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Master thesis
Autumn semester 2007
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Strategy for Project Portfolio Selection in Private Corporations in Vietnam

ABSTRACT

Selection of right sets of projects is considerably critical for organizations to successfully achieve their competitive advantages and corporate strategies. Due to limited resources and dynamic changes in business environment, this kind of selection is quite challenging for organizations. Beside one hundred selection tools and techniques, academics and practitioners have studied and recommended complex selection frameworks to facilitate the selection of right projects. However, these theoretical frameworks are not applied by private corporations in Vietnam. Therefore, this dissertation is intended to better understand the academic and practical literature about project portfolio selection; study current practices of project selection that private corporations in Vietnam are using; and propose a framework that is beneficially adaptable to these private corporations. A multiple-case study strategy accessing qualitative data through observations and semi-structure interviews is designed to investigate how private corporations select their project portfolio under the current contexts of booming economy in Vietnam to ensure successful realization of their growth and development strategy. The recommendations resulted from literature review and investigations do not only support the investigated corporations to improve the quantity and quality of their investment project portfolio(s) but also facilitate possible adaptation to project portfolio selection by other private corporations.

Key Words: *Project Selection, Project Portfolio Selection, Private Corporations, Vietnam*

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List of Abbreviations

ADB	Asian Development Bank
AHP	Analytical Hierarchy Process
APM	Association of Project Management
BCG	Boston Consulting Group
ECV	Estimated Commercial Value
FAP	Financial Appraisal Profile
GDP	Gross Domestic Product
IMF	International Monetary Fund
IPO	Initial Published Offering
NPD	New Product Development
NPV	Net Present Value
PMI	Project Management Institutes
PPM	Project Portfolio Management
R&D	Research and Development
ROI	Return On Investment
SMEs	Small Medium Enterprises
SOEs	State Owned Enterprises
TOC	Theory of Constraints
WB	World Bank
WTO	World Trade Organization

ACKNOWLEDGEMENTS

We gratefully acknowledge the insightful supervision of Professor Tomas Blomquist and the advice and helpful suggestions of Professor Ralf Müller and Professor Anders Söderholm. We also wish to express our gratitude to the chairpersons and management board of the two private corporations selected as our study of cases for their contributing valuable time and sharing professional experiences.

We are also indebted to our family for their spiritual support and encouragement.

1. Introduction

1.1. Background

Recent studies show that many organizations have been trying to implement their corporate strategies through projects (Englund & Graham, 1999; Gardiner, 2005; and Srivannaboon & Milosevic, 2006), and that projects under implementation commonly have little or no apparent link to the corporate strategies and goals (Englund & Graham, 1999). Hence selecting right projects and right mix of projects for the portfolio is considered as one of the most important tasks for the organizations to ensure the achievement of the corporate strategy within limited resources and capabilities of the organizations. Many discussions in the literature reveal that the right sets of projects for implementation of corporate strategies are importantly resulted from successful selection of project portfolio (Archer & Ghasemzadeh, 1999; Combe, 1999; Bridges, 1999; Sommer, 1999; Cooper et al., 2000; Rădulescu1 & Rădulescul, 2001; Yelin, 2005; Better & Glover, 2006; and PMI, 2006).

In addition, literature shows that there are more than one hundred tools and techniques which help the organizations in selecting projects for its project portfolio (Archer & Ghasemzadeh, 1999). Each tool and technique has its own advantages and disadvantages. Normally, organizations do not apply only one tool or technique but a set of tools and techniques (Archer & Ghasemzadeh, 1999 and Cooper et al., 2001b). This application requires organizations to adapt or develop a comprehensible framework or process with which necessary tools and techniques are integrated to support organizations' project portfolio selection. Dye & Pennypacker (2000) claimed that the importance of project portfolio selection is widely recognized; however, a clear and formal project selection and prioritization process is too often lacking. Many researchers and practitioners are concerned about this lacking and attracted to search and develop a selection framework or process integrated with tools and techniques (Archer & Ghasemzadeh, 1999; Englund & Graham, 1999; and Cooper et al., 2001b).

Our initial research and observation show that private corporations in Vietnam also face this challenge of lacking a project selection framework or process. They do not have many experiences in selection of project portfolio as well as in application of selection tools and techniques. This may be due to the fact that private corporations in Vietnam are at early stage of establishment and growth. They have been legally allowed to establish in the past 15 years but developed and expanded within the recent 5 years (WB, 2006b, 2007). More significantly, the recent booming economy in Vietnam has created many opportunities for growth and development of private

organizations. Yet, these private corporations have to deal with the challenges of selecting the right projects in terms of time, cost, scope and quality to realize their strategy of growth and development especially the setting of position in the market at this beginning stage of booming economy and initial growth of corporations. Successful realization of corporate strategies will help these private corporations create and sustain their competitive advantages in such a dynamic changing business environment as Vietnam's. Besides, the complex frameworks or processes of project portfolio selection in project portfolio management found in literature are hardly applicable to these pre-matured private corporations as they are normally developed for large and mature organizations (Gardiner & Carden, 2004). Therefore, our studying current practices of project selection in private corporations in Vietnam and proposing an adapted framework for project portfolio selection based on theoretical and practical review of literature will provide significant contribution to improvement of the quantity and quality of project portfolio selection in private corporations in Vietnam which entails more widely application of project portfolio selection in the industry of project management and project portfolio management.

1.2. Research Question

In this dissertation, we need to address the following question:

"*How should a private corporation in Vietnam select investment projects for its project portfolio to ensure the successful implementation of its corporate strategy*?"

1.3. Aims and Objectives of Dissertation

The aim of this dissertation is to capture the essence of project portfolio selection in project portfolio management leading to successful realization of corporate strategy. The aim constituted of three objectives:

a. to better understand how project portfolio selection works in the academic and practical field of project portfolio management;
b. to investigate the practice of project portfolio selection in private corporations in Vietnam; and
c. to propose an adapted framework for better selection of project portfolio in private corporations within the current characteristics of Vietnam's economy upon evaluation of the investigated practice in comparison to the theoretical frameworks recommended by other authors.

1.4. Research Scope

It is academically and practically recognized in the disciplines that project and program management is about *doing the project right* whereas project portfolio management is about *doing the right project* (Cooke-Davies, 2002; & PMI, 2004, 2006). Beyond doubt, there must be a process of project portfolio selection to be productively performed in order to *do the right project right*. Project portfolio management and project portfolio selection are understood in a slightly different manner:

- Project portfolio management is project portfolio selection as it is understood as a dynamic decision-making process to evaluate, select and prioritize a project or a set of projects for implementation through allocation of constrained resources and alignment with corporate strategies (Cooper et al., 2001b; and Archer & Ghasemzadeh, 2004), while

- Project portfolio management is inclusive of project management in addition to the process of project portfolio selection as understood above. PMI (2006) defined it as *the centralized management of one or more portfolios, which includes identifying, prioritizing, authorizing, managing, and controlling projects, programs, and other related work, to achieve specific strategic business objectives*.

Within this dissertation, we focus on the process and framework applied by private corporations in Vietnam in order to select projects for their project portfolios. Projects studied include large investment projects but research and development (R&D) or new product development (NPD) projects. The private corporations in Vietnam considered as premature and on-going expanding do not have many R&D and NPD projects. Under the current conditions of Vietnam's economy, private corporations mainly capitalize large investment projects in new business and factories to realize their strategies of growth and development with diversified investment project portfolios. Thus, selection of the right sets of large investment projects is of the essence for realization of corporations' strategies as once selected and implemented, large projects are hardly cancelled due to involvement of costs and resource re-allocation (Collins & Fabozzi, 1991; Frame, 1994; and Byers et al., 1997).

1.5. Research Methodology and Design

Based on the reasoning discussed above, we believed it was pertinent to take a qualitative approach along with an exploratory research design to inductively address our research question. A multiple-case study strategy accessing qualitative data through observations and semi-structured

interviews best served this research approach and design (Yin, 1994; Fisher et al., 2007; and Hair et al., 2007).

The key significant theme for this multiple case study focuses on systematic approach to and processes or frameworks of project portfolio selection. Academics' and practitioners' literature has been reviewed in order to facilitate our better understanding of project portfolio selection in project portfolio management. During the literature review, we identified and examined eight main academic and practical areas of knowledge related to the process of portfolio selection (presented in the literature review section). Based on these main areas of knowledge, the questionnaires (refer to Appendix) and guidelines for semi-structure interviews and observations were developed for the study of two private corporations. The study of two cases enables us to make detailed analysis on how each corporation selects its project portfolio and further explore the processes in comparison between the cases and with the processes and frameworks reviewed in the literature. Nevertheless, these case studies need further replications in order to be generalized to the larger population of corporations in Vietnam, which is a possible solution to one of the important limitations of qualitative research and studies of one or a few cases (Yin, 1994; Fisher et al., 2007; and Hair et al., 2007).

The author of this dissertation has been working as a strategic consultant for these two private corporations for over 1 year regarding development strategy and project development; therefore, we have had opportunities to participate in the strategic and project management processes of these two corporations. The author had many times to participate in internal meetings of the corporations so the author is very familiar with organizational structure and operational process of the cases. These practical experiences through past and current participation in the activities of these corporations lead us to decide observation as the main method of gathering data to build up cases. However, due to author's familiarities to the corporations, the data and information would be probably subjective-based. To prevent this from occurrence, semi-structured interviews with CEOs, managers and focus group of selection team are used to verify and clarify further understanding of data collected from observation. The focus group is utilized to triangle and cross-check information and data during the interview in order that consistency and avoidance of misunderstanding are ensured. The combination of these methods apparently fit the timeframe of this dissertation. The author made six visits to the two corporations (three for each corporation selected for the above mentioned clarification) for interviews with chief executive officers

(CEOs), managers and focus group of project selection team and observation of how their projects have been selected (see table 1 for further details).

Table 1: **Data Collection Process and Analysis**

Activities	Aims	Participants	Outcome
Pre-interview preparation	- Using previous knowledge about the companies - Good preparation for interview	- Authors	- Draft description of the company's organization, list of investment projects, selection process
First visits	- Introduction - Access to updated general documents about organizational structures, on-going projects	- Author - 2 chairpersons	- Information and data used to modify the questionnaire - Modified description of the companies and its process - Updated questionnaires and clarifying questions
Second visits	- Semi-structured interviews - Observations	- Author - 2 chairpersons - Focus groups: project officers, middle managers who are implementing investment projects and sometimes participated in selection process	- Collected data and information reading for being categorized and analyzed
Third visits	- Clarification of understanding of their response	- Author - 2 chairpersons - Focus groups	- Data and information ready for being categorized and analyzed

Activities	Aims	Participants	Outcome
Third-party data collection	- Validity and triangulation	- ADB, - WB, - IMF - Trade magazines and internet websites	- Data about Vietnam's economic contexts - Legal and administrative documentation related to projects in two corporations and their subsidiary companies
Data analysis	- Categorization and analysis of data and information in accordance with discussion topics identified from literature review	Authors	- Categorized and analyzed data and information for discussion and recommendations presented in sections 3 and 4

Besides, information and data are also collected from other sources such as meeting notes and documented reports of existing projects and project portfolio selection process, and third-party documentation (e.g. from World Bank (WB) reports, International Monetary Fund (IMF) reports, from national trade magazines and newspapers) in order to triangle the evidences and discussions, and increase validity and reliability of information, data and findings (Yin, 1994).

Collected information and data have been categorized in accordance with discussions within the areas of knowledge examined in the literature review. Upon analysis and discussion, we try to figure out the weakness of the current process and try to make recommendations and propose a framework that is beneficially applicable to these two cases and will be usefully adaptable to other private corporations in Vietnam.

1.6. Corporations Selected for Case Study

Two private corporations are selected for studies of their project selection process which may, to a certain extent, reflect current situations of private sector in Vietnam. One large-size corporation in the North of Vietnam which has had its first IPO (Initial Published Offering) in early 2007 and another

medium-size corporation[1] in the South of Vietnam which has not yet had its IPO. This selection may generally represent business performance and organizational culture of corporations in different regions of Vietnam as business and culture in the South are different from those in the North. In addition, this selection can also allow comparisons of practices applied in large-size and medium size enterprises. For purposes of confidentiality, the names of these two corporations and details of the process are not disclosed. The names will be replaced by Hanoi Corporation and Saigon Corporation.

[1] According to Article 3, Decree No. 90/2001/NĐ-CP dated 23-11-2001 by the Government, SME is enterprise which has registered capital of less than US$ 1.3 million or number of employees of less than 300.

2. Literature Review

The extensive literature review was performed upon our literature search in the field of project management, project portfolio management, and particularly project portfolio selection. The search engine of Google Scholar (http://scholar.google.com/) and the database search facilities were used to find relevant books, theses, dissertations periodicals, scholarly and peer-reviewed papers such as Academy of Management Journal; Journal of Management Decision; Harvard Business Review; MIT Sloan Management Review; Academy of Management Review, International Journal Project Management; etc., in the database of universities, academic publishers, professional societies, EBSCO, Emerald, Blackwell Synergy, JSTOR, and Science Direct. Besides, the handouts and teaching notes provided by professors during the whole MSPME course (Master of Science in Strategic Project Management - European) have also been referenced.

The extensive review of literature is aimed at improving our understanding of theoretical and practical concepts underpinning the process of project portfolio selection. During the literature review, eight main academic and practical areas pertinent to our research question have been identified, examined, and presented in the next sections:

a. Relevant definitions
b. Strategies for project portfolio selection
c. Decision making process supporting project portfolio selection
d. Constrained Resources / Theory of Constraints (TOC) and project selection
e. Project categorization facilitating project portfolio selection
f. Project portfolio selection models or methods
g. Project portfolio selection process or framework
h. Challenges in project portfolio selection

2.1. Relevant Definitions

2.1.1. Corporate Strategy

There are a number of various defitions of strategy in the literature; and in pracice, strategy exits in every organziation (Yelin, 2005). However, the following defitions found are relevant to the discussion context in this dissertation:

Minztberg et al. (1998, pp. 10-15) provided interesting discussions on strategy understanding which is known as:

- ***Plan**:* some sort of consciously intended course of action, a guideline (or a set of guidelines) to deal with a situation; intended strategy,

- ***Pattern**:* consistency in behavior, whether or not intended; realized strategy (Combination of the plan and pattern concepts explains deliberate strategy (intentions that existed previously were realized) and emergent strategy (patterns developed in the absence of intentions or despite them which went unrealized),

- ***Position**:* a means of locating an organization in external environment,

- ***Perspective**:* seeking to look inside the organization, indeed inside the heads of the collective strategist, and

- ***Ploy**:* a specific 'maneuver' intended to outwit an opponent or competitor.

Similarly relevant to the context of this dissertation, Johnson et al. (2006, p. 9) defined strategy as *the direction and scope of an organization over the long term, which achieves advantages in a changing environment through its configuration of resources with the aim of fulfilling stakeholder expectations;* adding that strategic management includes understanding strategic position of an organization, strategic choice for the future and turning strategy into action.

2.1.2. Project Portfolio Selection Process

Project portfolio selection has become increasingly popular during the past decade. More recent literature has been dedicated to the subject. Both academics' and practitioners' literature review reveals that selecting projects and optimizing the project portfolio that best align with the organization's strategic priorities is the essential focus of project portfolio selection (see literature review). As explained previously, this dissertation focuses on the process of project portfolio selection as project portfolio management or partial element of project portfolio management. Therefore, the following definition by PMI (2006) of project portfolio selection process is relevantly applicable and adaptable:

- ***Project portfolio management or project portfolio selection** is formally defined as a dynamic decision process whereby a business's list of active projects is constantly updated, revised. In this process*

new projects are evaluated, selected and prioritized; existing projects may be accelerated, killed, or de-prioritized and resources are allocated and reallocated to active projects (Cooper et al., 2001b)

Many scholars and practitioners (e.g. Dye & Pennypacker, 1999; Sommer, 1999; Cooper et al., 2001a) claim that decision-making, prioritization and reprioritization, strategic alignment and realignment, allocation and reallocation of resources are the ongoing processes of project portfolio management. APM (2006) defines:

- ***Process*** as a set of interrelated resources and activities which transform inputs into outputs.

In addition, as a guide, PMI (2006) defines:

- ***Project*** as a temporary endeavor undertaken to create a unique product, service, or result**,**
- ***Portfolio*** as a collection of projects or programs (whether interdependent or not) and other work that are grouped together to facilitate the effective management of that work to meet strategic business objectives; adding that projects and programs are known as portfolio components

2.2. Strategies for Project Portfolio Selection

2.2.1. What is a right project portfolio?

Addressing the vital question *which projects are worth of time, cost and investment performance?* is strategic to any organizations in their selection and management of project portfolio. Both academic researchers and practitioners highlight the importance of project selection and prioritization process in project portfolio management (Cooper et al., 1997a, 1997b, 1998; Archer & Ghasemzhadeh, 1999; Dye & Pennypacker, 1999; Sommer, 1999; Artto et al., 2004; Morris & Jamieson, 2004; PMI, 2006). They argued that cooperative efforts made in order to select the right mix of projects require consideration of internal capabilities and external possibilities (Mintzberg et al., 1998) and leverage of strategic resources (Hamel & Prahalad, 1993 and Kendall & Rollins, 2003) for the benefits of individual projects and overall project portfolios.

Literature in Project Portfolio Management increasingly discussed the requirements that a project portfolio must meet in order to achieve the

corporate strategy. All literature (Ghasemazadeh et al, 1999; Sommer, 1999; Rădulescu1 & Rădulescu, 2001; Cooper et al., 2001b; Yelin, 2005; Better & Glover, 2006; and PMI, 2006) shared the same common critical requirements including:

a. *Alignment with corporate strategy:* this is a very important criterion for achieving corporate strategy. As discussed above, strategy is implemented by projects so if these projects are not aligned with strategy they will not contribute to the implementation of strategy. Cooper et al. (2000) argued that corporate strategy must be reflected in the project portfolio and resource allocation to projects.

b. *Maximizing the value*: resources of organization are limited, the target of organization is to utilize them effectively to achieve the maximum value of project portfolio. Normally, the organization used financial indicators such as NPV, ROI. Sometimes, such as in weighted scoring model, organization can pre-develop criteria to score and rank the project based on the maximum score of portfolio. However, according to Blomquist & Müller (2006), the later method lacks acceptance because it is poorly crafted or outdated criteria.

c. *Balancing:* like financial investment, project portfolio requires balanced (Cooper et al., 2000). The main purpose is balancing risk and return; long and short term benefits, time-to-completion, competitive impact and others.

In addition, Levine (2005) added some more requirements for the project portfolio that include:

d. Appropriate to organization's value and culture;

e. Directly or indirectly contribute to cash flow;

f. Most efficiently utilize the resources (capital, human resource, physical);

g. Projects not only contribute to short term business but also long-term development.

Through literature review, it is evidently argued that PPM is a "*bridge between strategy and operation*" and enables organizations to transform the organization's vision into realities or successfully implement their corporate strategies (Morris & Jamieson, 2004; and Dey, 2006). For instance, growth in every organization is resulted from its set of successful projects generating new products, services (Englund & Graham, 1999). Cleland (1999) argued

that projects are building block in designing and implementing corporate strategy. Sharing this opinion, Wheelwright & Clark (1992) identified the importance of the right set of projects in project portfolio for a company's future or market growth overtime. However, it is not easy to evaluate the rightness of the project portfolio in aspect of contributing to corporate strategy since strategies are dynamic and change over time. The concept of strategy itself is also ambiguous and abstract. Kendall & Rollins (2003) says that strategic objectives of a business can take many forms such as improving profitability, increasing market share, compliance with mandated regulations or improving services, penetrating new market.

From strategy perspective, Dietrich & Lehtonen (2005) argued that the success of project portfolio is ultimately judged through the achievement of the sustainable competitive advantage. Nevertheless, it is not easy to achieve a right project portfolio in reality. Literature shows the following problems in selecting its project portfolio: Firstly, projects have conflicts in objectives; some are tangible and some intangible so it is not easy to compare and select (Archer & Ghasemzhadeh, 1996 and Ghasemzhadeh & Archer, 2000). Secondly, there are uncertainties associated with project parameters, cost, and risk (Rădulescu1 & Rădulescu, 2001). It is challenging to select right projects which contribute to successful implementation of the corporate strategy. Thirdly, some projects are highly inter-independent. This means the organization cannot compare one project to the others but a set of projects to the others (Ghasemzadeh et al., 1999).

2.2.2. Systemic Approach to Project Portfolio Selection

In order to ensure successful selection of right project portfolio(s) to sustain organizations' competitive advantages, a systemic approach should be captured in project portfolio selection. This systemic approach is understood as harmony involvement of three main factors, namely people or decision makers; selection tools, techniques, and models; and selection process or framework (Archer and Ghasemzadeh, 2000 and Cooper et al., 2000, 2001a, 2001b). These are discussed in details in sections 2.3, 2.6 and 2.7 respectively.

Furthermore, the systemic approach requires active adaptation of best practices derived from academic research or professional practices in the sector or industry such as Bottom-Up or Top-Down Approach to Strategy Formulation, Balanced Scorecard, Weighted Scoring Models, etc.; and proactive development of "*signature process*" defined as "*processes which are idiosyncratic and unique to individual organizations are the secret to sustainable competitive advantage*" (Gratton & Ghoshal, 2006, p. 5), for

example the performance of 3M's action teams (Unknown, 1997). The difference between best practice and "*signature process*" is summarized below:

Table 2: **Difference between Best Practice and Signature Processes**

	Best practice	**Signature Processes**
Origin	'bringing the outside in': starts with external and internal search for best-practice processes	'bringing the inside out': evolves from a company-specific history
Development	Needs careful adaptation and alignment to the business goal	Needs championing by executives
Core	Share knowledge from across the sector	Values

Source: Gratton & Ghoshal (2005, p. 52)

Agreeably, organizations should both adapt best practices and create signature processes to stay unique and sustainably competitive (Gratton & Ghoshal, 2005). However, they should put more efforts and focus on strategic creativity to develop their own systemic approach to project portfolio selection through signature processes. Repeating best practices (with successful adaptation though) possibly keeps the organizations one step behind in its competition with the rivals as their rivals may have reached higher levels of competition. More importantly, in the same light of discussions on understanding and application of dynamic capabilities (Eisenhardt & Martin, 2000), this systemic approach to project portfolio selection can ensure creation of dynamic capabilities in dynamic changing business environment.

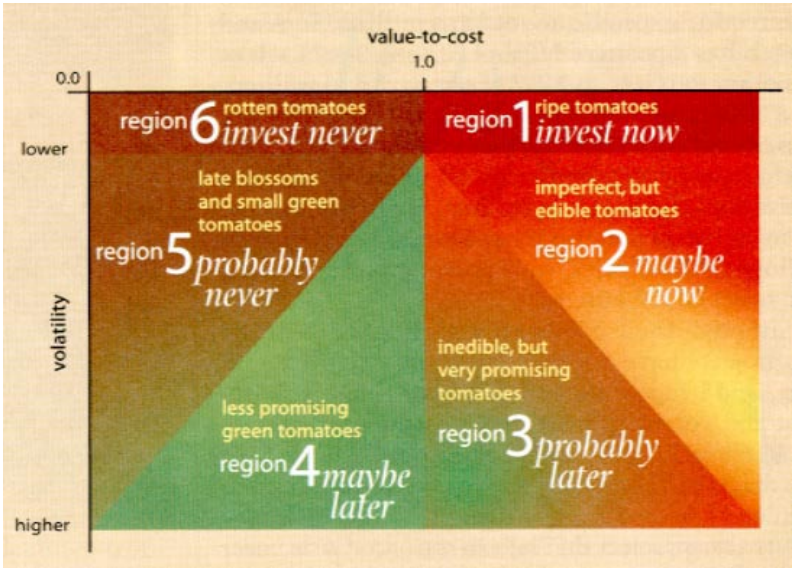
2.2.3. Project Portfolios Selected as Real Options

The empirical studies show that one of the critical factors leading to the failure of projects to deliver business strategies is the selection and implementation of too many projects beyond the organizations' capability and capacity (Wheelwright & Clark, 1992; Archer & Ghasemzadeh, 1999; Englund & Graham, 1999; Cooper et al, 2000; Yelin, 2005; Crawford et al., 2006; and Blichfeldt & Eskerod, 2007). Thus, short-term and long-term strategies should be taken into account in the process of selecting projects to deal with the challenge that availability of scarce resources entails strategic alignment of resources with business strategy delivery in terms of real options. Contributing to the appreciation of this approach, Luehrman (1998b) used the interesting metaphor of a tomato garden i.e. "*options as tomatoes*" to implicitly describe the process of creating, evaluating and selecting projects as options. The process is illustrated by the depiction of experienced

gardeners cultivating better crops in the garden of tomatoes (i.e. preparing land, seeding tomatoes, watering, fertilizing, weeding) and reaping the harvest in time (i.e. ignoring rotten or bad tomatoes, picking the ripened or good ones, and leaving the inedible or in-between ones for later pickup).

According to Luehrman (1998b), the garden of tomatoes is considered as option space with two option-value metrics inclusive of value-to-cost (net present value) metric and volatility metric in which tomatoes as projects are classified and located in the six region for selection and investment decisions (Figure 1). The discussion about calculating option value and exercising option prices is also mentioned in the article of "Investment Opportunities as Real Options: Getting Started on the Numbers" by Luehrman (1998a) which is, however, beyond the scope of this thesis.

***Figure 1*: Project Portfolios Selected as Real Options**



Source: Luehrman (1998b, p. 93)

More recently, contributing one chapter about project selection to the book of ***Project Management Toolbox*** by Milosevic (2003), Martino also discussed project selection as real options or selection of financial options, which is understood as considering future opportunity of investment for a profitably promising project. Within this perspective, real options are interestingly resulted from selecting the best combination of alternatives or projects whose upside and downside risks are identified and reduced.

Apparently, this approach of project selection as real options ensures the business strategy is successfully implemented in an effort of showing that a right project with the right scope should be selected at the right time to add its right value to the portfolio; and that 'not-right-enough' projects should be

chosen for ‘nurturing’ to reach its full potential to become a candidate for the portfolio value or “benefit pipeline” (Gardiner & Carden, 2004).

Furthermore, opportunity costs i.e. potential greater benefits with other opportunities or options sacrificed due to decisions of choice/alternative (Leiginger, 1977) and transaction costs e.g. commission, tax, cost of assets, expenses occurred due to bad project selected, etc. (Williamson, 1981; Collins & Fabozzi, 1991; and Byers et al., 1997) would complement further understanding of project selection as real options. More interestingly, instead of being too much concerned about the current inadequate capability and capacity, the project selection team should be also aware of potential internal and external resources in relation to business strategy when evaluating and selecting projects (Englund & Graham, 1999). Similarly, Frame (1994, p. 181) makes the following argument for project selection:

> *“A big problem with offhand project selection is that it leads to the ineffective use of resources. Support of a project to satisfy short-term exigencies may lead to long-term fiascos. Those making the decisions often forget that by committing resources to a poorly conceived project idea, they are tying up those resources. They have not taken into account the opportunity costs of their decision. If a truly good project prospect arises in the future, they may no longer have the resources to pursue it because their resources are tied up in marginal undertakings”.*

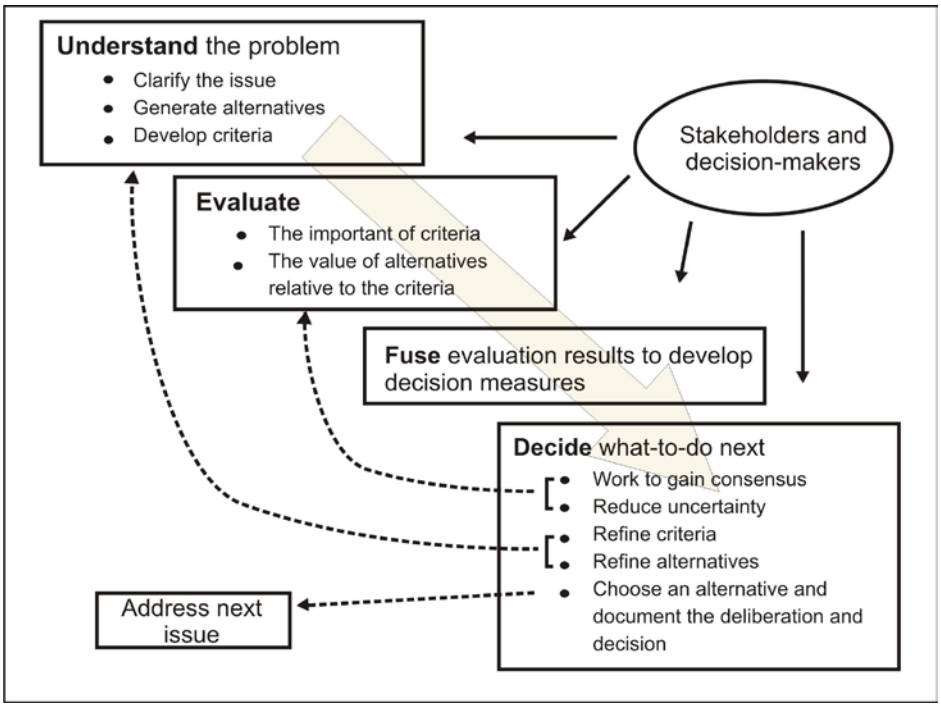
2.3. Decision Making Process Supporting Project Selection

Considering and integrating financial and strategic benefits of each project under uncertainty representing risks and within the framework of the organization’s strategic objectives are directed at increasing the effective allocation of resources to a set of competing project proposals. These consideration and integration require systemic processes of decision-making that assists in the selection of portfolio projects. Recent research in this context convincingly argued that a systemic decision-making process is desired to include a logical framework with a consistent series of activities at different stages insolated by proper usage of tools and techniques; and full participation of decision agents or actors (Archer and Ghasemzadeh, 2000 and Cooper et al., 2000, 2001a).

For instance, similar to other contemporary processes, the decision making process (figure 2) is described by Ullman (2006) as the involvement of stakeholders and decision makers in the four main activities, namely understand the problem, evaluate alternatives in comparison to criteria, fuse

evaluation results, and decide what-to-do-next. An iterative loop of the process is created by the two dotted arrows flowing back to earlier activities from the stage of 'decide what-to-do-next'.

Figure 2: **The Process of Making Decision**



Source: Ullman (2006)

Besides, Cooper et al. (2001b) claimed that the portfolio decision process encompasses or overlaps a number of decision-making processes within the business; and added that these processes include periodic reviews of all projects in the total portfolio; making Go/Kill decisions on individual projects, developing a new product strategy and making strategic decision on resource allocation. Supporting this discussion, Ullman (2006) argued that the decision making process entails consciously or unconsciously addressing the following five key questions:

a. Which is the best alternative?
b. What is the risk that our decision will not turn out as we expect?
c. Do we know enough to make a good decision yet?
d. Is there buy-in for the decision?
e. What do we need to do next to feel confident about our decision, within the scope of our limited resources?

Apparently, a critical feature facilitating project selection is that agents or actors with roles and responsibilities but logical frameworks or models make

decisions (Archer and Ghasemzadeh, 1999; Englund & Graham, 1999; and Meredith & Mantel-Jr, 2000). Depending on the types, sizes and structures of business organizations, decision agents are key individuals or teams of certain management members. For example, in the conceptual framework for the field of entrepreneurship research, Shane and Venkataraman (2000) laid emphasis on the influence of individuals on the existing, discovery and exploitation of entrepreneurial opportunities. Decisions to exploit these entrepreneurial opportunities are made by individuals with differences in considerations taken into expected value, costs of resources and opportunity costs; perception; risk-bearing willingness; and optimism. On the contrary to individual decision making, there often exist inevitable conflicts in team decision making due to a wide diversity of team members' social, cultural and educational background; knowledge, skills and experiences; and power and relationship within the organization. Amason (1996) suggested encouraging cognitive conflicts (known as "functional, task oriented and focused on judgmental differences about how best to achieve common objectives", p.127) and restraining affective conflicts (understood as "dysfunctional, emotional and focused on personal incompatibilities or disputes", p.129) to a certain extent for top management teams to produce higher-quality decisions with higher levels of consensus and affective acceptance.

More importantly, decision agents inclusive of individuals or teams should be empowered or hold certain roles and responsibilities during participation in the process of decision making to select project portfolio. Besides primarily discussing strengths and drawbacks of decision making techniques of ranking options for selection of projects, Frame (1994) recommended 5 general rules for selecting projects that lead to success, two of which are interrelated to each other referring to agents making decisions on project selection. These agents representing a variety of stakeholders and key project personnel constitute a project selection team.

Similarly, Levine (2005) suggests a selection team which is called project portfolio team or project portfolio management governance council. This governance council should be composed of high levels of key leaders and managers such as Chief Executive Officer, Chief Operating Officer, Chief Financial Officer and other senior officers. It is constituted in order to "bridge the gap between operation management and project management". Its main role and responsibility is to ensure the smooth loop of communication of data and information for making rational decision on portfolio contents.

However, it is arguable that how much time available these busy key leaders and managers share for detailed analysis, preparation and presentation of facts

and figures in the process of selecting projects. Gardiner and Carden (2004) claim that the selection and 'nurturing' process should be more advantageously done when this process can get the involvement and participation of people at lower levels especially in large and mature organizations. Furthermore, the interesting results of study done by Blomquist & Müller (2006) showed the significant roles and responsibilities of middle managers in program and portfolio management e.g. identifying business opportunities, look for synergies between projects, plan for and select required resources before project execution, etc.

Proper usage of tools, techniques, and models or methods to support project portfolio selection has been discussed in details in section 2.6.

2.4. Theory of Constraints (TOC) and Project Selection

Though Johnson et al. (2006) did not lay emphasis on project portfolio management in their '*exploring corporate strategies*', they explicitly argued that strategic capabilities defined as "*the adequacy and suitability of the resources and competences of an organization for it to survive and prosper"* (p.117) should be created in either strategic fit way (i.e. outside-in synergy, change of internal capabilities to better fit opportunities identified in the changing environment) or strategic stretch way (i.e. inside-out synergy, creation of new opportunities through enhancement and utilization of strategic capabilities) to develop and sustain competitive advantages. This implicitly encompasses the essence of competently dedicating resources especially strategic resources to support the organizations' strategies (Porter, 1985; Wernerfelt, 1995; and Johnson et al., 2006). This dedication of resources is described as leverage of resources inclusive of concentration of resources on strategic goals; more efficient accumulation of resources; complement of resources; conservation of resources; and recovery of resources (Hamel & Prahalad, 1993).

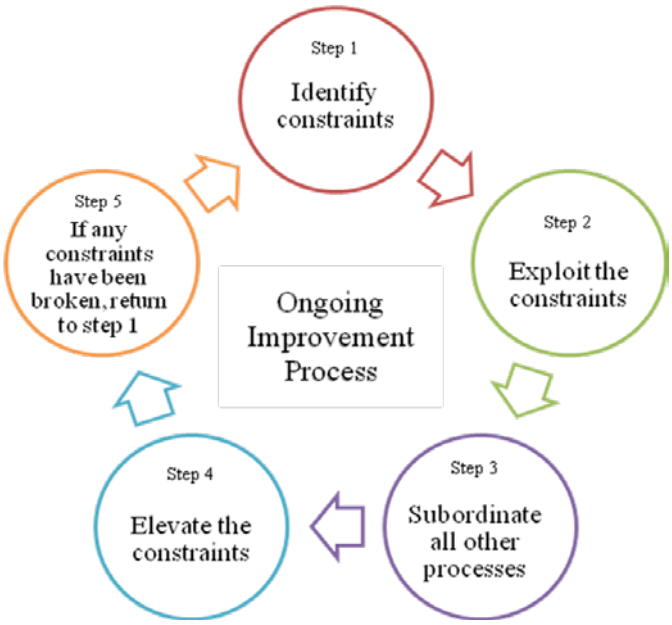
According to Johnson et al. (2006), resources of organizations are tangible or intangible. Tangible resources include physical assets of machines, building, finance, etc. whereas intangible ones include non-physical assets of skills, knowledge, experience, brand name, patents, etc. Strategic resources are known as ones whose availability is constraint to completion of many projects (Kendall & Rollins, 2003 and Blichfeldt & Eskerod, 2007) and have been categorized based on the value, rareness, limitability and substitutability (Barney, 1991).

Furthermore, Wheelwright and Clark (1992) discussed benefits derived from creation of an "aggregate project plan" within organizations. This plan is

intended to assist organizations in managing a set of projects instead of individual projects. It enables organizations to review the 'big picture' of their business strategies in which allocating resources, sequencing projects, and building up critical development capabilities are taken into consideration for strategic decisions on addition of new projects as well as elimination of on-going projects. More importantly, strategic leverage of constrained resources and enhancement of internal capabilities support organizations to manage the right mix projects, which lead them to achieve competitive advantages.

Obviously, projects or project portfolios are selected, prioritized and managed under certain constraints e.g. conflicts of resources in terms of time, budget, and human. In their research, many academics and practitioners have applied Goldratt's theory of constraints (TOC) to multi-disciplines of project management and more recently project portfolio management (Goldratt, 1997; Elton & Roe, 1998; Newbold, 1998; Leach, 1999; Rand, 2000; Jacob & McClelland-Jr, 2001; Steyn 2002; Kendall & Rollins, 2003; and Blichfeldt & Eskerod, 2007). The theory of constraints is a system approach based on the premise that there is at least one constraint (known as bottlenecks, delays, and barriers) in every organization that prevents the organization from utilizing its capability and capacity to achieve the organizational objectives (Goldratt, 1986). According to Goldratt (1986), the TOC approach focuses on the process of the ongoing improvement inclusive of effectively performing a series of 5 steps which are essentially involved in cause and effect thinking processes:

Figure 3: **Five Steps of TOC process**



Source: Adapted from Goldratt (1986)

The TOC approach, specifically “critical chain” has been expediently applied to time scheduling and resource leverage for either individual projects (Elton & Roe, 1998; and Rand, 2000) or a set of multiple projects (Newbold, 1998; Leach, 1999; and Jacob & McClelland-Jr, 2001). Besides, Steyn (2002) claimed that TOC approach is also considerably applicable to project risk management and project cost management. Discussions about TOC’s detailed applications in project risk management or cost management and enhancement of such existing time and resource scheduling techniques as Gant Chart, Critical Path Method (CPM), and Project Evaluation and Review Technique (PERT) are beyond the scope of this dissertation.

In their review, Elton & Roe (1998) stated that TOC has not significantly addressed the issue of managing multiple concurrent projects which share the same resources. They correctly argued that selecting the right number of projects would assist organizations to strategically leverage limited resources rather than suffering the constraints on resources shared by a large number of projects. Contributing to this interesting argument, Wheelwright and Clark (1992), Archer and Ghasemzadeh (1999), Englund & Graham (1999), Cooper et al. (2000); Crawford et al. (2006) and Blichfeldt & Eskerod (2007) indirectly implied the concept of TOC approach in their discussion about competition for resources amongst projects. Through their empirical study in project portfolio management, whether new or on-going, all projects are subject to resource allocation and reallocation in the alignment with business strategy during the process of project selection and prioritization. Hence, TOC is potentially applicable to portfolio project selection. The TOC’s cause and effect thinking processes aimed at answering the three very important questions: “what to change?”, “What to change to?”, and “How to cause the change?” would be advantageously pertinent to designing and developing portfolio project selection approach or framework.

2.5. Project Categorization Facilitating Project Portfolio Selection

It is advisable to select the right balance and mix of projects to maximize the value of the portfolio in respect of scope, scarce resources, and contribution to the short-term and long-term development strategy of the organizations (Cooper et al., 1997a, 1997b; Archer & Ghasemzadeh, 1999; Chien, 2002; and PMI, 2006). They stated that different types of projects that are interrelated and in alignment with organization strategies should be compared and selected. Hence, it is necessary and beneficial to classify projects for the purpose of facilitating the process of selecting and prioritizing projects in project portfolio management (Wheelwright & Clark, 1992; Cooper et al., 1998; Englund & Graham, 1999; Archibald, 2004; and Crawford et al., 2005).

Based on the degree of change in the product and the degree of change in the manufacturing, Wheelwright & Clark (1992) categorized projects into five types as follows:

a. ***Derivative***: ranging from cost-reduced versions of existing products to add-ons or enhancements for an existing production process,
b. ***Breakthrough***: involving significant changes to existing products and processes,
c. ***Platform***: offering fundamental improvements in cost, quality, and performance over preceding generations,
d. ***R&D***: is the creation of the know-how and know-why of new materials and technologies
e. ***Alliances and partnerships***: formed to pursue any type of project above

Relevantly, Atlantic Global (2007) introduced the following categories:

- based on competitive advantage, projects are categorized:
  a. ***Tactical***: delivering competitive advantage today,
  b. ***Administrative***: delivering concurrently promised service levels and supporting existing strategic projects,
  c. ***Strategic***: delivering competitive advantage in the future
  d. ***Innovation***: smaller and experimental projects delivering possible competitive advantage tomorrow
  e. ***Future vision***: contingent upon strategic and innovation projects
- based on level of importance, projects are categorized:
  a. ***mission-critical***: essential to successful delivery
  b. ***highly-desirable***: important but not essential
  c. ***desirable***: projects that do not belong to the two above

On the contrary, some other authors propose a categorization system for organizations to review and redesign their project categorization system. For instance, upon reviewing the system presented by Shenhar and Widerman (1996, 1997), Youker (1999, 2000) discussed characteristics of projects and four basic ways to establish a system of categorizing projects, namely geographical location, industrial sector, stage of the project life cycle, and product of the project. Similarly, Crawford et al. (2004) recommended the project categorization model consisting of two separate components:

a. ***purposes of categorization systems*** inclusive of:
   - strategic alignment,
   - capability specialization,
   - project approach promotion;

b. ***project attributes, namely***:
   - application area or product
   - stage of life-cycle
   - grouped or single
   - strategic importance
   - strategic driver
   - geography
   - scope
   - timing
   - uncertainty
   - risk
   - complexity
   - customer
   - ownership
   - contractual

Besides, PMI (2006) suggested three activities to categorize projects for project portfolio selection: identify strategic categories based on the strategic plan, compare projects and programs to these categorization criteria, and group each project or program into only one category. Primarily based on the work by Yorker (1999) and Crawford et al. (2004), Archibald (2004) developed and proposed a globally agreed project categorization system which is intended for the right application of project management methods and best practices for each project category, one of which serves project selection and prioritization.

2.6. Project Portfolio Selection Methods and Models

Selection tools and techniques are used to facilitate evaluating qualitative and quantitative indicators of an individual project or a set of projects, whose results are consulted by the selection team for their decision making on project portfolio selection. Selection tools and techniques are grouped into methods or approaches such as financial methods (e.g. Net Present Value - NPV, Internal Rate of Return – IRR), strategic approaches (e.g. strategic buckets) or they are integrated into models which are often categorized into 2 main types: numeric and nonnumeric such as scoring models (e.g. weighted factor scoring model) or checklists (e.g. Yes / No questions) (Evans & Souder, 1998; Meredith & Mantel-Jr, 2000 and Cooper et al, 2001a; Taylor, 2006).

There exist many discussions on methods and models for project portfolio selection in the literature. For instance, Taylor (2006) discussed good models which, whether nonnumeric or numeric, should have six basic characteristics as follows: realism, capability, flexibility, ease of use, cost-effectiveness, ease

of computerization. The first five characteristics were suggested by Souder (1973) and the sixth one was added by Meredith & Mantel-Jr (2000). Besides, in the discussion on choosing a project selection model, Meredith & Mantel-Jr (2000) provided three explanations for their preference for weighted scoring models: first, the models enable selection teams to make key decisions on supporting or rejecting the projects based on the organizations' multiple objectives; second, they are easily adapted to changes in either management philosophy or environment; and third, they do not suffer from bias towards the short run, inherent in profitability models.

Furthermore, Archer & Ghasemzadeh (1999) did the extensive review on project portfolio selection tools and techniques. They presented the advantages and disadvantages of each group of selection tools and techniques. For instance, the advantages of comparative approach include ease of understanding, ease of use, and allowing integration of quantitative and qualitative analysis; and their disadvantages are no explicit consideration of risks, repetition of entire process when adding or deleting new projects, difficulty in use when involving a large number of projects for comparison; and incapability to identify really good projects. These tools and techniques are then integrated into their project portfolio selection framework as follows:

Table 3: **Selection Tools Integrated in the Selection Framework**

Selection stage	Potential Tools / Methodologies
Pre-screening	Manually applied criteria, strategic focus, champion, feasibility study
Individual project analysis	Decision trees, uncertainty estimates, NPV, ROI, Resource Request estimates, Ad hoc techniques (e.g. profiles)
Screening Portfolio selection	AHP, Constrained Optimization, Scoring Models, Sensitive Analysis
Portfolio adjustment	Matrix displays, sensitivity analysis, project management techniques, data collection

Source: Adapted from Archer & Ghasemzadeh (1999)

In addition, Graves and Ringuest (2003) contributed considerable literature review on models and methods for project selection inclusive of two main streams: traditional management science stream and financial modeling stream. The authors presented the limitations and their suggested solutions of the models and methods that are related to mathematical programming (e.g. goal programming or multi-objective programming with binary or integer

variables); decision theory (e.g. static or stochastic conditions for decisions made at one time or several times on selecting projects to form a new portfolio or adding new projects to an existing portfolio); and finance (e.g. liner or non-linear optimization of portfolio

Cooper et al. (2001b) evidently discussed the popularity and dominance (dominating decision process) of tools, techniques, methods and models for project selection and portfolio management. The results of their survey interestingly show that first, organizations tend to use different combinations of tools, techniques, methods and models instead of any one alone to better select and manage their project portfolio (e.g. combination of financial methods and strategic approach); second, though financial methods are popularly used, they produce poorest performing portfolios; and finally, organizations with the best performance portfolios rely on strategic approach rather than financial methods. The table below presents the survey results of the popularity, dominance, and the using purpose of methods and models.

Table 4: **Survey Results of Project Selection Methods and Models**

Methods / Models	Popularity (%)	Dominance (%)	Use
Financial Methods such as NPV. ECV, ROI, EV	77.3	40.4	- to rank projects against each other, - to compare the financial result against a hurdle rate to make Go/Kill decisions on individual projects
Strategic approach such as strategic buckets, product road map	64.8	26.6	- to allocate resources based on business strategy and strategic priority
Bubble diagrams or portfolio maps	40.0	8.3	- to support the decision process
Weighted scoring model e.g. scale ratings, attractiveness score	37.9	18.3	- to rank and compare a number of projects against each other
Checklist	20.9	2.7	- to make go/kill decisions on individual projects

Source: Adapted from Cooper et al. (2001b)

In the interest of ensuring time, cost, scope and quality of any investment project; the tools, techniques, methods, and models reviewed in this section are concerned with financial analysis, strategic fit analysis and risk analysis. Lefley & Morgan (1998) and Rad & Levin (2006) claimed that utilization of project selection tools and techniques should collaboratively take into consideration of important aspects of strategy, resources, and risk. Moreover, depending on the objectives of the business, different levels of importance shared amongst these three aspects should be emphasized in the multifaceted process of project portfolio selection hence suitable sets of tools and techniques are deployed to avoid or limit their own drawbacks (Archer & Ghasemzadeh, 1999; Dye & Pennnypacker, 1999; Cooper et al., 2001b; and Rad & Levin, 2006). Another critical factor that should be considered when adapting tools, techniques, methods and models is the availability, accuracy, reliability (bias) and up-to-datedness of data input for analysis. This is more challenging for new organizations or organizations moving to new business industry where there are lacks of database, information and experiences (Rădulescu1 & Rădulescu, 2001).

Following is the presentation of typical tools, techniques, methods, and models that are widely discussed in our literature search. More discussion on these and others can be further studied in the work by Evans & Souder (1998); Archer & Ghasemzadeh (1999); Dye & Pennnypacker (1999); Meredith & Mantel-Jr (2000); Cooper et al. (2001a); Frame (2003); Graves and Ringuest (2003); Martino (2003); Rad & Levin (2006); PMI (2006); and Taylor (2006).

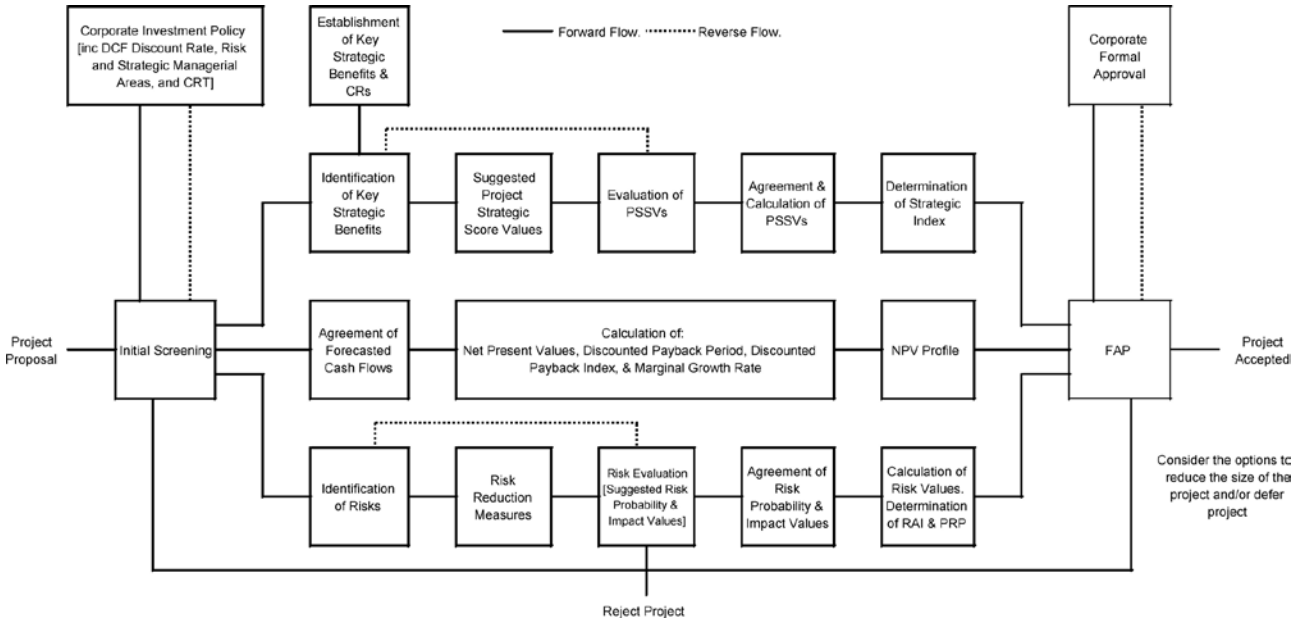
2.6.1. Analytical Hierarchy Process (AHP)

The AHP model developed by Saaty (1980) is used to support decision makers to rationally select the best alternative based on the qualitative and quantitative approach (subjective and pair-wise comparisons). The goal, evaluation criteria and sub-criteria are set in the hierarchical structure for order ranking, alternatives or options comparison in pairs, and selection of the best alternative. The analytical hierarchy can be structured inclusive of strategy, finance, and risk aspects of projects. However, too many criteria with different level of importance may make the decision making process challenging and complicated (Martino, 2003). Besides, as a result of selecting the best alternative, the AHP can help reduce the risk. Illustration example of project selection and application of AHP can be found in the work by Archer & Ghasemzadeh (1999); Frame (2003), Martino (2003) or at the website of Expert Choice company applying AHP in the specialized software, which was founded by Saaty and Forman:
http://www.expertchoice.com/solutions/index.html.

2.6.2. Financial Appraisal Profile (FAP)

Lefley (2000) presented the refined FAP model with an illustration of a case study applying this model, which he developed and first introduced in 1997. According to the author, adopting the management appraisal team approach, the FAP model consisting of three sub-models: the net present value profile (NPVP), the project risk profile (PRP), and the strategic index (SI) is capable of evaluating three main attributes of capital projects: finance, risk and strategic benefits (see figure 4).

Figure 4: **FAP Model**



Source: Lefley & Sarkis (2007)

In the NPVP, the "*economic value*" of projects is evaluated by using an adjusted discount rate to calculate their net present value (NPV = total of all net discounted cash flows during the project life – present value of the project's capital cost), discounted payback period (described as the break-even point at which the discounted returns from a project are equal to the capital cost of the project) , discounted payback index (DPBI is obtained by dividing the initial capital cost of a project into its accumulated discounted net cash inflows; i.e. showing how many times the initial cost of an investment will be recovered), and marginal growth rate (MGR = $[(DPBI)^{1/n} - 1] \times 100$, i.e. marginal return on a project after discounting the cash inflows at the cost of capital.

In the PRP, the "corporate risk threshold" (CRT) i.e. risk acceptance or tolerance point is established and the Risk Index (RI) is developed to identify, quantify, and manage project specific risks sourced from different departments or areas of responsibility. The risk exposure or risk value (R)

associated with each project is calculated by multiplying the probability risk occurrence (P) with the impact degree of the risk (R= P x I). The value for calculation is based on the judgments of appraisal team members. The scale of zero to -10 is applied to the risk value (-10 corresponds to the highest level of risk that the organization can accept from any risk area; the negative sign indicates risks as threats to the project). The RI is resulted from the adjustments on the level of risk in the highest risk area.

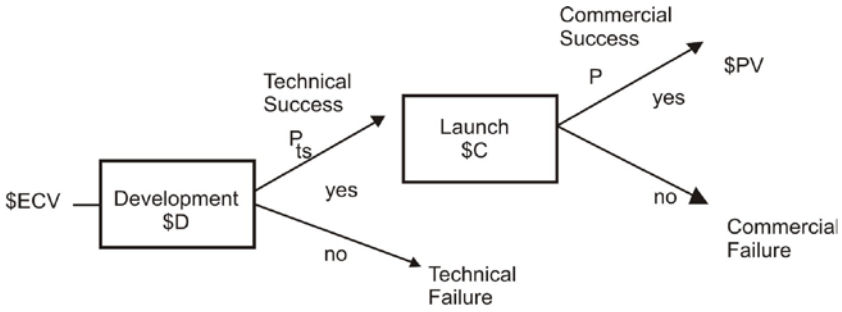
In SI, key strategic benefits that are potential or required in all projects are identified and ranked by the senior corporate management. This ranking is known as corporate ranking (CR). These key strategic benefits associated with each project are also valued by the appraisal team members. This valuing is known as project strategic score value (PSSV). Both ranking and valuing are scaled from 0 to 10 i.e. from no strategic benefits to the highest strategic level. The SI is calculated from the formula: (CR x PSSV) / CR. Thus, strategic benefits are considered at both corporate level and project level.

Illustration and case examples can be found in the work by Lefley (2000, 2006) and Lefley & Sarkis (2007).

2.6.3. Expected Commercial Value Method (ECV)

Cooper et al. (1997a, 2001a) noted that ECV (figure 4) known as a decision tree method is utilized to maximize the expected value of the portfolio, and added that it prevails over the weakness of the net present value and bang-for buck-methods which fail to consider risks, probability of technical and commercial success. Besides, in its application of ECV, English China Clay Company adds one more feature which is Strategic Importance Index (SI) to adjust the net present value of the project (Cooper et al., 2001a). The SI has three levels representing high (3), medium (2), and low (1). The net present value is adjusted by multiplying it by an SI. Another added feature is the ratio of ECV and constrain resources such as R&D funding or R&D personnel (ECV/R&D). However, this model has certain drawbacks, for example, heavily relied on financial and other quantitative data, and possible errors in probability estimates (Cooper et al., 2001a).

Figure 5: **ECV Method as a Decision Tree**



$ECV = [(PV-P_cs-C)+P_ts] - D

$ECV = Expected Commercial Value of the Project
P_{ts} = Probability of Technical Success
P_{cs} = Probability of Technical Success(given technical success)
$D = Development Costs remaining in the project
$C = Commercialization (Launch) Costs
$PV = Net Present Value of project's future earnings (discounted to today)

Source: Cooper et al. (1997a)

2.6.4. Benefit / Cost Ratio and Profitability Index

Frame (1994) discussed the analysis of weighting benefits of an option against its costs, which is known as Benefit / Cost (B/C) Analysis. The ratio is calculated by dividing the estimates of benefits by the estimates of costs as illustrated in the formula below:

$$B / C = \frac{\text{Estimated Sales x Estimated Profit Rate x Probability of Success}}{\text{Estimated Costs}}$$

The strategic factor (e.g. profit rate) and risk factor (e.g. success probability) are taken into consideration in this formula of financial analysis. It is noted that the benefit/cost ratio becomes the profitability index when the cash flows of benefits and cost are discounted. The benefit/cost ratio or profitability index is a quantitative tool which is very useful for ranking or prioritizing projects. When the ratio is greater than 1.0 a project is profitable and accepted; when it is less than 1.0, the project is unprofitable and rejected; and when it is equal to 0, the project is accepted or rejected depending on consideration of other strategic factors as benefits offset costs.

However, this ratio and index have certain drawbacks that need be aware of such as reliability of or bias toward estimates of benefits and costs; availability of data for estimates; some benefits are not measurable (e.g. competence improvement of project team); size-dependence nature of the ratio in '*apple to apple*' comparison (e.g. two projects have the same benefit/cost ratio of 4.0 resulted from different benefits and costs: the ratio of project A = 40 /10 whereas the ratio of project B = 4/1; or should project C

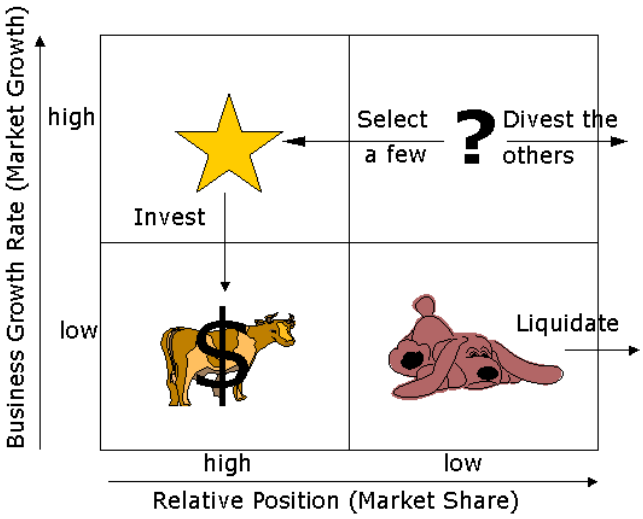
with ratio of 3.5 = $3,500/$1,000 be accepted or project B with ratio of 2.9 = $2,900,000 / $1,000,000 rejected?); and unknown payback periods of each project. Therefore, it is recommended that this ratio or index should be used together with other tools in order to make better decisions on project selection. (Frame, 1994; and Smith & Barker, 1999).

Further discussions on other financial tools serving project portfolio selection such as net present value (NPV), return on investment (ROI), internal rate of return (IRR) or modified IRR, etc. can be referenced in chapters 8-15 of the book ***Corporate Finance: Theory and Practice*** by Damodaran (2003).

2.6.5. Boston Consulting Group (BCG) Matrix

In 1970 the Boston Consulting Group (BCG) introduced the portfolio management tool which is now widely known as the BCG Matrix (figure 6). In the matrix, a portfolio of products is managed based on two dimensions: market share and market growth; and four segments: *stars* (high growth, high market share); *cash cows* (low growth, high market share); *dogs* (low growth, high market share); and *question marks* (high growth market share). The four segments represent the life cycle of a product. BCG (1970) stated that with a balanced portfolio consisting of stars to assure the future; cash cows to supply funds for that future growth; and question marks to be converted into stars with the added funds, a diversified company can use its strengths to truly capitalize on its growth opportunities. There are some limitations of the BCG matrix, for example, high market share is not the only success factor, availability and reliability of data on market share and market growth (12manage, 2007).

Figure 6: **The BCG Matrix**.



Source:12manage(2007)

2.6.6. Bubble Diagrams for Project Mapping

According to Cooper et al. (2001a, 2001b), recently developed bubble diagrams for project mapping are mainly based on the concepts of BCG matrix as portfolio management and GE/McKinsey matrix as portfolio analysis, and used to present project portfolio for resource allocation (i.e. they are not decision models) . A typical diagram has two dimensions of interests and four segments / areas to visually locate projects for creation of a balance portfolio. The table below shows the result of the survey on the popularity of the chart / diagrams (ranked from the highest to the lowest).

Table 5: **Popularity of Diagrams for Project Mapping**

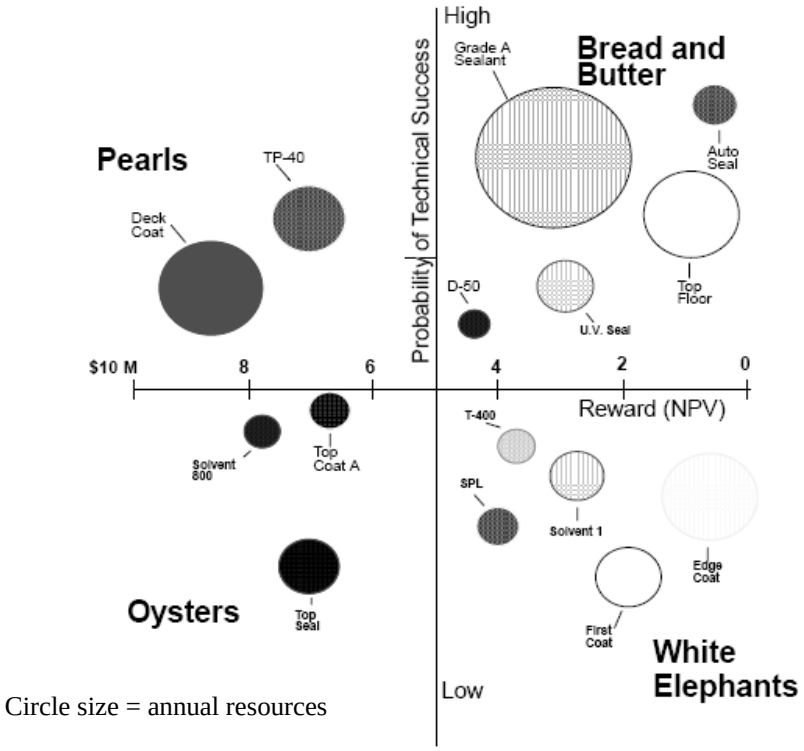
Rank	Type of Chart	Dimensions	
		Axis 1	Axis 2
1	Risk vs. Reward	Reward: NPV, IRR, benefits after years of launch; market value	Probability of Success (technical, commercial)
2	Newness	Newness	Market Newness
3	Ease Vs. Attractiveness	Technical Feasibility	Market Attractiveness (growth potential, consumer appeal, overall attractiveness, life cycle potential)
4	Our Strengths Vs. Project Attractiveness	Competitive Position (our relative strengths)	Project Attractiveness (market growth, technical maturity, years to implementation)
5	Cost Vs. Timing	Cost to Implement	Time to Impact
6	Strategic Vs. Benefit	Strategic Focus or Fit	Business intent, NPV, financial fit, attractiveness
7	Cost Vs. Benefit	Cumulative Reward ($)	Cumulative Development Costs ($)

Source: Adapted from Cooper et al (2001b)

As shown in the table, risk-reward bubble diagram is the most popular one. One dimension of this diagram shows the interest in qualitative and quantitative analysis of project earnings and benefits as future rewards whereas another one is associated with consideration of uncertainty and risk. Within the two dimensions, there are four quadrants for allocation of projects,

namely ***pearls*** - upper left quadrant (i.e. potential start products, projects with high chance of success and high rewards; ***oysters*** - lower left quadrant (i.e. projects with high expected payoff, but low probability of technical success; ***bread and butter*** - upper right quadrant (i.e. small, simple projects with a high success probability but low reward); and ***white elephant***- low right quadrant (i.e. low success and low reward projects). The bubble or circle represents projects. The size of the bubble or circle denotes the resource allocated to each project. When adding or deleting the new projects, resources strategically considered to share among projects make the size of the bubble or circle change as the total sum of the areas of the circles must be a constant. Below is the example of the risk-reward diagram of Company T.

Figure 7: **Risk-Reward Bubble Diagram**.



Source: Cooper et al., (2001a)

Many other variants of risk-reward bubble diagram can be further studied in the book titled ***Portfolio Management for New Products*** by Cooper et al. (2001a) or related articles by the same authors (1997a, 1997b, 1998, 2000, 2001b)

2.7. Project Portfolio Selection Process or Framework

There are more than one hundred tools and techniques for project portfolio selection (Archer & Ghasemzadeh, 1999); hence it is not difficult for organizations to select suitable tools. However, there is a lack of framework

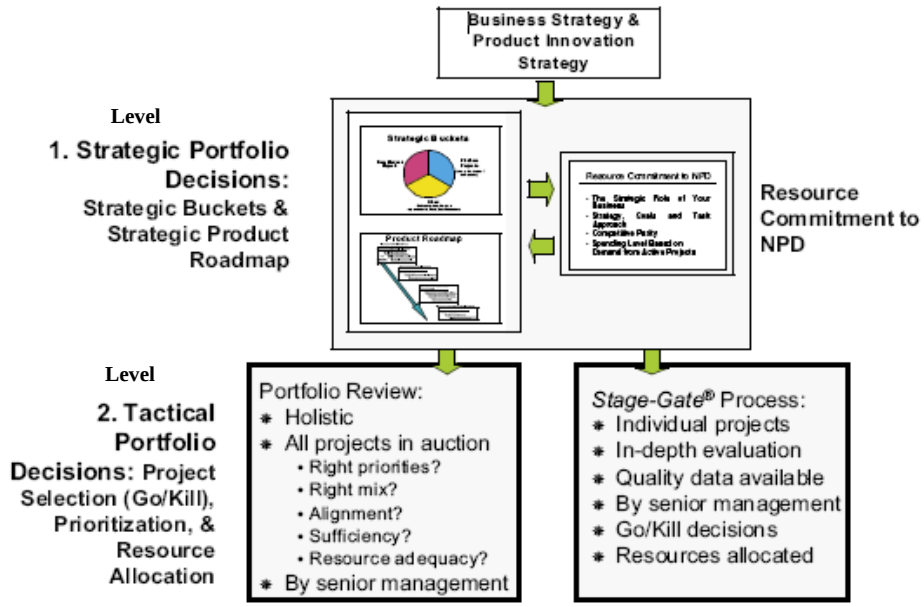
which organizes these tools and techniques logically (Archer & Ghasemzadeh, 1999). Therefore, it is important to adapt or develop an appropriate framework to evaluate project proposals and select a project portfolio which is aligned with the corporate strategy (Sommer, 1999).

In addition, recent literature focuses on approaches rather than tools and techniques. Common principles from these approaches can be described as followings: Firstly, they suggest dividing the project proposals into subsets (Englund & Graham, 1999; Sommer 1999; Cooper et al., 2001a; Rădulescu1 & Rădulescu 2001; and Crawford etal., 2006). Each project subset can be a group of projects which will share the same strategic buck as discussed by Cooper et al (2001a) or different categories of projects which have similar characteristics (Crawford et al., 2005, 2006). This will help the organization easily compare projects by same criteria or same tools and techniques. This is similarly applicable to ensure the balance of the project portfolio.

The frameworks discussed in this section are widely cited in our review of literature:

2.7.1. Framework by Cooper (2005)

Figure 8: **Hierarchical Process for Portfolio Selection**



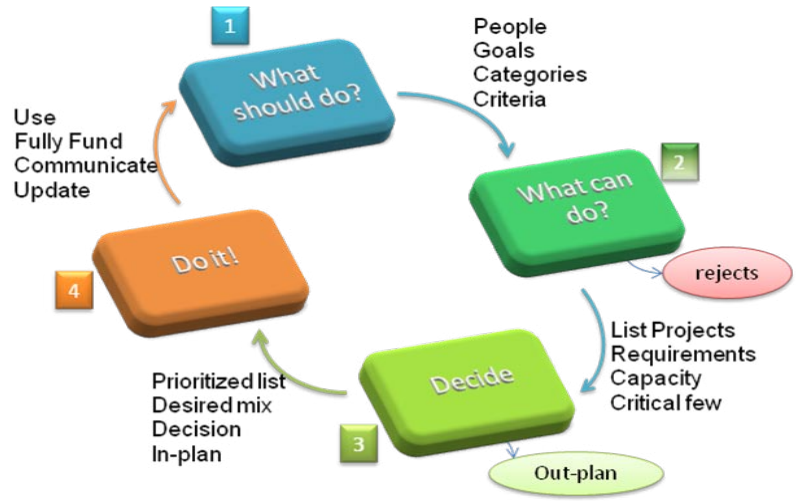
Source: Cooper (2005)

Regarding the selection framework, literature often proposed multiple steps for project selection process (Englund & Graham 1999 and Ghasemzadeh et al., 1999). Similarly, Cooper (2005) proposed a selection framework which

consists of 2 levels (figure 8). The first level is strategic portfolio decisions (strategic buckets) which is very important for the organization which wants to divide projects into subsets or categories. Each strategic buck will be resources allocated to one project subset. This will help the organization to have a balanced portfolio which is aligned with the corporate strategy since the decision of strategic buckets is done based on corporate strategy. In order to do this, the author suggested using matrix tool. The second level called tactical portfolio decision is project selection process. In this level different techniques and tools will be used to select right projects in each subset equivalent to each strategic bucket. The stage/gate is proposed to do in parallel in order to see if any resources are released from existing projects. Cooper et al. (2000) suggested that companies can apply both the stage/gate process and PPM at the same time because they complement each other. Within the scope of this dissertation, we do not discuss this stage/gate process in details since the focus of the discussion is selection process rather than rebalancing existing project portfolio and PPM as a whole. In addition, the stage/gate is more suitable for NPD and R&D projects but not very usefully applicable to large investment projects (real estate development, engineering projects).

2.7.2. Framework by Englund & Graham (1999)

Figure 9: **Mental Decision Process for Portfolio Selection**



Source: Adapted from Englund & Graham (1999)

Looking from another perspective, a systematic approach of 'mental decision process' to selecting projects was developed by Englund & Graham (1999). This process requires essential efforts of management team constituted by members that hold authority or are empowered to make decisions on projects and resource control and dynamic interaction among the team members. The

4 steps producing interrelated outputs make this approach truly systematic (figure 9). The 4 steps are described as follows:

a. ***What the organization should do***: Upon identified to lead the process, the team members start listing newly proposed and on-going projects. They, then, clarify or develop the expected goals of projects, taking into consideration of organizational strategies (vision, mission, objectives) and current as well as potential capabilities (either developed or acquired). It is advisable to classify projects into categories for the benefit of looking at projects from the view of 'big picture' inclusive of *out-of- the- box thinking, completeness, gaps, opportunities and compliance with strategy.* Projects classified/organized into the 'strategic buckets' (e.g. extent of product change: new- enhancement; and extent of process change: new- incremental) enable the team '*focus efforts on selecting the best set of projects within the categories,*' which constitute the right and balance mix. In order to facility decision making process, a set of criteria with weight or score reflecting requirements of organizational objectives (e.g. market positioning, available capacity, etc.) should be determined, modified and agreed upon for comparison and choices of projects.

b. ***What the organization can do***: the team members critically screen and evaluate projects based on consolidation and analysis of current or historical data, as a result certain new projects will be eliminated and on-going projects will be adjusted or terminated in respect of strategic priorities; availability of resources and technology challenges, etc. The authors describe the '***critical few***' with n screen subject to criteria sets agreed upon in step 1 e.g. screen 1- fit to goals; screen 2 market size, competence etc.

c. ***Analyze and decide on projects***: based on the comparison between resources available and resources required, projects are analyzed, prioritized and selected. The team should consider opportunity costs, project benefits before costs, return value when making decisions. With the sets of criteria agreed upon in step 1, the AHP (Analytical Hierarchy is recommended. Dedicated resources and contingencies should be committed to ensure the successful implementation of selected projects. Besides, communication loop should be developed and utilized to keep changes updated.

d. **Implement the plan**: staffing and allocating committed resources for implementation selected projects. A database should be created for monitoring, reporting and sharing. The plan is used as a communication

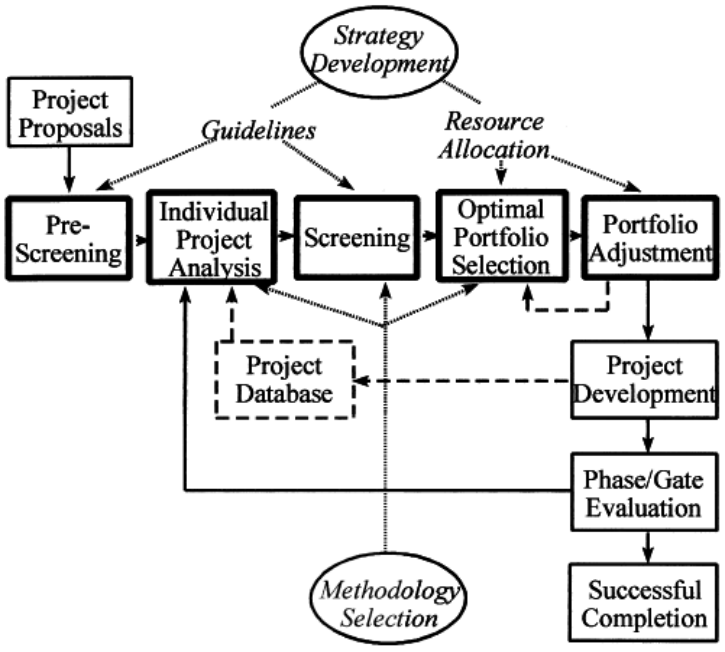
tool to help management team and those who are involved quickly respond to change and take corrective actions in terms of identifying new opportunities and leveraging resources.

It can be interpreted that completion of the first 3 steps in this process reflects the achievement of the three goals determined in the project portfolio selection by Cooper (2005): step 1 with '***should***' representing *project portfolio in alignment with strategy*; step 2 with '***can***' representing *portfolio value maximization using most effectively its resource and capability; step 3 '**analyze and decide**' representing right balance and mix of projects;* and step 4 with '***implement***' belonging to the next phase of execution and management in project portfolio management. The 4 steps reveal a loop of continuous stages, which is recognized as 'systematic approach'.

2.7.3. Framework by Archer & Ghasemzadeh (1999)

Ghasemzadeh et al. (1999), Cooper et al. (2001a) proposed the pre-qualification, each project should be evaluated separately first, if it passes initial criteria the project can go to next steps. It is the way to reduce bad proposals and the effort made by selection committee during selection process. However, it is argued that the prequalification process should not be so rigid that good projects are eliminated. Archer and Ghasemzadeh (1999) suggested a framework (figure 10) which composes of different stages one of which is project selection process:

Figure 10: **Framework for Project Portfolio Selection**



Source: Archer & Ghasemzade, (1999)

Observably, project selection process is the ending and starting point of other stages. Unlike a systematic approach of 'mental decision making process' discussed above, the integrated framework for project portfolio selection developed by Archer and Ghasemzadeh (1999) focuses on procedures and utilization of tools and techniques. This framework is widely cited in academic and practical research. In this framework of 'method-supporting-based decision making process', there are three main phases as follows:

a. *strategic considerations:* considering internal (strengths and weaknesses) and external (market place) environment to create competitive advantage in strategy development,
b. *individual project evaluation:* measuring benefit and value that each project contributes to portfolio objectives, and
c. *portfolio selection:* involving simultaneous comparison of a number of projects to rank and select projects for the portfolio based on certain measurement criteria and availability of resources

Besides, the integration of process stages and selection stages with recommended activities and methodologies creates flexibility for organizations to choose suitable techniques to make the most use of the framework for selecting project portfolio. Agreeably, this integrated process should be applicable for a wide range of possible project portfolios (Blomquist & Müller, 2006). As described, the *pre-process* facilitates organizations to determine strategic focus, resource constraints, choice of model techniques; the portfolio selection process comprised of pre-screening, individual project evaluation, screening, and portfolio selection supports the decision making process of rejecting and selecting projects based on data analysis resulted from application of different tools and techniques; and the post- process assists organizations to balance and make adjustments on project portfolio.

Observably, the three process stages of the framework support the argument of Cooper (2005) about the consideration of 3 critical factors in project portfolio selection: ***portfolio in alignment with strategy*** is achieved through pre-process; ***portfolio value maximization*** through portfolio selection; and ***right balance and mix of projects*** through post-process.

2.7.4. Principled Similarities of Frameworks

Each framework has its own advantages and disadvantages, and certain useful contribution to the project selection process of the organizations. However, there is no magic wand and no silver approach (Bridges, 1999; Dye & Pennypacker, 1999; and Cooper et al., 2001b). Apparently, there is not much difference and conflict in the frameworks discussed above. Though they are

utilized from different perspectives and approaches, they are commonly applied by the same principles and requirements in project portfolio selection.

In addition, Archer & Ghasemzadeh (1999) claimed that organizations can adapt or develop its own framework on the condition that the framework used in the organizations must meet following requirements:

a. Model must be flexible so that users, at each step, can choose techniques and tools which they are comfortable with.

b. For simplifying reason, it should include different steps, allowing decision makers to move logically towards an integrated consideration of projects. The idea of pre-screening and different-steps approach is also seen in practice. The interview result from Blomquist and Müller (2006) provides the evidence for this idea "*we started with establishing the simple process to review new ideas and the flow of tasks that we need to take place to validate them. We rapidly moved to the definition of the metrics by which projects could be fairly assessed against one another*".

c. Common measures in calculating criteria for each project are selected to compare projects during project selection process.

d. Project which reaches major milestone should be re-evaluated at the same time when new projects being considered for selection. This is necessary because available resources can be evaluated (adding from some completed or canceled projects), changes in strategic focus and business environment.

2.8. Challenges in Project Portfolio Selection

The challenges discussed in this section are evidenced in the literature review and likely possible in practice in organizations in Vietnam. Organizations should take into accounts effects of and solutions to these challenges in order to select a right project portfolio:

Firstly, data input are probably unreliable or unavailable. Rădulescu1 & Rădulescu (2001); and Cooper et al. (2001a) argued that in this process, organizations face many problems such as lack of information, unreliable data of cost, time to completion, availabilities of resource, and benefits of projects. This is especially concerned by organizations moving to new business where they have no database, information, experiences in new types of projects.

Secondly, organizations often review their strategic plans on annual basis, which automatically eliminate opportunities of new project proposals coming

from different sources. Lu, Chiu & Cox (1999); Englund & Graham (1999); and Kendall & Rollins (2003) argued that project proposals are randomly arriving, not at one time. This requires the model or process to be flexible so that organizations can select projects without waiting until annual planning meetings.

Thirdly, in the era of uncertainty, rapid change and increasingly competitive pressure, organizations especially large ones are mandatory to change for creation of dynamic capabilities to survive and outperform their competitors. Apparently, decisions on selection of project portfolio will create certain change in the organizations. For change to occur, large organizations often face such challenges as lack of a holistic proactive process or model to strategically plan realistic, achievable and measurable change and understand change implication and impact; failure to consult with and involve people influencing and affected by change; inconsistency in timely and intensive follow-through communication, monitoring and evaluation; and unsuccessful creation of change culture within the organizations (Bolman & Deal, 1991; Bechtel & Squires, 2001; Chrusciel & Field, 2006, and Walker et al., 2007). Change management and organizational behaviour management can be applied to deal with these challenges. However, the discussions are out of the scope of this thesis.

Lastly, Sommer (1999) noted that in large organizations with many business units, each business unit has its own list of priority and preferences. Besides, project portfolio selection is not always rational but it is biased by human being factor such as lobbying, (Englund & Graham, 1999; and Yelin, 2005). Therefore, the bias reduction should be factored in adapting or developing systemic approach to project portfolio selection.

3. Study of Cases in Vietnam

3.1. General Information about Vietnam's Economy

3.1.1. Economic Performance

Vietnam has transformed from the centrally planned economy into market economy with socialism orientation since 1986. However, the legal framework was first established in 1990 with the issuance of the Private Enterprise Law and the Company Law. The Constitution officially recognized the role of the private sector in 1992 (WB, 2006b). At the same time, the Government implemented "Open Door" and "Doi Moi" (renewal) policies to attract and allow foreign investment into Vietnam.

The reform policies, especially those in early 2000s have significantly contributed to the economic performance. For instance, GDP has recorded the second-highest growth rate in Asia over the last decade (see table 5) (IMF, 2007). It will be continuously stimulated by Vietnam's membership of World Trade Organization (WTO) from 2007. The estimated GDP growth rate of 2007 is 8.4%.

Table 6: **Vietnam's Basic Economic Data**

Nominal GDP (2006): US$60.9 billion — GDP per capita (2006): US$723
Population (2006): 84.15 million

	2002	2003	2004	2005	2006
Real GDP (annual percentage change)	7.1	7.3	7.8	8.4	8.2
Saving-investment balance (in percent of GDP)	-1.9	-4.9	-3.4	-0.9	-0.3
Gross national saving	31.3	30.6	32.0	34.6	35.0
Private	23.9	23.3	23.6	28.0	27.3
Public	7.4	7.3	8.4	6.7	7.7
Gross investment	33.2	35.4	35.5	35.6	35.3
Private	21.5	20.8	22.9	22.3	23.0
Public	11.7	14.7	12.6	13.3	12.3

Source: IMF (2007)

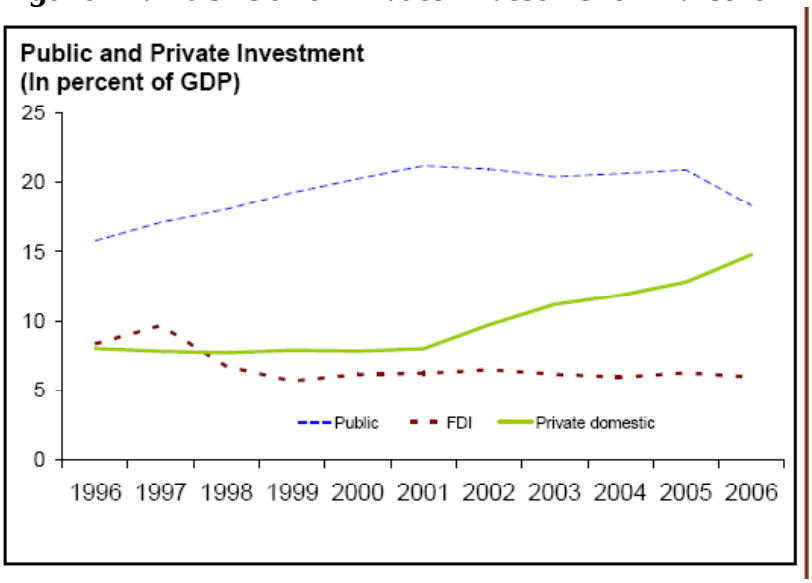
Private investment and private consumption has considerably contributed to these high growth rates. Private investment was encouraged by further simplification of administrative procedures for business and moves toward equal treatment between state enterprises and the private sector; and between domestic and foreign enterprises. The domestic private sector accounted for 33.6% of total investment in 2006. This proportion is up sharply from 22.6%, 5 year earlier. The non-state sector accounted for more than half of GDP in 2006. Preliminary estimates show that private businesses generated almost 90% of the 7.5 million jobs created during the 5 year to 2005 (ADB, 2007).

3.1.2. Private Sector Development

The growth of the private sector has been a significant feature of Vietnam's economic development over the past decade (ADB, 2007). A series of policy reforms gradually laid the foundations for sustained private sector development. The most important milestone for private sector development was, undoubtedly, the Enterprise Law in January 2000. On the surface, this piece of legislation combined the previous Company Law and Private Enterprise Law. In practice, it represented a radical change in approach (WB, 2006b, 2007). The number of private enterprises registered every year has been increasingly steadily, ever since. In the period of 1/1/2000 to 30/9/2003, there were 72,601 enterprises registered, which is equal 1.6 times of the number registered in the previous period of 9 years.

However, private enterprises still faced many difficulties in comparison to state-owned enterprises (SOEs). A recent survey of private enterprises showed such difficulties that private enterprises still faced are access to finance and access to land (WB, 2006b, 2007). The new unified enterprise law in July 1, 2006 effectively creates one common legal framework for all type of firms which is expected to solve the problem. In addition, the investment law has created a lot of incentives for newly established enterprises such as tax exemption. This is evidently proved by the significant increase of private investment in recent year (see figure 11)

Figure 11: **Public and Private Investment in Vietnam**



Source: IMF (2007)

3.1.3. Capital Market and the Booming of Stock Exchange Market

a. Banking System

The capital market in Vietnam has not yet been developed. It is at the start of development process (WB, 2007). The last decade has been characterized by remarkable financial deepening in Vietnam. In the initial stages of economic transition, banks were mainly serving as government windows to channel resources to SOEs. Requirements in terms of collateral value appear to be higher for private firms than for SOEs. Access to credit was more likely among larger enterprises (WB, 2006b). This indicates that private enterprises have difficulty in accessing to bank loan for their business and development but it is quite easier for large private corporations.

To support the private sector, the government has been strongly committed to reform the economy and support the private sector. In May 2006, the government has outlined a strategy for banking reform. State-owned commercial banks are to be restructured and "equitized" or partially privatized by 2010 (ADB, 2007). This has helped change the situation. It is stated in WB (2006a) that Vietnam's banking sector has expanded rapidly in recent years mostly by supplying loans to the private sector. In the banking sector, the credit to the economy rose from 35% of GDP in 2000 to 59% of GDP in 2004. In which, the credit to non-state enterprises increased from 19% of GDP in 2000 to 39% of GDP in 2004.

The number of commercial banks has increased rapidly recently, besides of 4 big state-owned commercial banks which are under the equitization preparation period there are about 35 joint-stock banks are operating at the end of November 20072. In 2007, there were 25 applications for establishing joint-stock banks submitted to the State Bank of Vietnam. It implies the booming period of banking system in Vietnam, the important factor for economic development and private sector investment.

b. The Booming of Stock Exchange Market

Beside banking system, stock exchange market is normally an effective financial channel for enterprises. However, Vietnam stock market is still very young and relatively small, even by Southeast Asian Standard (WB, 2006b). The first security center started its operations with just two listed companies in July 2000. The securities market expanded beyond expectations in 2006. The number of listed companies rose to 193 from 41 and total market capitalization increased by almost 20 times from 2005 levels to $14 billion, or

[2] Source: http://www.saga.vn/Taichinh/Thitruong/Nganhang/8614.saga . Retrieved December 2, 2007.

22.7% of GDP. The VN-Index soared from 307.5 at the end of 2005 to 751.8 twelve months later and climbed to 1,138 at the end of February 2007. A law on securities and securities market was approved and came into force in January 2007. It provides a legal base for investor protection and market transparency, including disclosure requirements for publicity held companies (ADB, 2007). This booming in 2006 and early 2007 supported well the Vietnam's investment need (IMF, 2007).

In addition, the unlisted stock market is much larger than the formal stock trading center, indicating the potential of market to grow (WB, 2006a). Many private companies were transformed into corporations in the form of mother-daughter companies and had their first IPO during 2006. It is a good chance for private sector to attract capital from public and indirect investment from domestic as well as foreign investors.

3.2. Project Selection in Selected Case Studies

Qualitative data and information about project portfolio selection in the two cases have been analyzed and presented below (Refer to sections 1.5 and 1.6 for data collection method):

3.2.1. Hanoi Corporation

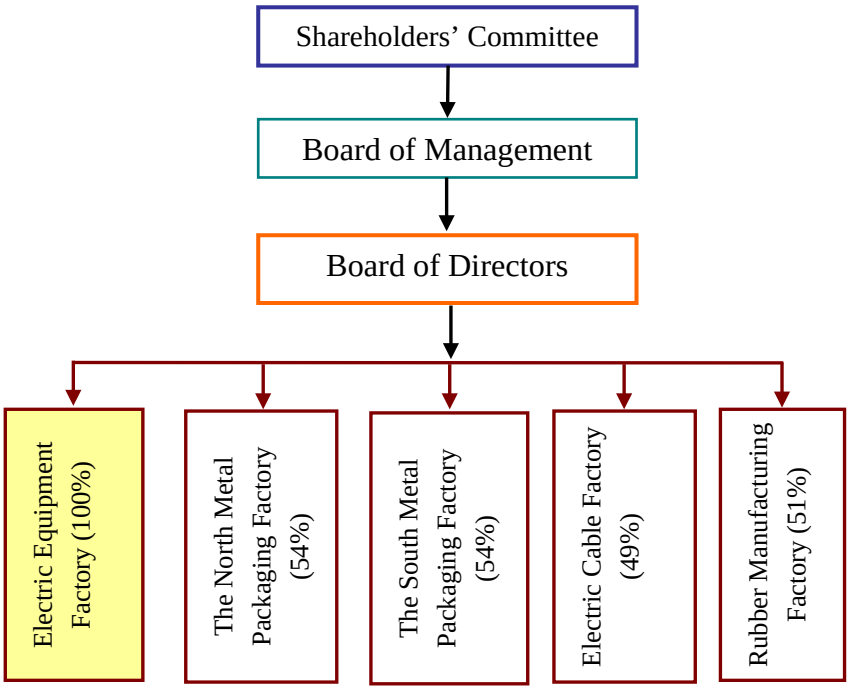
a. General Information

The origin company (before transformation) was established in 1994, operating in import and export trading business with registered capital of about 15,000 US$ and about 10 employees. The company had very impressive development during its operation, significantly from early 2000s. The first factory was built in 2001 and other 3 factories were built in 2006 and 2007, total employees are currently about 1,000, operating mainly in 2 industries (electricity industry and light industry). The company was limited liability owned 100% by the chairman of the company.

The company has transformed into holding corporation (joint-stock company) in February 2007 with registered capital of US$ 70 million. The new holding corporation is planned to operate in 5 industries including electricity manufacturing, light industry, construction & real estate development, banking and finance, and service industry. It had IPO, selling 10% of its share to the public and the result was so impressive: the average share price accepted by the public is 11 times higher than the original price. In recent years, business result of the company was high, revenue increased about 34%

annually, and profit margin is around 16%. Total corporate value is estimated around US$ 200 million[3]. The existing holding structure is described below:

Figure 12: Hanoi Corporation's Holding Structure



Notes*: the percentage means the portion of share held by the Corporation. The remaining portions owned by other individuals including the members of the board of management of each factory (subsidiary company).*

The Board of Management includes the chairman who owns about 70% of registered capital; other individuals who are top management of subsidiary companies hold 20% and 10% is distributed among many investors from the stock exchange market (through the IPO). Each factory (except the Electric Equipment Factory) is one subsidiary company whose accounting of income and expenses is independent from the parent company. Each company is independent in doing its business under supervision of the board of management. The Electric Equipment Factory is dependent accounting company. The special characteristic in this organization structure is that the members of board of management do not work full-time in the parent company because they are working in subsidiary companies as the top management.

In 2007, the corporation still operates in two traditional areas in which factories have come into operation: light industry and electrical equipment. The corporation has been planning to establish new businesses, making

[3] This figure is estimated and given by the chairman of the corporation during the interview.

investment into or becoming strategic shareholders of other companies to fully develop the 5 fields, namely industry, electrical equipment, construction, finance, and trading & service.

b. Projects Selected in Recent Years

The company has been in business for 12 years; however there haven't been many investment projects before. They started many new projects recently in 2006 and 2007 when the capital market, especially the stock exchange market was rapidly expanded. They selected many investment projects (about 10 investment projects in 2007). However, in this dissertation we only list the active projects whose investment hhas been started. The main active projects are listed in the table 6 below:

Table 7: **Hanoi Corporation' Active Selected Projects**

Year	Projects	Total capital (million US$)	Equity of the corporation (%)	Construction period (years)	Completion time*
2006	The North Packaging Factory	10	54	1.5	2007
	The South Packaging Factory	16	54	1.5	2007
	The High Tech-park (infrastructure)	12	100	1	2006
	Factory and Warehouse For Rent	3	80	1	2006
	The Package Label Factory	2.5	40	1.5	2007
2007	Rubber Manufacturing Factory	4	60	1	2008
	Hotel – Apartment Complex	15	100	2.5	2009
	Electric Cable Factory	20	49	1	2008
	High Voltage Cable Factory	14	51	1	2008

Note: * it can be actual completion time or planed completion time

c. Characteristics of Projects

Whenever they have new investment projects (such as new factory) they normally establish new joint-stock companies, except for few projects that they owned 100% of capital (see the table 6). The top management of these new companies normally consists of individual shareholders of the companies who have working experiences or knowledge in the field of investment projects.

Similar to the private sector as a whole, the Hanoi Corporation is still young, their factories are new so that they rarely have upgrading or expanding projects but many new investment projects. The investment projects always link with engineering works (construction, installation) and require land. The projects are big, for some projects it takes some (more than 2) years to complete the construction and installation before putting into operation.

d. Process of Project Portfolio Selection

There is no documented description of project portfolio selection. Upon completion of interviews with the chairman and project officers, and review of relevant documentation, we describe the process as follows:

- ***Project ideas from two main sources:***

The first source is from the chairman of the corporation[4]. Even the size of corporation is rather large however the operation of private corporations in Vietnam is still in form of entrepreneurial enterprise. This is due to the fact that the corporation is newly established from small and medium enterprise in which the owner of the enterprise directly manages every business activity. It will take time to change to the new style of management.

The second source is from outside, normally from the individual investors who desire to cooperate with the corporation to establish new subsidiary enterprise and become the top management of this new enterprise.

- ***Project proposing agency:***

When projects are 100% invested by the corporation i.e. without any additional investment from other individual investors, these projects are usually in the fields that the corporation has experiences. The supporting staff will prepare project feasibility study and directly submit it to the board of management for approval. This supporting staff is normally middle managers working in subsidiary companies which are operating in similar field of business.

When the corporation does not have experiences in new projects, the corporation seeks individual investors who have experiences in the field to cooperate. These individual investors will prepare project feasibility study and together with the top management of the corporation to approve the projects. These investors will invest in the project and then directly manage the project implementation and operation.

[4] In other corporations, the source may be from all members of the board of management if the corporation is owned by many members of the board.

The project screening activities are done shortly, unofficially through some meetings between the board of management and the individual investors if any. After this screening, the feasibility study will be prepared.

- ***Project prioritization & portfolio selection:***

The main criteria for prioritization and selection are financial indicators, such as NPV, IRR and investment payback period. In addition, it is also important that the investment project is within its selected fields or sectors. This indicates that the project should be financially feasible and in alignment with strategy.

It is very frequent that the corporation selected more investment projects than its resources and available capital. Within this large portfolio, the top management can decide the active investment project portfolio within a year or period of time. These active projects will be implemented as initial plan. The remaining projects will have delays or get little investment in order to keep the projects within the corporation[5]. This means the projects are not implemented according to the plan and may be speeded up later when financial sources are available and the market conditions are more favorable for the projects. This is purposely done because investment projects are normally related to land and it is difficult for private corporations to get land use permit in Vietnam as mentioned above. Therefore, they want to keep all selected projects even they do not have enough resources to implement these projects at the same time. They can use these projects as a mean to attract more capital from other investors who wish to invest or through stock exchange market. It appears that there are two project portfolios in the corporation: active portfolio and selected portfolio.

In selecting projects for the portfolio, the corporation also thinks about the interdependent effects between projects. For example, they selected the metal packaging factory together with the package label factory.

- ***Evaluation and readjustment of project portfolio:***

The chairman of the corporation closely monitors and controls every investment project. The movement of projects between the two portfolios (active and selected portfolios) can happen at any time based on the decision of the management board, the chairman in this corporation. Since investment projects take long time and require large resources especially capital; and the

[5] According to Vietnam's regulations, permit for investment projects requiring land use can be withdrawn by the authority if not implemented within a certain period of time.

financial and capital resource sometimes changes over a period of time, the company can add more projects or terminate on-going projects.

In addition, when the market changes or the project implementation is not as planned, the corporation can take some actions such as changing the purpose of projects if it is feasible. For example, after the construction of the factory buildings, and not yet bought the machinery and equipment, the company can change the project to another factory that can use the land and buildings. In practice, they changed one apartment building project into a hotel project after the construction of the first two storeys (the hotel has 17 storeys).

When projects have already been put into operation; and the business performance results are not as expected, the corporation can reduce its share portion in the projects by selling to the individual investors or another third party. This has not yet happened in this corporation but it is possible solution according to the chairman.

- ***Project selection committee and process***

There are no officially written documents about selection committee and process for project selection and project portfolio management. However, based on the actual practice, it can be summarized in the following table:

Table 8: **Project Selection Practice in Hanoi Corporation**

Steps	Project ideas	Project Proposal	Selection	Optimal Portfolio	Portfolio Adjustment
Acting agency	Individual investors or the board of management	Middle managers or individual investors	Board of Management, mainly the chairman	Board of Management, mainly the chairman	Board of Management and the top management of the subsidiary companies in case the projects have been put into operation
Decisive criteria	Within corporate strategy[6]	Based on experiences	Financial feasibility (NPV, IRR and Payback period), within strategy	Market situation, available resources both in short and long run.	Market changes, available resources, other opportunities, project results in comparison to plan.
Possible actions	Asking individual investors to participate in the project	Submitted to the board of management	Go/ Kill project ideas	Divide the project portfolio into two (active portfolio and selected portfolio)	Move projects between active portfolio and selected portfolio; postpone projects; reduce share in operating projects.

[6] Corporate strategy is very flexible according to changes in the market.

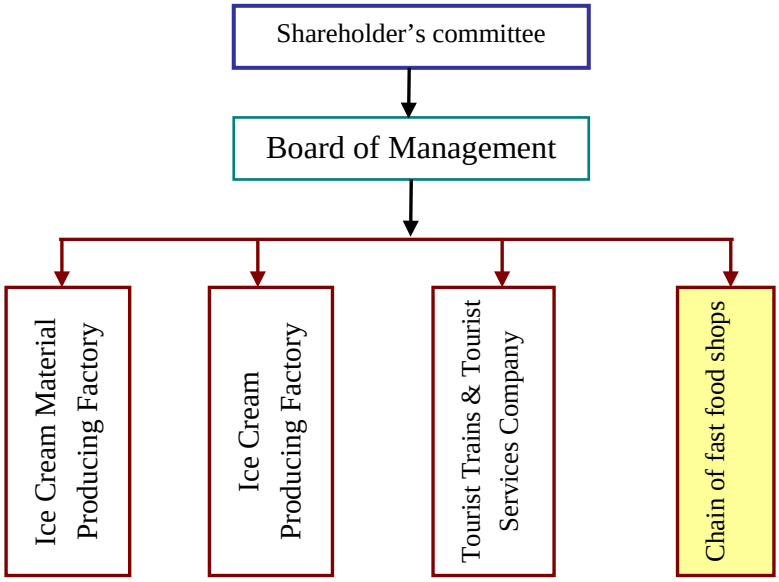
3.2.2. Saigon Corporation

a. General Information

In comparison to the first case, this is a smaller corporation in terms of size and number of investment projects. The total registered capital is about US$ 6 million; total asset is about US$ 20 million, total number of employees is about 250. This is considered small and medium enterprise in Vietnam[7].

The corporation has been doing business in producing ice cream materials, different types of ice cream (operating 02 factories) and a chain of small fast food shops which also sell ice cream and drinks. Thanks to the simplification of procedures, the ability to access to different capital resource, the company has expanded and selected many investment projects recently. In 2006, the corporation started its new business in tourist train.

Figure 13: **Structure of Saigon Corporation**



This corporation does not have a holding structure like the case of Hanoi Corporation. It is still a group of companies under the same owner rather than a holding company (mother-daughter). The member of board of management is from the same family (it is family-based company). In this organization, two factories and tourist train are operated under management of independent accounting companies, chain of fast food shops belong to the same company with Ice Cream Producing factory. However, the owner is taking necessary procedures to establish the holding corporation like the case of Hanoi Corporation.

[7] According to Vietnam's regulation, enterprise which has less than 300 employees is SME

b. Selected projects in recent years

In 2006, there is only one big project, constructing and operating a tourist train. Total investment capital is US$4 million. It took one year to construct the train and it was put into operation end of 2006. In 2007, there are many projects selected, three beach resorts with total estimated investment of US$ 30 million and two real estate development projects (housing projects), listed in the table below:

Table 9: **Saigon Corporation's Selected Projects**

Year	Projects	Total capital (million US$)	Equity of the corporation (%)	Construction period (years)	Completion time*
2006	Construction and operation of Tourist Train	4	100%	1	2006
2007	Beach Resort 1 (10ha)	15	N/A	3	2009
	Beach Resort 2 (5 ha)	10	N/A	3	2009
	Beach Resort 3 (2ha)	3.5	100%	**	2007
	Eco-tourism Village (hotel, villas) (20ha)	20	N/A	4	2010
	New Residential Development Area (30ha)	10***	N/A	2	2009

Notes: * *it can be actual completion time or planed completion time*
** *the corporation bought an existing beach resort*
*** *the corporation needs capital for infrastructure development only since the investment for housing can be mobilized from customers*

For the new real estate projects selected in 2007, the corporation will not invest 100% of capital but will cooperate with some capital funds and individuals in these investments. However, the cooperation agreements are still under confidential situation so that no available information regarding capital contribution is dissolved.

c. Project Selection Framework

Regarding project selection process and prioritization, its existing practice is similar to the way that Hanoi Corporation is applying when selecting projects for project portfolio, the corporation also thinks about interdependent impacts among projects, for example, tourist trains together with resorts and hotels at destination or bus services to connect between stations and resorts.

However, there are four main differences which were found as followings:

a. Firstly, the project ideas are mainly from the chairman of the corporation. Therefore, the chairman is also the main agent who decides the selection of projects.

b. Secondly, they directly manage the operation of the projects and do not rely on other individuals. They can employ experienced people to work for projects.

c. Thirdly they work like a developer who develops projects rather than investors who mainly invest in projects because they are smaller in terms of resources (capital) so when they have new investment projects they seek cooperation with large funds or organizations rather than individual investors which have experiences. In the Hanoi Corporation, they invest the main portion of capital except some small contributions from individuals who will manage the projects but in Saigon Corporation they do in the opposite way, they develop and manage projects but get main portion of investment from the others.

d. Finally, in Saigon Corporation there is no clear distinction between active portfolio and selected portfolio. This can be explained by the fact that the corporation does not take active position in providing investment capital. This means they have to rely mainly on external resources and they are not sure about available resource for active portfolio.

3.2.3. Project Selection Problems Faced by Two Corporations

The operation performance of the first years of projects in the industries, which the corporations did not have experience, did not meet the expectations as financially planned. This indicates that the financial estimates were probably miscalculated and many assumptions using in this calculation may not reflect the real situations. Hanoi Corporation has this problem in packaging factories and Saigon Corporation has the problem in the tourist train project. In Saigon Corporation, they do not understand clearly the transport and tourist business so that the train did not operate well; they did not select suitable itinerary for the train and did not know the potential costs when operating the train. This forces them to change management teams twice within a year and finally gave part of the share and management to the third party. They still keep the share of equity in the project but not 100% like from the beginning.

4. Analysis and Discussions

The approach to rationally making comparison between different processes of project portfolio selection is commonly based on the evaluation results of selected projects in project portfolio in terms of successfully delivering project objectives and beneficially realizing business strategy. However, we hardly follow this approach for the following reasons:

- Since private corporations in Vietnam, particularly our selected cases are still at an early stage of growth and development; they actually commenced their initial activities of selecting projects in 2006 and 2007. Some selected projects have been under implementation and put into operation for one year whereas some others have not yet (refer to tables 6 and 8). Such short period leads to the fact that the current results of these selected projects can hardly reflect successful implementation of corporations' strategy in the meantime.
- More importantly, these current results cannot be used to evaluate the success of these projects as investment projects commonly have fluctuating returns on investments (i.e. possible loss in the beginning but potential profit in the end) and long-term impacts on strategy.

Therefore, we base on reports of progressive projects together with the responses of the chairman and management board to our interview questionnaire to evaluate the effects of these projects on their business performance and corporate strategy, to a certain extent.

Moreover, we do not intend to judge the rightness of existing practices of project portfolio selection performed by these two private corporations. Instead, we apply the generally accepted understanding and principles of project portfolio examined in the literature to discuss, analyze these current practices and provide recommendations on selection process of project portfolio.

4.1. Corporate Strategy

The cases show that the private corporation focuses on short term and flexible strategies. It is entrepreneurial strategy since it is developed and implemented by the chairman of the corporation (Mintzberg, 1989). The strategy is not in written form and changed over time according to the fluctuations in the market. The Hanoi Corporation, which is bigger and already had its IPO, has its strategy in a written form. However, the strategy is still frequently changed but not always updated in the written one. On the contrary, there is no written strategy in the Saigon Corporation, which is smaller and has not had its IPO.

The strategies of these two corporations show that their main corporate objectives are to diversify and expand business investment, to increase investment capital as soon as they can, and to maximize profits from these investments.

This intention is clearer in smaller one, the Saigon Corporation. It is focusing on real estate projects like housing development. It is short-term investment because for this kind of projects invested by Vietnamese investors they can sell the house and get deposits from clients after getting investment permit before they already invest into projects[8]. The projects can be completed within 3-5 years and the investors do not have to worry about operation after the construction since they got all investment capital back and profit already at the end of construction period. This kind of business is not for long-term strategy but for short-term benefits (profit). Hanoi Corporation also participated in real estate development for short term profit but also targeted long term strategy with manufacturing factories which is for long-term operation.

In addition, due to the fact that individual investors, especially those buying shares and stocks of the company only focus on short-term profit[9], the corporations normally focus on satisfying them by getting more projects which have high financial return in short term or in hot industry where stock prices of companies operating in the field is attractive so that they can issue more securities with high prices for their new projects and expand the business as soon as they can because this will not last for a long time. As discussed in Section 3.1.3, this period of business environment is considered as the right time to expand business activities thanks to the newly established capital market which highly attracts individual investors and enterprises. This will be much more difficult when the financial market is already well-established and investors have more experiences in stock exchange market. This kind of strategy is not suitable for sustainable competitiveness because the corporation should focus more on long-term strategy (Johnson et al, 2006).

4.2. Selection Committee

In both cases, the selection committee is usually constituted of the chairman and members of management board and individual investors. It is clearly

[8] The law on real estate issued 2007 has limited this activity. However, they are allowed to do it when they already invested part of investment such as infrastructure.

[9] Many articles in newspapers and magazines discussed about the short-term investment strategy of investors in stock exchange market e.g. Vietnam Investment Review ; Vietnam Net; Saigon Times, Vietnam Economy, etc.

noticed that there is no participation of middle managers in selection process. However, the chairman is the main agent since in Hanoi Corporation, the chairman holds 70% of total share and in Saigon Corporation the chairman owns 100%. From the management point of view, we can state that the chairman has absolute power in making decisions on project portfolio selection within current organization structure and size. Similarly, Shane and Venkataraman (2000) appreciate the role of entrepreneurs in decision making process. On the contrary, this is quite different from literature which always argues that project selection is a team effort (Archer and Ghasemzadeh, 1999; and Englund & Graham, 1999) as discussed in Section 2.6.

The direct involvement and active participation of the chairman in the current process is evidently a good practice in Vietnam at this period of booming. Under this period of booming with high uncertainty, these direct involvement and active participation enable the corporations proactively plan and dynamically adapt to changes in the business environment. Investment opportunities require quick decisions on human and financial resources as they come and go very fast in accordance with changes in investment conditions of these booming situations. The cases studied show that the chairman can decide to postpone the implementation of projects, change project objectives, scope and also sell the projects to third parties when necessary.

Unlike the management board of Saigon Corporation, in addition to the chairman, members of management board in Hanoi Corporation of management also participated in the selection process. However, as discussed above, these members are top management of subsidiary companies whose interest and benefit mainly related to the operation of specific subsidiary companies. These members may not understand the overall strategy of the corporation. They are concerned about profitable performance of his / her own company and not directly interested in other potential investment projects. Thus, their opinions on selecting projects may be biased (neither independent nor constructive).

Additionally, in both cases the frequent change in committee members depending on the cooperation and partnership of each project may lead to the failure of balancing and optimizing the project portfolio.

4.3. Strategy Alignment

Selection of projects in alignment with corporate strategy has been importantly ensured by the participation of the chairman in the whole process of project selection as he / she masters their corporate strategy. However, this

full participation can be hardly carried out in the long run when the business expands in terms of increasing number of projects, scope of projects, and business field of investment. These expansions go beyond the knowledge and experience of the chairman, which require more professional experience and efforts of team members inclusive key personnel and stakeholders otherwise they will probably become the constraint of selection process. These team members must understand the corporate strategy and are empowered to make decisions so that selection of project portfolio can be successfully done in alignment with corporate strategy (Frame, 1994; Englund & Graham, 1999; and Pennypacker & Sepate, 2005).

In addition, since the corporate strategies of these two corporations are dynamically changeable and not well-written, it is very difficult to set up the criteria and to make decision on project selection. Wheelwright & Clark (1992) shared similar discussion about difficulties in evaluating the rightness of the project portfolio in aspect of contributing to corporate strategy because strategies are dynamic and change overtime.

Briefly, proposing, evaluating and selecting projects in alignment with business strategy in these cases are quite challenging due to the fact that those (except for the chairman) who participate in these activities do not know and understand the overall corporate strategy. The reasons include: firstly, the flexible strategy is not in written form and clearly communicated to the selection team members; secondly, the selection team members change over time depending on the project and investment cooperation with individual investors or enterprises; and finally, these individual investors who prepare, present project proposals and participate in the final approval may bias selection decisions for the sake of their own business strategy and financial benefits (Englund & Graham, 1999; Sommer, 1999; and Yelin, 2005).

4.4. Selection Criteria

In general, the corporations select projects based on two main sets of criteria, financial feasibility (NPV, IRR, and investment payback period) and strategy alignment. However, financial indicators are the main criteria since strategy is neither in written forms nor clearly communicated to lower level of management staff and employees. According to the results of the survey by Cooper et al. (2001b), organizations that have the best performance of project portfolio rely much on strategy alignment whereas organizations that have the worst performance of project portfolio put more emphasis on financial indicators. Under this consideration, these corporations need to reflect more strategy priorities and alignment in the criteria for selection of investment project portfolio.

The selection criteria are sometimes not clear. For example, the selection is based on the perception of the chairman or the board of management who may not rely on the financial calculation. He may decide the selection of projects with subjective expectation that the project will be potentially successful in future. It is not rational thinking but personal perception. This normally happened to entrepreneurs who follow entrepreneurial strategy (Mintzberg, et al 1998).

The corporations have neither official selection criteria nor clear categorization of investment projects, which causes difficulties for them to compare, decide and select investment projects from many project proposals. It is argued that it is necessary to divide project pool into categories or subsets (Wheelwright & Clark, 1992; Cooper et al., 1997a, 1997b; Englund & Graham, 1999; Aalto, 2001; Archibald, 2004 and Crawford et al., 2004) and then set selection criteria for different subsets (Copper et al., 2001a).

4.5. Optimal and Balance Mix

Optimal and balance mix is one of the main targets that project portfolio selection need to achieve. This achievement which requires selection teams' understanding of available resources and interdependent impacts between projects will support organizations to ensure optimal utilization of limited resources resulting in maximization of project portfolio value (Ghasemazadeh et al, 1999; Sommer, 1999; Rădulescu1 & Rădulescu, 2001; Cooper, 2005; Yelin, 2005; Better & Glover, 2006; PMI, 2006). However, optimal and balance mix in project portfolio selection is hardly achievable in both cases as selection team members only know about the individual project that they are selecting. Besides, they do not know the available resources which are considerably essential in optimizing the mix of projects. Though the chairman - one of the members of selection team - is properly aware of business strategy and availability of resources, he / she does not have sufficient knowledge, experience and time on portfolio optimization and analysis of interdependent impacts amongst projects. This achievement becomes more critical when the size of project portfolio increases.

4.6. Availability and Reliability of Input Data

In the two cases, the strategy at the moment is to expand business investment and diversify business activities into disparate fields. This means that many investment projects are in the new business field which the corporations do not have sufficient knowledge, experiences, and databases for rational analysis and decision making. Both corporations face these challenges. More seriously, the financial data can be purposefully manipulated for the benefits

of those who are involved in project proposal preparation and selection of projects. Cooper et al. (2001b) and Rădulescu1 & Rădulescu (2001) share the same discussion about these challenges as discussed in section 2.8. The results (refer to section 3.2) of projects under implementation in both cases provide more evidence for this argument.

4.7. No Clear Selection Framework

There is no fixed period for reviewing and selecting investment projects. The selection can happen at any time during the year and whenever there is a new project. It is a good practice and in agreement with the argument by Yen Lin (1999). This is especially appropriately applicable in this booming period when opportunities come and go very fast. If the corporations wait until the fiscal year or any fixed schedule, the investment opportunities will be missed.

The information and data from interviews and documentation show that there is no specific selection framework or process. The corporations do not adapt any theoretical framework or process of project selection. Currently, the chairman or the board of management directly monitor and control the whole process as they understand the entire situations and have all necessary information. This can be successfully done in the meantime thanks to the entrepreneurial thinking of the board of management and current capacity of corporations in seeking more investment capital from banks, stock exchange market or directly from other interested investors.

However, this process will probably fail to support the corporations to select the right, balance and mix projects in the long run when there are more projects to select for project portfolio; corporations cannot mobilize enough capital to follow long-term and large investment projects; corporations change their strategy priorities; and the top management cannot fully participate in the whole process. More seriously, under the current process, the two corporations try to keep all projects, reschedule the beginning of projects and flexibly reallocate resources (more discussion in sections 4.8 and 4.9) though they do not have enough available resources. This may lead to failure in delivery of project objectives, which has negative impacts on business strategy. This kind of selection is different from the discussion in the literature about termination of ongoing projects and refusal of new projects in accordance with the change in strategy priorities and availability of resources (Archer and Ghasemzadeh, 1999; Englund & Graham, 1999; and Cooper, 2005).

In addition, there is no integration of other different selection tools, techniques, and methods in current practice of selecting project portfolios

except financial methods in these two corporations. On the contrary, academics and practitioners encourage adapted combination of available useful tools, techniques, and methods in project portfolio selection as discussed in details in sections 2.6 and 2.7.

4.8. More Selected Projects than Available Resources

As discussed earlier, private sector still faces difficulties in getting land from the government[10]. However, big private corporations which have good reputation can get it more easily if they have good project proposals. For this reason, they normally get more projects than what they can implement with available resources because they can use these projects as a means to cooperate or attract investment capital from other enterprises or individuals who want to invest. Besides, they can easily get more investment funds from stock exchange market which has been recently booming. It is in light with similar argument of Englund & Graham (1999) that the organization should select projects not only based on current capabilities but also future potential ones. In 2006, if the corporation has projects they can establish a joint-stock company and can sell unofficially the share at the price that is 3-5 times higher than the origin price, which is enough for them to invest in projects, they occupy large share but pay less. This is not for long term. It can happen only when the stock exchange market is attractive to investors. The situation of stock exchange market at the end of 2007 has proved this conclusion. Some experts said that it is the period that the private corporation seeking investment opportunities and get as much as possible[11]. According to the industry's cycle (Johnson et al, 2006), at growth period, the main objective of enterprise is to expand and occupy as much market share as possible.

4.9. Active Portfolio versus Selected Portfolio

It may be the special issue in Vietnam's private sector that private corporations often have active project portfolio and selected project portfolio. The projects in active portfolio get enough resources for implementation. The other projects in selected portfolio are selected but not yet implemented. These projects may have to wait for resources or until the right time to start (future market). For example, according to the government or provincial development plan, there will be a large new urban and industrial area to be developed in one location, private sector may propose some related projects such as hotels, entertainment, etc. However, in Vietnam, the government's plan regarding urban and industrial development always do not follow initial

[10] In Vietnam, land is not privately owned so that enterprise needs to lease land from the government.

[11] Opinions from the directors of PMI-Vietnam and training and consulting institutions in the field of project management and management consultancy in Vietnam.

plan[12]. In this case, private organizations keep projects but will not implement until the government's projects are implemented. In another example, the land, especially in good location is limited; the large private corporations always try to register investment projects in that location so that other corporations cannot have it and they may implement it or cooperate with others to implement them later when they have resources. Sometimes, the corporations never implement those projects if then they cannot find resources or when the market conditions change. To discourage this kind of projects called "hung projects"[13], when issuing land use permit and project operation permit, the authority regulates the deadline that the organizations have to start implementing the projects. Big investment projects normally have the deadline of 5-7 years from the issuance date of the permit. Breaking this regulation will lead to the cancellation of projects by the government authority. For instance, the entertainment project selected by the Hanoi Corporation was the one which used to be selected by other corporation but was terminated by the provincial committee since it was not started after 5 years. To prevent this cancellation from happening, when the private corporations almost meet the deadline, they can start the project with little investment and then postpone the implementation if they still want to keep the project. Implicitly, this approach is similar to the real options discussed in section 2.2.3. Placing active project portfolio and selected project portfolio into 6 different regions of tomato gardens (Luehrman, 1998a & 1998b), the active portfolio can be the 1st region "invest now", the other remaining projects in selected portfolio can be 2nd and 3rd regions "may be now" and "probably later". We can also understand these remaining projects as nurtured projects which the corporations need to wait until the right time to invest.

4.10. Flexible Portfolio Adjustment

Theoretically it is difficult to adjust the investment project portfolio since the projects are large. However, what they did in the two selected cases is very flexible. They can change the project scope or sell the whole projects or partial components of them to other parties and use the capital gained from project selling to invest in other projects. They can also move the projects between two project portfolios: the active portfolio and selected one. This is a particular technique of adjustment featured in the investment context of current private sector development and expanding stock exchange market in Vietnam. These two corporations unconsciously utilize the theory of

[12] Information from the Minister of Land & Natural Resource. Retrieved Dec 2, 2007 from http://vnexpress.net/Vietnam/Kinh-doanh/2006/08/3B9ECB5A/

[13] "hung project" is the term usually used by government officers when talking about investment projects which occupy land but are not implemented in a long period of time.

constraints as discussed in section 2.4 to adjust their investment portfolios. They deal with problems of implementing all selected projects at the same time under conditions of resource shortages (e.g. investment capital or management personnel) by flexibly leveraging the resources. These leverages are aimed to keep all selected projects in their portfolio. However, this may cause additional problems as large investment projects take long time to deliver fruitful objectives. Besides, possibly inaccurate estimates of project costs, short-term profits and available resources due to dynamic change in booming economic environment may lead corporations to make decisions on delaying or selling wrong projects, which entails serious impacts on corporate strategy.

The main ideas analyzed and discussed in this section have been summarized in the table below:

Table 10: **Summary of Analysis and Discussion**

#	Discussion Topics	Literature	Hanoi Corporation	Saigon Corporation
1	Types of Enterprise	Large, mature	Large, pre-mature	Medium, premature
2	Corporate strategy	Long term, written	Written, changeable	No written, short-term, changeable
3	Selection committee	Team efforts: top management, & middle managers; key stakeholders	Top management, mainly the chairman	The chairman
4	Corporate strategy alignment	Highly important, the target of project selection framework, corporate strategy should be well communicated	Strategy alignment is important but it is challenging because strategy is not clear; not well communicated	Not clear strategy, short-term benefit
5	Selection Criteria	Approved sets of selection criteria for each category of projects	No official sets of selection criteria; Unclear project categorization; more emphasis on financial criteria	No official sets of selection criteria; Unclear project categorization; more emphasis on financial criteria

#	Discussion Topics	Literature	Hanoi Corporation	Saigon Corporation
6	Optimal & Balance Mix	Main targets of project selection within limited resources	Balance but profit-oriented. Resources are not fixed	Maximum profit, resources are uncertain
7	Availability and reliability of data	Critical issue in financial calculation of every project, especially in new business, long-term projects	Having problems with projects in new business	Having problems with projects in new business
8	Clear selection framework	Important, officially and clearly instructed frameworks; Integration and combination of tools, techniques, and methods	No official framework; mainly financial methods	No official framework; mainly financial methods
9	Selected projects & available resources	Selected projects within available resources, taking into account the future resources	More selected projects than resources	More selected projects than resources
10	Active portfolio & selected portfolio	Application of “real option”, “nurturing” and Theory of Constraints	Active portfolio; selected portfolio	Active portfolio; selected portfolio, distinction is not clear
11	Portfolio Readjustment	Terminate on-going projects; add new projects; stage-gates; periodical readjustment	In addition to literature, moving projects between portfolios; selling projects or parts of projects; flexible readjustment	Similar to Hanoi Corp.

5. Recommendations

In general, we do not find any serious problem in the current practices applied by these private corporations since what they are doing is appropriately applicable to the current size and organizational structure of the corporation as well as the economic situations in Vietnam. However, due to the fact that the size of investment project portfolio is becoming larger and larger and the entrepreneurial approach to decision making on project selection is not appropriate in the long run, we recommend certain changes in existing practice of project portfolio selection should be made in order to improve the quantity and quality of selected projects in aspect of ensuring successful implementation of corporate strategy. Our recommendations significantly reflect the systemic approach to project portfolio selection inclusive of selection committee, selection models or methods, and selection process or framework. This systemic approach is resulted from consideration of practically applying discussions in the literature review to the existing practice of project portfolio selection in order to achieve better project portfolio.

5.1. Selection Committee

As discussed in section 4.2, the middle management team and permanent members do not exist in the selection committees; and in section 4.6, lack of availability and reliability of input data. These limitations have caused negative impacts on the selection of project portfolio in the meantime. Hence, we make the recommendation that the corporations should establish middle management team under the board of management to facilitate the process of project portfolio selection. Preferably, the selection committee should include three groups of members: board of management (including the chairman), middle managers and other key stakeholders (e.g. individual investors) as described in figure 14. They all must understand the corporate strategy of the corporations. Besides, they are professionally trained to manage the process of selection. In this context, the roles and responsibilities of middle managers include:

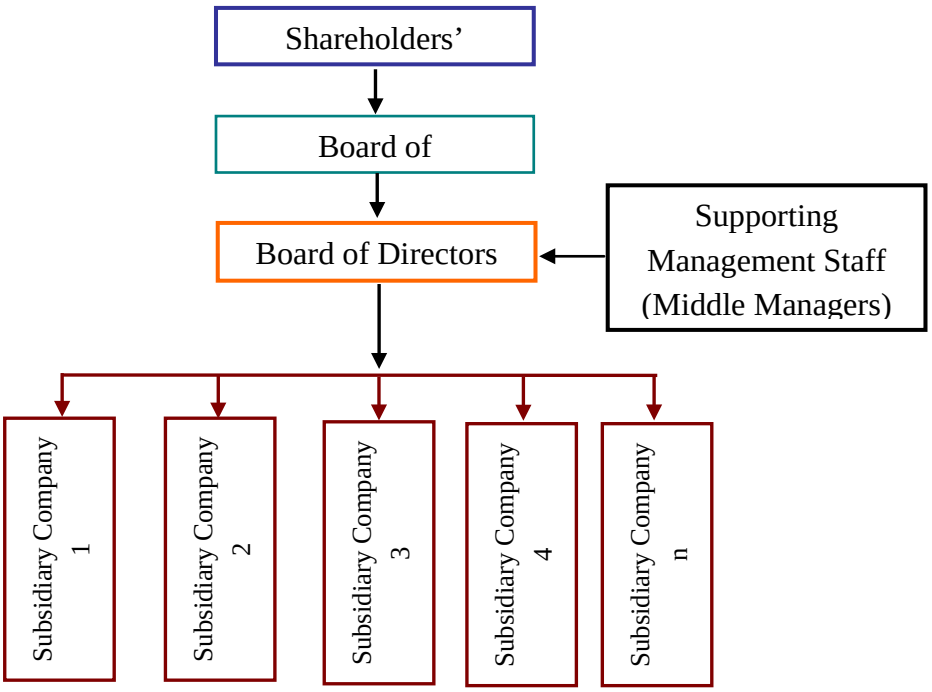
- Supporting the board of directors in managing and monitoring the operation of subsidiary companies whose projects have the investment shares of the corporations.
- Establishing project portfolio database regarding all the stages of investment projects from preparation, implementation and operation.
- Participating in preparing or evaluating project proposals together with the board of management

- Providing all necessary information required by board of directors
- Documenting best practices and experiences for future training to those who will be involved in the process of project selection.

Potential benefits, but not limited to, are:

- time saving for board of management (currently too much time spent on collection of data to evaluate projects).
- availability of database with more reliable data (e.g. project's cost, time, strategy alignment, types of projects, resources) which will usefully contribute to more accurate financial calculation and estimation. This will also help the process of defining and quantifying selection criteria, ensuring the strategic alignment, quick response to top management's requirements.
- more reliability of financial calculation and project evaluation as middle managers are independent from particular projects.
- bias reduction in top managers' decisions on project selection.
- creation of signature process of project portfolio selection to sustain competitive advantage.

Figure 14: **Suggested Organizational Structure**



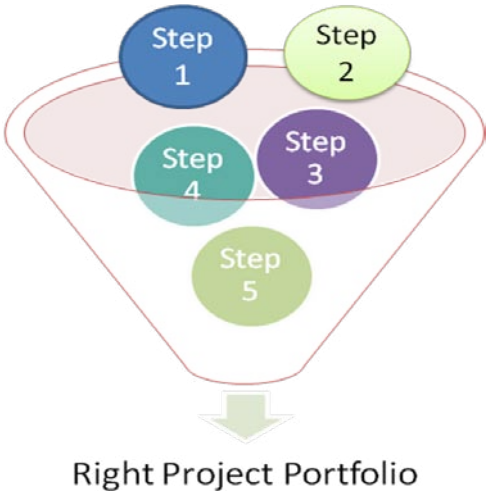
5.2. Selection Models or Methods

The discussions of strategy alignment problems and the current results project selection mainly based on financial criteria in sections 4.3, 4.4, and 4.5 resulted in the following recommendation: beside current financial methods, corporations should also adapt such beneficial models or methods as bubble diagrams for project mapping and strategic buckets to facilitate project portfolio selection for successful realization of corporations' short-term and long-term strategy of investment diversification and growth. We believe that application of these models and methods significantly ensure a right project portfolio in terms of right mix, strategy alignment, and resource leverage. This has been evidenced in academic and practical literature.

5.3. Selection Process or Framework

Clearly presented in sections 4.7, 4.8, 4.9 and 4.10, the official and easily understandable framework of project selection is still lacking in the corporations, which affect such critical requirements for a right project portfolio as balancing, mixing, terminating or adjusting. Thus, combining discussions in literature review and findings in current practice of selecting projects, we propose the following process or framework for project portfolio selection, which expectedly ensure successful realization of these two corporations' strategy. This process or framework can also be easily and practically adapted by other private corporations in Vietnam:

Figure 15: **Proposed Framwork of Project Portfolio Selection**



Step 1: Define and agree on corporate strategy and its priorities (e.g. short-term or long-term strategies; expansion of investment into real estate, manufacturing, etc. in response to the dynamic change in business environment). As discussed in literature review this is especially important for strategy alignment and ensures that all members of selection committees

share the same common understanding of the corporation's direction and priorities which is lacking in these two corporations (see sections 4.1; 4.2 and 4.3).

Step 2: Set up and approve quantitative (e.g. financial indicators) and qualitative (e.g. strategic fit) criteria addressing corporate strategy priorities.

Step 3: Categorize projects into subsets (e.g. strategic projects served for long-term strategy or tactic projects for short-term benefits)

Step 4: Evaluate and leverage resources for project portfolio including newly categorized projects and ongoing projects (first within subsets and then between subsets) in respects of strategic resources, internal capability and external capacity, existing and potential resources.

Step 5: Make decisions on selecting new qualified projects; terminating existing projects; and nurturing potential projects.

Note: Steps 1 and 2 are periodical-based performance in accordance with periodical review of corporate strategy whereas steps 3, 4 and 5 are continuous- based activities as project ideas or investment opportunities can occur at any time.

Following is the summary of steps in the recommended framework:

Table 11: **Summary of Recommended Framework**

Step	Activities	Acting Agents	Outcome	Time
1	Defining and Communicating Corporate Strategy, Priorities. Translating corporate strategy into subsets of projects	Board of Management, Middle Managers	Common understanding of corporate priorities, list of project subsets[14]	Fiscal year, before annual meeting of shareholders
2	Setting up and approving selection criteria for each project subset	Setting up by Middle Managers, approving by Board of Management	Sets of selection criteria for each project subset	After the first step

[14] Name list of project subset, not list of projects

Step	Activities	Acting Agents	Outcome	Time
3	Collecting and classifying project ideas, proposals	Middle Managers	List of project proposals in each project subset	Any time when project ideas and proposal come
4	Evaluating and Leveraging resources within and between project subsets	Top management and Middle Managers	Strategic Buckets of resource for each subset	Any time
5	Selecting projects and adjusting them into active and selected portfolio	Top management and Middle Managers & Individual investors	List of projects in active and selected portfolio	Any time

6. Conclusion

6.1. Conclusion

Project portfolio selection evidently contributes to success of project portfolio management and more importantly to achievement of corporate strategy. In order to ensure fruitful outcome resulted from effective and efficient selection of project portfolio, organizations need to develop or adapt a systemic approach to project portfolio selection. This systemic approach includes integration of three important factors of selection committee, methods or models; and processes or frameworks. Our research results show that complex processes or frameworks of project portfolio selection recommended by academics and practitioners better and best serve mature organizations but pre-mature private corporations in Vietnam. This is obviously confirmed in our findings revealing that the two private corporations in Vietnam as our case studies have been practising an entrepreneurial and flexible approach without an appropriate selection committee, strategic models or methods, and clear process or framework to select their project portfolio. This practice may fail to support these corporations to realize their corporate strategy in the long run when competition becomes fiercer in the dynamic changing of business environment and the size of their project portfolio becomes larger in response to sustain competitive advantage. Thus, our recommendations upon reviewing the literature and studying two cases are desirably beneficial to these two private corporations and practically adapted to other corporations within the booming economy context of Vietnam.

Moreover, the results of findings and discussion have valuable and interesting contribution to approach of studying practices and best practices of project portfolio selection and project portfolio management in SMEs in comparison with approaches focusing in large and mature enterprises as identified in the literature, for instance, studies by Cooper et al. (1997a, 1997b, 1998, 2000, 2001b).

6.2. Limitations and Further Research

During our research, we are aware of the facts that there is little academic and practical literature about application of project portfolio selection in Vietnam context (except for ADB's and IMF's reports, newspapers and trading magazines); investment projects take long time to realize the corporations' strategy of growth and development; and that our recommended systemic approach to project portfolio selection has not yet practically applied by these corporations; hence further research is recommended to review successful implementation of corporations' strategy through the current selected project portfolio and new project portfolio using our recommended systemic

approach; to conduct a survey to collect and analyze quantitative data for better and more reliable understanding related to practice and application of project portfolio selection by many other private corporations; and to adapt this approach to other types of projects and a larger population of other private corporations or different types of corporations in Vietnam and other countries with similar economic conditions to Vietnam's. Last but not least, it would be of interest to see more studies of project portfolio management, especially project portfolio selection in other settings and other countries.

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Appendix: Semi-Structured Interview Questionnaire

1. What is your corporate strategy?
2. How do you formulate corporate strategy?
3. Which projects were selected last year? and this year?
4. How are projects selected? Could you describe the selection process?
5. What are the criteria for selecting a new set of projects?
6. Are there any constraints that hinder the performance of on-going projects? If any, what are they?
7. Who made decisions on selecting and prioritizing projects? Who else were involved in the decision? Do you have permanent committee who will evaluate and select every project?
8. What do you think would happen if selected projects do not perform well (expected value, profit)? Have you ever cancelled any projects which were already approved or started?
9. What kind of risks that you are concerned when selecting projects?
10. What could make a project or a set of project priority? Are project priorities changed? How? Why?
11. Have you ever refused project proposals, which are profitable, due to lack of resource?
12. Who made and sold (presented) the project proposals to the selection committee?