

Strategic Assets Driving Organizational Capabilities of Thai Construction Firms

Piyanut Wethyavivorn¹; Chotchai Charoenngam²; and Wasan Teerajetgul³

Abstract: This research study aims to identify strategic assets which currently drive and enhance the organizational capabilities of construction firms. There were 258 sets of questionnaires assessing the level of importance given to 106 substantial resources underlying six organizational capabilities of Thai construction firms that were analyzed. Using factor analysis, these 106 items were reduced to 14, which were termed strategic assets. These 14 strategic assets were then classified based on their influence on the six organizational capabilities. The results indicate that Thai construction firms concentrate mostly on developing *excellent reputation*, creating *strong bargaining power* with suppliers and subcontractors, and strengthening the firm's *financial stability*. However, they do not give much importance to *effective risk and investment management*, *continuous development and innovation*, and *explicit strategic management*. These findings provide in-depth insight to comprehensively understanding a Thai construction firm's capabilities. These 14 strategic assets should thereafter be used to develop a practical tool for managers of construction firms to evaluate their firm's strengths and weaknesses as well as to identify strategic assets required to enhance competitiveness in the market.

DOI: 10.1061/(ASCE)CO.1943-7862.0000091

CE Database subject headings: Assets; Construction companies; Organizations; Thailand; Business management.

Introduction

Globalization presents formidable challenges to developing countries as they struggle to compete in the world market. A firm's success is less dependent on the attractiveness of its industry or country's environment, and more on firm-specific factors that determine its competitive advantage (Hawawini et al. 2004). Firms need to extend their thinking beyond national borders when it comes to competition, capabilities, and customers.

In the construction industry, globalization together with the improved knowledge-based economy and information revolution has fundamentally altered the market (Chinowsky and Meredith 2000). The client's needs in the industry have moved toward a greater emphasis on speed of delivery and value-based services (Yisa et al. 1996; Jaafari 2000). Innovative construction procurement methods such as design-build, build-own-operate-transfer, and design-build-finance-operate have therefore emerged in response to these shifting needs. In addition, protocols of the World Trade Organization have lowered barriers to entry into previously insulated markets, resulting in ever more intense competition (Ngowi et al. 2005). In order to secure long-term competitiveness in this new scenario, managers of construction firms must shift

their focus from a project level to an organizational strategic direction, simultaneously aligning all project goals along with the firm's overall strategy. Since the early 1990s, processes of adopting strategic management in the construction industry have been discussed by many scholars, such as Betts and Ofori (1992), Warszawski (1996), Price and Newson (2003), and Cheah et al. (2004).

Based on literature in the field of strategic management derived from resource-based theory, strategic assets leading to sustainable competitive advantage are characterized as: valuable, scarce, difficult to trade, difficult to imitate, and difficult to substitute (Barney 1991; Peteraf 1993). Due to the nature of these characteristics, tangible resources such as capital and construction equipment, despite being essential, can hardly contribute to enhancing competitive advantage. Rather, intangible resources such as human resources, knowledge, reputation, customer loyalty, valuable relationships, and technological as well as managerial competencies are necessary as complementary sources of enhancement. However, some studies further suggest that firms with comparable tangible and intangible resources still perform differently due to a particular asset called organizational capability, which is the firm's mechanism of transforming its tangible and intangible resources for the purpose of delivering services (Stalk et al. 1992; Teece et al. 1997; Eisenhardt and Martin 2000). In the construction industry, several capabilities have been proposed as increasing competitive advantages: innovation capability, learning organization, strategic partnering, information management, and the ability to provide project finance.

During the last decade, the Thai government has continuously invested in large infrastructure projects such as the Bangkok Sky Train lines, underground train lines, cable-stayed bridges, and the renowned Suvarnabhumi International Airport. These projects required high technological capabilities which could not be fulfilled solely by local contractors. As a result, a number of international engineering and construction firms from Europe, United States, Japan, and China entered the region to undertake these sophisti-

¹Lecturer, Dept. of Civil Engineering, Kasetsart Univ., 50 Phaholyothin Rd., Bangkok 10900, Thailand (corresponding author). E-mail: fengpyv@ku.ac.th

²Associate Professor, School of Engineering and Technology, Asian Institute of Technology, P.O. Box 4, Klong Luang, Pathum Thani 12120, Thailand.

³Lecturer, Dept. of Civil Engineering, Srinakharinwirot Univ., Rangsit-Nakhonnayok Rd., Nakhonnayok 26120, Thailand.

Note. This manuscript was submitted on January 17, 2009; approved on May 8, 2009; published online on May 9, 2009. Discussion period open until April 1, 2010; separate discussions must be submitted for individual papers. This paper is part of the *Journal of Construction Engineering and Management*, Vol. 135, No. 11, November 1, 2009. ©ASCE, ISSN 0733-9364/2009/11-1222-1231/\$25.00.

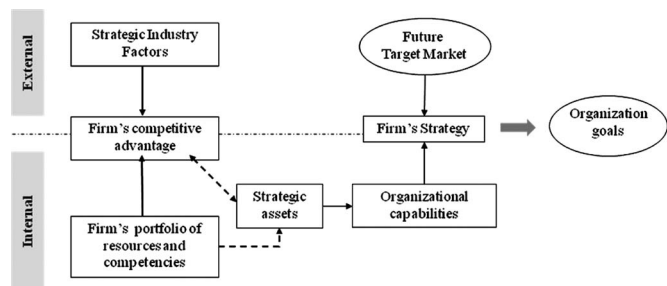


Fig. 1. Framework adopting the concept of strategic asset driving organizational capabilities to achieve organization goals

cated projects. Furthermore, following Thailand's free trade agreements with many countries, a number of foreign investors began investing in large capital projects such as power plants, manufacturing plants, luxury hotels, and residential projects throughout the country in alarming numbers. Local contractors who wished to survive in this new environment or enter into the emerging market in the region needed to successfully craft effective strategies and quickly develop the required resources and capabilities to seize upcoming opportunities [Ogunlana et al. 1996; Tam 1999; Teerajetgul and Charoenngam 2006; Waroonkun, T., and Stewart, R. A. (2007). "Modeling the international technology transfer process in construction projects: Evidence from Thailand." *J. Technol. Transf.*].

This study therefore aims to identify strategic assets driving a construction firm's capabilities in enhancing their competitive advantage in the Thai construction industry. From this, owners and managers can comprehensively evaluate their firm's capabilities and focus on the strategic assets that need strengthening in order to compete successfully in the market.

Strategic Assets and Competitiveness of Firms

Organizations possess various resources and competencies in some key routines and activities. However, the lack of capability to effectively deploy these resources and competencies seems to be a critical problem. The resources in this study are human resources, physical resources, marketing resources, and technological resources. Competencies refer to a specific skill or ability used to perform a specific task. Capability here is defined as a firm's capacity to deploy integrated resources and competencies to operate the business. Different capabilities require different combinations of resources and competencies. The competitiveness of a firm is the result of the performance of these capabilities when compared to its rivals.

To understand how competitive advantage in construction firms develops, a framework adopting the concept of strategic assets driving organizational capability to achieve organizational goals was proposed, as shown in Fig. 1. A firm's resources and competencies can be sources of competitive advantage if they are matched with strategic industry factors (Amit and Schoemaker 1993). These strategic industry factors are industry-specific. They are determined at a market level and as a result of complex interactions among external stakeholders including clients, competitors, suppliers, and government regulations. A firm can identify its strategic assets by analyzing its sources of competitive advantage, and then craft an effective strategy to compete in the future target market to achieve organizational goals.

In the construction industry, several intangible resources and capabilities have been considered to provide a competitive advantage. Innovation capability through knowledge management was emphasized by Egbu (2004), whereas an ability to develop a learning organization through strategic alliances was stressed by Holt et al. (2000). On the other hand, some studies have highlighted project management capability through particular aspects such as project information technology (Stewart 2007), speed of delivery (Mahmoud-Jouini et al. 2004), environmentally-friendly building processes (Ngowi 2001; Wenblad 2001), and value creation to clients (Abidin and Pasquire 2007). Finally, many studies, especially with reference to the large-scale public-private participation sector, have stressed that the ability to raise funds serves as an advantage for contractors operating in this particular market (Hassan and McCaffer 2002).

Capability Framework

The capability framework used to investigate strategic assets driving the competitiveness of a firm was developed from earlier studies including the explanation of organizational capabilities by Ansoff (1965), the generic value chain by Porter (1985), the classification of resources by Grant (1991), and the core capabilities model of Rangone (1999). Additionally, classification of a construction firm's resources by Warszawski (1996) was reviewed to incorporate capabilities particularly essential for construction business operations. A framework of six organizational capabilities, namely marketing, project procurement, construction, financial, business management, and learning and innovation, was established. Then resources and competencies supporting each capability were gathered from previous literature in order to design the survey instrument used to identify strategic assets.

Methodology

The methodology for this research study is herewith elaborated in four parts, as follows.

Identification of Resources Contributing to Enhancing a Competitive Advantage

The initial list of resources contributing to an enhanced competitive advantage was compiled from antecedent literature in many fields of study and across industries. Such literature included documents published by Thai industries: annual reports, newspapers, newsletters, and various financial institutions' research publications. In-depth interviews with 17 managers having at least 10 years of experience in the Thai construction industry were conducted to clarify operational definitions and confirm the significance of these resources. Prior to design of the questionnaire, this list of items representing the resources was validated with five industry experts who were top executives in their organizations and also had a minimum of 15 years' experience in the construction industry. This validation of content was carried out through interviews accompanied by questionnaires. Subsequently, 106 items structured under the six organizational capabilities previously described in the framework were used to design the survey questionnaire.

Questionnaire Design

The survey questionnaire was designed to identify the level of resources that Thai construction firms possess. It was designed with two sections consisting of the firm's general information and its resources. The first section was intended to obtain general demographic information such as the firm's turnover rate, duration of operation, type of services, and nature of clients. The latter part was aimed at identifying the level of resources that the construction firms possessed by asking respondents to rate the firm's performance along the 106 items mentioned earlier. The questionnaire was in a self-reporting format, and a five-point Likert scale from "not true" to "completely true" was used.

Data Collection

The construction firms in this study were all general contractors. Subcontractors and construction management consulting firms were excluded due to significant differences in their strategic business natures. The sample was developed using a database of construction firms from the Thai Ministry of Commerce. There were 3,485 registered construction firms listed with the ministry. Information from the ministry confirmed that a total of 1,027 firms were actively in operation during the study period (2001–2005). The questionnaires were thus mailed to all 1,027 firms, asking top management in charge of the firm's strategic direction to personally respond to the questionnaire. Following this, 258 sets of questionnaires were returned (25.12%), of which five sets were dropped due to incomplete data.

In summary, 60% of the respondents (top management personnel) had more than 15 years of working experience in the Thai construction industry. Similarly, more than 60% of the sampled firms had been established for over 15 years in Thailand. The majority of the sampled firms operated in the public sector. The firm's size, determined by its 3-year average annual sales, along with other key characteristics, are tabulated in Table 1 below.

Strategic Assets Identified through Factor Analysis

In order to identify the strategic assets, exploratory factor analysis was employed. The results revealed 14 strategic assets driving the capabilities of construction firms in Thailand. Cronbach's α coefficients for constructs underlying the six organizational capabilities were all higher than 0.70. Prior to factor analysis, a correlation matrix of all 106 assets was checked. Seven items were removed as their correlations were lower than 0.3 (Pett et al. 2003), leaving 99 items for which a principal component analysis with Varimax rotation was carried out. Twelve items were then removed due to their relatively low factor loadings (less than 0.4) except for a few items which contributed significantly to the interpretation of the rotated groups. Left with 87 items, 14 strategic assets were then extracted. Communalities of all items ranged between 0.5–0.8. Eigenvalues as well as total variance of all factors after rotation are shown in Table 2.

The construction firm's capability structure along with the grouping of 14 strategic assets into each capability was resubmitted for review to the 17 managers interviewed. After confirmation with these industry practitioners, the final structure of 14 strategic assets underlying the six organizational capabilities was achieved. The results of the factor analysis together with the mean scores of each item are shown in Table 3. The strategic assets driving each of the six capabilities are discussed in detail below.

Table 1. Sample Characteristics

Variables	Frequency	Percentage
Respondent's data		
Years in current firm		
Less than 5 years	44	17.39
6–15 years	101	39.92
More than 15 years	108	42.69
Working experiences		
Less than 5 years	19	7.51
6–15 years	82	32.41
More than 15 years	152	60.08
Firm's data		
Age of firm		
Less than 5 years	18	7.11
6–15 years	79	31.23
More than 15 years	156	61.66
Size of firm (determined by a 3-year average sales)		
Less than \$250,000	26	10.28
\$250,000–\$1,000,000	67	26.48
\$1,000,001–\$5,000,000	113	44.66
More than \$5,000,000	47	18.58
Major group of client		
Public sector	161	63.64
Private sector	68	26.88
Equally both	24	9.49

Marketing Capability

In Thailand, price was found to be the most decisive factor for project owners in both the public and private sectors. The rule of the lowest bidder was enforced in the public sector, whereas the private clients left room for negotiation despite also being price sensitive. In addition to having a competitive price, the following three strategic assets were considered as providing superior access to the Thai construction market: excellent reputation, exceptional client relationships, and strong networking.

Excellent Reputation

Reputation is imperative for the Thai construction industry, as past performance records are not documented and a formal classification of reputation in the form of a rating system is unavailable. Among the various areas requiring a strong reputation, a reputation for high quality of services had the highest factor loading of 0.688. In contrast to western countries which rely mostly on contract documentation, relevant parties involved in the Thai construction industry rely more on verbal commitments. This inevitably made *reputation for honesty and responsibility* of the contractor equally as important to clients and other stakeholders as indicated by a factor loading of 0.618. On the other hand, *reputation for high technology* and *previous project records* have helped clients to decide whether a firm is qualified to undertake their projects of interest. It was also found that obtaining well-publicized projects or renowned clients can enhance reputation. In some cases, contractors were willing to take such projects despite minimal or zero profit.

Exceptional Client Relationships

Excellent client-contractor relationships brought about not only a smooth working atmosphere at the project level but also har-

Table 2. Total Variance Explained of the 14 Extracted Factors

Component		Initial eigenvalues			Rotation sums of squared loadings		
		Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	Professional project management	41.196	41.612	41.612	11.996	12.117	12.117
2	Explicit strategic management	4.365	4.409	46.021	7.052	7.123	19.240
3	Effective learning organization	3.614	3.651	49.672	5.019	5.069	24.309
4	Positive organization culture	2.481	2.506	52.178	4.780	4.828	29.137
5	Continuous development and innovation	2.179	2.201	54.379	4.704	4.752	33.889
6	Strong networking	2.034	2.054	56.433	4.338	4.382	38.271
7	Efficient information technology	1.754	1.772	58.205	4.003	4.044	42.314
8	Financial stability	1.583	1.599	59.804	3.904	3.944	46.258
9	Efficient construction technology	1.506	1.521	61.324	3.899	3.938	50.196
10	Strong bargaining power	1.412	1.426	62.751	3.627	3.663	53.859
11	Effective risk and investment management	1.390	1.404	64.155	3.461	3.496	57.355
12	Excellent reputation	1.321	1.335	65.490	2.916	2.946	60.301
13	Excellent human resources management	1.192	1.204	66.693	2.558	2.584	62.884
14	Exceptional client relationships	1.160	1.172	67.865	2.497	2.523	65.407

nessed potential for future projects. *Works from existing client database* had the highest factor loading of 0.687 and was followed by *excellent relationship with clients* with a factor loading of 0.651. The development of a client database based on the client's preferences and constraints was found to be valuable in giving such clients unique services and unparalleled satisfaction. By endeavoring to make an honest effort to solve clients' problems and responding to clients' requests as well as dissatisfaction effectively, some firms had gained trust and loyalty from their respective clients. Like in many Asian countries, once established, a client's trust often provides opportunities for firms to be awarded subsequent projects without having to bid against other firms. In the public sector, it was noted that close ties with the concerned authorities were considered imperative. Unlike in western countries, when doing business in many Asian countries, connections with local authorities can provide a substantial advantage (Pheng 1997).

Strong Networking

To strengthen marketing capability, healthy relationships must be established among clients and all involved stakeholders such as design firms, construction management firms, various trade associations, and other contractors. In the Thai context, strong family ties and informal networks were seen to provide advantages in various circumstances such as more bidding opportunities, invaluable unpublished information, and acquiring stakeholders' trust. Relationships with various groups of investors who directly financed projects were considered essential and were indicated by the highest factor loading of 0.700. Similarly, *relationships with international firms* with a factor loading of 0.603 also gave a technological and financial edge to Thai contractors. These foreign firms needed Thai partners in order to tap into the local network, since most Thai businesses, like those in other Asian countries, do business with those they trust (Chen 1995; Roslin and Melewar 2004; Fletcher and Fang 2006). As such, once these international firms found a satisfactory contractor, the former often used the services of the latter for successive projects. Participation in a broader spectrum of social circles including industry professionals also increased a firm's opportunity to obtain unpublished bidding information and also to meet and mingle with potential clients.

Procurement Capability

All respondents agreed that obtaining required project resources at the lowest price is one of the key factors contributing to project success. Strategic assets, driving the procurement capability of Thai construction firms, were found to be a strong advantage for suppliers and subcontractors.

Strong Bargaining Power

Construction firms with stronger bargaining power were able to obtain superior services at lower prices than their competitors. Good relationships with suppliers and subcontractors developed through long years of business were ranked highest with a factor loading of 0.624. This was especially true for family-owned businesses in Thailand, whose their bargaining power stemmed from personal relationships between business owners. The Chinese concept of *guanxi* explained in Ambler et al. (1999), where enforcement is not on the basis of contractual obligation but rather on trust and the continuity of the relationship, also applies in Thailand. However, long-term contractual relationships which mandate that the contractor must use a particular supplier or subcontractor for all projects during a specified contractual period were becoming increasingly more important. This was noted by a factor loading of 0.618. On the other hand, construction firms with large and continuous volumes of work usually got cheaper prices and higher priority. Explicit procedures in selecting qualified suppliers and subcontractors were considered to create fairness, reduce conflict, and maintain good business relationships. Contractors with strong bargaining power would get more favorable credit terms.

Construction Capability

Construction capability, rooted in a firm's accumulated experience and its key personnel, undoubtedly set the firm's market boundaries by defining the type, size, and complexity of projects it was able to undertake. Firms with varieties of construction competencies were able to compete in a broader spectrum of markets, especially in large-scale and high-technology markets, where there are less competition and higher profit margins. Two strategic assets found to enhance this construction capability were

Table 3. Mean Score and Factor Loading for Items Underlying the Six Capabilities of Construction Firms

Capability	Strategic assets	Variables	Mean	Factor loading	Alpha
Marketing Capability	Excellent reputation	Reputation on high quality	4.04	0.688	0.8268
		Reputation on honesty and responsibility	4.28	0.618	
		Reputation on high technology	3.45	0.500	
	Exceptional client relationships	Extensive project record	4.10	0.395	0.7497
		Repetitive works with existing clients	4.08	0.687	
		Relationship with clients	3.68	0.651	
		Client database	3.27	0.461	
	Strong networking	Relationship with investors	2.70	0.700	0.8538
		Relationship with international firms	2.48	0.603	
		Active in institutional alumni and social clubs	3.17	0.597	
		Relationship with consultants	3.45	0.567	
		Participation in professional associations	3.16	0.476	
Procurement Capability	Strong bargaining power	Relationship with suppliers and subcontractors	4.36	0.624	0.8635
		Long-term contractual relationship with suppliers and subcontractors	3.67	0.618	
		A major client for suppliers and subcontractors	3.99	0.579	
		Established selection criteria for suppliers and subcontractors	3.74	0.467	
		Supplier credits	3.80	0.437	
		Cost estimate procedures	3.66	0.700	
Construction capability	Professional project management	Resource scheduling	3.70	0.646	0.9631
		Pricing policy	3.54	0.631	
		Understanding of project contract by staffs	3.76	0.626	
		Project quality control	3.72	0.611	
		Identification of project cost overrun	3.83	0.603	
		Identification of direct and indirect costs	3.85	0.596	
		Previous project cost database	3.46	0.587	
		Plans for procurement method	3.74	0.579	
		Project status reports	3.78	0.571	
		Detailed project budgets and schedules	3.83	0.568	
		Safety manuals	3.56	0.566	
		Identification of project delay	3.90	0.555	
		In-house foremen and workers	4.01	0.517	
		Project organization setup	3.63	0.492	
		Detailed records of all project operations	3.64	0.492	
		Project documentation system	3.61	0.463	
		Regular meetings with project stakeholders	3.81	0.461	
		Evaluate suppliers and subcontractor's performance	3.61	0.460	
		Meetings to review firm's cost structure	3.48	0.445	
		Clear authority and responsibility of employees	3.58	0.436	
	Efficient construction technology	Wide range project experiences	3.74	0.601	0.8382
		Large-scale project experiences	2.81	0.580	
		Excellent construction technology	3.52	0.538	
		Special construction equipment	3.24	0.508	
		Qualified project key personnel	3.67	0.489	

professional project management and efficient construction technology.

Professional Project Management

The success of a project critically depends on the ability of a construction firm to plan and control its construction operations and to efficiently solve related problems. *Cost estimate procedure* was ranked highest with a factor loading of 0.700 due to its high impact on project success. It is well known that detailed cost

estimates provide realistic budgets and schedules as well as insight into risk factors. Thus, the project team is better able to manage the project effectively. Pricing policies were also considered very important to project success and are noted with a factor loading of 0.631. In addition, it is crucial for project managers to grasp the fundamentals of project management, starting from first understanding the project contracts to monitoring time, cost, and quality. During the interviews, respondents stated that an experi-

Table 3. (Continued.)

Capability	Strategic assets	Variables	Mean	Factor loading	Alpha
Financial Capability	Financial stability	Credit and record with banks	4.31	0.744	0.8016
		Physical assets	4.04	0.627	
		On-time payment for all payables	4.15	0.612	
		Reserved cash (retained earnings)	3.64	0.599	
		Quality of cash flow forecast	3.52	0.505	
	Effective risk and investment management	Finances through shareholders	3.57	0.406	0.8314
		Evaluate client's risk (financial stability)	3.34	0.547	
		Cash and investment policy	3.30	0.546	
		Match sources and utilization of funding	3.04	0.515	
		Quantitative evaluation of investment	2.80	0.507	
Business Management Capability	Explicit strategic management	SWOT analysis	3.54	0.675	0.9291
		Long-term planning	3.25	0.597	
		Firm's performance evaluation system	3.22	0.572	
		Annual review of strategies	3.39	0.553	
		Firm's vision and strategy	3.58	0.552	
	Positive organization culture	Evaluate customer's feedback	3.24	0.533	0.8800
		Management team	3.70	0.497	
		Reputation on excellent work place	3.51	0.430	
		Team-based environment	3.75	0.778	
		Employee's commitment and loyalty	3.75	0.771	
	Efficient information technology	Good business philosophy	3.69	0.571	0.8031
		Creativity and adaptability of staffs	3.48	0.525	
		Computerized information system	3.69	0.648	
		Electronic communication	3.34	0.643	
		Integrated database from all systems	2.90	0.595	
	Excellent human resources management	Accounting system	3.56	0.438	0.8062
		Staff promotion policy	3.37	0.526	
		Offer good remunerations and benefits	3.42	0.498	
		Competent staffs remain long term with firm	3.59	0.464	
		Staff participation in business plans and policies	2.83	0.433	
Learning and Innovation Capability	Effective learning organization	Inter-departmental meetings	3.43	0.720	0.9019
		Informal work discussions across departments	3.47	0.613	
		Informal work discussions across projects	3.65	0.512	
		Inter-project meetings	3.50	0.505	
		Client's satisfaction through problem-solving skills	3.60	0.458	
	Continuous development and innovation	Formal internal training programs	3.17	0.358	0.8747
		External trainings and seminars	3.05	0.345	
		On-the-job training	3.69	0.342	
		Technology patent	1.89	0.767	
		Partner for technology transfer	2.28	0.676	
		Implementation of new knowledge	3.07	0.628	
		Monitor external business practices	2.72	0.545	
		Dissemination of firm's knowledge	3.13	0.438	
		Business operation manual	2.79	0.409	

enced project management team with clear responsibility and delegated authority was critical for achieving solid project management. This may be due to the emphasis on tacit knowledge of construction project management embedded in Thai project managers, as found in Teerajetgul and Charoenngam (2006).

Efficient Construction Technology

Efficient construction technology can certainly reduce construction cost, shorten project duration, increase quality, and more important provide needed innovative solutions for any technical

problems that arise. *Wide range of project experiences* including *large-scale projects* was ranked highest, with factor loadings of 0.601 and 0.580, respectively. Construction technology is usually accumulated through a series of experiences and is inherent in key personnel of the organization. Few firms have been able to extract the technical know-how accumulated therein and reproduce it in the form of organization manuals. Therefore, key personnel with experience in various complicated projects were considered vital for implementing the most appropriate construction technology for similar projects. Implementation of modern

technology and the use of highly technical equipment can also increase operational efficiency. During the presurvey, a firm proved its technological advantage by winning various projects through capitalizing on its unique access to a large pool of sophisticated technologies from its strategic partner in Japan, thus facilitating lower construction costs.

Financial Capability

Construction firms with higher financial capabilities were in a better position to absorb risks, explore innovative ideas, expand their volume, and capture new investments. The financial capability of construction firms was found to be driven a sound financial stability plus effective risk and investment management.

Financial Stability

Without sound financial stability, if any unanticipated financial crisis arises during the course of project execution, construction firms may not be able to obtain urgently required capital at an affordable rate. The financial stability of construction firms can be best evaluated through its credit record with local banks, and this is indicated with a factor loading of 0.744. This is clearly indicative as lenders (banks) are directly affected by the successes or failures of such construction businesses. For firms with excellent credit records, banks grant them larger credit values for both overdrafts and letters of guarantee, with minimal collateral. These firms also receive much lower interest rates with favorable terms and conditions of payment. Physical assets, especially properties, were another important indicator of financial stability and were ranked with a factor loading of 0.627. All construction firms investigated during the presurvey were found to have used their physical assets, especially real estate, to secure bank loans. They noted that the value of such properties increases every year, particularly land in Bangkok, major cities and vicinities, and thus they could periodically renegotiate for larger loans. The state of financial stability can also be determined through timely settlement of debts to suppliers, subcontractors, and employees. Finally, it was noted that a firm's reserve cash, accuracy of cash flow forecasts, and wealth of shareholders are all related to its financial stability.

Effective Risk and Investment Management

It is well known that risks must be systematically assessed and carefully managed or else they will result in unexpected losses which adversely affect cash flow and impede continuous development of the firm. The most influential factor disrupting a contractor's cash flow is delayed payment by its clients. By carefully assessing a client's ability to pay, and the risks related to the said client's business (factor loading=0.547), such financial issues can be greatly reduced. An effective *cash and investment policy*, ranked with a factor loading of 0.546, not only allows construction firms to better handle risks, but it also aligns the firm's capital investment with its strategy. An incongruity of source and use of funding was found to be a potential risk interrupting business cash flow. A case in point is when short-term loans are withdrawn for long-term investments. Most Thai construction firms assessed their potential investments on the grounds of management intuition only. Quantitative evaluation of investments was rarely conducted within the Thai construction businesses although it was widely accepted that such evaluations contribute to good risk and investment management practices (factor loading of 0.507). This practice of intuitive decision-making found in many Asian countries was argued to be quite effective in the environment, where

there is an informational void or no reliable objective information is available (Haley and Tan 1999).

Business Management Capability

Nearly all construction firms in Thailand are led by their owners or a top management team with members having an engineering background. They prefer focusing on technical construction activities rather than management of the business itself. It was therefore noted that business management capability was driven by four strategic assets: explicit strategic management, positive organizational culture, efficient information technology, and excellent human resources management.

Explicit Strategic Management

Explicit strategic management can guide firms in efficiently responding to market changes and effectively expanding into new markets. Conducting a strengths, weaknesses, opportunities, and threats (SWOT) analysis was considered relevant as indicated by the highest factor loading of 0.675. On the other hand, a firm's performance evaluation system for identifying strengths and weaknesses was also considered important as indicated by a factor loading of 0.572. In addition, the existence of a firm's vision and strategy, long-term planning, and an annual review of strategies were definite indicators of explicit strategic management. Without an effective performance evaluation of a firm's SWOT analysis, it cannot establish realistic visions and strategies. Such visions were found to be greatly influenced by the management team or the business owners themselves. From the interviews with organization managers, very few construction firms had explicit long-term business plans extending beyond a 1-year period. However, Haley and Tan (1999) found that the strategic planning process in south east Asian countries was very different from that of the west. Strategic planning behavior of Asian firms relies heavily on the executive's personal market knowledge, with limited systematic environmental scanning. The analysis of these executives might be entirely internal with no written analytical form. Therefore, it is possible that the strategic planning might exist, but that it is known only to the executives or the business owners.

Positive Organizational Culture

In order to manage a business successfully, positive organizational culture, which includes acceptance of the right values and norms by its members, is required to maintain an alliance. A team-based environment was considered essential as indicated by the highest factor loading of 0.778. This was especially crucial in construction, which requires a seamless integration of knowledge and experiences from various disciplines. Such an environment will inevitably minimize conflicts among staff, thus resulting in efficient operations in the long run. Employee commitment and loyalty, a deep-rooted value respected in many Asian countries, had a factor loading of 0.771. This often emerges through years of intricate interactions between all involved parties as well as the environment at large. In some cases, a clear business philosophy, stemming from the intent of the business founders at the onset of the business, played a vital role in setting the desired set of values and norms. A dynamic also contributed greatly to a firm's positive culture.

Efficient Information Technology

Without an efficiently designed information system, the flow of relevant information to support decision-making at all levels can

be delayed or hindered. Thus, computerized information systems had the highest factor loading of 0.648, as they can improve both accuracy and speed of information related to cost accounting, project management, and cost estimation. Electronic communication such as e-mail and video conferencing was also considered vital, as indicated by a factor loading of 0.643. This is of course expected to facilitate the efficient dissemination of data and information within the firm and also with external parties. In addition, integration of databases from projects and all departments at the head office 0063an also minimize repetitive data entry and also generate holistic reports to facilitate management's decision-making. However, it was found that only large construction firms invested in developing efficient information technology. Due to the small number of key staff members, most small construction firms in Thailand argued that it was more efficient to use various informal meetings and phone calls to facilitate the information exchange required for decision-making.

Excellent Human Resources Management

All respondents acknowledged the value of the human workforce as a primary ingredient of success in construction firms, but ironically, only a few could manage their human resources successfully. There were high staff turnover rates in most Thai construction firms. This was mostly noted during the economic expansion period, when firms were engaged in cutthroat competition for experienced key personnel. The enforcement of a staff promotion policy which would support employees in developing their individual career paths thus indicating fairness among all employees was considered vital and is indicated by the highest factor loading of 0.526. Similarly, satisfactory remuneration and welfare benefits including bonuses and health insurance were strongly indicative of excellent human resources management (factor loading of 0.498). Encouraging and permitting employees to participate in the development of business plans and policies also increased employee satisfaction. Since most construction technology is embedded in key personnel, the ability to retain valuable staff until their retirement is critical to a firm's competitiveness.

Learning and Innovation Capability

Most respondents agreed that learning and innovation capability was an essential element for long-term success, although they did not put much effort into developing this key capability. This was shown by the low ranking of assets in this category. There were two strategic assets found to improve this capability: effective learning systems, and continuous development and innovation.

Effective Learning Organization

Knowledge and experiences accumulated from various projects embedded and inherent in particular individuals in tacit form are difficult to transfer to other personnel without an effective learning mechanism. Therefore, the inability to transfer such valuable project knowledge was a barrier for construction firms to improve their quality and efficiency of services. Both formal and informal communications across departments were considered rather important as shown by factor loadings of 0.720 and 0.613. Formal and informal communication across projects was considered fairly important to organizational learning, as shown by loadings of 0.505 and 0.512. Knowledge and experiences across fields were transferred and exchanged during discussions in order to solve technical and managerial issues. Since confrontation in formal meetings could lead to negative results, as has been found in

Table 4. Mean and Ranking of 14 Strategic Assets

Ranking	Strategic assets	Mean	Standard deviation
1	Excellent reputation development	3.97	0.7068
2	Strong bargaining power	3.91	0.7709
3	Financial stability	3.87	0.7304
4	Professional project management	3.70	0.7481
5	Exceptional client relations	3.68	0.8234
6	Positive organization culture	3.67	0.7999
7	Effective learning organization	3.45	0.7988
8	Explicit strategic management	3.43	0.8190
9	Construction technology	3.40	0.8506
10	Efficient information technology	3.37	0.9282
11	Excellent human resources management	3.30	0.8272
12	Effective risk and investment management	3.12	0.9388
13	Strong networking	2.99	0.9635
14	Continuous development and innovation	2.65	0.9645

many Asian countries, informal channels of communication such as socialization during lunch breaks, dinner, or other group activities have often proven to be more effective (Morden and Bowles 1998). Despite the fact that on-the-job training was ranked lowest, it was a cost-efficient method commonly practiced in all firms for transferring and disseminating knowledge and skills from experienced to inexperienced personnel. This could be effectively enhanced through a job rotation policy.

Continuous Development and Innovation

Technology patents, which are quite rare in the Thai construction industry, were given the highest factor loading of 0.767. Sourcing for strategic partners for technological collaboration (factor loading of 0.676) allowed immediate access to sophisticated know-how necessary to execute certain projects more efficiently than competitors. Continuous application of new ideas allows firms to explore and develop both technical and managerial technologies accordingly. On the other hand, large construction firms attempted to transform their tacit knowledge embedded in key personnel into explicit knowledge by developing task-specific operation manuals. The accumulated knowledge could then be integrated into the regular manuals periodically. Such manuals also assisted the training of new staff, thus raising the standard of services. By monitoring outstanding business practices of not only their counterparts but also other industries, any given firm can study relevant developments which could prove beneficial.

Ranking of Strategic Assets Emphasized by Thai Construction Firms

After the resources and competencies of construction firms were grouped into 14 strategic assets, mean scores and ranking of these strategic assets among Thai construction firms were shown in Table 4. Thai construction firms placed the most emphasis on their *reputation development*, then strong bargaining power with suppliers and subcontractors, then financial stability. These assets are undoubtedly critical to the survival of a construction business. They also put great emphasis on project management and *client relations*, which are clearly required to operate the business successfully. Thai construction firms did not put much effort in continuous development and innovation or effective risk and investment management. This was partly because the majority of

Thai construction firms were family-owned businesses with the exception of a very few large firms listed in the Stock Exchange of Thailand. Family businesses tended to limit their growth and thus their investment in order to maintain control of the business by a few family members (Kotey 2005). Also, the Thai construction market was not sophisticated like those in developed countries. The market was mostly price sensitive, giving less importance to the quality or the design of projects. Therefore, there was no motivation for construction firms to invest in developing high technology.

The mean score of *strong networking* was also very low. There were five variables constituting this strategic asset (see Table 3). The scores were very low on relationship with investors and international firms. But most of Thai construction firms' networking were expanded through relationships with consultants, alumni, various social clubs, and professional associations. This agrees with the Asian business culture, which often relies on local networking due to trust developed through long-term personal relationships with family members, close friends, and other social clans who share similar values and culture (Fletcher and Fang 2006).

The results also show that Thai construction firms did not give priorities to strategic management, information technology, and human resources management like other industries did. This is due to the nature of family businesses, which often centralize all decisions and keep valuable information among top management, including strategic plans (Kotey 2005). This practice limits a firm's ability to grow and capture opportunities in the market efficiently. However, growth might not be the primary objective of these family-owned construction firms, as long as they can earn the desired profit.

Conclusions and Managerial Implications

The competitiveness of a firm greatly depends on its capability to transform its resources to create a unique value in the target market. Through factor analysis, 14 strategic assets driving the six organizational capabilities, which enhance a firm's competitive advantage within the Thai construction market, were identified. Most construction firms in Thailand attempt to build strong relationships with various stakeholders such as bankers, suppliers, subcontractors, designers, etc., in order to gain a competitive advantage. Since these relationships are attached to key individuals, the benefits from these relationships are often limited. For a construction firm to reap the full benefits of these relationships, the firm must focus on developing three essential strategic assets: explicit strategic management, *excellent human resources management*, and continuous development and innovation.

First, a construction firm should set a realistic vision and a corresponding set of long-term goals. This vision must be constantly communicated to all employees. The firm should develop an effective performance evaluation system and constantly conduct SWOT analysis in order to craft an effective strategy.

Second, the firm should put more emphasis on recruiting and retaining competent staff. Management must carefully craft an appropriate promotion policy together with an attractive salary structure and fringe benefits. Staff knowledge and skills should be expanded continuously through an efficient learning system. This eventually provides firm ground for continuous development and innovation within the firm.

Finally, management should more aggressively seek business partners such as international design and construction firms with

the superior technology required to achieve the firm's strategy. The firm must develop a policy to support continual monitoring and trial of new products, equipment, and other up-to-date technologies.

Development of these three essential strategic assets could help to develop the other strategic assets more efficiently. The findings hereof should provide the insights required to comprehensively understand a construction firm's capabilities. Further study could explore the relationships among these assets in order to understand the mechanism of these assets in driving the competitiveness of construction firms in Thailand.

References

- Abidin, N. Z., and Pasquire, C. L. (2007). "Revolutionize value management: A mode towards sustainability." *Int. J. Proj. Manage.*, 25(3), 275–282.
- Ambler, T., Styles, C., and Xiucun, W. (1999). "The effects of channel relationships and guanxi on the performance of inter-province export ventures in the People's Republic of China." *Int. J. Res. Mark.*, 16, 75–87.
- Amit, R., and Schoemaker, P. J. H. (1993). "Strategic assets and organizational rent." *Strategic Manage. J.*, 14, 33–46.
- Ansoff, I. (1965). *Corporate strategy*, Penguin Books, New York.
- Barney, J. (1991). "Firm resources and sustained competitive advantage." *J. Manage.*, 17(1), 99–120.
- Betts, M., and Ofori, G. (1992). "Strategic planning for competitive advantage in construction." *Constr. Manage. Econom.*, 10(6), 511–532.
- Cheah, C. Y. J., Garvin, M. J., and Miller, J. B. (2004). "Empirical study of strategic performance of global construction firms." *J. Constr. Eng. Manage.*, 130(6), 808–817.
- Chen, P. S. J. (1995). *Asian management systems*, Routledge, London.
- Chinowsky, P. S., and Meredith, J. E. (2000). "Strategic management in construction." *J. Constr. Eng. Manage.*, 126(1), 1–9.
- Egbu, C. O. (2004). "Managing knowledge and intellectual capital for improved organizational innovations in the construction industry: An examination of critical success factors." *Eng., Constr., Archit. Manage.*, 11(5), 301–315.
- Eisenhardt, K. M., and Martin, J. A. (2000). "Dynamic capabilities: What are they?" *Strategic Manage. J.*, 21(10–11), 1105–1121.
- Fletcher, R., and Fang, T. (2006). "Assessing the impact of culture on relationship creation and network formation in emerging Asian markets." *Eur. J. Market.*, 40(3/4), 430–446.
- Grant, R. M. (1991). "The resource-based theory of competitive advantage: implications for strategy formulation." *California Manage. Rev.*, 33(3), 114–135.
- Haley, G. T., and Tan, C. T. (1999). "East vs. West: Strategic marketing management meets the Asian networks." *J. Bus. Ind. Mark.*, 14(2), 91–101.
- Hassan, T. M., and McCaffer, R. (2002). "Vision of the large scale engineering construction industry in Europe." *Autom. Constr.*, 11(4), 421–437.
- Hawawini, G., Subramanian, V., and Verdina, P. (2004). "The home country in the age of globalization: how much does it matter for firm performance?" *J. World Bus.*, 39(2), 121–135.
- Holt, G. D., Love, P. E. D., and Li, H. (2000). "The learning organisation: toward a paradigm for mutually beneficial strategic construction alliances." *Int. J. Proj. Manage.*, 18(6), 415–421.
- Jaafari, A. (2000). "Construction business competitiveness and global benchmarking." *J. Manage. Eng.*, 16(6), 43–53.
- Kotey, B. (2005). "Goals, management practices, and performance of family SMEs." *International Journal of Entrepreneurial Behavior & Research*, 11(1), 3–24.
- Mahmoud-Jouini, S. B., Midler, C., and Garel, G. (2004). "Time-to-market vs. time-to-delivery: Managing speed in engineering, procure-

- ment and construction projects." *Int. J. Proj. Manage.*, 22(5), 359–367.
- Morden, T., and Bowles, D. (1998). "Management in South Korea: A review." *Manage. Decis.*, 36(5), 316–330.
- Ngowi, A. B. (2001). "Creating competitive advantage by using environment-friendly building processes." *Build. Environ.*, 36(3), 291–298.
- Ngowi, A. B., Pienaar, E., Talukhaba, A., and Mbachu, J. (2005). "The globalization of the construction industry—A review." *Build. Environ.*, 40(1), 135–141.
- Ogunlana, S. O., Promkuntong, K., and Jearkijrm, V. (1996). "Construction delays in a fast-growing economy: Comparing Thailand with other economies." *Int. J. Proj. Manage.*, 14(1), 37–45.
- Peteraf, M. A. (1993). "The cornerstones of competitive advantage: A resource-based view." *Strategic Manage. J.*, 14(3), 179–191.
- Pett, M. A., Lackey, N. R., and Sullivan, J. J. (2003). *Making sense of factor analysis*, Sage Publication, Thousand Oaks.
- Pheng, L. S. (1997). "Thick face, black heart and the marketing of construction services in China." *Mark. Intell. Plann.*, 15(5), 221–226.
- Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance*, Free Press, New York.
- Price, A. D. F., and Newson, E. (2003). "Strategic management consideration of paradoxes, process, and associated concepts as applied to construction." *J. Manage. Eng.*, 19(4), 183–192.
- Rangone, A. (1999). "A resource-based approach to strategy analysis in small-medium sized enterprises." *Small Bus. Econ.*, 12, 223–248.
- Roslin, R. M., and Melewar, T. C. (2004). "Linking practices reflective of 'Asian values' and relationship marketing in the grocery distribution channels in Malaysia." *International Journal of Retail & Distribution Management*, 32(1), 33–44.
- Stalk, G., Evans, P., and Shulman, L. E. (1992). "Competing on capabilities: The new rules of corporate strategy." *Harvard Bus. Rev.*, 70, 57–69.
- Stewart, R. A. (2007). "IT enhanced project information management in construction: Pathways to improved performance and strategic competitiveness." *Autom. Constr.*, 16(4), 511–517.
- Tam, C. M. (1999). "Build-operate-transfer model for infrastructure developments in Asia: Reasons for successes and failures." *Int. J. Proj. Manage.*, 17(6), 377–382.
- Teece, D. J., Pisano, G., and Shuen, A. (1997). "Dynamic capabilities and strategic management." *Strategic Manage. J.*, 18(7), 509–533.
- Teerajetgul, W., and Charoenngam, C. (2006). "Factors inducing knowledge creation: empirical evidence from Thai construction projects." *Eng., Constr. Archit. Manage.*, 13(6), 584–599.
- Warszawski, A. (1996). "Strategic planning in construction companies." *J. Constr. Eng. Manage.*, 122(2), 133–140.
- Wenblad, A. (2001). "Sustainability in the construction business—A case study." *Corp. Environ. Strategy*, 8(2), 157–164.
- Yisa, S. B., Ndekugri, I., and Ambrose, B. (1996). "A review of changes in the UK construction industry: Their implications for the marketing of construction services." *Eur. J. Market.*, 30(3), 47–64.