0069***
				(.001)
Financial resource x Linkage to other enterprise				-.0040***
				(.001)
Financial resource x Linkage to financial institutes				.0225***
				(.003)
Technological resource x Linkage to venture networks				10.805***
				(1.360)
Financial resource x Linkage to government				-.017***
				(.003)
Technological resource x Linkage to venture capital				7.582***
				(2.213)
Financial resource x Linkage to venture capital				-.0012**
				(.001)
Adj. R2	.135	.412	.474	.916
Incremental F-test		22.514***	3.615***	291.937***

Note: Standard errors are in parentheses.
* p < .10; ** p < .05; *** p <.01

THE ROLE OF ETHICAL DECISION MAKING STYLES IN JUDGMENTS OF ETHICAL O. D. CONSULTING BEHAVIOR

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THE ROLE OF ETHICAL DECISION MAKING STYLES IN JUDGMENTS OF ETHICAL O.D. CONSULTING BEHAVIOR

ABSTRACT

The study demonstrates that individuals classified in accordance, with Forsyth's (1980) four ethical decision making styles differentially evaluate the ethicality of fifteen of fifteen types of O.D. interactions. The differences between each of the four groups are shown to be related to two types of client-consultant interactions: (1) withholding of information and resources and (2) willful misrepresentation, manipulation and misuse of data. The findings shed light on an issue not previously addressed in the O.D. literature, yet considered critically important to the success of O.D. intervention efforts. Implications of the results of the results for the training of new O.D. practitioners and for resolution of client-consultant conflicts are discussed.

To what extent can ethical judgements of organizational development consulting behavior be explained by individual differences in ethical decision making styles? Unfortunately, the answer is not available in the existing Organization Development (O.D.) literature. O.D. scholars have contributed case studies and narrative descriptions of interactions leading to ethical dilemmas (e.g., French and Bell, 1984; Huse, 1980; Lippit and Lippit, 1978; Maidment and Losito, 1980; Miles, 1979; Pfeiffer and Jones, 1977; Shay, 1965; Walton and Warwick, 1973; Warwick and Kelman, 1973; Zaltman and Duncan, 1976). Further, they have produced empirical results indicating that ethicality rating depend upon the nature of the client-consultant interaction being evaluated (Rhodeback, Lai and White, 1990) and have shown that these ratings are culturally dependent (White and Rhodeback, 1992).

Whereas scholarly case studies and narrative descriptions facilitate a preliminary undrestanding of the ethical dilemmas confronting the change agent and client system, Rhodeback, et. al. (1990) and White and Rhodeback (1992) have demonstrated empirically that those outside the field can recognize and evaluate the ethicality of client-consultant interactions. Moreover, these studies have isolated two sources of judgements of variation: the nature of the behaviors being judged and the cultural membership of the rater. Extant cultural differences do suggest, among other possibilities, that variations in judgements of ethical behavior may be related to differences in ethical decision making styles; however, White and Rhodeback did not address why, within respective cultures, ethical judgments vary.

The conspicuous absence of attempts to empirically elaborate on the role of individual differences in judgements of ethical O.D. consulting behavior is critical for two reasons. First, a successful intervention effort involves a reciprocal relationship between the change agent and various members of a client system (White and Wooten, 1983). This indicates that at least two individuals will bring their respective, and potentially different, ethical decision making styles to the consulting table. Knowing how these styles differ should enhance the client and consultant's ability to recognize in themselves and each other, an antecedent condition for role conflict. Secondly, if two or more parties do exhibit different ethical decision making styles, and conflicts do emerge, an understanding of these stylistic differences may facilitate constructive approaches to conflict resolution congruent with each individual's ethical value system.

Fortunately, scholars outside the O.D. field have conducted extensive research relevant to an understanding of individual differences in ethical judgements, including Hogan (1970,1973); Kelman and Lawrence (1972); Kohlberg (1968, 1976); Rest, Cooper, Coder, Masanz and Anderson (1974) and Schlenker and Forsyth (1977). Perhaps the most parsimonious of these explanations has been proffered by Schlenker and Forsyth. They suggest that there are two important dimensions underlying these differences: (1) the extent to which the individual accepts or rejects universal moral rules when making judgements and (2) the extent to which the individual believe that desirable consequences are always achieved with the right action. The first dimension has been labeled "Relativism" and the second, "Idealism". Forsyth (1981, 1984) has demonstrated that crossing the Relativism and Idealism dimensions yields an elegant four-group typology which can be used to describe differences in ethical decision making styles. Forsyth

characterizes these four groups as Situationists, Absolutionists, Subjectiveists and Exceptionists. A brief description of these different decision making is provided below:

Situationists

According to Forsyth (1980), Situationists are individuals who are highly Idealistic and highly Relativistic. These individuals reject moral absolutes when making ethical judgments and believe that desirable consequences always follow the right action. When evaluating the ethicality of a situation these individuals will carefully consider whether or not the right actions were taken. "Rightness" is purportedly based on an individual analysis of each situation's consequences.

Absolutists

Forsyth notes that Absolutists are similar to Situations in that both are highly Idealistic, i.e. both believe that describe consequences always follow the right action; however, unlike Situationists the Absolutists endorse the application of universal moral rules. Absolutists reject the Relativistic approach to ethical decision making exhibited by the Situationists. No exceptions are allowed to moral "truths." Good is good and bad is bad.

Subjectivists

Forsyth notes that subjectivists are similar to Situationists in that both are highly Relativistic. Like the Situationists, Subjectivists reject universal moral rules. However, unlike both the Situationists and Absolutists, Subjectivists are not high Idealists. They recognize that both god and bad consequences come from ethical decisions. As such the Subjectivist's ethical decision making style reflects an emphasis on their individual values and perspectives rather than adherence to universal moral principles. According to Forsyth, these individuals are highly pragmatic. Judgments are not made out of concern for the extent to which they may harm others or whether or not the actions fit the context; instead, Subjectivists believe that every individual should make ethical decisions in keeping with one's own perspective.

Exceptionists

Exceptionists are described by Forsyth as utilitarian and pragmatic. They are neither highly Idealistic nor highly Relativistic. This group is said to evaluate the ethicality of a situation by determining whether or not the actions taken produce the greatest good for the greatest number. Potential benefits of an action are weighted against the potential costs when making judgment of ethical behavior. While they may invoke moral rules, they are just as likely to exclude these rules when and if the greatest numbers of people could benefit.

Considered collectively, Forsyth refers to these different ethical decision making styles as "Ethical Ideologies". These different ideologies have been shown to be related to differences moral judgments of social science research (Forsyth and Pope, 1984), but have not been examined in the context of ethical judgments relevant to organizational

development practice. If it can be assumed that Forsyth's results are generalizable, then one may expect that individuals using these different ethical decision making styles will differentially evaluate the ethicality of organizational development consulting interactions.

Hypothesis: Ethicality ratings of O.D. consulting behaviors will differ according to the individual's ethical ideology.

Given evidence to support the preceding hypothesis, the remainder of the study was intended to focus on describing and interpreting the differences among the four groups.

Previous research has suggested that different consulting interactions elicit different judgments of ethicality (Rhodeback,et. al., 1990; White and Rhodeback, 1992); therefore, it was anticipated that more than one linear combination of situations subject to ethical judgments would be needed to characterize group differences. Given this expectation, the following exploratory research questions were posed:

1. How many of three possible functions are useful in describing the nature of the group differences?

2. In the event that multiple functions can be used to describe these group differences:

   a. In what ways do the groups resemble one another and in what ways do the groups differ?

   b. Which consulting interactions define these functions?

Whereas, the first research question was intended to determine if groups might differ in more than one way, the second set of questions was intended to illustrate the meaning of those differences.

METHOD

Participants

Three hundred and twenty two (332) graduate business students enrolled in evening business courses at three universities completed two questionnaires, the White and Rhodeback Survey of Ethical Behavior in Organizational Development Consulting (White and Rhodeback, 1987) and Forsyth's (1978, 1980) Ethical Position Questionnaire. The age of the respondents ranged from 20 to 63, with a median age of 27. Fifty-eight percent (58%) of the respondents were male, thirty eight percent (38%) were female. The remaining subjects did not respond to this item. Most of the students (91%) were employed as managers, professionals or administrators. The remaining were full time students.

Measures

The Survey of Ethical Behavior in Organizational Development Consulting

(Rhodeback and White. 1987) was created by sampling from the domain of change agent and client behaviors which may lead to role conflict or ambiguity and subsequently, may produce ethical dilemmas (White and Wooten, 1986). The instrument is composed of 38 items which were combined to form fifteen scales. Each scale reflects client-consultant interactions described by organizational development scholars and practitioners as behaviors leading to ethical dilemmas (Gellerman, Frankel, and Ladenson, 1990; Macy and Izumi, 1993). The fifteen scale were created by forming composites of items designed to measure the same types of interactions. Individual item scores were derived from respondent assessments of each situation's ethicality using a five point Likert-type scale ranging from Very Ethical (5) to Very Unethical (1).

The Ethical Position Questionnaire Forsyth's (1978, 1980) methodology was used to identify each individual's ethical decision making style. Scale scores obtained from Forsyth's Ethical Positoin Questionnaire, were used to classify individuals as Situationists, Subjectivists, Absolutists or Exceptionists. In keeping with Forsyth's methodology, individuals were assigned to these classes based in the relative magnitude of each individual's score on two scales, Relativism and Idealism. Each of these scales is composed of ten items with each item eliciting a response of Agree-Disagree on a nine point continuum.

RESULTS

Test of the hypothesis: ethical ratings depend upon ethical decision making style.

A four group multivariate analysis of variance (MANOVA) was employed to test the global hypothesis that groups comprising the four ethical ideologies differ in their ethicality ratings of the fifteen consulting interactions. Group means and standard deviations for the fifteen scales are reported in table 1.

TABLE 1

The results of the global test revealed that at least two of the groups differed in their ethicality ratings ($F=2.37$, $df=45,894$; $p< .001$). pair-wise multivariate analyses of variance were employed to determine which of the four groups differed on the jointly considered scales. The experiment wise error rate was controlled by testing each at .034, in keeping with a Boneferroni approach. The results revealed that each group's ethicality ratings differed from every other group including: Subjectivists and Absolutists ($F=3.04$, $df=15,140$); Subjectivists and Situationists($F=2.99$, $df=15,138$); Exceptionists and Situationists ($F=2.77$, $df=15,142$); Exceptionists and Absolutists ($F= 2.58$, $df=15,144$); Exceptionists and Subjectivists ($F=1.91$, $df=15,142$); and Situationists and Absolutists ($F=1.91$, $df=15,140$). The results indicate that Subjectivists, Exceptionists and Absolutionists to differ in their judgment of ethical consulting behavior.

Research question 1: the number of functions.

A multiple discriminant function analysis (MDA) was employed to interpret groups differences in the ratings of the fifteen scales. Since the MANOVA results were statistically significant it was known that the first of the three possible functions would

significantly separate the four groups. Successive tests of the remaining functions, with the receding function removed from consideration, indicated that the second function was significantly separating the groups (Wilk's = .847, X^2 = 150.07, 28df, p< .01), but the thirt function was not (Wilk's = .93, X^2 = 219.86, 13df, p =.09). a canonical correlation of .40 was obtained for the first function and .31 for the second function. This indicates that the proportion of total variability explained by differences between ethical ideologies is 25%. The percentage of the total, explainable variance attributable to each function is 53% and 29% for the first and second functions, respectively. This indicates that the first function is more closely aligned with group differences in ethical judgments than the second function.

Research question2a: Group resemblance and differences.

Figure 1 presents a graph of the group centroids for the two significant functions. The horizontal axis corresponds to the first discriminant function. The horizontal space between each group indicates how much the groups are distinguished from one another on this function. This first discriminant function separates the Low idealists (Exceptionists and Subjectivists) from the High Idealists (Absolutists and Situationists). Exceptionists and Subjectivists appear on the far right side of the graph, with the Absolutists and Situationists appearing on the far left side.

FIGURE 1

The graph indicates that individuals believing the right consequences will always follow the fight actions (Absolutists and Situationists) are more similar in their judgments of ethical organizational development consulting behaviors than those who recognize that good or bad consequences can occur (Exceptionists and Subjectivists). Further, those who recognize that good or bad consequences can occur from an otherwise ethical decision tended to rate consulting interactions as more ethical (Subjectivists and Exceptionists) than those who idealistically maintain that good outcomes are always a function of correct actions (Absolutists and Situationists).

The vertical dimension corresponds to the second discriminant function and illustrates which groups are distinguished in a way unrelated to the way they are separated on the first function. Whereas the first function clearly separated the High and Low Idealists, the second function is less effective in separating the High and Low Relativists. Exceptionists (Low Relativism) are clearly distinguishable from the Subjectivists and Situationists (Both High relativism) on this function; however, there is a greater resemblance between Absolutists (Low Relativists) and Situationists (High Relativism) than exists between the Absolutists and Exceptionists (both Low Relativism), or Subjectivists and Situationists (both High Relativism). This function most effectively separates the Exceptionists from the Subjectivists.

The graph makes clear the correspondence between ethical ideology and ethicality rating of O.D. consultant and client behaviors. Despite thr existence of significant multivariate differences between all groups, the Absolutists and Situationists closely resemble one another on the second function. The Exceptionists and Subjectivists, while

similar on the first function are clearly distinct on the second function. By contrast, the Absolutists and Situationists are more distinguishable on the first function. This suggests that the extent to which differential judgments are discernible is dependent upon the nature of the judgments being considered. In this case, two linear functions were required to distinguish the groups.

Research question 2b: The variables defining the functions.

Table 2 presents the discriminant function-ethics scale correlations, rank ordered within each of the two significant functions. As the Table indicates, all fifteen of the ethics scales exceed a .20 function correlation, meeting a criterion typically used to determine if a variable is contributing to a linear function composed of several variables. In effect, all of scales contribute to at least one of the two functions. Nine of the ethics scales were used to interpret the first function, with the remaining six used to interpret the second function.

TABLE 2

Function 1. Subjectivists and exceptionists distinguished from ansolutists and situationists

The scale with the highest function correlation is Scale 2: The consultant prevents the client from participating in intervention decisions. The relative magnitude of this correlation indicates that this is th elaregst contributor to the separation of Absolutists and Situationists from the Exceptionist and Subjectivists. That is, Absolutists and Situationists viewed this behavior on the part of the consultant very differently than did the Exceptionists and Subjectivists.

As indicated in Table 1, both the Subjectivists and Exceptionists provided more favorable ethicality ratings than the other groups. This suggests that both are more accepting of client exclusion than their High Idealist counterparts. Perhaps it is the Subjectivist's pragmatic perspective influencing their more favorable judgment of client exclusion than the judgments made by the Absolutists and the Situationists. They may believe that the consultant, as the expert, is exercising an individual value judgment which con only be made by an expert. The Exceptionists nay be weighing the costs and benefits of exclusion, rather than attending to the goodness or badness of the action, as the Absolutiists would; or its fit within the context of the situation, as the Situationists might.

The second, third, forth and fifth largest correlations with the first function are contributing about equally to group differences, but less so than scale 2. This is indicated by a range in the scale-function correlations of .39 to .47. Three of the four scales are indicative of information or resource withholding (Scales 1, 13, and 10). The fourth scale involves the consultant's use of ingratiating behavior to improve status with the client. The results suggest that the Subjectivists and Exceptionists, as compared to Situationists and Absolutists, place differential ethical emphasis on the open exchange of information between the client and the consultant.

As indicated in Table 1, the Subjectivists and Exceptionists tended to provide more

favorable ethicality ratings than the other groups on these scales, indicating that withholding of information or resources at the expense of another party is generally viewed more favorably by pragmatic decision makers than idealistic decision makers. Further, the Subjectivists and Exceptionists tended to view ingratiating behavior more favorably than the other two groups, indicating that the pragmatic orientation of these groups identify them as less critical in their ethical judgments than the Absolutists or Situationists.

Four other scales provided modest contributions to the first function, as indicated by scale-function correlations ranging from .23 to .33. Three of the scales were designed to measure different facets of willful misrepresentation and misuse of information (scale 7,8 and 11). The fourth scale is another form of information manipulation, i.e., consultant failure to reveal errors made during the consulting engagement.

Considered collectiveyl, the scales contributing the most to group seperation on this first function are those indicative of failure to endorse an equal partership in the client-consultant relationship, i.e., exclusion of the client from decisions effecting the consulting engagement, information and resource withholding. These situations have stronger function correlation than those scales depicting willful misrepresentation and misuse of data. This suggests that the separation of High Idealists from Low Idealists from Low Idealists may be attributed principally to their judgmental differences with respect to these types of interactions. More favorable judgments came from those pragmatic individuals who assess the costs versus the benefits of an action and from those who assume that any behavior is ethical, as long as it is congruent with one's personal philosophy. Less favorable ratings came from those who strictly apply universal moral rules when making ethical judgments and from those who evaluate the "fit" between the context and the action.

Function 2. exceptionists distinguished from subjectivists, absolutists and situationists

Six scales define this function and distinguish the Exceptionists from the other groups. The scale with the highest function correlation is Scale 6, Management uses consultant-derived data in ways incongruent with the original intent. On this scale, the differences between the Subjectivists and Exceptionists are clear. Table 1 indicates that the Subjectivists provided a more favorable ethical judgment than the remaining groups whose mean ratings are very similar. Scale 6 is not, however, indicative of the general tendency for those situations defining this function.

Five of the six scales defining Function 2 contribute about equally to group separation, as indicated by function-variable correlations ranging than the Subjectivists (Scale 3,4 and 9). Further, the Exceptionists provided more favorable ratings on four of the scales when compared to the average of the remaining three groups. This is the reason the Exceptionist centroid, reported in Figure 1, is positive, while the remaining groups have negative centroids. The scalesdefining this second function include those indicative of manipulation/coercion (Scale 3 and 5), willful and deliberate information misrepresentation or misuse of data (scale 6,9 and 14) and withholding of services (scale 4).

Overall, the results suggest that individual differences in the judgments of what constitutes ethical organizational development consulting can be expected to vary according to ethical decision making styles. All four groups differed from one another when fifteen organizational development interactions were treated as jointly dependent. Nevertheless, the nature and extent if differences in judgments of O.D. interactions were not the same across all four groups as indicated by the existence of two significant discriminant functions. The placement of the groups in the discriminant planes suggests that while differences exist, some groups are more distinguishable from one another than others. These results suggest that it is naïve to ask which group will provide more lenient or harsh judgments of ethical organizational development consulting behaviors. A more sophisticated question would be: in what ways do individuals using different ethical styles similarly and differentially judge ethical behaviors?

These findings suggest that the pragmatic Exceptionists and Subjectivists similarly evaluate situations involving information and resource withholding, provide more favorable ethical judgments of these actions than those who are highly idealistic. However, they are polar opposites when evaluating instances of manipulation and willful misuse of data, with Exceptionists providing, in general, more favorable ethical ratings. Ethical judgments made by the idealistic Absolutists and Situations differ more when they are evaluating acts that involve information withholding than they do when evaluating deliberate manipulation or information misuse. Regardless of the type of situation they are judging, their ethical evaluations are decidely harsher than the Exceptionists, and certainly harsh than Subjectivists in their evaluations of information and resource withholding.

These results suggest that decision making styles influence both the extent to which an action is regarded as ethical or unethical, and the nature of the issue viewed as ethical or unethical. Such findings have important implications for O.D. scholars and practitioners.

DISCUSSION

White and Wooten (1984, 1986) have suggested that ethical dilemmas in organizational development consulting emerge from unresolved role ambiguity and conflict between the client and consultant. They have proffered a model suggesting that this ambiguity and conflict emerge if antecedent conditions are left unresolved. They have described these antecedent conditions as differences in change agent and client values, goals, resources, skills and abilities. The findings present here provide further elaboration of these antecedent conditions by illustrating that what is perceived as ethical or unethical is subject to the individual's decision making style and the type of interaction being judged. The results imply the possibility that clients and consultants relying on different ethical decision making styles may not even be aware that they have engaged in behaviors viewed as ethical violations by others. As such, ethical making style is an antecedent condition to he recognition of an emergent ethical dilemma not previously identified in the White and Wooten model, or for that matter, in the Organizational Development literature.

The information from this study having implication for trainers and educators, sheds light on which specific dilemmas create difficulties for a given 'ethical ideology'. By supplying awareness education as to the differential effects of a given dilemma (Rhodeback, Lai, and White, 1990; White and Rhodeback, 1992) relative to a given "ethical ideology' (Forsyth, 1981, 1984) change agents and client systems will be better prepared to deal with the dynamic properties of an O.D. intervention. For example, training scenarios can be prepared illustrating specific dilemmas while correspondingly training practitioners as to the reaction propensities of each of the four categories of ethical ideologies. This would enable the change agent and client system to recognize the dilemma and the behavior of the role sender and the role receiver as a function of 'ethical ideology'.

For experienced practitioners as well as those organizations employing O. D. consultants, the findings provide a tool for understanding one's own and other's ethical decision making styles. While stylistic differences suggests the possibility of unresolvable impasses, knowledge of stylistic differences also provides a framework of departure for discussing ways to resolve conflict congruent with each individual's ethical value system. Thus boundarying the range of offensive behaviors either the change or client system have engaged in.

The results provide an incremental step in achieving a better understanding of individual variations in ethical judgements of O. D. consulting. Nevertheless, perceptions are not behaviors. Additional research is needed to determine the nature and extent to which ethical decision making styles are related to client-consultant engagement in the types of behaviors evaluated in this study. Furthermore, it would be beneficial to learn if , and in what ways, individuals with different ethical decision making styles also differ in their approaches to the resolution of ethical dilemmas in the O. D. arena. More modest requirements also exist. For example, replication of this study would be very useful given the need to cross validate the discriminant model. Further, the issue of cultural influences when dealing with the ethics of O. D. consulting behaviors needs to be investigated (Law, 1996). The subject to variable ratio of 20:1 implies that the results should be stable; nevertheless, replication would be particularly useful in ensuring that the weaker of the two functions reported was not an artifact of capitalizing on chance.

REFERENCES

Fletcher, J. 1996. Situation ethics. Philadelphia, Pa.: Westminister Press.

Forsyth, D. 1978. Moral attribution and the evaluation of action. Unpublished doctoral dissertation, University of Florida.

Forsyth, D. 1980. A taxonomy of ethical ideologies. Journal of Personality and Social Psychology Bulletin, 7, 218-223.

Forsyth, D. and Pope. 1984. Ethical ideology and judgements of social psychological research: multidimensional analysis. Journal of Personality and Social Psychology, 40. No. 6, 1365-1375.

French, W. L. and Bell, C. H. Jr. 1984. Organization development. 3rd ed. Englewood Cliffs, N. J.: Prentice Hall.

Gellerman, W., Frankel, M. S. and Landnson, R. F. 1990. Values and ethics in organizational and human systems development: Responding to dilemmas in professional life. San Francisco, CA. Josey-Bass.

Huse, E. F. 1980. Organizational development and change. 2nd ed. St. Paul, Minnesota: West Publishing Company.

Kelman, H. C. & Lawrence, L. H. 1972. Assignment of responsibility in the case of Lt. Calley: Preliminary report on a national survey. Journal of Social Issue, 28, 177-212.

Kohlberge, L. 1976. Moralization: The cognitive developmental approach. In T. Likona(Ed.) Morality theory, research and social issues. New York: Holt, Rinerhart & Winston.

Law, C. M. 1996. A culture-based perspective of organization development implementation. Research in Organizational Change and Development, 9: 49-79.

Lipppit, G. and Lippit, R. 1978. The consulting process in action. La Jolla, Ca.: University Associates.

Macy, B. A. and Izumi, H. 1993. Organizational changes, design, and work innovations: A meta-analysis of (3) North American field studies – 1961-1991. In W. Passmore and R. Woodman (eds.) Research in Organizational Change and Development, vol. 7: 235-313. Greenwich, CT: JAI Press.

Maidment, R. and Losito, W. 1980. Ethics and the consultant/trainer. Selected Paper no. 11. Madison, WI.: American Society for Training and Development.

Miles, M. B. 1979. Ethical issues in OD intervention. OD Practitioner, October: pp. 1-10.

Pfeiffer, J. W. and Jones, J. E. 1977. Ethical considerations in consulting. In J. E. Jones

and J. W. Pfeiffer (eds) The 1977 Handbook for Group Facilitator. La Jolla, CA: University Associates.

Rest, J. R., Cooper, D., Coder, R., Masanz, J., Anderson, D. 1974. Judging the important issues in moral dilemmas – An objective measure of development. Developmental Psychology, 10, 491-501.

Rhodeback, M., Lai, W. B. and White, L. P. 1990. Ethical Considerations in Organization Development: An Empirical Approach. Organizational Development Journal, Winter: 40-45.

Schlenker, B. R. and Forsyth, D. R. 1977. On the ethics of psychological research. Journal of Experimental Social Psychology, 30: 369-396.

Shay, P. W. 1965. Ethics and professional practices in management consulting, Advanced Management Journal, 30, no. 1: 13-20.

Walton, R. E. and Warwick, D. P. 1973. OD: the ethics of organizational development Journal of Applied Behavioral Science, 9, no. 6: 681-699.

Warwick, D. P. and Kelman, H. C. 1973. "Ethics in Social Intervention" in G. Zaltinan (ed.) Process and phenomenon of social change. New York: Wiley.

While, L. P. and Rhodeback, M. J. 1992. Ethical dilemmas in organization development: A cross cultural analysis. Journal of Business Ethics, 11, 663-670.

White, L. P. and Wooten, K. C. 1986. Professional ethics and practice in organizational development. New York: Praeger Publishers.

White, L. P. and Wooten, K. D. 1983. Ethical dilemmas in various stages of organizational development. Academy of management Review 1, no. 2; 57-73.

Zaltinan G. and Duncan, R. 1976. Ethics in social change. in G. Zaltman and R. Duncan (eds) Strategies for planned change. New York: John Wiley and Sons: 323-377.

THE BEHAVIOR AND MECHANISM DISCUSSION OF INTELLIGENCE-INTEGRATION IN SMALL AND MEDIUM-SIZED ENTERPRISES

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THE BEHAVIOR AND MECHANISM DISCUSSION OF INTELLIGENCE-INTEGRATION IN SMALL AND MEDIUM-SIZED ENTERPRISES

ABSTRACT

With the emerging of the age of knowledge economy , the small and medium-sized enterprises, which play a magnitude role in a state's economy, are facing a new task that maybe more important than financing the task of "intelligence-integration". It means a modem administration activity aim at absorbing the brain resources. This article with the small and medium-sized enterprises as the main object, the maximizing of the whole state's brain resources as the main object.

FOREWORD

The small medium-sized enterprises are those total sales or turnover is less than 50 million CNY, which have the characteristics of short-term objectives, fast-changing strategies, lack of professionals and the forth.

The "Intelligence-Integration" in small and medium-sized enterprises means an administration activity developing and taking full advantage of intelligence resources that are existing, creative, but may not be taken seriously, to serve for enterprises and create considerable values.

The purpose of intelligence-integration services for small and medium-sized enterprises is to provide the best integration of market, capital, technology, information and human resources, to improve competitive edges and to strength the risk-resistance capability. Based on the diagnosis of aspects such as development strategies and policies, regulations and rules, operation processes, staff behavior specifications and organizational culture, with the introduction of an effective management mode to improve regulations and rules, offering proposals on business strategy, operation process and organizational culture, meanwhile implementing a series of training on staff management, performance and behavior standardization, the enterprises may have much knowledge of self-management, form an operation mechanism involving responsibility, right and benefit, to achieve healthy, long-term and steady development by motivating employees.

STRENGTHS AND WEAKNESS

There is a saying: "It is easy to turn round for small boats." Indeed, as for big enterprises, the small enterprises with combination of ownership and managerial authority have unparalleled strengths in business decision and specific operation efficiency. Small-scale enterprises can react in business and adapt at external environment quickly. But it is easy to "turn round", also easy to "turn over". Small enterprises have much more difficulties than edges as well.

- Small number of employees, lack of professionals in some sectors;
- Leaders make decisions only on their intuition without scientific basis;
- Most of leaders are specialists or experts in some field, having little knowledge of other fields, lacking modern management skills;
- Enterprises' development keeps steady resulting from leaders' personal traits and the promising prospects; lacking standardized management.
- Leaders wouldn't like to have links with best enterprises for worrying about being annexed.

The characteristics mentioned above confuse many leaders after small enterprises have developed to some extent. Either turn round abruptly in the face of "dangerous shoal" in markets; or stop developing further and keep within their own field, even

knowing the clouded prospects, and miss new improvement opportunities; or go forward without thinking and lead to competitors' counterattack. Therefore, if small enterprises are expected to become large businesses one day, it is urgent to be supported by the government and society. Since small and medium-sized enterprises play an important role in economy and society, after separating ownership from managerial authority, governments should emphatically establish social service system and provide pre-, during-, after-production service for small and medium-sized enterprises and form a service network.

INTELLIGENCE-INTEGRATION

The study of "intelligence-integration" will concentrate much on the point of "shareability". Usually, it is inevitable to pay high price for valuable acquisitions. But small and medium-sized enterprises hope to pay as less as possible and obtain as much as possible. Though it seems like a daydream, a kind of mew mechanism can be constructed to maximize the sharing and bring every bit of talent into full play as several times, dozens times even decades times, which is the same as data-sharing revolution in network era. So intelligence-integration is just to make fortunes by others' brains. We can say it is a further development of recommending new talents.

Available Intelligence-integration Cases

Hong Kong Hang Lung Center

To study Chinese business management deeply, Hang Lung Center invited some scholars to Hong Kong in July of this year, with systematic and well conceived planning. During this period, scholars were divided into groups, and every group respectively put forward current problems on Chinese business management, then select meaningful issues to design research programs, finally all the groups reported their programs together. Thus, Hang Lung Center has acquired not only different aspects of management issues and information, also the research programs. It can't be estimated in the view of research and information values.

Henan Bangjie Company

Bangjie began to integrate intelligence in 1999. It invested 500 thousand CNY to found "Bangjie Center for Small and Medium-sized Enterprises Management Research" with prominent universities, in which professors directly participate in management-decision making, offer programs and resolving measures. But very few people know that thousands of money has to be spent in advertising for one product, here only 500 thousand CNY spent, long-term help can be got from the "intelligent group".

Guangdong Hua Wei

Hua Wei Company invites six professors from the People's University of China to diagnose the matter of management regularly and irregularly, which only needs to

pay 3,000~20,000 CNY per person per month for consulting.

The above examples indicate that small and medium-sized enterprises can get high-level intelligence service but cost a little.

Reference Conception of Intelligence-integration

Lease Intelligence-integration

Lease means lessors grant lessees to possess and use properties during contracted period when paid by lessees.

When an enterprise requires urgently some specialists in a short period, for instance, a network technician to establish MIS, and no specialist can undertake the task internal, it is certain to employ one from external. But the problem is that the specialist may not be wanted any more after the system is established, and daily maintenance can be dealt with by computer operators. So, this kind of costly recruitment is not appropriate for small and medium-sized enterprises.

It is not necessary to have eggs every day, perhaps have one in a week. So we can buy some eggs when wanting and have chickens bred rather than raise a hen by ourselves. The characteristic of tentative requirement of eggs is the same as that of lease. It is very ideal to rent a hen to have eggs. But it is still very difficult to find a place to buy eggs at any time.

Construct Service Network of Intelligence-Integration

There are a lot of operating entities that provide all kinds of specialized services. They will come up to serve when enterprises have requirements and make a phone call. These entities are so specialized that the costs and prices of the services are not very high.

"Wisdom Bank"

Banks are considered as a place to collect and distribute funds. Small and medium-sized enterprises make relationship with banks for support of loans. In fact, we can set up a suppositional institute, suppositional wisdom bank or talents banks and so forth, to provide intelligence services for small and medium-sized enterprises, such as

1. Consulting service of how to use and develop human resources.

2. Information consulting. Small and medium enterprises are restricted by its scope and have not enough funds to develop new products, but banks have natural advantages of it. Banks keep in touch with hundreds of thousands of enterprises and have a whole view of them, so they can provide the small and medium enterprises with such information as market requirements, new approaches, technologies, equipment which are helpful for products development.

3. Financing consulting. Lack of specialized finance talents, small and medium-sized enterprises are not familiar with financial market. Banks can help them finance efficiently, simply and low-costing. Also banks can provide consulting on long, medium or shot-term investment for those having idle funds.

4. Planning and operation of assets reconstruction. Assets reconstruction involves a series of specialized knowledge and experiences of finance, investment and securities. Banks can offer consulting on information, laws and regulations, which may become resources of new transaction, also contribute to economic reforms.

"Enterprises Clinic"

According to newspaper, Shanghai Light Industry Holding Company has set up an "enterprises clinic" that over 10 famous entrepreneurs offer services. They point out problems on the spot for the fixed enterprises that are in difficulties. The first 12 large-loss enterprises have registered. They and their "doctors" make efforts to search for a method to turn losses into profits.

It is an inspiring report. "See doctor" can be said to an action of intelligence-integration. If "enterprises clinic" is popular just like practical hospitals, and enterprises in trouble can get help conveniently, it is no doubt a Gospel for small and medium-sized enterprises.

FEASIBILITY CONDITIONS

If "intelligence-integration" is to be developed to a social service system, not only an organizational behavior, or some clever person grasps opportunities to become a pioneer in a new industry, the problems should be considered all-sidedly and carefully.

Demand of Intelligence Requirers

Considering intelligence-integration as a process from which both two participants can benefit, it involves at least two groups: requirers and suppliers. Here the requirers we mainly mean are small and medium-sized enterprises, whose demand can be understood. Then a direction current is formed:

$$\text{Suppliers} \xrightarrow{\text{intelligence}} \text{requirers}$$

Recognizing the importance of intelligence for enterprises, especially for small and medium-sized enterprises, it is possible to understand equally the urgency of intelligence requirers. That is to say, the factors on the right of arrow have strong incentives to intelligence-integration.

Demand of intelligence suppliers

Intelligence requirers' urgency can be understood relatively, then do the suppliers

have the same strong requirements or care little about it?

Companies are worried as if a house caught fire when needing hands, but pecialists still stay at home doing nothing——they hope to be sold off.

According to statistics, in big and medium-sized cities the turnover rate of specialists increases as 5% per year at present, and ideas of selecting occupation have changed a lot. The first choice is not light pressure of work and job stability any more, but high salary and able to give full play to their professional knowledge. Under the circumstances, more and more specialists hope to be commercialized and "sold" by intermediary companies.

This shows us that not only enterprises, those potential intelligence suppliers also have strong, not less than enterprises', demand, eager to turn knowledge into wealth, individual and social wealth as possible. It is a new issue in the Age of Knowledge Economy. The model of above section can be converted into:

$$\text{suppliers} \xrightarrow[\text{benefits}]{} \text{requirers}$$

Social Demand

It is surveyed by State Scientific and Technological Commission, in our country, only 14.6% of professional technicians can give full play to their talent while working, and 30% of them can do little for the present. Another management center for scientific research shows, in large and medium-sized enterprises of China, only 47.7% of engineering technicians are able to develop themselves and the rest 52.3% can do nothing.

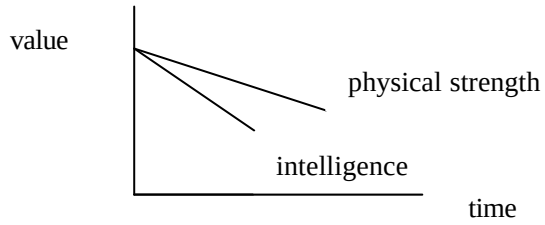
Some enterprises may have many "inventory talents" for the following reasons:

1. Some enterprises recruit many talents of the same sort, which causes the surplus. Or they employ the kind of talents who are not needed at present.
2. Some enterprises have not enough market requirements for their products to make full use of the fixed assets and human resources.
3. A few leaders are narrow minded, so that they are reluctant to bring the professional knowledge of the talents into full play out of envy.
4. Some leaders tend to appoint people by favoritism and real talents work on unsuitable positions.

For these reasons, the limited human resources are wasted somewhere and can't contribute to the society or country. So the society needs to build up a system through which the human resources can flow freely and make the most of their wisdom.

The common ground of "financing" and "intelligence-integration" is that both will devalue with the passage of time, till to be scrapped and valueless.

Equipment and machinery will devalue for wear and tear; currency and cash also have "time value". Capitals will become a loss as "opportunity cost" without being used. Human resources, which will devalue as the passage of time likewise, means the sum of labor forces among all of the people within some scope, or the generalization of people who possess intelligence and physical labor capacities which can propel the society and economy forward. Skills are getting rusty without practising; physical labors are going down with aging. Science and technology stated above will be affected more obviously by the time. As the following illustrates, the speed of losses of intelligence is much faster than that of physical capabilities.



So patent technologies will be protected within the number of years. Beyond this, the protection will become meaningless because the technology has lost its value. Values of human resources are named as "human resource capital". It promotes a dynamic concept and warns us to add new values continuously, which is increment of human resource capital. Because of the depreciation of intelligence capital, naturally it is very urgent to take full advantage of it and make it revalue.

It is easy to know from the above analysis, the real significance of proposing the concept of "intelligence-integration" is that it points out a bright direction of resolving problems of enterprises' existence and development, especially for small and medium-sized enterprises, not only puts forward a completely new and modern conception of using talents. When facing a golden opportunity large enterprises perhaps have to give up for the complexity of changing production line, but small enterprises can catch this opportunity to change the whole business in short time. The present facts have proved, neither lacking these enterprises which need the "golden ideas", nor having the available "pioneering intelligence", on the contrary, both sides are eager to exchange their requirements, just being short of a smooth and complete communicating channel.

DISCUSSION OF BUILDING THE SOCIAL MECHANISM OF INTELLIGENCE-INTEGRATION

"Intelligence-integration" is very important to support small and medium-sized enterprises as well as "financing". So a kind of social mechanism has to be built, and it's a tremendous, social systematic project just like the construction of "financing mechanism".

The Principle of "Pareto Optimum"

The economy can not improve any others' utilities by changing the allocation of products and resources without decreasing one's utility. On the contrary, "Pareto no efficiency" means the economy can promote one or some people's utility by changing the allocation of products and resources with holding one's utility. In the situation of no efficiency in economy, if reallocating the resources, the level of some people's utility will increase while others' won't lower. This reallocation is called "Pareto improvement".

Here, we regard products and resources as labor forces and human resources, and consider improving the utility of one or some enterprises even the whole society. Then we can say the use of talents is in a state of "Pareto no efficiency" and needs "Pareto improvement".

At present, the specialists generally work in a state of "light load", which shows the situation of using talents is dissatisfactory. People's talent cannot be done justice in their own unit. If we make the most of talents to improve the utility of some enterprises which need hands urgently, while keeping the utility of those the talents belong to, is it possible to improve the using efficiency of the whole country or society? From the analysis of current situation, it is quite possible. It only needs to change the method of allocating talents in the society, namely, "Pareto improvement".

Establish New Methods of Allocating Talents

Talents are also a production factor. The quantity and quality of talents are the main deciding elements. If talents of the whole society are considered thoroughly and brought into full play, the method of allocating talents is an important factor besides the quality and quantity.

From an elementary level to an advanced level the method can be divided into 3 parts:

Brownian movement→intermediary communication→operating lease

Brownian movement

"Brownian movement" is a physics concept. It means molecules or atoms of fluid move and collide at random and irregularly, and the movement of individuals is hard to predict and control. We name it as Brownian movement because irregular, spontaneous movements and random collisions of talents fulfill the allocation process in talents market. The process is spontaneous, blind, random and macro-uncontrollable, but is direct, flexible, convenient and efficient during the contact of requirers and suppliers.

suppliers→requirers

The allocation of "Brownian movement" is relatively primitive. The essential motivation is the benefits of two sides. Like molecules' energy consumption incurred by collision in Brownian movement, the method of allocating talents, in the sense of whole society, has few probabilities of rational allocation. It is impossible to gain much social

effects, the balance of demand and supply is also temporary and partial. Meanwhile, for lack of micro statistics, the market information on demand and supply is inclined to be false and delayed. It will cause excessive feedback of all kinds of information, worsen the imbalance and uncontrollability. In addition, considering their own benefits, intelligence requirers and suppliers couldn't conscientiously undertake the responsibility of safeguarding whole social interests. As well it may lead to conflicts between them.

Generally speaking, the talent allocation of Brownian movement is a method with obvious faults.

Intermediary Communication

This talent allocation with intermediary communication means suppliers and requirers select each other by the way of special middle-organization, till meet both sides' demand. Its characteristic is that intermediary organizations gather information on supply and demand, select the suitable partners and play a role of "go-between". Suppliers and requiers get in touch with each other through them.

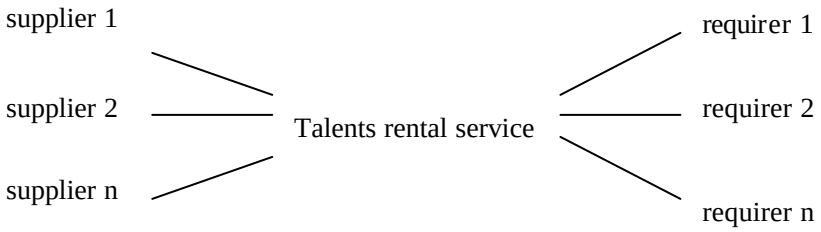
suppliers→middle-organization→requirers

This method is open, information sharing and widespread. It greatly improves the scale benefits of allocation, to a relative extent, overcomes and eliminates the faults of Brownian movement such as blindness, spontaneousness and uncontrollability, which makes the management of talents market enter a standard, perfect and harmonious stage.

Although this method may play a role of guidance by immediately releasing information, it is not authoritative. Evaluated from the whole society, this method can't, to the greatest degree, realize the whole benefits of social talents and avoid the blindness of operation. Under the circumstances of imperfect market and legal system, some intermediary organizations are very prone to lack of standardization.

Operating Lease

Operating lease regards talents as a relatively independent production factor. Departing from other factors, as a kind of resources or capital inventory, a managing object and profitable means, talents are managed by professional companies, and allocated in a way of compensated lease according to the employing units' demand. This special business is called "talents rental service" or "talents assigning company".



The difference from intermediary organizations is that talents rental service is a

socialized enterprise with corporate qualification, and possesses rights of operation, management, control and gains. It is an independent behavior object with united operating qualification of responsibility, rights, duty and benefits on human resource development, allocation and supersession. Without shifting ownership, rental companies assign talents, offer labors to requirers and collect rents according to the market and demand. After fulfilling tasks the talents will return and wait for the next opportunity. The talents are long-term employees and paid by the rental company.

The allocation of operating lease is carried out in an open job market. Suppliers and requirers both can accomplish the commercialization of intelligence and labor forces with the aids of information communication from renting companies and regulating function of markets, on the base of consensus reached by three sides of management (talents rental company), supply (talents for lease) and lease (employing unit). This method will eliminate very effectively the social faults of smothering and stifling real talents caused by private monopoly of human resources. It is very valuable for resolving structural problems on imbalance of talents' supply and demand, and common on-the-job unemployment.

To sum up, we can draw a conclusion that the allocation of operating lease is the direction and goal tried to meet. It has many important edges:

1. It breaks with the traditional dual-subject model, that is, individuals as suppliers and employing units as requirers, and achieves a leap to more steady and balancing three-subject model involving business administration, talents and employing units.

2. It realizes the strategy of talents optimum allocation transfers from microcosm to macrocosm, from individual to entirety, from labor forces to social resources.

3. It makes the administers, suppliers and requirers reach an agreement to the greatest degree on benefits on the base of three rights (social management right, individual occupation selection right, unit using talents right) mutual control, market regulation and contract guarantee.

4. It indicates talents as an independent productive factor, separate from productivity and will realize the specialized allocation, enterprise operation, socialized management and industrial development.

The more markets develop, the more divided management, which is an inexorable law of increasing economic benefits. Under the condition of modern market economy, talents as the most complex and initiative production factor, it is an inevitable direction to establish a market-oriented, specialized, socialized and large-scale business management mechanism with the help of internal benefits mechanism. It is an important task for government to establish the talents using and allocating mechanism.

Concepts Training and Proposals of Government Measure

Leading Directors to Form a Social "Intelligence Sharing" Concept

In modern society the flow of trained personnel has become more and more frequent and normal. "Changing a job" or "job hopping" is very widespread. Enterprises begin to face the problem of retention while thinking of recruitment of talents. In some enterprises, critical technicians are only paid relevant salaries with their technical level, not supported even allowed to attend examinations similar to professional posts to obtain general standards admitted by society. So they have no qualifications for working for other businesses and have to keep their minds on their work in the unit.

We can't say this method of work is not clever, but it is very narrow and limited if considered from interests of the whole society not from individual benefits. Talents belong to the country and whole society in the final analysis. They become one part of an enterprise merely through the interest's relation or realize their values by the medium of enterprises. The method of keeping one's own property obstinately will impede talents inevitably to improve and develop further, which is the social loss, also enterprises' own loss. Since human resources is a dynamic concept the static human resources will depreciate continuously. It is necessary to add new values constantly. Monopolizing talents will result in shortage of incentives to ongoing study.

I am impressed deeply by the viewpoint of "intelligence sharing" proposed by a personnel manager from some enterprise. He advocates talents shouldn't be taken as our own private property and should be encouraged to develop themselves; the flow of talents shouldn't be regarded as flood and beast of prey as well. If every enterprise can do this the human resources of whole society will be extraordinary active and prosperous, every enterprise will become a processing station among the talent flow and contributes to our society.

Referring to the supporting forms of "risk investment" and "pioneering fund" to small and medium-sized enterprises, establishing a special collecting organization, pooling those temporarily idle intelligence resources, just like collecting idle capital from masses to form an "intelligence fund", and searching for targets to "invest intelligence".

Building up a management organization to serve for small and medium-sized enterprises specially, providing guidance service on "intelligence-integration", for instance, valuable information such as acquisition methods of expiring patents. Training management staff to form the concept of intelligence-integration; establishing intermediary organizations sponsored by government, making a model for markets; investigating conditions of supply and demand, publishing the data to catch attention.

REFERENCES

Academy of Management Journal , Anne S.Tsui

China Business , Sponsored by Industrial Economic Research Center of Social Science Institute of China

China Medium- and Small-Sized Enterprise, 1997—1999

Decision , 1997.2

Economic and Research , 1998.5

HR Development , 1997.4

Knowledge Mangement , Sun Tao ,

Modern Enterprise , 1999.2—1999.5

Modern Enterprise Business , 1998.4

Political Economics Analysis for Gradual Reform , Fan Gang, Shanghai Far-East Publishing House

Shanghai Medium- and Small-Sized Enterprise, 1997.6

www.asiansources.com

www.libnet.sh.cn

www.china-union.com