AN ANALYSIS OF KNOWLEDGE MANAGEMENT, COMPETENCY
AND ORGANIZATIONAL CHARACTERISTICS AFFECTING
ORGANIZATIONAL PERFORMANCE OF THAI UNIVERSITIES:
PERSPECTIVE OF UNIVERSITY ADMINISTRATORS

Panuwong Kumpirarusk

A Dissertation Submitted in Partial
Fulfillment of the Requirements for the Degree of
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ABSTRACT

Title of Dissertation  An Analysis of Knowledge Management, Competency and Organizational Characteristics Affecting Organizational Performance of Thai Universities: Perspective of University Administrators

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Degree  Doctor of Philosophy (Development Administration)
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The objectives of this study were to investigate the differences of organizational performance between university classifications, to investigate the determinants of knowledge management, organizational competency, and organizational characteristics affecting organizational performance, and lastly to recommend policy implications for enhancing the effectiveness of knowledge management and organizational competency in the Thai university context. All of the objectives were achieved through the analysis of data obtained from the mixed method study, however primarily through the quantitative method.

The model for the analysis was derived from the integration of organizational performance in the framework of Balanced Scorecards by Kaplan and Norton; organizational competencies by Lado and Wilson in association with the managerial competency of Boyatzis; and last knowledge management concepts emphasizing the tacit knowledge creation developed by several scholars.

It was found that in general public universities have greater organizational performance than private universities, research universities have greater organizational performance than teaching universities, and last autonomous public universities do not have different organizational performance from non-autonomous public universities.

In addition, the researcher employed the stepwise multiple regression technique to analyze the relationships between variables and used Path Analysis to establish the
direct and indirect effect of each determinant on organizational performance. It was found that seven determinants, namely organizational competency, the public-type university, the research-oriented university, the knowledge management process, knowledge management culture, knowledge management technology, and knowledge management measurement had either direct or indirect effects on organizational performance, while two determinants, namely university autonomy and knowledge management leadership, had no effects.

In terms of the direct effects, organizational competency had the highest effect, followed by the public-type university, knowledge management technology, and the research-oriented university, respectively. Three of them showed a positive impact, except for the case of knowledge management technology. In terms of indirect effects, knowledge management technology had the highest effect, followed by knowledge management measurement, knowledge management process, and knowledge management culture. All of the indirect effects had a positive impact on organizational performance.

Regarding the total causal relationships, organizational competency was the highest influencer, followed by the public-type university, the research-oriented university, knowledge management measurement, the knowledge management process, knowledge management culture, and last knowledge management technology. Six of them exhibited a positive impact, except for knowledge management technology.

Four factors of knowledge management were proven to play a supportive role in the improvement of organizational performance by elevating organizational competency. Knowledge management was recognized as a part of the key drivers in accomplishing the high performance organization status of the knowledge-based service operators.
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Working as a technical support team member for the Minister of Industry, M.R. Pongsvas Svasti, I have learned from his Excellency the way that knowledge is plugged in to ensuring the effectiveness, integrity, and sustainability of public policies. I would like to thank his Excellency for being my role model and for confirming the power of knowledge in the real workplace.

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TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>iii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>v</td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>viii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>xi</td>
</tr>
<tr>
<td>CHAPTER 1 INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Statement of the Problem and Significance of the Study</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Objectives of the Study</td>
<td>5</td>
</tr>
<tr>
<td>1.3 Scope of the Study and Limitations</td>
<td>5</td>
</tr>
<tr>
<td>1.4 Benefits of the Study</td>
<td>8</td>
</tr>
<tr>
<td>CHAPTER 2 HIGHER-EDUCATION SYSTEM IN THAILAND</td>
<td>9</td>
</tr>
<tr>
<td>2.1 Higher Education Legislation</td>
<td>9</td>
</tr>
<tr>
<td>2.2 Development of Autonomous Public Universities</td>
<td>11</td>
</tr>
<tr>
<td>2.3 Development of Research Universities</td>
<td>14</td>
</tr>
<tr>
<td>2.4 University Characteristics</td>
<td>16</td>
</tr>
<tr>
<td>2.5 Educational Standards and Quality Assurance</td>
<td>17</td>
</tr>
<tr>
<td>2.6 University Rankings</td>
<td>25</td>
</tr>
<tr>
<td>CHAPTER 3 LITERATURE REVIEW</td>
<td>28</td>
</tr>
<tr>
<td>3.1 Organizational Performance</td>
<td>31</td>
</tr>
<tr>
<td>3.2 Factors Affecting Organizational Performance</td>
<td>41</td>
</tr>
<tr>
<td>3.3 Related Studies</td>
<td>66</td>
</tr>
<tr>
<td>3.4 Conceptual Framework of the Study</td>
<td>72</td>
</tr>
<tr>
<td>3.5 Research Hypotheses</td>
<td>73</td>
</tr>
<tr>
<td>CHAPTER 4 RESEARCH METHODOLOGY</td>
<td>75</td>
</tr>
<tr>
<td>4.1 Research Design</td>
<td>75</td>
</tr>
<tr>
<td>4.2 Quantitative Method</td>
<td>77</td>
</tr>
</tbody>
</table>
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Tables</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Autonomous University Groups</td>
<td>13</td>
</tr>
<tr>
<td>2.2 University Orientation and Weight of Associated Missions</td>
<td>16</td>
</tr>
<tr>
<td>2.3 Top-Ten Universities Based on Audited SAR Scores</td>
<td>26</td>
</tr>
<tr>
<td>3.1 Definitions of Organization</td>
<td>29</td>
</tr>
<tr>
<td>3.2 Organizational Effectiveness Measurement Approaches</td>
<td>32</td>
</tr>
<tr>
<td>3.3 Knowledge Management Implementation Effectiveness</td>
<td>51</td>
</tr>
<tr>
<td>3.4 Knowledge Management Performance Criteria</td>
<td>69</td>
</tr>
<tr>
<td>3.5 Knowledge Management Performance and Balanced Scorecard</td>
<td>71</td>
</tr>
<tr>
<td>4.1 Preliminary Design Considerations on Mixed Method Research</td>
<td>75</td>
</tr>
<tr>
<td>4.2 Aspects to Consider in Planning a Mixed-Method Design</td>
<td>76</td>
</tr>
<tr>
<td>4.3 University Orientation and University Type</td>
<td>78</td>
</tr>
<tr>
<td>4.4 Source of Proven Scales and Secondary Data</td>
<td>81</td>
</tr>
<tr>
<td>4.5 Measures of Dependent and Independent Variables</td>
<td>82</td>
</tr>
<tr>
<td>4.6 University Internal Quality Assurance and Balanced Scorecards</td>
<td>92</td>
</tr>
<tr>
<td>4.7 Number of Indicators Classified by Process Approach</td>
<td>93</td>
</tr>
<tr>
<td>4.8 Revised Measures in Organizational Performance Scale</td>
<td>94</td>
</tr>
<tr>
<td>4.9 Revised Measures in Knowledge Management Scale</td>
<td>96</td>
</tr>
<tr>
<td>4.10 Revised Measures in Organizational Competency Scale</td>
<td>98</td>
</tr>
<tr>
<td>4.11 Reliability of the Scales</td>
<td>100</td>
</tr>
<tr>
<td>4.12 Comparison of Scale Robustness</td>
<td>101</td>
</tr>
<tr>
<td>4.13 Samples for In-Depth Interview</td>
<td>104</td>
</tr>
<tr>
<td>5.1 Gender of Respondents</td>
<td>108</td>
</tr>
<tr>
<td>5.2 Age and Retention of Respondents</td>
<td>109</td>
</tr>
<tr>
<td>5.3 Education Level of Respondents</td>
<td>109</td>
</tr>
<tr>
<td>5.4 Position of Respondents</td>
<td>110</td>
</tr>
<tr>
<td>5.5 Degree of Knowledge Management Involvement of Respondents</td>
<td>111</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figures</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Relationship Between Internal Quality Assurance and External Quality Assessment</td>
<td>20</td>
</tr>
<tr>
<td>3.1 Mintzberg’s Organization</td>
<td>30</td>
</tr>
<tr>
<td>3.2 Proposed Model for Analysis</td>
<td>73</td>
</tr>
<tr>
<td>5.1 Path Model of Factors Affecting Organizational Performance</td>
<td>125</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

1.1 Statement of the Problem and Significance of the Study

In an era of “Knowledge Economy,” managers in both public and private sectors have realized that the most important resource for any organization is knowledge. “Knowledge Management,” so-called KM, is therefore increasingly well-known as a new management tool and practice to address challenges in a changing world. Since knowledge is crucial for competitiveness in any sector, understanding knowledge management is particularly important because it is a vital sign for creating an organization’s continuity and sustainability.

As organizations are increasingly viewing knowledge as their most valuable and strategic asset, it is crucial to effectively manage their intellectual resources and capabilities. Organizations are learning to align and integrate technology and organizational initiatives for managing and supporting knowledge processes. Although building such knowledge management systems is congruent with exploiting knowledge, there should be concrete evidence that their organizational capabilities are appropriately managed and utilized. There needs to be systematic alignment between the organization’s strategy and knowledge management. By having superior intellectual resources, an organization will understand how to exploit and develop their resources better than competitors. The implication of this perspective is that the value of intellectual capital exists with the knowledge of individuals, but can be institutionalized as part of the organization’s systems and structures (Boyce, 2002).

Nonaka et al. (2000: 5-34) stated that despite the widely-recognized importance of intellectual capital (IC), although they primarily equate IC with knowledge, as a vital source of competitive advantage, there is little understanding of how organizations actually create IC by dynamically managing knowledge.
The researcher believes that firm value is created from the combination of the firm’s stock of knowledge and intellectual capital, embedded in both people and systems and the flow of knowledge through creation, transfer, and integration in a way that is valuable, rare, inimitable, and organized. In general, intellectual capital comprises three elements; namely human capital, customer capital, and structural capital.

First, knowledge stocks at the individual level—human capital—represent the knowledge, skills, capabilities, experience, and commitment of the employees of the firm. Second, most conceptualization of knowledge stocks at the group level—customer capital—consider them as the knowledge embedded in a firm’s relations both with current and potential customers, suppliers, shareholders, local and national administrations, and the environment and other agents. Third, knowledge stocks at the firm level—structural capital—represent knowledge embedded in the organizational structures, as in the case of organizational culture, policies, routines, or procedures.

The fact that an organization cannot own its human capital distinguishes this dimension of intellectual capital from the other two capitals (Edvinsson and Malone, 1997). Uncertainty about the employee’s commitment to the organization reduces the organization’s willingness to make investments in human capital development (in order to acquire needed competencies), even though competent personnel are a key in an organization’s endeavor to realize and develop its business initiatives. Value can only be created if the members of the human capital pool (a highly-skilled and highly-motivated workforce) individually and collectively choose to engage in behavior that benefits the organization. The human capital pool is regarded a major source of sustainable competitive advantage (Wright et al., 1994: 301-326).

The rise of the new economy, principally driven by information and knowledge, is attributed to the prominence of human capital as a business and research topic. The competency-based approach has also been well introduced and adopted as a part of human resource management (HRM) by public and private sectors, both in Thailand and overseas. In general, competency is a standardized requirement for an individual to properly perform a specific job. It encompasses a combination of knowledge, skills and behavior utilized to improve performance.
The resource-based view of the organization suggests that human capital and the potential to transform knowledge into skilled action provides organizations with a competitive advantage (Drucker, 1999; Prahalad and Hamel, 1994). From a strategic perspective, human capital is used to create and use knowledge to enhance a firm’s value. Ulrich (1998: 15-26) has proposed an innovative formula based on HRM principles whereby intellectual capital (IC) is a product of competency (competence) and commitment. This means that the organizations have to make their people competent and willing to work.

Knowledge management and competency approaches have become critical for universities, mainly due to the fact that universities’ ultimate goals are the production and diffusion of knowledge, and their important investments are in research and human resources (Elena, 2004). Universities are knowledge producers *per se*—their most important output is knowledge, incorporated in research results, publications, educated students, and productive relationships with their stakeholders. Among their most valuable resources are professors, researchers, managers, and students with their organizational processes and networks of relationship (Warden, 2004). These resources are part of their intellectual capital, and despite their importance, universities seldom deal with them in a proper manner. In conclusion both inputs and outputs of the universities are mainly intangibles.

In the private sector, which has been directly affected by globalization and international competition, many large companies have resources dedicated to internal KM efforts—often as a part of their business strategy, information technology, or human resource management departments (Addicott, McGivern and Ferlie, 2006). Knowledge management and competency are proven beneficial by improving organizational performance through increasing efficiency, quality, responsiveness, and innovation. Knowledge management and competency also generate a higher rate of productivity by having access to employees’ knowledge, better decision making, streamline processes, minimizing re-work, and higher data integrity and greater collaboration.

Universities, not different from the profit organizations in the private sector, have to deal with new challenges created by the knowledge economy. Their challenges include: (1) knowledge as a critical determinant of competitiveness; (2) higher social
expectations regarding better quality and services provided by universities; (3) budget constraints and incorporation that force universities to change and become more self-dependent; and (4) the claims and aspirations of various stakeholders. In order to face these challenges and increase the role of universities, it is necessary to develop knowledge management and competency models to reach the strategic and legitimate objectives of the universities.

In Thailand, increasing the number of public organizations, including public universities, has received a mandate to adopt KM in the operation of their administration according to the requirements of the Royal Decree on Criteria and Procedures for Good Governance 2003. The private universities, which have more focus on providing public services rather than maximizing profit, like private firms in general, also adopt KM in line with the recommendations of the Commission on Higher Education. Sombat Thamrongthanyawong (2007: 431-432) suggested 7 factors that influence policy implementation; they include leader competency and organizational leadership, source of policy, clarity of policy, support for the policy, complexity of the administration, incentives for implementors, and lastly resource allocation. He emphasized the impact of leadership on the success or failure of programs and projects according to the policy implementation.

Currently, the firm-level experience of knowledge management and competency is of increasing interest and is used by university administrators. According to the basic concept of the new public management approach (NPM), the public sector should apply the same management as the private sector, which has proved to be effective. The question is whether successful approaches of knowledge management and competency in the private sector can fit the Thai universities or if there are some specific needs that should be met in addressing the needs of these kinds of organization. The NPM suggestions have been criticized because of differences between the private and public sector, where business practices cannot be directly transferred. Therefore it is a must for Thai universities to develop strategies to address these differences or fill in these gaps.

Like any other management initiatives, implementing knowledge management and competency development is an investment decision so that outcomes can be clearly defined and measured. Current research indicates that widely-accepted criteria
and performance measures for these management tools have not been developed. Two major questions remain: 1) Does knowledge management implementation improve organizational performance? And 2) Does competency development implementation improve organizational performance?

1.2 Objectives of the Study

1) To investigate the organizational performance of Thai universities
2) To investigate the major determinants of knowledge management, organizational competency, and organizational characteristics affecting the organizational performance of Thai universities
3) To investigate the differences of organizational performance among research, teaching, autonomous, public and private universities in Thailand
4) To recommend policy implications for enhancing the effectiveness of knowledge management and competency in the Thai university context

1.3 Scope of the Study and Limitations

The Office for National Education Standards and Quality Assessment (Public Organization) reported that, as of February 2010, Thailand had a total of 298 universities and approximately three-fourths of them were public entities governed by many ministries; namely the Ministry of Education, the Ministry of Public Health, the Ministry of Culture, the Ministry of Defense, etc. There were 71 private universities and only one international university, the Asian Institute of Technology, that received funding from organizations and governments around the world. The Ministry of Education is the major agency accountable for all kinds of education for Thai citizens—from basic education to higher education.

The target universities of the study consist of 121 universities that were chosen for a number of reasons.

First, they are listed by the Commission of Higher Education, the Ministry of Education. As of February 2010, there were 169 higher education institutes listed by this agency. They comprised 14 autonomous public universities, 65 non-autonomous
public universities, 71 private universities/institutes/colleges (later called private university) and lastly 19 community colleges.

Secondly, the universities provide bachelor’s or upper degrees. The community colleges offer degrees lower than a bachelor’s degree; therefore nineteen community colleges were out of the scope of the study.

Thirdly, the universities had more than 2,000 undergraduate and/or graduate students in the educational year of 2009; therefore twenty-two small universities were out of the scope of study.

Fourthly, the universities submit internal audit reports to the Commission of Higher Education, which was used as secondary data for analysis. Seven institutions had not submitted an internal audit report at the time of the data analysis; therefore they were removed from the scope of the study.

In conclusion, this study will focus on 121 large Thai universities listed by the Commission of Higher Education as of February 2010. They can be regarded as a large organization according to Stephen Robbins’ definition, as quoted in Bidhya Bowornwathana (2012: 126-127), because they had organization members of more than 2,000. It can be inferred then that all population members were “on the same floor” in terms of organization size; therefore the organization size could be taken out of the study.

The population of this study is 121 universities consisting of 76 public and 45 private universities. The public universities are composed of 13 limited admission public universities, 14 autonomous universities, 38 Rajabhat Universities, 9 Rajamangala Universities of Technology, and 2 open-admission universities. The private universities are composed of 31 universities, 4 institutes, and 10 colleges. A directory of universities within the scope of study is shown in Appendix A.

All of these universities have adopted the governmental policy enacted by the Royal Decree on Criteria and Procedures for Good Governance and the Recommendations of the Commission on Higher Education to implement knowledge management. The public universities also have to follow the implementation guidelines developed by the Office of Public Sector Development Commission. All of these universities have conducted annual internal audits on their educational standards and quality assurance, as well as the key performance indicators specified by the Commission of Higher
Education. Annually the university administrator has to appoint an external auditor listed by the Commission to perform as Chairman of the internal audit team. The internal audit’s report must be submitted to the Commission for review and public distribution on its website. Moreover, all universities also have been audited by an independent body, namely, the Office for National Educational Standards and Quality Assessment (Public Organization), every five years.

However, some limitations on conducting this dissertation were faced. In general, organizational characteristics are a set of comprehensive aspects relating to organizational structures, technology, organization size, organizational culture, organizational life cycle, and organization design, as Bidhya Bowornwathana mentioned (2012: 19-21). In addition, politics in the organization is another significant factor in determining organizational structure, as discussed in Bidhya Bowornwathana (2012: 83). These factors were not included in this study and can be regarded as a major limitation. However, the readers can find numerous studies on the impacts of these organizational characteristics and the politics in organization regarding organizational effectiveness or performance.

The researcher selected only two specific organizational characteristics used world-wide to classify universities. They are:

1) University type based on ownership and source of funding, and
2) University orientation or focus.

In Thai society, these two characteristics are also used as one of the selection criteria when applying for university admission by students and their parents. Thais generally believe that public universities are better than private universities in many aspects, especially higher quality and reputation. Most Thais believe that research universities tend to perform better than teaching universities. The researcher takes this opportunity to investigate and prove these enquiries.

In addition, knowledge management, like any other new management tool, is generally preferred by managers or management because it increases their power to centralize resource allocation and control with legitimate claims. This phenomenon can be regarded as managerial blindness that becomes another limitation of the study. The next limitation is that not all Thai universities are at the same implementation phase of knowledge management. Enormous universities, such as Kasetsart and
Mahidol Universities, have established centers of knowledge management to take care of many activities, ranging from supporting new faculties or offices to setting up KM systems to leverage their intellectual capital for patents or commercialization. In contrast, smaller universities are just in the infant stage of implementing this new approach. Furthermore, up to now, only a few universities have taken the challenge of trying to measure, manage, and report on knowledge asset values.

1.4 Benefits of the Study

As Cohen (1998) has suggested, since most American research to date has focused on processes related to explicit knowledge and information technology orientation, it is time for more research to focus on tacit knowledge processes that are advocated by Japanese scholars, such as those discussed by Takeuchi and Nonaka. The researcher hopes to illuminate the creation and dissemination of such tacit knowledge that mainly produces the competent human capital of the organization. It is the hope that by conducting research built on firmly-established organization and human resource theories, the researcher can find the linkages among four relevant concepts. The researcher attempts to conduct empirical research that seeks to strengthen the causal relationships among knowledge management, organizational competency, organizational characteristics, and organizational performance in the setting of Thai universities. The researcher will not only uncover interesting findings, but will also add to a robust cumulative research tradition.

The findings from the analyses will reveal which variables or determinants have a significant influence on university performance. The researcher will use these to recommend policy implications for enhancing the effectiveness of knowledge management and competency for Thai universities, as well as other knowledge-based service operators under governmental agencies, local administration agencies, state-enterprises, and independence public organizations or private firms. The knowledge-based service operators include research institutions, libraries, museums, and archives.
CHAPTER 2

HIGHER-EDUCATION SYSTEM IN THAILAND

The purposes of this chapter are to describe the relevant legislation and developments affecting the higher-education system in Thailand, to identify the university characteristics used in the study, and lastly to introduce the educational standards and quality assurance implemented by the universities in Thailand.

Universities in Thailand have been traditionally dominated by the public sector since the end of the Second World War. They have served to produce technocrats for government agencies and economic sector, and have been recognized as the prime movers of the country. Until the last two decades, the private sector has taken a supplementary role in providing higher education, as manpower demand sharply increased due to economic development.

Thailand’s education system has faced various problems, including a low level of research and development, disparity in quality and access to higher education among different parts of the country, and weak engagement between universities and economic operators. Several studies have concluded that academic freedom and excellence cannot go with bureaucracy.

To understand the changes in the higher-education system in Thailand, it is necessary to review the relevant legislation and developments.

2.1 Higher Education Legislation

2.1.1 The National Education Act of 1999 and Its Second Amendment of 2002

This law upturned the higher-education system in Thailand by integrating three agencies, namely, the Ministry of Education, the Ministry of University Affairs, and the National Education Commission, and by creating the Ministry of Education,
Religion, and Culture (which were later separated into the Ministry of Education and the Ministry of Culture). This law extended compulsory education from 9 years to 12 years, which has had substantial impact on higher-education provision. It also caused higher demand for university admission but a decrease in the share of the government budget. In addition, this law established the Office for National Education Standards and Quality Assessment (Public Organization) or ONESQA, which is responsible for national education quality assurance. According to the National Education Act, there has been a substantial push to incorporate public universities into autonomous public universities, where they receive more managerial autonomy, while the relevant public agencies changed their roles from regulatory to supervisory agencies. Furthermore the philosophy of providing higher education has changed towards student-centered learning and citizen lifelong learning, together with higher societal participation in education provision.

2.1.2 The Private Higher Education Institute Act of 2003 and Its Second Amendment of 2007

This law gives the right and authority to private institutions to deliver higher education equivalent to that of public universities. The private universities do not get financial support from the government; they depend on their own revenue and licensee. Major revenues come from tuition and training fees. According to this law, a monitoring and evaluation system for private universities was established. At the earlier stage, private universities were new to the Thai public and some questioned their quality. The responsible public agency had to closely monitor the arrangement and report their performance to the public. The law amendment in 2007 addressed the problem of managerial inflexibility and gave, to a certain extent, autonomy to the private universities, which have gradually gained more public confidence and a better reputation.

2.1.3 The University Personnel Act of 2004 and Its Second Amendment of 2008

This law focuses on motivating university personnel (including administrators, faculties, and staff) to enhance the knowledge and capability needed for conducting
jobs, decentralizing authority to universities to formulate their own policies, standards, principles, criteria, procedures and practices, which are part of academic freedom and excellence. The amendment touches on the extension of the retired age of professors and associate professors from 60 to 65 years in order to benefit from their expertise.

2.1.4 The Administration of Higher Education Institute Internal Affairs Act of 2007

The objective of this law is to decentralize the authority to each university council and management in terms of flexibility and governance. Any university can set up its own internal units to run any specific activities and programs supported by its own generating budget. The chief of the internally-established units can get rights and privileges equivalent to other chiefs of official departments and bureaus.

2.2 Development of Autonomous Public Universities

Prior to the official policy promulgation on university autonomy enacted by the National Education Act in 1999, as mentioned above, there was a movement to bring the public universities out of the bureaucratic civil service in the mid-1960’s, when the term of the autonomous university was first introduced in Thailand. “Autonomy” means control itself, freedom with responsibility and accountability. This concept was formally turned into action in the First 15-year Long Range Plan for Higher Education (from 1990 to 2004). The first plan announced that for future public universities to be established they must be autonomous universities from the beginning, whereas existing public universities should be incorporated (changed to be) within 10 years or by the year 2000.

The “autonomous public university” can be described as a university not governed by the Office of the Higher Education Commission or it is self-governing under each university’s regulations. Sources of revenue are from state subsidy and income from tuition fees, research, seminars, funding and other benefits. The autonomous public university is intentionally designed to take advantage of the strengths of both the public and private university.
In the 1990’s there were three newly-established autonomous public universities; namely, Suranaree University of Technology, Walailak University, and Mae Fah Luang University. On the other hand, fifteen existing public universities did not successfully incorporate into autonomous institutions as a result of university employees’ resistance and the public ignorance. The negative aspect of the autonomous university is the fear that universities will become private organizations geared towards turning a profit; tuition fees would soar so much that youth from poor families would lose their educational opportunities, while the positive aspect is that the public university would become independent from bureaucracy and perform better.

University autonomy was again mentioned and part of the conditions under the International Monetary Fund’s (IMF) loan package when Thailand faced an economic crisis in 1997. To minimize public expenditures, all state agencies, including public universities, were encouraged to be self-sufficient and self-administrating. The government enacted a total of 13 acts to safeguard the operation of autonomous public universities, which were empowered to govern overall administrations in terms of personnel, financing, academic, and other university management systems under the delegated authority of the university council. The autonomous public universities still receive partial budget from the government as with traditional public universities. Their employees are entitled to similar privileges as other government officers.

The first successful case of incorporating the public university into the autonomous public university occurred in 1998 with the case of King Mongkut’s University of Technology Thonburi (KMUTT), which had adopted a dual personnel management system to reduce the fear of university employees from contract-basis employment. Existing personnel could maintain the status of civil servant, or voluntarily change to be a university employee in order to get a higher salary in association with the new evaluation system. Newly-recruited employees were employed on contract basis. This brought smoother transformation to such universities. Now, the majority of KMUTT employees are university employees.

The existing public universities and two Buddhist universities have continually proposed reform bills for cabinet and parliament approval. After KMUTT, another batch of reform bills by four universities was approved by the national
legislative assembly in 2007. This batch comprised Chulalongkorn University, Chiang Mai University, King Mongkut’s University of Technology North Bangkok, and King Mongkut’s Institute of Technology Ladkrabang. Five other institutions, namely Burapha University, Mahidol University, Mahachulalongkornrajavidyalaya Buddhist University, Mahamakut Buddhist University, and Thaksin University, were approved later. Nowadays, there remain 13 additional draft bills for university reform under the legislative process. Recently the cabinet approved the reform bill of Kasetsart University on 21 August, 2012.

As of February, 2010, there were 14 autonomous public universities which could be classified into 3 groups, as shown in Table 2.1

Table 2.1 Autonomous University Groups

<table>
<thead>
<tr>
<th>Autonomous University Groups</th>
<th>University Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Newly-established autonomous</td>
<td>Suranaree University of Technology</td>
</tr>
<tr>
<td></td>
<td>Mae Fah Luang University</td>
</tr>
<tr>
<td></td>
<td>Walailak University</td>
</tr>
<tr>
<td></td>
<td>University of Phayao</td>
</tr>
<tr>
<td>2) Later changed by reform bills</td>
<td>Chulalongkorn University</td>
</tr>
<tr>
<td></td>
<td>Chiang Mai University</td>
</tr>
<tr>
<td></td>
<td>Mahidol University</td>
</tr>
<tr>
<td></td>
<td>King Mongkut’s University of Technology</td>
</tr>
<tr>
<td></td>
<td>Thonburi</td>
</tr>
<tr>
<td></td>
<td>King Mongkut’s University of Technology</td>
</tr>
<tr>
<td></td>
<td>North Bangkok</td>
</tr>
<tr>
<td></td>
<td>King Mongkut’s Institute of Technology</td>
</tr>
<tr>
<td></td>
<td>Ladkrabang</td>
</tr>
</tbody>
</table>
Table 2.1 (Continued)

<table>
<thead>
<tr>
<th>Autonomous University Groups</th>
<th>University Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Burapha University</td>
</tr>
<tr>
<td></td>
<td>Thaksin University</td>
</tr>
<tr>
<td>3) Buddhist University</td>
<td>Mahamakut Buddhist University</td>
</tr>
<tr>
<td></td>
<td>Mahachulalongkornrajavidyalaya Buddhist University</td>
</tr>
</tbody>
</table>

2.3 Development of Research Universities

Referring to the Second 15-Year Long Range Plan on Higher Education (from 2009 to 2022), the Commission of the Higher Education places more emphasis on a quality system founded on academic freedom, and the diversity and unity of the system. A quality system is tailored to help address good governance, financing management, higher educational standards, and university networking. The Commission agrees that no universal strategy fits all kinds of universities and reflects the strengths and aspirations of higher education institutes regarding four groups; namely 1) research and post graduate universities 2) specialized universities including science and technology and comprehensive universities 3) four-year universities and liberal arts colleges and 4) community colleges. Each group has different priorities (or orientations) and strategies as follows:

1) Research and postgraduate universities: play important roles in the development of academic excellence through producing research and post-doctoral research, aiming to generate a new body of knowledge and technologies that can address global demands and national needs.

2) Specialized including science and technology and comprehensive universities: provide comprehensive study programmes in their respective fields of
study and focus on producing researchers and skilled workforces required by the business sector at the national level.

3) Four-year universities and liberal arts colleges: provide bachelor’s degree programmes that are needed by business sector at the national and regional level.

4) Community colleges: focus on offering degrees lower than a bachelor’s degree which are required by local manufacturing and the service sector. They also play important roles in life-long learning and local community development.

Furthermore, in October 2009, the Office of Higher Education Commission which is under the Ministry of Education selected nine leading universities to be upgraded to “national research universities.” These universities received additional financial government support to fulfill their research mission, which was expected to enhance national competitiveness and to promote Thailand as a regional education center. The national research universities included 1) Chulalongkorn University 2) Thammasat University 3) Mahidol University 4) Kasetsart University 5) King Mongkut’s University of Technology Thonburi 6) Chiang Mai University 7) Khon Kaen University 8) Suranaree University of Technology and (9) Prince of Songkla University.

In addition, the National Education Act identifies 4 missions of Thai universities. These missions are: 1) teaching 2) research 3) academic services for social development and 4) art & cultural development. Each university has different proportions of activities for achieving its own missions. The Office for National Education Standards and Quality Assessment (Public Organization) or ONESQA has classified the universities in Thailand into 4 groups based on university orientation, as seen in Table 2.2
### Table 2.2 University Orientation and Weight of Associated Missions

<table>
<thead>
<tr>
<th>University Orientation</th>
<th>Teaching</th>
<th>Research</th>
<th>Academic Services</th>
<th>Art &amp; Cultural Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Producing graduates and research</td>
<td>$\geq 30%$</td>
<td>$\geq 30%$</td>
<td>$\geq 20%$</td>
<td>$\geq 10%$</td>
</tr>
<tr>
<td>2. Producing graduates and social development</td>
<td>$\geq 30%$</td>
<td>$\geq 20%$</td>
<td>$\geq 30%$</td>
<td>$\geq 10%$</td>
</tr>
<tr>
<td>3. Producing graduates and art &amp; cultural development</td>
<td>$\geq 30%$</td>
<td>$\geq 20%$</td>
<td>$\geq 20%$</td>
<td>$\geq 20%$</td>
</tr>
<tr>
<td>4. Producing graduates only</td>
<td>$\geq 35%$</td>
<td>$\geq 20%$</td>
<td>$\geq 20%$</td>
<td>$\geq 10%$</td>
</tr>
</tbody>
</table>

### 2.4 University Characteristics

In this study the researcher will use the term “university” for all kinds of higher education institutions, where students can seek academic degrees and/or where academic research is carried out. University type and orientation are two major organizational characteristics of the universities, enforced by relevant legislations and governing agencies.

#### 2.4.1 University Type

Thailand has three types of universities, namely the public, autonomous, and private university, in accordance with the National Education Act and the Private Higher Education Institute Act. Public and private universities are different in terms of ownership and sources of funding. They are also different in terms of goals, and their administration and management system. In Thailand, public universities are classified into 2 subgroups; autonomous and non-autonomous. Major public universities, located in Bangkok vicinity and major cities in the region, intend to be research universities, while Rajabhat universities and Rajamangala Universities of Technology, located in the provinces, concentrate on producing graduates and academic services for local communities. Most private universities aim to produce graduates only, while a few of them plan to become research universities.
2.4.2 University Orientation

In this study, the researcher will classify universities into 2 groups based on university orientation or focus; they are the research university (as identified Group 1 belonging to ONESQA’s criteria in Table 2.2) and the teaching university (as identified Group 2, 3 and 4 belonging to ONESQA’s criteria in Table 2.2).

2.5 Educational Standards and Quality Assurance

2.5.1 Governing Agencies

The Royal Thai Government approved the National Education Standards suggested by the Ministry of Education on 26 October 2004. The national education standards specify the preferred qualifications and standards for all education institutions. These are used as the basis for promoting, supervising, auditing, assessing, and assuring the quality of the education system. The Commission of Higher Education has developed Higher Education Standards based on the national education standards, describing the purposes and principles of the education administration for all groups and categories of higher education institutions in Thailand so that they can utilize these standards and set their own missions and standards of operation.

In the context of Thai universities, they have adopted a manual for the internal quality assurance for higher education institutions published by the Commission of Higher Education, Ministry of Education in February 2008. This manual is used as a guideline in response to the National Education Act 1999 (2nd amendment in 2002) and related regulations and standards. It identifies a comprehensive set of educational quality-assurance indicators covering 9 quality components, including: 1) philosophy, commitments, objectives and implementation plans 2) teaching and learning 3) student development activities 4) research 5) academic services to the community 6) preservation of arts and culture 7) administration and management 8) finance and budgeting and 9) systems and mechanism for quality assurance. The universities have to set up an internal quality-assurance committee, develop and implement the quality manual and associated procedures and instructions, carry out internal quality audits, and annually report the audit findings to the Office of the Commission of Higher Education.
Furthermore Thai universities also have been audited by an external independent body, the Office for National Education Standards and Quality Assessment (Public Organization) or the so-called ONESQA, every five years. The ONESQA has developed a comprehensive set of standards, together with relevant indicators such as the audit criteria. The first round of university audits was done during 2001-2005 nationwide. The ONESQA took all feedback and complaints from the first round into consideration and then came up with an improved set of 7 standards and 48 indicators for the second round of university audits focused on 4 dimensions: effectiveness, administration and management, learning, and quality assurance. The former 4 standards focus on the university’s outputs and outcomes related to quality of graduates, research and innovation, academic services, and art & cultural development. The latter 3 standards focus on the university’s internal processes which are related to institutional and human resource development, curriculum and teaching & learning, and quality assurance. There are two types of indicators—39 common indicators for all universities and 9 specific indicators for each university group.

The Office of The Public Sector Development Commission (OPDC) also plays a role in auditing non-autonomous public universities. The OPDC initiated the leverage of public administration quality in accordance with the Royal Decree on Criteria and Procedures for Good Governance B.E. 2546. A research study on the quality of public sector management was done and criteria for quality measurement were set as a Public Sector Management Quality Award: PMQA, a tool to increase performance and guidelines for self-assessment in 7 categories related to the following: 1) Leadership 2) strategic planning 3) stakeholders and customers’ importance 4) measurement evaluation, and knowledge management 5) human resource management 6) process management and last 7) result-based management.

The OPDC provides public universities with two choices for annual performance evaluation. These choices are:

1) OPDC audit according to PMQA’s performance indicators, or
2) Reference to the internal audit results based on the Commission of Higher Education’s indicators.
Only twelve public universities chose the former choice and the rest chose the latter choice. These twelve universities include Khon Kaen University, Prince of Songkla University, Princess of Naradhiwas University, Nakhon Sawan Rajabhat University, Mahasarakham Rajabhat University, Udon Thani Rajabhat University, Buriram Rajabhat University, Phranakhon Si Ayutthaya Rajabhat University, Suan Sunandha Rajabhat University, Roi-et Rajabhat University, Rajamangala University of Technology Thanyaburi, and lastly Rajamangala University of Technology Rattanakosin.

2.5.2 Educational Quality Audits

After reviewing the university performance indicators belonging to the three public organizations supervising or conducting assessment of Thai universities, as mentioned above, the researcher found that each university had received both an internal audit and external audit. The internal audit aims at creating a system and mechanism to control, audit, and assess the operation of the institution to comply with each university’s policies, purposes, and levels of quality established by the university and the governing authorities. The internal quality assurance is a mandatory part of the education administration process that should be maintained on an ongoing basis. On the other hand, the external quality assurance is the assessment performed by the Office for National Education Standards and Quality Assessment (Public Organization). All educational institutions are subject to being assessed by this agency at least once every five years. Each university has received four types of audit, as shown on Figure 2.1:

1) Internal audit conducted by internal auditor–this is performed at least once a year by trained faculty and staff in order to check on the achievements and progress of activities in accordance with individual university’s indicators, which are also partially adopted or aligned with the recommended indicators of the relevant authorities.

2) Internal audit conducted by the audit subcommittee–the audit subcommittee is composed of external and internal auditors appointed by the university. The audit subcommittee is chaired by external auditor, who is listed by the Commission of Higher Education, in order to obtain more reliability and transparency. It
is performed at least once a year. The findings from the audit subcommittee are reported to both the university and the Commission of Higher Education.

3) External assessment conducted by the Office for National Educational Standards and Quality Assessment (Public Organization)—this is performed at least every five years. The assessment is done by a third party which is not involved in the university administration; therefore this can ensure more transparency and independence.

4) External assessment conducted by the Office of The Public Sector Development Commission—this is performed annually in case the public university does not make use of reference to the assessment result on 2.

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**Figure 2.1** Relationship Between Internal Quality Assurance and External Quality Assessment

**Source:** Commission of Higher Education, 2010: 14.

### 2.5.3 Audit Criteria and Score of the Commission of Higher Education

Although almost all of the audits use nearly the same audit criteria, the internal audit by the subcommittee is in between and is more acceptable to related parties, including the universities themselves, the supervisory or governing agencies,
as well as other stakeholders. The researcher decided to use secondary data from the internal audit subcommittee’s report for the educational year of 2009 (from June 2009 to May 2010) in order to formulate the dependent variable for organizational performance for this study since it is more transparent and exhibits a lower bias. Most audits were conducted in the second half of year 2010 and the audit reports were completed by the first quarter of 2011. Therefore the data were available for the researcher from April, 2011.

The internal audits were conducted to verify the objective evidence of organizational performance related to 9 quality components in association with 44 indicators, as identified in the Manual or the Internal Quality Assurance for Higher Education Institution, published by the Commission of Higher Education (CHE) in February, 2008.

2.5.3.1 Audit Criteria of the Commission of Higher Education

1) Philosophy, commitments, objectives, and implementation plan, with 2 indicators:

   (1) An identification of the philosophy or vision followed by strategies and implementation plans. Indicators should be set up to observe the progress of these plans

   (2) The percentage of attaining indicators stated for each plan

2) Teaching and learning, with 13 indicators:

   (1) A system and mechanism for curriculum development and management

   (2) A learning process that emphasizes the learner

   (3) Projects or activities to support a curriculum development and learning process that allows individuals, the organization, and the external community to participate

   (4) The proportion of the number of full-time equivalent students to the number of full-time faculty

   (5) The proportion of the number of full-time faculty holding bachelor, master, and doctoral degrees or equivalent to the number of full-time faculty
6) The proportion of the number of full-time faculty holding the position of instructor, assistant professor, associate professor, and professor to the number of full-time faculty

7) A mechanism to promote ethical professional practices among faculty

8) A mechanism to promote research for teaching and learning development among full-time faculty

9) Percentage of bachelor graduates that can secure jobs and that can be self-employed within one year

10) Percentage of bachelor graduates receiving starting salaries in accordance with the standardized scale

11) Level of satisfaction of employers, business operators, and graduate users

12) The percentage of students or alumni that have graduated within 5 years and granted an award in terms of academic, professional, morality, ethics, sport, health, art and culture, or environment at the national or international level

13) The percentage of full-time faculty that really function as thesis advisors in proportion to the number of those that are qualified (only for institutions that emphasize producing graduates and research)

3) Student development activities, with 2 indicators:

1) Services offered to students and alumni

2) Support for student activities that are complete and conform to preferred characteristics of graduates

4) Research, with 5 indicators:

1) A development of systems and mechanisms to support the conduct of research and innovation

2) A knowledge management system for research and innovation

3) The amount of internal and external grants for research and innovation in proportion to the number of full-time faculty
(4) The percentage of research and innovation published or registered as intellectual property or patented or utilized at the national or international level in proportion to the number of full-time faculty

(5) The percentage of research articles cited in refereed journals or national or international databases in proportion to full-time faculty (only for institutions that emphasize producing graduates and research)

5) Academic services to the community, with 5 indicators:

(1) Processes and mechanisms to provide academic services to the society mentioned in the objectives of the institution

(2) The percentage of full-time faculty that are involved in providing academic services as consultants, thesis committees outside the institution, academic or professional committees at the national or international level in proportion to the number of full-time faculty

(3) The percentage of academic and professional service activities/projects responding to the needs for development and strengthening the society, community, nation, and the international community in proportion to the number of full-time faculty

(4) The percentage of satisfaction levels of those that receive services from the institution

(5) The number of academic and professional service centers nationally or internationally recognized (only for institutions that emphasize producing graduates and social development)

6) Preservation of arts and culture, with 3 indicators:

(1) A process and mechanism for the preservation of arts and culture

(2) Pieces of work/accomplishments resulting from knowledge-building and standard-setting for arts and culture (only for institutions that emphasize producing graduates and developing and promoting arts and culture)

(3) Effectiveness in the preservation, enhancement, and promotion of artistic and cultural identity (only for institutions that emphasize producing graduates and developing and promoting arts and culture)
7) Administration and Management, with 9 indicators:
   (1) The institution council exhibits good governance and drives the institution to compete at the international level
   (2) The exhibition of leadership among administrators at all levels
   (3) Institution development for transformation into a learning organization
   (4) A human resources system and mechanism to develop and maintain qualified and efficient human resources
   (5) Effectiveness of the database system for teaching & learning and research activities
   (6) The level of achievement in allowing external individuals to participate in institutional development
   (7) The percentage of full-time faculty that have received academic or professional awards at the national and international level
   (8) The implementation of risk management programs for education management
   (9) The level of achievement to convey organizational indicators and targets at the individual level

8) Finance and budgeting, with 2 indicators:
   (1) A system and mechanism to allocate and analyze expenses and audit finance and budgeting efficiently
   (2) Internal and external sharing of resources

9) Systems and mechanism for quality assurance, with 3 indicators:
   (1) A system and mechanism for internal quality assurance infused as one part of the education management process
   (2) A system and mechanism to share knowledge and skills relevant to quality assurance with the students
   (3) The level of achievement of the internal-quality assurance program
2.5.3.2 Audit Score of the Commission of Higher Education

The internal audit subcommittee uses the 9 quality components in association with 44 indicators as listed above to evaluate university performance by identifying 3-point score criteria of these indicators:

1) One point means that the implementation of the indicator is partial and it is below a satisfactory level or the performance results are substandard.

2) Two points means that the implementation of the indicator is acceptable and close to standards or the performance results are close to the standards.

3) Three point means that the implementation covers all aspects of the indicator or the performance results passed the standard requirements.

In the case of non-performance or if the performance is below “one point” in the audit criteria, the score is zero.

2.6 University Rankings

Nowadays there is no official ranking for universities in Thailand. Particular universities apply for international ranking, such as Chulalongkorn University and Mahidol University. In July 2007, the Commission of Higher Education approved a comprehensive set of Education Quality Assurance indicators (later called EQA indicators) that covered all quality components, as mentioned in the Ministerial Regulation Regarding Internal System, Criteria and Procedures for Higher Education Quality Assurance, 2003. These EQA indicators can assess all dimensions of the system, balance all administrative perspectives, and in accordance with all standards developed, including the External Quality Assurance indicators specified by the Office for National Education Standards and Quality Assessment (Public Organization) and the Office of the Public Sector Development Commission. The Commission of Higher Education encourages the university to employ this new approach in order to improve the education administration and contribute to producing educated and qualified graduates as well as other outputs that match the needs of the society and the nation’s sustained development.
The university’s performance is initially evaluated by its internal audit team, which generates a self-assessment report, the so-called “SAR.” Then the university administration will appoint an audit subcommittee chaired by the external assessor that is listed in the assessors’ pool of the Commission of Higher Education. The internal audit subcommittee will re-evaluate the SAR report by reviewing objective evidence, proving the existence of outputs and achievements as referred to in the SAR report. The internal audit subcommittee’s report is finally submitted and publicized on the website of the Commission of Higher Education in the section of “CHE QA online.”

Although the educational-quality assurance system, as mentioned above, is not designed for university ranking, the researcher proposes to use the average scores of the overall measurements under the 9 quality components as a primary ranking criterion for the 121 universities in the scope of study. A list of the top-ten universities based on audited SAR scores in educational year 2009 is shown in Table 2.3.

Table 2.3 Top-Ten Universities Based on Audited SAR Scores

<table>
<thead>
<tr>
<th>Rank</th>
<th>University</th>
<th>Audited SAR scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>National Institute of Development Administration</td>
<td>2.87</td>
</tr>
<tr>
<td>2</td>
<td>Suranaree University of Technology</td>
<td>2.85</td>
</tr>
<tr>
<td>3</td>
<td>Mahanakorn University of Technology</td>
<td>2.83</td>
</tr>
<tr>
<td>4</td>
<td>Sukhothai Thammathirat Open University</td>
<td>2.79</td>
</tr>
<tr>
<td>5</td>
<td>Chiang Mai University</td>
<td>2.78</td>
</tr>
<tr>
<td>5</td>
<td>Bansomdej Chaopraya Rajabhat University</td>
<td>2.78</td>
</tr>
<tr>
<td>5</td>
<td>Suan Sunandha Rajabhat University</td>
<td>2.78</td>
</tr>
<tr>
<td>5</td>
<td>Siam University</td>
<td>2.78</td>
</tr>
<tr>
<td>9</td>
<td>Mahidol University</td>
<td>2.76</td>
</tr>
<tr>
<td>9</td>
<td>Khon Kaen University</td>
<td>2.76</td>
</tr>
</tbody>
</table>

There are many kinds of Thai universities in the top-ten list. In terms of university type, there are 5 non-autonomous public, 3 autonomous public, and 2 private universities. In terms of university orientation, there are 6 research and 4 teaching universities. The rankings for all 121 universities in the study are shown in Appendix B.
CHAPTER 3

LITERATURE REVIEW

Scott (2003) has summarized the theoretical perspectives on the organization comprehensively in his famous textbook “Organizations: Rational, Natural, and Open Systems.” They can be highlighted as follows:

1) Rational perspective: organizations are collectives oriented to the pursuit of relatively specific goals and exhibit a relatively highly formalized structure.

2) Natural perspective: organizations are collectives whose participants pursue multiple interests, both disparate (unequal) and common, but recognize the value of perpetuating the organization as an important resource. The informal structure of relations that develops among participants provides a more informative and accurate guide to understanding organizational behavior than the formal (structure).

3) Open System perspective: organizations are systems of interdependent activities linking and shifting coalitions of participants. The systems are embedded independent on continuing exchanges with the environment. Moreover, they are also constituted by the environment in which they operate.

From the above perspectives, it can be seen that an organization will have the following elements or characteristics: a social structure, social actors, goals, and technology and environment. In summary, organizations are durable, reliable, and accountable. They are designed in such a way as to persist over time; are good in doing things over and over; and establish a framework of rationality that allows participants to give an accounting of their behaviors, and the bases on which past actions can be reviewed.

The term “organization” has been used in a number of ways. Generally speaking, the term “organization” is used in different senses as a process, a structure of relationships, a group of persons, and lastly a system. In terms of the organization
as a process, it is treated as a dynamic process and a managerial activity which is essential for planning the utilization of the organization’s resources, money and people to accomplish various objectives. In terms of the organization as a structure of relationships, this refers to the structure of relationships among job positions which are created to accomplish certain objectives. As a group of persons, the organization in this third sense means that the organization is frequently viewed as a group of persons contributing their efforts towards certain goals. An organization begins when people combine their efforts for a common purpose. Organization as a system: the organization is viewed as system made up of components each of which has unique properties, capabilities, and mutual relationships. The constituent elements of a system are linked together in such complex ways that actions taken by one producer have far reaching effects on others.

The works of three prominent scholars that exhibit a common emphasis on goal attainment of the organization are reviewed here. Weber is the prime mover; Chandler and Plano suggest designing an organizational structure to fit its objectives; and recently Daft has added the concept of the effect of the external environment on the organization. The definitions of the organization are given in Table 3.1 below.

Table 3.1 Definitions of Organization

<table>
<thead>
<tr>
<th>Scholars</th>
<th>Definition of Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Weber (1947)</td>
<td>A system of continuous purposive activities of a specific kind</td>
</tr>
<tr>
<td>Chandler and Plano (1982)</td>
<td>A goal-seeking group of individuals that use a structure designed to help achieve its objectives</td>
</tr>
<tr>
<td>Daft (1998)</td>
<td>A social entity that is goal-directed, is designed as a deliberately-structured and coordinated activity system, and is linked to the external environment</td>
</tr>
</tbody>
</table>
In this study, the researcher adopts the concept of the organization as suggested by Daft (1998). This scholar viewed the organization as an open system that must interact with the environment in order to survive. The system is a set of interacting elements that acquire inputs from the environment, transform them and discharge outputs to the external environment. The organization cannot seal itself off the environment.

Daft (1998) also emphasized the organizational configuration mentioned by Mintzberg—that the organization has five parts as follows:

1) Operating core: people that do the basic work close to the organization’s customers

2) Strategic apex: the top management that provides directions, strategies, goals, and policies for the entire organization

3) Middle line: people that are responsible for implementation and coordination on the departmental level

4) Technostructure: people that are responsible for standardization, research and development

5) Support staff: people that are responsible for the smooth operation and coordination and upkeep of the organization

The five crucial parts of the organization proposed by Mintzberg are shown in Figure 3.1.

![Figure 3.1 Mintzberg’s Organization](image)

This study is based on organization theories and involves four variables, comprising organizational performance as the dependent variable, and knowledge management, organizational competency, and organizational characteristics as the independent variables. The major literature on these four concepts and their relationships is reviewed and summarized below.

3.1 Organizational Performance

3.1.1 Organizational Effectiveness

Organizational effectiveness is the concept of how effective an organization is in achieving the outcomes that the organization intends to produce. Organizational effectiveness is an abstract concept and is basically impossible to measure. Etzioni (1964) defined organizational effectiveness as the degree to which an organization has realized its goals. Campbell (1977), as quoted in Bidhya Bowornwathana (2012: 180-184), gathered 30 meanings of this term. Organizational effectiveness can refer to overall effectiveness, productivity, efficiency, profit, quality, accidents, growth, absenteeism, turnover, job satisfaction, motivation, morale, control, conflict/cohesion, flexibility/adaptation, planning and goal setting, goal consensus, internalization of organizational goals, role and norm congruence, managerial interpersonal skills, managerial task skills, information management and communication, readiness, utilization of environment, evaluations by external entities, stability, value of human resources, participation and shared influence, training and development emphasis, and lastly emphasis on achievement.

Robbins (1990: 77) provided greater clarification. He concluded that organizational effectiveness is the degree to which an organization attains its short-term (ends) and long-term (means) goals, the selection of which reflects strategic constituencies, the self-interest of the evaluator, and the life stage of the organization. Table 3.2 summarizes all four approaches and their conditions in measuring organizational effectiveness.
### Table 3.2 Organizational Effectiveness Measurement Approaches

<table>
<thead>
<tr>
<th>Approach</th>
<th>Definition of Organizational Effectiveness</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal Attainment</td>
<td>An organization is effective to the extent that...it accomplishes its stated goals.</td>
<td>Goals are clear, time bound, understood, consensus, and measurable.</td>
</tr>
<tr>
<td>Systems</td>
<td>It acquires needed resources and has capability to transform input into output.</td>
<td>Goals are not clear but a clear connection exists between inputs and outputs.</td>
</tr>
<tr>
<td>Strategic Constituencies</td>
<td>All strategic constituencies are at least minimally satisfied.</td>
<td>Organizational goals must be consistent with the demand of powerful constituencies whose goals may change over time.</td>
</tr>
<tr>
<td>Competing Values</td>
<td>Depend on the values the of organization’s evaluators: human relations, open, rational-goal, or internal-process model</td>
<td>The organization is unclear about its own emphases or changes in criteria over time.</td>
</tr>
</tbody>
</table>

**Source:** Robbins, 1990: 77.

The goal-attainment approach has been used around the world by public and private organizations. The Management by Objectives (MBO) approach, a goal-attainment technique, was famous a few decades ago because of its straightforward linkages between ends and goals. The Balanced Scorecard was an extension of the purely goal-attainment approach. It should be remembered that the Balanced Scorecard is a tool to encourage people to participate in the strategy formulation process and to set out measurable objectives. The goal-attainment approach is easy to
communicate to an organization’s members at all levels, including all stakeholders. It emphasizes ends rather than means. There are five assumptions of this approach: 1) there are goals in reality 2) the goals are perceived and well-defined and can be understood 3) there are not too many goals to manage 4) the goals are based on consensus and 5) the goals are measurable.

The goal-attainment approach has faced some problems during implementation: 1) formal goals may be different from actual goals 2) who are goal identifiers? and sometimes the goals are not deployed from the top management 3) organizational goals are conflicting and cannot reach a consensus 4) goal priority is not clear or impossible in case of conflicting goals and its priority can be changed in accordance with political power change; and last 5) the priority of short-term, medium term, and long-term goals is not clear.

In case of unclear organizational goals or ends, the second approach may be helpful and applied. The system approach addresses the weakness of the first approach by extending the emphasis from output to input and to process as well. It gives importance to the long-term goals and interactions among related activities within the organization. The system approach also faces two weaknesses: 1) difficult to measure and 2) more concentration on the means to achieve the goals.

The third approach, the so-called “strategic-constituency” approach, focuses on constituency groups, and the effective organization is the one that can satisfy the important constituency groups and can determine the organizational goals to meet the needs of such constituency groups. This approach does compromise goals in an effort to reconcile conflicts and accommodate the concerns of those constituency groups. This approach is quite difficult to implement and faces the changing goals of the constituency groups over time.

Lastly, the competing-values approach depends on the values or preferences of the organization evaluators in three dimensions: flexibility or control, human or organization orientation, and lastly means or ends. Since it is based on personal attitude, a problem of bias may exist. Four models are suggested. The human relation model focuses on human and flexibility. The open model focuses on organization and flexibility. The rational-goal model focuses on organization and control. The internal-process model focuses on human and control.
Similar to the thought of Robbins, Daft (1998) proposed the contingency effectiveness approach that measures the effectiveness of different parts of the organization and concerns which measurements managers choose to track. He proposed three approaches include a goal approach, a resource-based approach, and an internal process approach.

The goal approach is based on identifying an organization’s output goals and assessing how well the organization has attained those goals. The important goals to consider are operative goals because they reflect the actually-performing activities of the organization. Measuring effectiveness by this approach must be conducted for multiple goals, which may be conflicting, unbalanced, or subjective. This approach is similar to the goal-attainment approach, as mentioned earlier.

Daft’s second approach is based on observing the beginning of the process and evaluating whether the organization has achieved its goals in terms of desired levels of output. Major indicators are the bargaining position in getting all of the resources that an organization needs, the ability to perceive and correctly interpret the real properties of the external environment, the ability to use tangible and intangible resources, and the ability to respond to a changing environment. Formulation of these kinds of measurement is quite difficult. The resource-based approach is similar to the system approach of Robbins.

The last approach, the so-called “internal-process approach,” is based on assessing the efficient use of resources and the harmonious internal functioning of relevant internal activities. Major indicators are for example corporate culture, communications, and the interactions among functional units. It does not evaluate the organization’s outputs and its relationships with the environment. This approach shares the internal process model of the competing-values approach suggested by Quinn and Rohrbaugh (1981).

As mentioned above, effectiveness is a subjective term, which each organization must translate into measurable goals and means, together with clearly-operative definitions and common agreement among its stakeholders. In summary, either approach has its own strengths and weaknesses, as well as appropriate conditions for application.
The researcher chose to adopt the goal-attainment approach for measuring organizational effectiveness in this study. This is because Thai universities have quite clear goals, as specified in the National Education Act and related regulations and standards. Universities can be regarded as goal-seeking organizations. The assumptions and pitfalls of the goal-attainment approach, as mentioned above, require deliberate care and caution when applicable. Although multiple goals may be conflicting in terms of ends/means, and short-term/long-term goals, mandatory audits can help university administrators overcome the weaknesses of the goal-attainment approach.

3.1.2 Organizational Performance as Proxy Measure

Instead of measuring organizational effectiveness directly, in general the organization determines proxy measures, the so-called “organizational performances” which will be used to represent organizational effectiveness. The proxy measures used may include such things as the number of people served, the types and sizes of the population segments served, and the demand within those segments for the services that the organization supplies. Organizational performance comprises the actual output or results of an organization as measured against its intended goals and objectives.

The traditional measures for organizational performance are based on financial evaluation, such as profit, profit margin, return on investment, debt-equity ratio, etc. There has been much evidence indicating that firms with sound financial indicators are not really healthy or sustainable. This is because the most valuable assets of the firms have changed from physical and tangible assets, such as buildings and machines, to intangible assets such as knowledge, intellectual capital, and reputation.

Historically, the distinction between intangible assets and intellectual capital was vague until Sveiby divided intellectual capital into the categories of customer capital, structural capital, and human capital. There are items of an intangible nature that do not logically form part of a firm’s intellectual capital, such as firm reputation. The limitations of the existing financial reporting system have motivated an evolving dialogue in finding new ways to measure and report a firm’s intellectual capital. Non-financial measures offer clear advantages over financial measurement systems. The first advantage is a closer link to long-term organizational strategies. Financial
evaluation systems generally focus on annual or short-term performance against accounting indicators. They do not deal with progress relative to customer requirements or competitors; nor other non-financial objectives that may be important in achieving profitability, competitive strength, and longer-term strategic goals. For example, new product development or expanding organizational capabilities may be important strategic goals, but may hinder short-term accounting performance. By supplementing accounting measures with non-financial data about strategic performance and implementation of strategic plans, organizations can communicate objectives and provide incentives for management to address long-term strategies.

Principal among the new reporting models are the intangible asset monitor (Sveiby, 1988; 1997) and the Balanced Scorecard (Kaplan and Norton, 1992; 1996). These two models have the same three broad categories of customers, and structural and human capital, but there are major differences regarding assumptions and indicators. Sveiby regards people as the only profit generators in a firm, an assumption not shared by Kaplan and Norton. The intangible asset monitor puts forward the idea that indicators should be found for the growth, renewal, stability, and efficiency of intangible assets in order to assess how the intangibles base is developing. The balanced scorecard, on the other hand, aims to balance the traditional perspective (financial measurements) by adding the customer, process, and learning and growth perspectives. The balanced scorecard is more popular and well-known in Thailand, both in public and private sectors. The Office of Public Sector Development Commission has also adopted this management tool and modified the financial perspective into the achievement perspective since the public organizations are not profit organizations. The achievement perspective emphasizes the achievements of goals as committed in the performance agreement and the annual operation plan. The financial issue emphasizes financial and budgeting system efficiency and resource sharing. Therefore the researcher has chosen to study the Balanced Scorecard in detail because it fits the context of the study.

3.1.3 The Balanced Scorecard Approach

In 1992, Robert S. Kaplan and David P. Norton began publicizing the Balanced Scorecard through a series of journal articles. In 1996, they published the
book The Balanced Scorecard. These authors defined organizational performance as the degree to which organizational objectives are fulfilled. The Balanced Scorecard is a performance management tool which began as a concept for measuring whether the smaller-scale operational activities of an organization are aligned with its larger-scale objectives in terms of vision and strategy.

The grouping of performance measures in general categories or perspectives is seen to aid in the gathering and selection of the appropriate performance measures for the organization. Four general perspectives have been proposed by the Balanced Scorecard: the financial perspective, the customer perspective, the internal process perspective, and the learning and growth perspective.

The financial perspective examines if the organization’s implementation and execution of its strategy contribute to the bottom-line improvement of the organization. It represents the long-term strategic objectives of the organization and thus it incorporates the tangible outcomes of the strategy in traditional financial terms. The financial objectives and measures for the growth stage stem from the development and growth of the organization, which will lead to increased sales volumes, acquisition of new customers, growth in revenues, etc. The sustaining stage, on the other hand, is characterized by the measures that evaluate the effectiveness of the organization in terms of managing its operations and costs by calculating the return on investment, the return on capital employed, etc. Finally, the harvest stage is based on cash flow analysis with measures such as payback periods and revenue volume. Some of the most common financial measures that are incorporated in the financial perspective are Economic Value Added (EVA), revenue growth, costs, profit margins, cash flow, net operating income, etc.

The customer perspective defines the value proposition that the organization will apply to satisfy customers and thus generates more sales to the most desired (i.e. the most profitable) customer groups. The measures that are selected for the customer perspective should measure both the value that is delivered to the customer (value proposition), which may involve time, quality, performance, service, cost, and the outcomes that result from this value proposition (i.e. customer satisfaction, market share).
The internal process perspective is concerned with the processes that create and deliver the customer value proposition. It focuses on all of the activities and key processes required for the organization to excel at providing the value expected by the customers, both productively and efficiently. These can include both short-term and long-term objectives, as well as incorporating innovative process development, in order to stimulate improvement. In order to identify the measures that correspond to the internal process perspective, Kaplan & Norton proposed using certain clusters that group similar value-creating processes in an organization. The clusters for the internal process perspective are operations management (by improving asset utilization, supply chain management), customer management (by expanding and deepening relations), innovation (by new products and services), and regulatory & social relations (by establishing good relations with the external stakeholders).

The learning and growth perspective is the foundation of any strategy and focuses on the intangible assets of an organization, mainly on the internal skills and capabilities that are required to support the value-creating internal processes. The learning and growth perspective is concerned with the jobs (human capital), the systems (information capital), and the climate (organization capital) of the organization. These three factors are related to what Kaplan & Norton claim as the infrastructure that is needed in order to enable the ambitious objectives in the other three perspectives to be achieved. This of course will be in the long term, since improvement from the learning and growth perspective will require certain expenditures that may decrease short-term financial results whilst contributing to long-term success.

3.1.4 The Balanced Scorecard’s Pitfalls

Like other management tools, the Balanced Scorecard also has several pitfalls connected with its life cycle: stages of design, implementation, and maintenance and renewal (Davies, 2007). At the stage of design, it is impossible to even consider a Balanced Scorecard if the organization has not developed its strategy because an unclear strategy will lead to an ambiguous and confused scorecard. The key steps and changes necessary to implement the strategy must be worked through at least at a high level by the top management team. Strategy maps are regarded helpful because the
maps take each of the four perspectives and set out a series of interrelated actions that will ultimately deliver the strategic objectives, financial results, and finally value for all stakeholders. The Balanced Scorecard is proving to be a powerful shaper of organizational behavior.

One should not rush the development of measures with no validity tests. The deliberate Balanced Scorecard should be prepared by relevant functions in the organization under an appropriate extent of supervision by the management. By nature, this approach tends to concentrate on internal factors than external factors of the organizational issues. This is another pitfall which can be eliminated by a properly-constructed Balanced Scorecard.

At the implementation stage, there is a need to ensure that all management reaches a consensus and is committed to common goals and means. Flexibility for change will lead to improvements and innovations. Too much committed to the plan and the agreed goals and means may impede the staff’s involvement and their creativity. In general, the Balanced Scorecard will create a need for data that cannot be sourced from existing financial information systems. Management should pay attention to convince the staff to generate extra documentation that must benefit both teams and individuals. At the maintenance and renewal stage, lack of updating the scorecards intentionally to address changing strategies, environment, and objectives is also another pitfall.

### 3.1.5 The Balanced Scorecard in the Thai Context

The Balanced Scorecard has been popular and well-known in Thailand, both in the private and public sectors, since the national economic crisis in 1997. At that time, many large firms with sound financial indicators that reported to their shareholders and the stock market of Thailand collapsed and became bankrupt. The surviving companies looked for new management tools to mitigate the shortcomings of the traditional financial and accounting measurement of their organizational performance.

Yongvanich and Guthrie (2009: 132-149) examined the manner and extent of the Balanced Scorecard usage and performance effects among listed companies in Thailand. They surveyed the top management of all SET-listed companies. Completed
questionnaires were returned from 123 companies, yielding a response rate of around 34 percent. Of these companies, 15 and 34 companies respectively had implemented the Balanced Scorecard in individual business units and extensively for entire companies. The results of this study indicated that most companies had used the Balanced Scorecard to obtain the benefits that Kaplan and Norton suggested. The companies ranked improved alignment of departmental and personal goals to the strategy as the most important benefits. Consistent with previous studies, this study found no significant association between types of the Balanced Scorecard usage and company size. The study also specified no significant differences in perceived benefits gained and satisfaction from using different types of the scorecard (straightforward, cause-and-effect relationships, double-loop learning). Moreover, the extent of Balanced Scorecard usage was not significantly different between different types of the scorecard. The significant finding is that implementation of the Balanced Scorecard does not automatically result in superior financial performance.

In the context of the public sector, Kalayanee Koonmee (2009) concluded in her paper that the Thai public sector has adopted and adapted the Balanced Scorecard concept to derive four standard strategic perspectives used as the performance evaluation framework according to the performance agreement. These include the financial perspective (effectiveness as planned), the customer perspective (service quality), the internal process perspective (efficient practice), and the learning and growth perspective (organization development). These perspectives emphasize ultimate goals, together with the crucial management foundation—organizational and human resource development. Since a public organization is not a profit organization, the Office of The Public Sector Development Commission has replaced the financial perspective with the achievement perspective, reflecting the result-oriented management approach according to the annual Thai Government development plan for 2003-2007.

In the context of the university, Rompho (2003), from the Faculty of Commerce and Accountancy, Thammasat University, conducted a survey research on the implementation of the Balanced Scorecard in Thai public universities. He found that the bottom-up approach was more appropriate than the top-down approach. The top three important driving forces were: 1) new government regulations requiring university performance measurement 2) increasing competition among universities
and 3) government policy for the autonomy of universities. The top three important restraining forces were: 1) data insufficiency 2) insufficient resources for implementing the new performance measurement system and 3) heavier workload. The most critical success factors went to: 1) good communication processes 2) involvement of individuals and 3) the commitment of senior management. Rompho (2004) conducted another research on building a Balanced Scorecard for the universities in Thailand: the case of Thammasat University. He found that most university management was unsatisfied with the existing performance measurement and urgently required a new performance measurement framework. The implementation of the Balanced Scorecard within the university was welcomed, but most university management had just heard the term “Balanced Scorecard” or knew only about aspects of it.

3.2 Factors Affecting Organizational Performance

3.2.1 Knowledge Management

The delineation of the terms “knowledge management (KM)” and “intellectual capital (IC)” also seems unclear at times. Petty and Guthrie (2000; 1999) suggested that KM is about the management of the IC controlled by an organization. KM as a function, describes the act of managing the object, IC. To get a clear framework of this new management concept, the researcher has placed greater effort on reviewing the KM literature.

The reasons why organizations or companies invest in KM are that it either gives them a temporal effectiveness or efficiency advantage over their competitors, or negates the competitive advantages of others. Many dress up the decision to invest in KM in softer terms, but the underlying motives remain simply to have an advantage or to survive (Lyles and Schwenk, 1992; Huber, 1990). Practice reviews show that KM is not just a fad and is taken seriously by companies and governments (Ruggles, 1998; KPMG, 2000). Given this, it is rather unexpected to find that according to surveys, such as that by CTP (1999), few companies think that their investment in KM was a success, while between 16 percent and 36 percent felt that it was a failure. Other studies found that KM practices often increase the knowing-doing gap (Pfeffer and Sutton, 1999).
3.2.1.1 Definitions of Knowledge Management

1) The American Productivity and Quality Center (quoted in Tippawan Lorsuwannarat, 2005: 47) defined KM as a conscious strategy of getting the right knowledge for the right person at the right time and helping people share and put information into action in ways that will improve organizational performance.

2) Salleh and Goh (2002) defined KM as a process of leveraging knowledge as a means of achieving innovation in processes, products, and services, effective decision-making, and organizational adaptation to the market for creating business value and generating a competitive advantage for organizations.

3) Cong and Pandya (2003) defined KM as the ability of an organization to use its collective knowledge through a process of knowledge generation, sharing, and exploitation enabled by technology to achieve its objectives.

4) Dalkir (2005) defined KM as the deliberate and systematic coordination of an organization’s people, technology, processes, and organizational culture in order to add value through reuse and innovation.

5) Tippawan Lorsuwannarat (2005: 47) concluded that KM is comprised of the processes of creating, accumulating, and combining, disseminating, and applying knowledge in order to increase operational effectiveness.

6) The Office of The Public Sector Development Commission, Thailand (2005) defined KM as the systematic collective knowledge within an organization that resides in the individual and documents, and the use of that knowledge to develop people in the organization to be professional and efficient and to gain competitiveness.

3.2.1.2 Knowledge and Knowledge Creation

1) Nonaka’s Knowledge Creation

According to Nonaka and Konno (1998: 40-54), knowledge creation requires a shared context, which they call “ba” (equivalent to “place” in English). Ba is a shared space which can be physical, virtual, or mental. Knowledge, in contrast to information, cannot be separated from the context—it is embedded in ba.

The requirements for ba imply that in order for organizations to succeed with KM, an understanding of exactly what it is that is being managed is required and, in addition, an understanding of who is using it to do what. It seems
crucial that the KM practices in organizations match the knowledge creation requirements of individuals or groups of individuals that are involved in the knowledge creation. In addition, it is usual to find that different parts of an organization use different KM practices to fulfill their allotted function. This means that if organizations have global and uniformed KM practices, or if the KM practices have been designed for the requirements of one specific group, the KM system is not adequately serving all or at least one of the groups and is therefore sub-optimal. Typical modes of failure are that the KM system is ignored and knowledge is created outside the KM system. Thus, in order to ensure the effectiveness of KM implementation and creation of IC for the key functional groups in the organization, it is important to understand their epistemological belief systems with regard to knowledge and how they compare with the corporate epistemology which is represented by the organization’s KM system. Furthermore, it is vital to determine the roles that knowledge plays in creating value for the organization and how it changes the organization through organizational learning and intellectual capital.

To shed more light on the issue of epistemology, the researcher will discuss different theories of knowledge and knowledge creation below.

2) Differing Notions of Knowledge Creation

There is considerable latitude among human beings as to the nature of knowledge, what it means, and how it should be managed, if at all. If organizations try to impose a model of knowledge creation and then attempt management on a basis that is foreign to the workforce, they will most certainly fail. It is therefore critical to understand people’s beliefs and use of knowledge in order to design the KM system that matches the requirements of individuals and groups of individuals.

The theoretical understanding of organizational knowledge has evolved over the last five decades. A predominant view is the positivistic science view of knowledge creation. The so-called cognitive perspective (Simon, 1993: 131-142; Varela et al., 1991) is characterized by information processing and the rule-based manipulation of symbols. Under this epistemological view, knowledge is seen as abstract, task specific, and oriented toward problem solving (von Krogh et al., 1994: 53-71). The world is seen as pre-given and representations of reality can be re-created.
and stored (Varela et al., 1991). This means that managers and organizations are able to create representations of truth through processing the information available to them in their external environment, which is then storable and retrievable in KM systems (March and Simon, 1958; Daft and Weik, 1984; Prahalad and Bettis, 1986).

In a contrasting view of autopoieses, knowledge is seen as socially constructed and therefore objective observation is impossible. Realities are not pre-given and representable; instead, reality and knowledge are context-sensitive and history-dependent. In this autopoietic view, cognition is a creative act of bringing forth a world, and knowledge is created through an interpretation process and social cognition connected to observation (von Krogh et al., 1994). This view conforms to the Japanese intellectual tradition, where knowledge involves emotions, values, and hunches and is not viewed simply as data or information that can be stored (Takeuchi, 2001: 315-335).

The third view is that of connectionistic epistemology, in which organizations are seen as self-organized networks composed of relationships, the rules of how information is processed are not universal, and they vary locally (Venzin et al., 1998). Intellectual capital consists of individual knowledge and of organizing principles (Kogut and Zander, 1995). Kogut and Zander (1995: 76-91) distinguished between know-how and information. Knowledge is held by individuals, but is also expressed in regularities by which members cooperate in a social community.

The differing philosophical positions impact how individuals and organizations view the practicalities of knowledge creation. From the more positivistic-scientific viewpoint of the cognitivists, knowledge can be codified and made available in systems. Therefore, organizational knowledge can be created separately from individuals. In the contrasting interpretive and phenomenological viewpoint of autopoetics, on the other hand, knowledge is seen as private and constantly interpreted and re-interpreted depending on the social context and experience of the individual (Habermas, 1984; Bhaskar, 1975; Weber, 1962). From the connectionistic viewpoint, private and public knowledge is combined, and organizations only exist because they are better at transferring and sharing knowledge than the market (Kogut and Zander, 1995).
3.2.1.3 Management of Knowledge

1) The Role of Organizational Culture in Knowledge Management

An organization’s culture can have a strong effect on individual behavior. Organizational culture is the set of values, beliefs, norms, and patterns of behavior that are shared by an organization’s members and that guide their behavior. Individuals that understand an organization’s culture are better able to accurately interpret organizational events, know what is expected of them, and behave in appropriate ways in new or unfamiliar situations.

Organizational culture is believed to be the most significant input for effective knowledge management and organizational learning in that corporate culture determines the values, beliefs, and work systems that could encourage or impede learning (knowledge creation), as well as knowledge sharing, and ultimately, decision making (Schein, 1985). Therefore, an organization’s culture should provide support and incentives as well as encourage knowledge-related activities by creating environments for knowledge exchange and accessibility. It is worth noting that knowledge management is a business process and practice, not a technology. That is, technology on its own cannot make knowledge management successful and, therefore, the most effective knowledge management strategies should aim at strengthening and developing organizational cultures, specifically knowledge-centered cultures or learning cultures (DeTienne and Jackson, 2001; Pitman, 1994). Furthermore, a learning culture has been viewed as evidence of an organization’s competitiveness, which, in turn, serves as a strategic resource. Consequently, organizations should develop a learning culture in order to gain a competitive edge in their markets (Hult et al., 2002).

Learning culture and learning climate are closely related and are usually assumed to have significant impacts on individuals, teams, and organizational learning (Alavi and Leidner, 2001; Gold et al., 2001: 185-214; Mikkelsen and Gronhaug, 1999). In general, an organization’s climate is thought to be a direct behavioral manifestation of organizational culture, which is a deeper and less consciously held set of cognitions and affective attachments (Schein, 1985; Mikkelsen and Gronhaug, 1999). A climate conducive to learning is expected to influence the rate of organizational learning and, ultimately, organizational performance (Moss-
Kanter, 1983; Slater and Narver, 1995). The notion of organizational learning climate pertains to the perceptions that employees have on how work settings either facilitate or hinder learning (Mikkelsen and Gronhaug, 1999; Mikkelsen, Ogaard and Lovrich, 1997; Slater and Narver, 1995).

2) The Role of Networking in Knowledge Management

Diffusion of innovations theory explores social networks and their role in influencing the spread of new ideas and practices. Change agents and opinion leaders often play major roles in spurring the adoption of innovations, although factors inherent to the innovations also play a role.

Granovetter (1973: 1360-1380) found in one study that more numerous weak ties can be important in seeking information and innovation. Cliques have a tendency toward homogeneous opinions as well as sharing of common traits. This homophilic tendency can be the reason for the members of the cliques to be attracted in the first place. However, being similar, each member of the clique would also know more or less what the other members know. To find new information or insights, members of the clique will have to look beyond the clique to its other friends and acquaintances. This is what Granovetter has called the “the strength of weak ties.”

Learning and knowledge are inextricably linked in the knowledge management literature. For this study, the researcher will focus on the processes related to learning—in this case cooperative learning between knowledge workers—in order to better understand knowledge creation and knowledge transfer. The distinction between explicit (formal, systematic, easily codified and communicated) and tacit (highly personal, context specific, difficult to codify and communicate) knowledge has been made (Nonaka, 1991).

Nonaka (1991) proposed four basic modes for creating knowledge in any organization: socialization (from tacit to tacit), externalization (from tacit to explicit), combination (from explicit to explicit), and internalization (from explicit to tacit). The socialization mode of knowledge creation, defined as conversion of tacit knowledge to new tacit knowledge among individuals, is learned through observation, imitation, and practice whereby individuals share experience through face-to-face interaction. Nonaka and Takeuchi (1995) have stressed the importance of tacit knowledge and placed great emphasis on establishing conditions
that encourage the exchange of tacit knowledge between individuals through a highly-
interactive social process and direct interaction in a co-located, face-to-face work
environment (Cohen, 1998). As will be discussed later, cooperative learning describes
such processes.

With regard to explicit versus tacit knowledge, Hansen, Nohria
and Tierney (1999) have classified an organization’s primary approach to knowledge
transfer into two distinct strategies: codification and personalization. The codification
approach implies that learning is reliant on the utilization of knowledge databases and
connecting people with reusable, codified knowledge (Bixler, 2002; Hansen, Nohria
and Tierney, 1999). In contrast, in the personalization approach, knowledge transfer
relies more on direct interaction between individuals in that the learning occurs
through direct collaborative interaction with experts and peers in small groups of
people (Bixler, 2002; Hansen et al., 1999; Kogut and Zander, 1992). As such,
cooperative learning is similar to this latter approach.

The above discussion clearly stresses the importance of
socialization, face-to-face relationships, and cooperative interaction among individuals for
the purposes of knowledge creation and sharing. More important, bringing
knowledgeable people together in a collaborative environment so that knowledge can
be shared and enhanced is imperative for knowledge management (Alavi and Leidner,
2001) and organizational learning. Consequently, team orientation is a key characteristic
of the organizational learning process (Hult, 1998; Hult et al., 2000; Senge, 1990),
and it seems reasonable to assume its importance within the context of knowledge
management. This is supported by the perspective that an organization is an
institution for integrating the knowledge that resides in individuals and, therefore, a
team-based structure is an essential characteristic of organizational structures
pertinent to value creation through knowledge utilization (Grant, 1996).

The previous discussion along with previous research suggests
that knowledge management and organizational learning are integral to each other
(Bixler, 2002; Schulz, 2001). Learning, knowledge creation, and knowledge sharing
occur at individual, team, and organizational levels and are the significant
contributors to the success of organizational learning and organization knowledge
management (Alavi and Leidner, 2001; Grover and Davenport, 2001). Given the
importance of socialization among individuals, this study primarily focuses on the learning, as well as knowledge creation and transfer, among small groups of people since taking an organization as the unit of analysis would fail to take into account the fact that organizational knowledge is created through the interaction of individuals and, as a result, would provide little guidance on how management can influence the learning process (Grant, 1996; Hedberg, 1981; Lynn, Reilly and Akgün, 2000).

Team-oriented work environments provide opportunities for employees to learn from colleagues with expertise that are supportive and willing to help one another through working together, sharing information, and watching out for one another (Janz, 1999; Mikkelsen, Ogaard and Lovrich, 1997). Similarly, teams play a critical role in a knowledge-creating company in the sense that team members create new ideas through dialogue and discussion (Nonaka, 1991). Teams comprise a communication channel for knowledge seekers and knowledge senders to exchange, and this exchange behavior in turn leads to superior performance (Guzzo and Dickson, 1996). Such behaviors, in fact, are the primary mechanisms of learning and knowledge management activities.

3) The Role of Technology in Knowledge Management

Knowledge management technologies expanded in the mid of 1990s. Subsequent KM efforts leveraged semantic technologies for the search and retrieval and the development of e-learning tools for communities of practice (Capozzi, 2007). Knowledge management systems can thus be categorized as falling into one or more of the following groups: groupware, document management systems, expert systems, semantic networks, relational and object oriented databases, simulation tools, and artificial intelligence (Gupta and Sharma, 2004).

More recently, development of social computing tools such as Facebook and Twitter, has allowed a more unstructured, self-governing approach to the transfer, capture, and creation of knowledge, including the development of new forms of communities and networks. However such tools for the most part still represent explicit knowledge transfer.

Software tools in knowledge management are a collection of technologies and are not necessarily acquired as a single software solution. Furthermore, these knowledge management software tools have the advantage of
using the organization’s existing information technology infrastructure. Organizations and business decision makers spend a great deal on resources and make significant investments in the latest technology, systems, and infrastructure to support knowledge management. It is imperative that these investments be validated properly, made wisely, and that the most appropriate technologies and software tools be selected or combined to facilitate knowledge management.

3.2.1.4 Knowledge Management in the Thai Context

It can be asserted that knowledge management as a new management tool has been in trend since the economic crisis of Thailand in 1997, beginning with the large private organizations such as Siam Cement Group (SCG), PTT Group, and leading banks and financial institutions, and then moving to small and medium enterprises (SMEs) a few years later. The ultimate goals of implementing KM are to increase competitiveness and to survive in the global environment. At the SCG, human resources are a critical factor in organizational success and human resource management has been given a high priority. Highly-selective new hiring, and a committed investment in human resource development and knowledge management implementation, are key drivers. The dedicated knowledge management programs include the promulgation of Best Practices for various disciplines among group companies through ongoing, year-round activities, the establishment of a Knowledge Management database system, constantly update training programs to keep abreast of changes in methods and practices, etc.

Thai public organizations have to include KM as a new key performance indicator enacted by the Royal Decree on Criteria and Procedures for Good Governance (2003). The eleventh section states that the government agency, for result-based management under this Royal Decree, shall make itself a global learning organization. For this purpose, the government agency shall acknowledge and analyze information in all aspects and shall then apply analytical results to its administration for correct, quick, and suitable service. The government agency shall also promote and develop the capability, vision, attitude and co-learning of its officials, encouraging efficiency and mutual learning which affect the results of performance.

KM has been put into the government’s four-year administrative plan (2005-2009) as the sixth strategy under the public system development policy. The
Office of Public Sector Development Commission (OPDC) is the major unit responsible for promoting and building change management teams through KM activities within the public sector. All governmental departments have to appoint Chief Knowledge Officers (CKO) responsible for internal KM processes and developing their organization’s KM project plan as per the OPDC guideline.

Two studies of KM implementation in Thai public organizations are reviewed. Warangkana Jakawattanakul (2007) studied the factors affecting the successful implementation of KM to support the e-Revenue policy of the Revenue Department of Thailand. She found that implementers’ attitude, implementing agency capacity, resources, political support, and lastly incentive had significant positive effects on KM implementation.

Jutharat Sarawanawong (2009) found that KM processes at Khon Kaen University (KKU) focused upon sharing knowledge among staff. KKU lacked the ability to store, organize, capture, and codify knowledge. KKU had many problems during the developing stage of its KM program because of staff misunderstanding and resistance. She suggested that KKU should improve KM processes in terms of knowledge capture, storage, and organization. The appropriate KM strategy for KKU should be a hybrid strategy, where a personalization strategy takes the leading role and a codification strategy takes the supporting role. These strategies, however, still need more factors to bring about successful application, including commitment of the culture, information technology, staff, organization management, leadership, Chief Knowledge Officer and KM team, KM process, and useful measurements.

3.2.1.5 Factors Affecting the Effectiveness of Knowledge Management

Some studies relating to “Knowledge Management Implementation Effectiveness” are reviewed below and summarized in Table 3.3.
Table 3.3 Knowledge Management Implementation Effectiveness

<table>
<thead>
<tr>
<th>Components</th>
<th>Arthur Anderson &amp; APQC</th>
<th>Davenport et al.</th>
<th>Xerox</th>
<th>Lindsey</th>
<th>Holsapple &amp; Joshi</th>
<th>Chong &amp; Choi</th>
<th>Jakawatanaikal</th>
<th>Sarawanawong</th>
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<tr>
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<td>KM technology</td>
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<tr>
<td>KM measurement/ Linkage to performance and values</td>
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<td>KM structure</td>
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<td>Motivational practices</td>
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<td>Clarity of purpose &amp; language</td>
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<td>Training &amp; learning</td>
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<td>Communication</td>
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<td>Resources</td>
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<tr>
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</tr>
</tbody>
</table>

1) Arthur Anderson and The American Productivity and Quality Center (1996) proposed five factors affecting KM implementation. They are: 1) the knowledge management process 2) knowledge management leadership 3) knowledge management culture 4) knowledge management technology and 5) knowledge management measurement.

2) Davenport et al. (1997) proposed eight factors that contribute to KM project implementation effectiveness. They are: 1) linkage to economic
performance or industry value 2) technical and organizational infrastructure 3) standard and flexible knowledge structures 4) knowledge-friendly culture 5) clarity of purpose and language 6) different motivational practices 7) multiple channels for knowledge transfer and 8) senior management appreciation and support.

3) Xerox Corporation (1999) proposed 6 components of the KM cycle that can lead to a desired World Class KM environment. They include: 1) transition and behavior management 2) communication 3) process and tools 4) training and learning 5) measurements and 6) recognition and rewards.

4) Lindsey (2002) proposed a KM effective model based on Balance Scorecard Approach (Kaplan and Norton, 1992) combined with the Organizational Capability Perspective Theory (Gold et al., 2001) and the Contingency Perspective Theory (Becerra-Fernandez and Sabbherwal, 2001). This model consists of two main constructs: knowledge infrastructure capability and knowledge process capability. Knowledge infrastructure capability can be measured through technology, structure, and culture. Knowledge process capability, being influenced by a knowledge task, can be measured through knowledge acquisition, knowledge conversion, knowledge application, and knowledge protection.

5) Holsapple and Joshi (2002) proposed the three-fold framework comprising knowledge resources, knowledge management activities, and knowledge management influences. The KM influences were elaborately classified into: 1) resource influences (financial, human, knowledge, and material) 2) managerial influences (leadership, coordination, control, and measurement) 3) environmental influences (competitors, fashion, markets, times, technology, and climate).

6) Chong and Choi (2005) proposed eleven factors affecting the successful implementation of KM in the case of ICT companies in Malaysia. These factors are: 1) top management leadership and commitment 2) employee training 3) employee involvement 4) open and trustworthy spirit of teamwork 5) employee empowerment 6) information technology infrastructure 7) performance management 8) knowledge-friendly culture 9) benchmarking 10) knowledge structure and 11) elimination of organizational constraints.

7) Warangkana Jakawattanakul (2007) proposed five factors affecting the successful implementation of KM to support the e-Revenue policy of the
Revenue Department of Thailand. These factors are: 1) implementers’ attitude 2) implementing agency capacity 3) resource 4) political support and 5) incentive.

8) Jutharat Sarawanawong (2009) found eight factors affecting the successful implementation of KM at Khon Kaen University. These factors are: 1) commitment of the culture 2) information technology 3) staff 4) organization management 5) leadership 6) Chief Knowledge Officer and KM team 7) KM process; and (8) useful measurements.

The scholars above have found some common factors for knowledge management implementation effectiveness. The five indicators suggested by Arthur Anderson and The American Productivity and Quality Center appear in almost all studies. These five factors are essential to the effectiveness of knowledge management implementation in several kinds of organizations. The concepts of these common factors are as follows.

1) Knowledge Management Process

Knowledge management is a strategic and process approach to the management of knowledge resources, particularly knowledge workers. It concerns how the organization can nurture, leverage, and motivate people to improve performance, speed up innovation, and share their capacities to meet organizational objectives.

2) Knowledge Management Leadership

Knowledge management requires the commitment and involvement of top management since it has high concern for deep-rooted behavior and strategic change at all levels and of the whole organization. It is not a simple add-on business, but it must have a business focus and should be built around existing core competencies. Leaders at all levels should believe in almost value of knowledge management to bring the organization into the future.

3) Knowledge Management Culture

Knowledge management involves creating the environment, condition, and organizational climate for people to create, leverage, and share knowledge that is valued for customers and other key stakeholders. The culture of team-based learning, openness, trust, flexibility, and accountability should be embedded and appear in organizational beliefs, structures, and routines.
4) Knowledge Management Technology

Knowledge management requires technologies to support the new strategies, processes, methods, and techniques to better create, disseminate, share, and apply the best knowledge, anytime and anyplace, across the team, across teams, across the organization and across several organizations, especially its customers and other key stakeholders.

5) Knowledge Management Measurement

A holistic approach to the measurement of the impact of knowledge management activities and programs regarding business process performance is needed. It will evaluate whether the activities and programs meet the agreed objectives and whether they align with the organizational strategies. A quantitative or qualitative approach and hard or soft indicators can be applied as appropriate to life-cycle stages of knowledge management implementation.

3.2.2 Competency

Competency can be viewed at two different levels: individual competency and organizational competency, as determined by Turner and Crawford (1994). Individual competencies are possessed by an individual or at most by a few people. Organizational competencies, belonging to the organization, are embedded in the systems, processes, values, cultures and routines that are absorbed by all organizational members and structures. These kinds of competencies will remain even if individuals leave the organization.

3.2.2.1 Individual Competency

Personal or individual competency is a standardized requirement for an individual to properly perform a specific job. It encompasses a combination of the knowledge, skills, and behavior utilized to improve performance. More generally, competency is the state or quality of being adequately or well qualified, and having the ability to perform a specific role. Competency is also used with more general descriptions of the requirements of human beings in organizations and communities. The term “competency” is generally used in the U.S. in the same meaning as “competence” used in the European arena. However Woodruff (1993) raised the issue distinguishing between competence and competency and proposed that competence is
a performance criterion, while competency is behavior driving the competence. This is similar to the notion of Klein (1996), who argued that competencies are not psychological constructs but thematic groups of demonstrated observable behaviors that discriminate between superior and average performers.

The term “competency” in the sense of having these three common elements is generally used. First, competencies are comprised of the knowledge, skills, attitudes or other attributes that underlie superior job performance. Second, competencies must be observable or measurable. Third, competencies must differentiate between superior and average performers.

Today there is a set of general competencies which are required if anyone wants to keep the job or get a promotion. The four general competences are:

1) Meaning competency: identifying the purpose of the organization or community and acting from the preferred future in accordance with the values of the organization or community

2) Relation competency: creating and nurturing connections to the stakeholders of the primary tasks

3) Learning competency: creating and looking for situations that make it possible to experiment with the set of solutions that make it possible to solve the primary tasks and reflect on the experience

4) Change competency: acting in new ways when it will promote the purpose of the organization or community and make the preferred future come to life

The Occupational Competency movement was initiated by McClelland in the 1960s with a view to moving away from traditional attempts to describe competency in terms of knowledge, skills, and attitudes and to focus instead on the specific self-image, values, traits, and motive dispositions (i.e. relatively-enduring characteristics of people) that are found to consistently distinguish outstanding from typical performance in a given job or role. The specification of a competency came from the personality theory by McClelland (1951) as comprised of the relationships among a person’s unconscious motives, self-schema, and observed behavioral patterns.

It should be noted that different competencies predict outstanding performance in different roles, and that there is a limited number of competencies that
predict outstanding performance in any given job or role. Thus, a trait that is a "competency" for one job might not predict outstanding performance in a different role.

According to the theory of performance, McClelland (1973: 1-40) argued that intelligence testing, such as scholastic grades and traditional job analytic approaches to personnel selection, fail to predict job performance. Instead he first proposed the concept of competency-based human resources as a critical differentiator of performance. However McClelland did not provide a clear definition of “competency.”

Boyatzis (1982: 21) introduced the term of job competency in his famous book “The Competent Manager” and he defined “competency” as: an underlying characteristic of a person that leads to or causes effective or superior performance.

The theory used in Boyatzis’ approach is the basis contingency theory. Maximum performance is believed to occur when the person’s capability or talent is consistent with the needs of the job demands and the organizational environment.

In his view, competency has changed to a comprehensive combination of inner aspects consisting of motive, trait, skill, social role or aspect of one’s self image and a body of knowledge. Boyatzis presented his idea using concentric circles, with the person’s unconscious motives and trait dispositions at the center. These affected and were affected by the next expanding circle of the person’s values and self-image. The surrounding circle was labeled as the skill label including observed specific behaviors.

In very simple terms, Boyatzis saw effective performance as requiring a consistent attainment of three factors: job demands, organizational environment, and individual competency (Boyatzis, 1982: 13). Job demands were seen as being formed around the roles in planning, organizing, controlling, motivating, and coordinating (Boyatzis, 1982: 17). The organizational environment was almost exclusively seen as being formed around a study of climate and culture, with a heavy emphasis on the theorists and concepts associated with identifying the role or function and characteristics of management in a given organizational environment. This was consistent with the ideas advanced by such theorists as Mintzberg (1975) and Drucker (1973).
Spencer and Spencer (1993: 11) defined competency as an underlying characteristic of an individual that is causally related to criterion-referenced effective and/or superior performance in a given job or situation.

Research published over the last three decades has shown that outstanding leaders, managers, and professionals appear to require three clusters of behavioral habits as threshold abilities and three clusters of competencies as distinguishing performance. The threshold clusters of competencies are: 1) expertise and experience 2) knowledge and 3) basic cognitive competencies such as memory and deductive reasoning. The three clusters of distinguishing competencies are: 1) cognitive competencies such as systems thinking and pattern recognition 2) emotional intelligence competencies such as self-awareness, self-manage and self-control; and 3) social intelligence competencies such as social awareness, relationship management, and teamwork.

A job competency model is a description of those competencies possessed by the top performers in a specific job or job family. In effect, a competency model is a blueprint for outstanding performance. Models usually contain 8-16 competencies, with definitions often grouped into the “competency cluster” along with behavioral descriptors. There are three different approaches of job competency models.

First, the “single job” approach provides critical competencies for a specific job. It is more accurate but less general.

Second, the “one-size-fits-all” approach defines a set of competencies for a broad range of jobs. General abilities and personal qualities are more emphasized than technical knowledge and skills.

Third, the “multiple job” approach defines the set of competencies believed to be common to all jobs and the set of specific competencies needed for a specific job or job family.

Based on the second approach, Boyatzis’ recent research carried out at the Weatherhead School of Management of Case Western Reserve University has shown that people can change or are developed in adulthood on a complex set of emotional and social intelligence competencies.
In conclusion, competencies are a behavioral approach to emotional, social, and cognitive intelligence. Emotional intelligence competency is the ability to recognize, understand, and use emotional information about oneself that leads to effective or superior performance. Social intelligence competency is the ability to recognize, understand, and use emotional information about others that leads to effective or superior performance. Cognitive intelligence competency is the ability to think or analyze information and situations that leads to effective or superior performance.

3.2.2.2 Organizational Competency

Competitive advantage occurs when a firm uses its resources and capabilities to develop organizational competencies that, in turn, create value for customers. It can be said that organizational competencies are the foundation of competitive advantage. Organizational competencies are created through the strategic use of organizational resources and capabilities. Organizational resources include human, financial, factory, location, patents and trade secrets, trademarks and copyrights, and lastly brand image and reputation. Organizational capabilities integrate and utilize all resources by management, production, finance, legal, research and development, as well as information systems.

Multiple conceptualizations of organizational competencies exist. They can be viewed as an organizational level phenomenon—a meta construct encompassing multiple individual member-held bodies of knowledge and skills. The skills consist of individual skills and the relationships between them.

Prahalad and Hamel (1990: 79-91), the authors of the article entitled “The Core Competence of the Corporation,” introduced a new term, “core competence,” in line with management theory. Core competence is the integration and collaboration of the skills, capabilities, and technology (collective learning) in the organization that lead to comparative advantage. Core competence is a specific factor that a business sees as being central to the way it, or its employees, works. It fulfills these key criteria: 1) not easy to imitate 2) able to be leveraged widely to many products and markets and 3) contributes to the end consumer's experienced benefits.

Prahalad and Hamel noted that “a core competence can take various forms, including technical/subject matter know-how, a reliable process and/or close
relationships with customers and suppliers. It may also include product development or culture, such as employee dedication.” The core competences lead to the development of core products which further can be used to build many products for end users. Core competences are developed through the process of continuous improvements over a period of time. It is important to identify core competences because it is difficult to retain those competences in a price war and cost-cutting environment. The successful corporation must integrate core competences using strategic architecture in view of changing market requirements and evolving technologies.

In “Competing for the Future,” Prahalad and Hamel discussed the idea that management should develop and exercise core competences for the future in order to revitalize the process of new business creation. The key to future industry leadership is to develop an independent point of view about tomorrow’s opportunities and to build the capabilities that exploit them. In order to be competitive an organization needs tangible resources; however, intangible resources such as core competences are difficult and challenging to achieve. It is even critical to manage and enhance the competences with reference to industries’ changes and their future. But in general most corporations spend their resources and capabilities aiming at cost-cutting or quality and productivity improvements, as suggested by Porter (1980), rather than building core competencies for the future.

The researcher argues that core competences are particular strengths relative to other organizations in the industry which provide a fundamental basis for the provision of added value. Core competences are the collective learning in organizations, and involve how to coordinate diverse production skills and integrate multiple streams of technologies. Communication, an involvement and a deep commitment to working across organizational boundaries generate sustainability for the long run.

Organizational competencies are the basis of gaining a competitive advantage over rivals. However, not all organizational competencies are created equal. Competencies fall into three categories: 1) distinctive 2) shared and 3) non-relevant.
Distinctive organizational competencies are those that are unique to one or very few companies in an industry. Such competencies increase the value that customers obtain in the business offerings. Distinctive competencies lead to sustainable competitive advantages for the businesses that use them wisely.

Shared competencies are those that, while not one-of-a-kind, are not widely held by rival businesses. These competencies include the use of resources and capabilities that allow a firm to conduct its business in a successful manner within its industry. While shared competencies are more commonplace than distinctive competencies, they are valuable due to their role in a firm's ability to offer increased value to customers.

Non-relevant competencies are those areas that a business does well, and even takes pride in doing but do not increase value for the customers. Non-relevant competencies can have a negative impact on the firm, as they use the business's limited resources, and may actually direct management focus on areas that are not strategically important to the long-term health of the organization. A business with a non-relevant competency has three options: 1) do nothing with the non-relevancy and conduct business as usual 2) cease the practice altogether or 3) turn it into distinctive competency.

The competency-based perspective shifted the focus of the determinants of competitive advantage and sustainability from outside to inside the organization in the work of Kogut and Zander (1995: 76-91) and Nonaka and Takeuchi (1995) on knowledge-based theory, followed by Foss and Knudsen (1996) and Sanchez, Heene and Thomas (1996) with the competency-based competition theory. According to knowledge-based theory, collective learning organizations have sustainable competitiveness and identity. Wedchayanon (2006) concluded that there are 4 important factors affecting the development of organizational core competencies. They are: 1) a shared mindset 2) management and human resource practices 3) capacity for change and 4) transformational leadership.

It is the organization as a whole that performs—not just an individual employee. Shoemaker and Amit (1994) suggest that organizational competency means the set of organization-specific resources and capabilities that bestow the organization’s competitive advantage. Lado et al., 1992; Lado and Wilson, 1994
propose that organizational competencies can be grouped into 4 types, as managerial competencies, input-based competencies, transformation-based competencies, and lastly output-based competencies. Among these four types of organizational competencies, managerial competencies assume a central position in developing and deploying the other three types of competencies. Additionally, input-based competencies, transformation-based competencies, and output-based competencies are conceptualized to be linked to each other, implying potential synergistic interactions among them.

Another group of scholars defined organizational competency as assets, skills or resources belonging to the organization that allow an activity to be performed systematically (Sanchez et al., 1996). They indicated three conditions that competencies have to meet as follows: 1) they must have an organizational component in terms of coordination and asset deployment 2) they must have an intention component and 3) they must have a goal attainment component.

Edgar and Lockwood (2008) provided a definition of organizational competencies as a set of progressive, iterative understandings, and integrated skills held by corporate employees that collectively operate at the organizational level. The integrated skills, in turn, reinforce the corporate understandings of phenomena, disciplines, and general and specific technologies together with types of products and services.

From the point of view of the researcher, the grouping of organizational competencies suggested by Lado and Wilson can fit well with the concepts of the value chain and process approach, generally adopted by most organizations, both private and public. The grouping is easy to understand, identify, develop, and measure. Moreover the researcher agrees that managerial competencies are central and critical to the synergy of other three competencies. The Lado and Wilson’s approach is also consistent with the main idea of Boyatzis, that the competent management can lead to or cause effective or superior performance of the organization when the manager has the following 12 competencies: 1) efficiency orientation 2) proactivity 3) diagnostic use of concepts 4) concern with impact 5) self-confidence 6) oral presentation 7) conceptualization 8) use of socialized power 9) managing group process 10) perceptual objectivity 11) self-control and 12) stamina and adaptability.
In this study the researcher will follow Lado and Wilson’s organizational competency grouping into 4 types, as follows:

1) Managerial competencies
   Unique capabilities of an organization’s strategic leaders to articulate, communicate, and implement a strategic vision and to enact a beneficial firm-environment relationship

2) Input-based competencies
   Physical resources, organizational capital resources, human resources, knowledge, skills, and capabilities that enable an organization’s transformational processes to create and deliver products and services that are valued by customers

3) Transformation-based competencies
   Organizational capabilities required to advantageously convert inputs into outputs, and include innovation and organizational learning, entrepreneurship, and organizational culture

4) Output-based competencies
   Organizational capabilities required to encompass all knowledge-based and invisible strategic assets, ranging from corporate reputation or image to product or service quality and customer loyalty

### 3.2.3 Organizational Characteristics

In general, a university means an educational institution designed for instruction, examination, or both, of students in many branches of advanced learning, conferring degrees in various faculties, and often embodying colleges and similar institutions. In the United States, this term has traditionally been used to designate research institutions and was once reserved for research doctorate-granting institutions. In the United Kingdom, an institution can only use the term if it has been granted by the Privy Council, under the terms of the Further and Higher Education Act 1992. Lombardi et al. (2000) mentioned that the fundamental concepts establishing a university are teaching and research. The key element or characteristic is the organizational focus or orientation that permits the university to operate as a single institutional entity. Research universities differ from teaching ones because of their different focus.
Although each university is organized differently, nearly all universities have a board of trustees; a president, chancellor, or rector; at least one vice-president, vice-chancellor, or vice-rector; and deans of various departments. Universities also offer many services such as bookshops, job centers, libraries, sports and health centers, student unions, computer laboratories, and research laboratories.

In general, the structuring of universities can be regarded as a “Professional Bureaucracy Organization,” as Mintzberg (1979) suggested. Teaching and research jobs are complicated and need highly-educated and specially-trained operating cores. Therefore the operating core (faculty members) is the most important and largest part of the organization. Power is decentralized to the operating core. The operating core works closely with the students and other kinds of customers. The technostructure is non-existent or small. The middle line is also small and receives limited development because the operating cores can perform their duties according to professional standards. In general, the university gives importance to support staff and develops them to deliver better service and facilitation to the operating cores. The support staff includes those that work in the library and the information technology center.

In order to control the university administration, faculty members as the operating core also perform the roles of the strategic apex as university administrators and middle line as Dean of department or school as well as Director of relevant academic affairs. The power of university administrators is not as great as in the machine bureaucracy organization because the university administrators must get support from the operating cores to survive in their positions. The relationships between these two groups are of mutual benefit. However, the strategic apex or university administrator has the authority to control the support staff.

As mentioned above, the structure of most universities is nearly the same because of their specific nature. Furthermore, the university characteristics are also determined by relevant laws and regulations, as well as the associated guidelines formulated by regulating and supervising agencies. Legal and regulatory requirements reduce the choice of organizational structure. This phenomenon is called “managerial selection,” as mentioned in Bawornwathana (2012: 198).

Graham T. Allison Jr., as quoted in Bidhya Bowornwathana (2012: 12), stated that “…public and private management are at least as different as they are similar, and
that the differences are more important than the similarity.” It is important to discover the characteristics that are different among universities and this will be discussed below.

3.2.3.1 University Type

The funding of universities varies widely between different countries around the world. In some countries universities are predominantly funded by the state, such as the United Kingdom and Australia, while in other funding may come from donors or from fees which students attending the university must pay. In some countries the vast majority of students attends the university in their local town, while in other countries universities attract students from all over the world, and may provide university accommodations for their students.

Public universities are ruled over by government-run higher education boards and are predominantly funded by public means through a national or sub-national government. They review financial requests and budget proposals and then allocate funds for each university in the system. They also approve new programs of instruction and cancel or make changes in the existing programs. In addition, they plan for the further coordinated growth and development of the various institutions of higher education in the state or country. However, many public universities in the world have a considerable degree of financial, research, and pedagogical autonomy. Other sources of income are student fees, university hospitals, incomes from research, development, training and consultancy services, university endowments and investments, and overseas grants and loans.

Private universities are privately funded and generally have a broader independence from state policies. However many private universities receive public subsidies, especially in the form of tax breaks and public student loans and grants. Depending on the region, private universities may be subject to government regulation.

Autonomous universities are self-governing universities and intentionally designed to gain the strengths of both the public and private university. Sources of revenue are from state subsidy and income from tuition fees, research, seminars, funding and other benefits. They are expected to have better academic freedom and excellence achieving getting managerial autonomy.
In the context of Thai universities, as earlier summarized in Chapter 2, there are three types of universities in this study. They are the non-autonomous public university, the autonomous public university, and the private university.

3.2.3.2 University Orientation

In the context of American universities, university classification plays an important role in the university’s goals and strategies formulation because it clearly identifies the competition arena to engage potential students and faculties, to acquire needed resources, and to improve university ranking.


In the 2010 edition of the university classification, the latest update retains the same classification structure as the 2005 edition. The six basic classification categories of American universities and colleges are as follows.

1) Associate’s colleges: include institutions where all degrees are at the associate’s level, or where bachelor’s degrees account for less than 10 percent of all undergraduate degrees. Institutions eligible for classification as Tribal Colleges or Special Focus Institutions are excluded.

2) Doctorate-granting universities: include institutions that awarded at least 20 research doctoral degrees during the update year (excluding doctoral-level degrees that qualify recipients for entry into professional practice, such as the JD, MD, PharmD, DPT, etc.). Special Focus Institutions and Tribal Colleges are excluded.

3) Master’s colleges and universities: include institutions that awarded at least 50 master’s degrees and fewer than 20 doctoral degrees during the update year (with occasional exceptions). Special focus institutions and tribal colleges are excluded.

4) Baccalaureate Colleges: include institutions where baccalaureate degrees represent at least 10 percent of all undergraduate degrees and where fewer than 50 master’s degrees or 20 doctoral degrees were awarded during the update year.
(Some institutions above the master’s degree threshold are also included.) Special Focus Institutions and Tribal Colleges are excluded.

5) Special focus institutions: institutions awarding baccalaureate or higher-level degrees where a high concentration of degrees (above 75 percent is in a single field or set of related fields. Tribal Colleges are excluded.

6) Tribal Colleges: colleges and universities that are members of the American Indian Higher Education Consortium, as identified in IPEDS Institutional Characteristics.

In the context of Thai universities, as earlier summarized in Chapter 2, the universities, in accordance with the National Education Act 1999, have four missions comprising teaching, research, academic services, as well as art and cultural development. The university whose research mission is more than 30 percent of the total mission is called a “research university.” The rest are called “teaching universities.”

3.3 Related Studies

Knowledge Management, Competencies, Organizational Characteristics, and Organizational Performance

1) Fernandes, Mills and Fleury (2005: 340-354) found that employee competency level presented no correlation with organizational performance, and they suggested that if competent people are not coordinated properly, their competencies will not be converted to organizational performance. These results also reinforce the resource-based view argument, indicating an empirical situation in which organizations in similar conditions with comparable resources perform very differently according to the way they coordinate their resources.

2) Stubbs (2005) found that team leader emotional intelligence is significantly related to the presence of emotionally-competent group norms in relation to the teams they lead, and that emotionally-competent group norms are related to team performance. This research was conducted in the context of military organization.

3) Quinn, Anderson and Finkelstein (1996) stressed the importance of managing information systems for capturing and leveraging intellectual capital and
organizational capabilities in order that the intellectual professional can transfer knowledge to other parts of the organization, which can improve performance.

4) Han (2001: 203-223) indicated that the synergy generated from the components of intellectual capital can create obvious performances rather than produce results independently, and Kaplan & Norton (2004) concluded that intangible assets should build upon the capabilities created in other intangible and tangible assets, rather than create independent capabilities with no synergy among them.

5) Huang (2005: 237-252) indicated that innovation capital has an inverted U-shape with firm performance; information technology capital has no significant impact on firm performance. However, the interaction between innovation capital and information technology capital has a positive effect on firm performance.

6) Dalkir et al. (2007: 1497-1509) indicated that the role of knowledge management is to support, facilitate, and leverage the development and use of intellectual capital.

7) Afiouni (2007: 63-69) indicated that human resource initiatives alone are not enough to impact organizational performance. Rather, they need to be integrated within broader knowledge management initiatives to allow the company to develop its human capital and to create value. From a resource-based perspective, this would allow the development of the firm's human capital, a resource that would be rare, valuable, difficult to substitute and imitate, and thus could be considered a source of competitive advantage or a driver of organizational performance.

8) Yang (2007: 83-90) indicated that effective organizational learning and knowledge sharing enables an organization to improve organizational behaviors by way of the creation of advanced knowledge and better understandings, and hence to become innovative and competitive; furthermore, the overall contribution to bottom-line profits would be attained. Eventually, this results in enrichment of overall organizational effectiveness.

9) Warden (2004) and Ramírez, Lorduy and Rojas (2007: 732-748) gave explanations for three components of intellectual capital of universities. Human capital is the set of explicit and tacit knowledge of the university personnel acquired through the formal and informal educational and actualization processes embodied in their activities. Structural capital is the explicit knowledge related to the internal
process of the dissemination, communication, and management of scientific and technical knowledge in the organization. Customer capital is the wide set of economic, political, and institutional relationships developed and maintained by the university.

10) Benjamin Loh et al. (2005) concluded that the universities would become smarter organizations with effective knowledge management, and they also identified 6 KM initiatives to enhance research in the case of the Singapore Management University. These initiatives are: 1) leadership 2) strategy (3) culture 4) human resource management and rewards 5) technology, and (6) KM processes.

11) Lombardi et al. (2000) clustered American research universities into groups defined by their relative performance on a variety of research university characteristics: total research expenditures, federal research expenditures, endowment assets, annual giving, faculty members in the National Academies, faculty awards, doctoral degrees, postdoctoral appointees, and entering freshmen SAT scores. In this study, the authors presented the performance of public and private universities separately, however, because the public and private research universities operate in significantly different contexts by virtue of their governance and funding structures. Private universities tend to have much larger endowments than public universities, while public universities enjoy a much higher level of tax-based public support. Public universities tend to serve much more diverse constituencies in ways that affect their size and organization. Private universities often focus their efforts more closely and define their missions more precisely.

**Criteria for Measuring Knowledge Management Effort in Organizational Performance**

1) Longbottom and Chourides (2001) discussed the idea that there are positive feelings concerning improved organizational performance affected by KM implementation, but that performance measures are not well developed. However performance measures linked to the balanced scorecard framework were suggested.

2) KPMG (2000) surveyed 423 European and American organizations that had implemented knowledge management and concluded a list of 14 expected benefits, including: 1) better decision making 2) better customer handling 3) improved employee skills 4) faster response to key business issues 5) improved productivities 6) increased profits 7) sharing best practices 8) reduced costs 9) new or better ways of
working 10) increased market share 11) create additional business opportunities 12) improved new product development 13) staff attraction/retention and 14) increased share price.

3) Vittal Sree Panduranga Anantatmula (2004) concluded that knowledge management performance criteria were different for government, non-profit, and for-profit organizations as the missions, objectives, and goals for these organizations are different. Improved communication is a common criterion for both government and non-profit organizations. Enhanced collaboration within the organization is a common criterion for both non-profit and for-profit organizations. Overall, improved communication, enhanced collaboration within the organization, and improved employee skills are considered as the criteria for knowledge management efforts. These criteria can support organizational performance in improving efficiency, effectiveness, and innovation. In his study, Anantatmula carried out a comprehensive literature review on measuring the KM effort in organizational performance from 11 researches and studies, and he came up with 24 criteria, as shown in Table 3.4:

**Table 3.4 Knowledge Management Performance Criteria**

<table>
<thead>
<tr>
<th></th>
<th>KPMG</th>
<th>Skyme</th>
<th>Perkmann</th>
<th>Wiig</th>
<th>Oke &amp; Sarvary</th>
<th>Kelly</th>
<th>Booz, Allen &amp; Hamilton</th>
<th>BP Amoco</th>
<th>Ruggles</th>
<th>Longbottom et al.</th>
<th>Allee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Better decision making</td>
<td>✗</td>
<td>✗</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Better customer handling</td>
<td>✗</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faster response to key business issues</td>
<td>✗</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved employee skills</td>
<td>✗</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>Improved productivity</td>
<td>✗</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Increased profits</td>
<td>✗</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Sharing best practices</td>
<td>✗</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.4 (Continued)

<table>
<thead>
<tr>
<th>Benefits</th>
<th>KPMG</th>
<th>Skyrme</th>
<th>Perfmann</th>
<th>Wrig</th>
<th>Ofek &amp; Sarvary</th>
<th>Kelly</th>
<th>Booz, Allen &amp; Hamilton</th>
<th>BP Amoco</th>
<th>Ruggles</th>
<th>Longbottom et al.</th>
<th>Allee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced costs</td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
<tr>
<td>New or better ways of working</td>
<td>◦</td>
<td></td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
</tr>
<tr>
<td>Increased market share</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
<tr>
<td>Creation of new business opportunities</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td></td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
<tr>
<td>Improved new product development</td>
<td>◦</td>
<td></td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
<tr>
<td>Better staff attraction/retention</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td></td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
<tr>
<td>Increased share price</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
<tr>
<td>Enhanced product or service quality</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
<tr>
<td>Creation of more value to customers</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
<tr>
<td>Enhanced intellectual capital</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td></td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
<tr>
<td>Improved communication</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
<tr>
<td>Increased innovation</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
<tr>
<td>Improved learning/adaptation capability</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
<tr>
<td>Return on investment of KM efforts</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td></td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
<tr>
<td>Increased market size</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
<tr>
<td>Entry to different market type</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td></td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
<tr>
<td>Increased empowerment of employees</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
<td>◦</td>
<td>◦</td>
<td>◦</td>
<td></td>
</tr>
</tbody>
</table>

In the light of the Balanced Scorecard framework, the performance criteria in Table 3.4 can be grouped into 4 perspectives, as shown in Table 3.5

Table 3.5 Knowledge Management Performance and Balanced Scorecard

<table>
<thead>
<tr>
<th>Financial Perspective</th>
<th>Customer Perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved productivity</td>
<td>Better customer handling</td>
</tr>
<tr>
<td>Increased profit</td>
<td>Creation of new business opportunities</td>
</tr>
<tr>
<td>Reduced costs</td>
<td>Enhanced product or service quality</td>
</tr>
<tr>
<td>Increased market share</td>
<td>Creation of more value for customers</td>
</tr>
<tr>
<td>Increased share price</td>
<td></td>
</tr>
<tr>
<td>Enhanced intellectual capital</td>
<td></td>
</tr>
<tr>
<td>Return on investment of KM efforts</td>
<td></td>
</tr>
<tr>
<td>Increased market size</td>
<td></td>
</tr>
<tr>
<td>Entry to different market types</td>
<td></td>
</tr>
<tr>
<td>Internal Process Perspective</td>
<td>Learning &amp; Growth Perspective</td>
</tr>
<tr>
<td>Better decision making</td>
<td>Sharing best practices</td>
</tr>
<tr>
<td>Faster response to key business issues</td>
<td>New or better ways of working</td>
</tr>
<tr>
<td>Improved employee skills</td>
<td>Improved new product development</td>
</tr>
<tr>
<td>Better staff attraction/retention</td>
<td>Increased innovation</td>
</tr>
<tr>
<td>Improved communication</td>
<td>Improved learning/adaptation capability</td>
</tr>
<tr>
<td>Increased empowerment of employees</td>
<td></td>
</tr>
</tbody>
</table>
3.4 Conceptual Framework of the Study

In this study the researcher adopted the definition of organizational performance defined by Kaplan and Norton as follows: Organizational performance as the degree to which organizational objectives are fulfilled.

Second, the researcher adopted the definition of knowledge management initiated by the Office of The Public Sector Development Commission of Thailand as follows:

Knowledge Management as the systematic collective knowledge within organization that resides in the individual and document and the use of those knowledge to develop people in that organization to be professional and efficient and gain competitiveness.

Third, the researcher adopted the definition of organizational competency defined by Shoemaker and Amit as follows: Organizational competency as a set of organization-specific resources and capabilities that bestow the organization’s competitive advantage.

Finally, the researcher adopted the definition of organization as an open system defined by Richard L. Daft as follows: Organization as a social entity that is goal-directed, is designed as deliberately structured and coordinated activity system, and is linked to the external environment.
3.5 Research Hypotheses

**Hypthesis 1**: The KM process, KM Leadership, KM culture, KM technology, KM measurement, organizational competency, the public-type university, the research-oriented university, and university autonomy directly affect organizational performance.
**Hypothesis 2:** The KM process, KM Leadership, KM culture, KM technology, and KM measurement indirectly, through organizational competency, affect organizational performance.

**Hypothesis 3:** The organizational performance of the public university is different from that of the private university.

**Hypothesis 4:** The organizational performance of the autonomous public university is different from that of the non-autonomous public university.

**Hypothesis 5:** The organizational performance of the research university is different from that of the teaching university.
CHAPTER 4

RESEARCH METHODOLOGY

4.1 Research Design

The emergence of mixed methods as a third methodological movement in the social and behavioral sciences began during the 1980’s (Tashakkori and Teddlie, 2003: 697) and the developing innovative techniques have gradually appeared with the proof of their contributions to many perspectives, such as validation of quantitative and qualitative data, offsetting the weaknesses of either approach, and an explanation of the findings and unexpected results from the other approach. The mixed methods increased credibility and enhanced the integrity of findings.

Morse (1991: 127-145) and Creswell (2009) provided preliminary design considerations for applying mixed methods, as shown in Table 4.1 and Table 4.2, respectively. The common design considerations suggested by both authors are timing (concurrent or sequential) and weighting (equal or not equal). In addition, Creswell suggested three choices of mixing the data obtained using the quantitative and qualitative methods.

Table 4.1 Preliminary Design Considerations on Mixed Method Research

<table>
<thead>
<tr>
<th>Approach</th>
<th>Timing</th>
<th>Purpose</th>
<th>Limitations</th>
<th>Resolutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUAL + quan</td>
<td>Simultaneous</td>
<td>Enrich description of sample</td>
<td>Qualitative sample</td>
<td>Utilize normative data for comparison of results</td>
</tr>
<tr>
<td>QUAL</td>
<td>Sequential</td>
<td>Test emerging hypothesis, determine distribution of phenomenon in population</td>
<td>Qualitative sample</td>
<td>Draw adequate random sample from same population</td>
</tr>
</tbody>
</table>
Table 4.1 (Continued)

<table>
<thead>
<tr>
<th>Approach</th>
<th>Timing</th>
<th>Purpose</th>
<th>Limitations</th>
<th>Resolutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUAN + qual</td>
<td>Simultaneous</td>
<td>To describe part of phenomena that cannot be quantified</td>
<td>Quantitative sample</td>
<td>Select appropriate theoretical sample from random sample</td>
</tr>
<tr>
<td>QUAN</td>
<td>Sequential</td>
<td>To examine unexpected results</td>
<td>Quantitative sample</td>
<td>Select appropriate theoretical sample from random sample</td>
</tr>
</tbody>
</table>

Source: Morse, 199: 127-145.

Table 4.2 Aspects to Consider in Planning a Mixed Methods Design

<table>
<thead>
<tr>
<th>Timing</th>
<th>Weighting</th>
<th>Mixing</th>
<th>Theorizing</th>
</tr>
</thead>
<tbody>
<tr>
<td>No sequence concurrent</td>
<td>Equal</td>
<td>Integrating</td>
<td>Explicit</td>
</tr>
<tr>
<td>Sequential</td>
<td>Qualitative</td>
<td>Connecting</td>
<td>Implicit</td>
</tr>
<tr>
<td>Qualitative first</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sequential</td>
<td>Quantitative</td>
<td>Embedding</td>
<td></td>
</tr>
<tr>
<td>Quantitative first</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Creswell, 2009: 207.

Creswell (2009) mentioned four important aspects for planning mixed method study, which include timing, weighting, mixing, and theorizing. He also suggested six strategies to incorporate into the above aspects. The strategies include: 1) the
The sequential explanatory strategy 2) the sequential exploratory strategy 3) the sequential transformative strategy 4) the concurrent triangulation strategy 5) the concurrent embedded strategy and 6) the concurrent transformative strategy.

The fourth strategy: The concurrent triangulation strategy is the fittest approach for this study since the data collection time is shorter than the sequential strategies and the mixing occurs during the phase of the discussion and interpretation of the findings. The researcher used both methods to offset the weaknesses within one method with the strengths of the other method and to obtain comprehensive, accurate, and meaningful findings.

The researcher gave priority to the quantitative method based on survey research, in which data were collected from the target population by using a questionnaire. The qualitative research as a supplement tool was conducted through in-depth interviews of chief knowledge officers and KM committee members of certain universities.

4.2 Quantitative Method

4.2.1 Population and Sampling Procedure

4.2.1.1 Target Population and Unit of Analysis

Since the objective of this study is to determine the determinants affecting the organizational performance of universities in Thailand, the unit of analysis is universities. This study will focus on 121 Thai universities listed by the Commission of Higher Education as of February, 2010. They had more than 2,000 undergraduate and/or graduate students in educational year 2009.

The population of this study is 121 universities, consisting of 76 public and 45 private universities. The public universities are composed of 13 limited admission universities, 14 autonomous universities, 38 Rajabhat Universities, 9 Rajamangala Universities of Technology, and 2 open-admission universities. Thai universities are also grouped by university orientation as research university and teaching university. There are 21 research universities and 100 teaching universities.

Many scholars have suggested an appropriate sample size for statistical analysis. Some focus on allowable error, while some focus on the number of
independent variables. Yamane (1963) suggested a famous formula, depending on the population size and the allowable error. The formula is: \( n = \frac{N}{1+Ne^2} \), when \( n \) is sample size, \( N \) is population size, and \( e \) is allowable error. In this study, the population size is 121 and the allowable error is 5%; therefore the appropriate sample size for random sampling is 93. Stevens (1996, 72) suggested having 15 subjects per predictor (independent variable); therefore the appropriate sample size is 135. Tabachnick and Fidell (2001, 117) suggested having a sample size of more than 50 plus 8 times the number of independent variables; therefore the approximate sample size is 122. In conclusion, this study, in association with the 9 independent variables, should have approximately 93 to 135 samples. However, the sample size may be lower than generally recommended when the respondents are educated, as Alwin and Krosnick (1991) concluded.

The researcher decided to do the survey with all population members, which consisted of 121 universities, since it is the policy of the Thai Government and the Ministry of Education to promote and implement knowledge management with educational service providers, especially at the higher education level, and all public and private universities have more or less adopted these policies in order to strengthen their capabilities. Investigating the entire population presents a good opportunity to reveal this policy’s outcomes. The matrix of university orientation and university types is shown in Table 4.3 as follows:

<table>
<thead>
<tr>
<th>University Type</th>
<th>Public University</th>
<th>Private University</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomous</td>
<td>Autonomous</td>
<td>8</td>
<td>21</td>
</tr>
<tr>
<td>Autonomous</td>
<td>Non-autonomous</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Non-autonomous</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Orientation</td>
<td>Research</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Orientation</td>
<td>Teaching</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Orientation</td>
<td>Total</td>
<td>76</td>
<td>45</td>
</tr>
<tr>
<td>Orientation</td>
<td></td>
<td>121</td>
<td></td>
</tr>
</tbody>
</table>
The directory of universities within the scope of this study is shown in Appendix A.

4.2.1.2 Representatives of Each University

According to the straightforward approach in previous studies on organizational aspects, the top management that has the title of Chief Executive Officer, Managing Director, President, or Chairman of the board of directors is the target sample to be interviewed or to be asked to fill out the questionnaire, since top management can represent all dimensions of the organization in terms of goals, policies, strategies, resources, processes, controls, improvements, etc.

Even though several groups of personnel in each university are involved in implementing knowledge management, the university top management is the leader and the most important person in terms of directing policies and allocating the resources needed to implement knowledge management and to improve organizational competency in order to achieve the desired organizational performance. Top management also takes the role of organization representative in all kinds of activities and has full responsibility and accountability for all matters in the university. Top management in this study includes the president, vice-president and assistant president of the universities.

The other group of people that can provide overall pictures of the university in terms of knowledge management, organizational competency, and organizational performance is the director, who is designated to have fully responsibility for running the activities, programs, campaigns, etc. related to knowledge management and educational quality assurance at the level of the whole organization. With profound understanding and knowledge on matters related to this study, the designated director is the other important person that could lead to success or failure of the implementation.

In this study, university administrators will include university top management and all middle line management, who manage the relevant departments, schools, bureaus, divisions, offices, centers or others at an equivalent level. The middle line’s titles include dean, deputy dean, directors, and deputy Director, etc.

In addition, all question items on the questionnaire focused on evaluating the overall picture of the university in terms of knowledge management
implementation and organizational competency. It is not an attitude survey but an evaluative survey. The above reasons are justifications for using individual responses for the organization’s response.

The unit of analysis is the organization or university level. Top management and the designated director in charge of knowledge management and educational quality assurance are the target respondents because both of them are good representatives of the university. Therefore the total number of respondents is 242. However, this study uses university as the unit of analysis, and the average score of both respondents at the same university will represent the individual university score.

4.2.2 Operational Definitions and Measurement

Referring to the review of the literature related to the 4 variables of this study—organizational performance, knowledge management, organizational competency, and organizational characteristics—the researcher proposed the operational definitions of each variable in order to measure these constructs. The process of operationalization or transforming abstract into observable or measurable variables must be carried out carefully to ensure the reliability of the data and of the statistical analysis. The measurement scale also had to be tested or proven prior to use.

In this study, the researcher faced a limited population (only 121 universities) so proven scales from relevant studies were chosen, as well as the secondary data kept by reliably-competent agencies. Some newly-constructed items were added to complement the existing scale in order to make the scale completely reflect the relevant literature. The sources of the proven scales and secondary data for the variables are listed in Table 4.4:
Table 4.4 Source of Proven Scales and Secondary Data

<table>
<thead>
<tr>
<th>Variables</th>
<th>Sources of proven scale and secondary data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational performance</td>
<td>University internal audit subcommittee’s reports for educational year 2009 which have been already submitted to and approved by the Commission of Higher Education</td>
</tr>
<tr>
<td>Knowledge management</td>
<td>The KMAT questionnaire developed by Arthur Anderson and the American Productivity &amp; Quality Center (APQC)</td>
</tr>
<tr>
<td>Organizational competency</td>
<td>The measurement scale of The Competent Manager, developed by Boyatzis. The model for evaluating organizational competencies, developed by Ana Belen Escrig-Tena and Juan Carlos Bou-Llusar.</td>
</tr>
<tr>
<td>Organizational characteristics</td>
<td>University orientation and weight of associated missions, developed by the Office for National Education Standards and Quality Assessment (Public Organization)</td>
</tr>
</tbody>
</table>

All variables are operationalized as shown in Appendix C and can be summarized as shown in Table 4.5.
Table 4.5 Measures of Dependent and Independent Variables.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Definitions</th>
<th>Operationalization</th>
<th>Statement No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational performance</td>
<td>degree to which organizational objectives are fulfilled</td>
<td>• <strong>Achievement performance:</strong> long-term strategic objectives of the organization and thus it incorporates the tangible outcomes of the strategy</td>
<td>90-93</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>Customer performance:</strong> value proposition that the organization will apply to satisfy customers</td>
<td>94-95</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>Internal process performance:</strong> key processes that create and deliver the customer value proposition</td>
<td>96-99</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>Learning &amp; growth performance:</strong> internal skills and capabilities that are required to support the value-creating internal processes</td>
<td>100-102</td>
</tr>
</tbody>
</table>
Table 4.5 (Continued)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Definitions</th>
<th>Operationalization</th>
<th>Statement No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent Variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) Knowledge management</td>
<td>systematic collective knowledge within organization that resides in the individual and documents and the use of that knowledge to develop people in the organization to be professional and efficient and to gain competitiveness</td>
<td>• <strong>KM process:</strong> strategic and process approach to manage knowledge resources, particularly knowledge workers</td>
<td>9-14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>KM leadership:</strong> management’s commitment and involvement in knowledge management at all levels of organization.</td>
<td>15-20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>KM culture:</strong> environment, condition and organizational climate for people to create, leverage, and share knowledge that is valued by customers and other key stakeholders</td>
<td>21-27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>KM technology:</strong> technologies to support the new strategies, processes, methods, and techniques to better</td>
<td>28-33</td>
</tr>
</tbody>
</table>
Table 4.5 (Continued)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Definitions</th>
<th>Operationalization</th>
<th>Statement No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>create, disseminate, share and apply the knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Independent Variables (cont.)**

1) Knowledge management (cont.)

- **KM measurement:** holistic approach to measuring the impact of knowledge management activities and programs for business process performance

2) Organizational Competency

- **Managerial competencies:** unique capabilities of an organization’s strategic leaders to articulate, communicate, and implement a strategic vision and to enact a beneficial organization-environment relationship
- **Input-based competencies:** physical resources,
<table>
<thead>
<tr>
<th>Variables</th>
<th>Definitions</th>
<th>Operationalization</th>
<th>Statement No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>organizational capital resources, human resources, knowledge, skills and capabilities that enable transformational processes</td>
<td>• <strong>Transformation-based competencies:</strong> organizational capabilities required to advantageously convert inputs into outputs</td>
<td>72-85</td>
<td></td>
</tr>
<tr>
<td>Independent Variables (cont.)</td>
<td>• <strong>Output-based competencies:</strong> encompass all knowledge-based and invisible strategic assets ranging from corporate reputation or image to product or service quality and customer loyalty</td>
<td>86-91</td>
<td></td>
</tr>
<tr>
<td>2) Organizational Competency (cont.)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4.5 (Continued)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Definitions</th>
<th>Operationalization</th>
<th>Statement No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3) Organizational characteristics</td>
<td>University orientation</td>
<td>• Research university or teaching university</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>University type</td>
<td>• Non-autonomous public university, autonomous public university or private university</td>
<td>8</td>
</tr>
</tbody>
</table>

4.2.3 Validity and Reliability

As the researcher mentioned above, the proven scales from previous studies were extracted and partially modified to fit this study. In addition some newly-constructed items were introduced in order to increase the value of the application in the university setting in Thailand. Therefore the scales were tested to ensure the quality of the instruments. Validity and reliability are the most important for social research because the constructs in social theory are often ambiguous, diffuse, and not directly observable. Validity is an indicator related to capturing the meaning of the constructs, while reliability is an indicator of the dependability and consistency of the measurement scale.

4.2.3.1 Validity

Babbie (2001: 144) summarized four approaches to evaluating validity. They comprise: 1) face validity 2) criterion-related validity 3) content validity and 4) construct validity. In this study, content validity and construct validity are used.

1) Content Validity

According to Julie Pallant (2005: 6), “content validity” refers to the adequacy with which a measure or scale has sampled from the intended universe or domain of content. Cronbach (1971) recommended a review process whereby experts in the field that are familiar with the content evaluate the measures repeatedly until they can reach a consensus.
In this study, the measure items of each variable were reviewed and discussed by the researcher and three experts in field of knowledge management, human resource, and organization theories. The guideline for in-depth interview was also reviewed by this panelist.

For the dependent variable, namely Organizational performance, the researcher and the experts have carefully considered the performance indicators (audit indicators) suggested by the Commission of Higher Education to identify which ones should be affected by the knowledge management implementation and came up with 15 indicators, mainly focused on process indicators and output indicators.

For the independent variables, the panelist reviewed the questionnaire many times in order to ensure that the questionnaire items covered the range of meaning included in all relevant concepts that were to be measured.

The questionnaire had to be translated into Thai for easy reading. Accurate translation was a must, with great support from two proficient experts in English. The English and Thai versions of the questionnaires were again reviewed by a panel of experts in field, as mentioned earlier. Both versions of the questionnaires are shown in Appendix D and E.

2) Construct Validity

According to Julie Pallant (2005: 6-7), “construct validity” involves testing a scale not against a single criterion but in terms of a theoretically-derived hypothesis concerning the nature of the underlying variable or construct. The researcher conducted factor analysis as an indicator of the degree of the construct validity for each measurement of the questionnaire.

Bryman and Cramer (1990: 253) discussed the idea that factor analysis determines the characteristics which go together. Moreover this technique is a powerful statistical tool in helping researchers achieve a balance of two conflicting needs: the need to find a simple solution with as few factors as possible; and the need to explain as much of the variance in the original data set as possible. In this study the researcher adopted Kaiser’s criterion or the Eigenvalues rule, where only factors with Eigenvalues of 1.0 or more were retained for further investigation. The Eigenvalue of a factor represents the amount of the total variance explained by that factor. However, in some circumstances, the Eigenvalue threshold may be violated in order to the cope
with the review of the literature on the variable constructs. For such a case, the researcher must justify and pay more intention to the interpretation of the results.

A high factor loading ensures congruity between the measuring instrument and the hypothetical construct. It is noted that factor loadings of 0.5 or above are acceptable for larger samples or for exploratory analysis (Hair et al., 1998 quoted in Hooper and Zhou, 2007: 279).

With the limited number of samples for this study, the researcher used factor loadings of 0.4 or above as an acceptable level. The question items with factor loadings lower than 0.4 were removed from the scale. The researcher gave higher concentration to the strength of the inter-correlations among the items and the sampling adequacy for factorability. Julie Pallant (2005: 178) suggested that for factor analysis, the correlation matrix should show a correlation of 0.3 or greater, the Kaiser-Meyer-Olkin value should show 0.6 or greater, and Barlett’s test of sphericity should be statistically significant at p < .05.

Factor rotation is another condition that needed to be clearly identified. According to Julie Pallant (2005: 176), there are two main approaches to rotate: orthogonal rotation, which assumes that the underlying constructs are not correlated; and oblique rotation, which assumes that the underlying constructs are correlated. Tabachnick and Fidell (2001) suggested that the orthogonal approach results in solutions that are easier to interpret and to report. In general, both rotations often result in similar solutions, particularly when the pattern of correlations among the items is clear. In this study the researcher used the orthogonal rotation based on Varimax method, which attempts to minimize the number of variables that have high loadings on each factor.

The communality result for each variable indicates how well the data would fit the model of analysis. Gorsuch (1983) mentioned that the minimum limit is 0.0 if the variable has no correlation with any other variable in the matrix, and a maximum limit of 1.0 if the variance is perfectly accounted for by the set of factors underlying the matrix.

4.2.3.2 Reliability

According to Julie Pallant (2005: 6), “reliability” indicates how free the scale is from random error. Two frequently-used indicators are 1) test-retest
reliability and 2) internal consistency. For this study it was more appropriate to use the internal consistency indicator for testing the scale reliability. Internal consistency measures the degree to which the question items all measure the same underlying attribute.

The researcher conducted a Cronbach Alpha statistical analysis as the indicator of the reliability degree for each measurement of the questionnaire. Cronbach’s Alpha coefficient is sensitive to the number of items in the scale. The short scale (with fewer than 10 items) often finds lower values than the long scale. In this study, each of the three scales of organizational performance, knowledge management, and organizational competency contained more than 10 items. Julie Pallant (2005: 90) suggested that the Cronbach Alpha coefficient of a scale should be above 0.7. In this study, the researcher used 0.7 as the acceptable level of scale reliability.

4.2.4 Pretest Process

Owing to the limited numbers of the sample, the pretest process was skipped. However the results of the factor analysis and of the Cronbach Alpha analysis led to the elimination of some question items with poor loading power as well as inconsistency with the review of the literature.

4.2.5 Data Collection

In this study, the researcher employed quantitative data collection through the survey questionnaires and used secondary data related to the internal audit report of the universities for educational year 2009, which had been already submitted to and approved by the Commission of Higher Education.

4.2.5.1 Survey Questionnaire

The questionnaire is composed of four sections. In Section 1, the respondents were asked to write up the exact numbers and choose the best choice that fit the respondent’s demographic data. Dummy variables were employed for the variables of university type, university orientation, and university autonomy. In Section 2 and 3, all question items requested the respondents to rate the frequency of occurrences or the extent of behavior expressed or performed, as well as the quantity
of activities that were noticeable at the university. A Likert scale was employed for Section 2 and 3 of the questionnaire. In Section 4: an open-ended question, the respondents were asked to describe their practice and opinion concerning how to develop a knowledge management system successfully in his or her university.

The Likert scale was developed by Rensis Likert in 1932 as a five-point bipolar response format, which most people are familiar with today. These scales ask respondents to indicate the extent to which they agree or disagree, approve or disapprove, like or dislike, etc. The responses from the five-point scale are acceptable for use by the statistician as an interval or ratio scale of measurement, which is normally required by advanced statistic tests.

Likert scales may be subject to distortion because of their central tendency and social desirability. Respondents may avoid choosing extreme answers or try to portray themselves or their organization in a more favorable way. A bipolar scale has an equal number of positive and negative statements that can obviate the problem of acquiescence bias. Some scholars advocate forcing the respondents to exhibit a negative or positive direction using a four-point scale in order to solve the central tendency problem. In addition, the use of a “don’t know” option is inconclusive in some studies.

Most studies are not conclusive regarding the appropriate number of points on a scale. Alwin and Krosnick (1991: 20; 139) found that numbered scales are difficult for people and that labeled scales need to be as accurate as possible. Attitude questions with more response options tend to have higher reliability. The characteristics of the respondents have also been found to be related to the level of reliability. Less-educated respondents provide less reliable responses than educated people. Miller (1956: 63, 81-97) suggested the use of a seven-point scale, plus or minus two points. More than a nine-point scale is too difficult for people because of the limit in their ability to process information. In line with the above scholars, Nunnally (1978) mentioned that the user of the Likert scale can increase the ends of the scale by adding “very” to create a seven-point scale, which tends to reach the upper limit of reliability.

Although the Likert scale was initially designed to capture the intensity of the respondent’s feeling and is frequently used by psychologists, today researchers
and practitioners in several fields, including engineering, business management, and public administration often apply this kind of scale in more developed applications. The scale items ask the respondents to rate the frequency of their observation or level of behavior.

In this study, the researcher used a seven-point Likert scale in Section 2 and 3 of the questionnaire. Because in this study the respondents were highly educated, the researcher expected reliable responses, as Alwin and Krosnick suggested. The questionnaires were distributed to 121 public and private universities in Thailand by hand or mailed with a letter asking for cooperation from the National Institute of Development Administration.

The question items in the questionnaire are as follows:

Section 1- Demographic information of respondents and university characteristics

1) Gender
2) Age
3) Retention
4) Educational levels
5) Position levels
6) Degree of knowledge management involvement
7) University orientation
8) University type

Section 2- Knowledge management measures, consisting of 5 sub-concepts:

1) Knowledge management process
2) Knowledge management leadership
3) Knowledge management culture
4) Knowledge management technology
5) Knowledge management measurement

Section 3- Competency, consisting of 4 sub-concepts:

1) Managerial competencies
2) Input-based competencies
3) Transformation-based competencies
4) Output-based competencies
Section 4 – Open-ended question on how to develop the knowledge management of the organization successfully

4.2.5.2 Use of Secondary Data

The researcher made use of the internal audit results on educational quality assurance that were submitted to the Commission of Higher Education. Most records were available on the website of the Commission of Higher Education (www.mua.go.th) in the section of “CHE QA online system, Version II.” However, some universities had not uploaded their audit reports onto the website. The researcher received cordial support from the management and officers working at the Bureau of Standards and Evaluation, the Commission of Higher Education, in retrieving data from the hard copies of those internal audit reports. All audit indicators were grouped into four management perspectives that were consistent with the concept of the Balanced Scorecard, as compared in Table 4.6.

Table 4.6 University Internal Quality Assurance and Balanced Scorecards

<table>
<thead>
<tr>
<th>University Internal Quality Assurance</th>
<th>Balanced Scorecards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finance</td>
<td>Finance</td>
</tr>
<tr>
<td>Students and stakeholders</td>
<td>Customers</td>
</tr>
<tr>
<td>Internal process</td>
<td>Internal process</td>
</tr>
<tr>
<td>Human resources, learning, and innovation</td>
<td>Learning and growth</td>
</tr>
</tbody>
</table>

4.2.6 Preliminary Data Analysis for Scale Validity and Reliability

According to the limitation of the sample numbers, the pre-test process had to be skipped. However, the statistical techniques were applied to testing the suitability of the scale before further analysis for hypothesis testing. Two techniques were used. Factor analysis was performed for validity purposes, followed by Cronbach’s Alfa for a reliability check.
4.2.6.1 Scale Validity Test

1) Variable of Organizational Performance

Initially, the researcher chose 15 measures from a total of 41 measures as presented in the internal audit subcommittee’s reports of 103 universities and used them as the secondary data for this study. After screening the data, the researcher decided to take out two measures comprising Indicator 4.5 (D45) and Indicator 9.1 (D91).

For “D45,” which related to the percentage of research articles cited in the refereed journals or the national or international databases in proportion to the number of full-time faculty, the researcher found that only 19 research universities reported this specific indicator. It was not applicable in general. For “D91,” which was related to a system and mechanism for internal quality assurance infused as one part of the educational management process, the researcher found that all 103 universities reported the same score on this indicator. Using a statistical technique, it was removed because no variation was exhibited.

The extracted indicators were grouped into four dimensions according to the Balanced Scorecard framework. These extracted indicators (measures) were used as variable items for the organizational performance in this study. Validity of the measurement was tested prior to the analysis of the hypothesis testing. A summary of the indicators classified by the process approach is shown in Table 4.7

<table>
<thead>
<tr>
<th>Indicator Dimension</th>
<th>Used in Internal Audit</th>
<th>Initial Extraction for the Study</th>
<th>Final Extraction for the Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>7</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Process</td>
<td>21</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Output</td>
<td>13</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>15</td>
<td>13</td>
</tr>
</tbody>
</table>
A total of 13 measure items were tested for validity. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy or KMO statistics showed .624, which was greater than the acceptable level of .60, and the Bartlett’s Test of Sphericity value was significant (at p < .05); therefore, factor analysis was appropriate for the set of data. All 13 measure items had factor loadings higher than 0.4 of the acceptable level and were grouped into 4 factors in accordance with the review of the literature. The scale explained approximately 61% of the total variance of the variable. In conclusion, the scale of organizational performance was proven for its validity.

Table 4.8 Revised Measures in Organizational Performance Scale

<table>
<thead>
<tr>
<th>Factors</th>
<th>Initial Measure Items</th>
<th>Revised Scale Measure Items</th>
<th>Varimax Solution</th>
<th>Communalit y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievement</td>
<td>D21</td>
<td>D21</td>
<td>.522</td>
<td>.600</td>
</tr>
<tr>
<td></td>
<td>D211</td>
<td>D211</td>
<td>.886</td>
<td>.868</td>
</tr>
<tr>
<td></td>
<td>D212</td>
<td>D212</td>
<td>.744</td>
<td>.679</td>
</tr>
<tr>
<td></td>
<td>D79</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer</td>
<td>D44</td>
<td>D28</td>
<td>.447</td>
<td>.429</td>
</tr>
<tr>
<td></td>
<td>D77</td>
<td>D44</td>
<td>.753</td>
<td>.633</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D77</td>
<td>.785</td>
<td>.641</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D79</td>
<td>.588</td>
<td>.422</td>
</tr>
<tr>
<td>Learning</td>
<td>D42</td>
<td>D42</td>
<td>.475</td>
<td>.458</td>
</tr>
<tr>
<td></td>
<td>D73</td>
<td>D73</td>
<td>.740</td>
<td>.590</td>
</tr>
<tr>
<td></td>
<td>D74</td>
<td>D74</td>
<td>.697</td>
<td>.510</td>
</tr>
<tr>
<td>Internal Process</td>
<td>D11</td>
<td>D11</td>
<td>.726</td>
<td>.617</td>
</tr>
<tr>
<td></td>
<td>D28</td>
<td>D41</td>
<td>.767</td>
<td>.674</td>
</tr>
<tr>
<td></td>
<td>D41</td>
<td>D75</td>
<td>.855</td>
<td>.743</td>
</tr>
<tr>
<td></td>
<td>D75</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
However, the allocation of items to either factor was not exactly the same as initially designed. Two items (D28 and D79) were moved. A comparison of item allocation with the sub-constructs is shown in the Table 4.8. The item from achievement performance and another item from internal process performance were moved to customer performance. They include D28: a system and mechanism to support full-time faculty’s research on teaching and learning development (indicator 2.8), and D79: the level of achievement to convey organizational indicators and targets at the individual level (indicator 7.9).

Regrouping the above items into the customer scale was justified. The quality of the research support system and the commitment of the individual targets to both teaching and researches led to quality of research and innovations, which could be utilized by a variety of customers, such as governmental policy makers and business operators.

Relevant SPSS outputs are shown in Appendix G.

2) Variable of Knowledge Management

According to the initial run of the factor analysis with the constraint of Eigenvalue ≥ 1, it resulted in 4 factors with a power of explanation equal to 73.134% of the total variance of the variable. The items belonging to the KM culture were allocated to the existing four factors. Referring to the literature review in the chapter three, the culture component was obviously mentioned as one of the key success factors of KM implementation. Using a statistical technique, the SPSS program can set the number of factors for extraction. The researcher made the decision to maintain the cultural factor in the scale and to run the second round of factor analysis. The fifth factor (KM culture) had an Eigenvalue = .841.

From the second run of the factor analysis, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy or KMO statistics showed .947, which was greater than the acceptable level of .60, and the Bartlett’s Test of Sphericity value was significant (at p < .05); therefore factor analysis was appropriate for the set of data.

The researcher had to take 7 measure items from the total 29 items out of the scale since they were not allocated to the factors built upon the literature. All items of the KM process, KM technology, and KM measurement were kept as in the initial design. On the other hand, KM leadership had to take out 3 from
6 items. KM culture had to take out 4 of the 7 items. The KMAT questionnaire used in this study was designed in the setting of American culture and leadership, which may be inconsistent with the Thai university context in certain aspects. The deleted items, in the section on KM leadership, related to strategy setting, compensation policy, and project leadership. Regarding the KM culture perspective, the deleted items involved encouraging and facilitating a climate of knowledge sharing, openness, and trust throughout the university and relevant external organizations.

The revised items in the knowledge management scale are shown in Table 4.9. The revised scale could explain 76.034 percent of the total variance of the variable of knowledge management. In conclusion, the scale of knowledge management was proven for its validity.

**Table 4.9** Revised Measures in the Knowledge Management Scale

<table>
<thead>
<tr>
<th>Factors</th>
<th>Revised Measure Items</th>
<th>Varimax Solution</th>
<th>Communality</th>
</tr>
</thead>
<tbody>
<tr>
<td>KM process</td>
<td>KMP1</td>
<td>.694</td>
<td>.768</td>
</tr>
<tr>
<td></td>
<td>KMP2</td>
<td>.640</td>
<td>.836</td>
</tr>
<tr>
<td></td>
<td>KMP3</td>
<td>.630</td>
<td>.716</td>
</tr>
<tr>
<td></td>
<td>KMP4</td>
<td>.703</td>
<td>.760</td>
</tr>
<tr>
<td></td>
<td>KMP5</td>
<td>.684</td>
<td>.811</td>
</tr>
<tr>
<td></td>
<td>KMP6</td>
<td>.556</td>
<td>.710</td>
</tr>
<tr>
<td>KM leadership</td>
<td>KML2</td>
<td>.833</td>
<td>.827</td>
</tr>
<tr>
<td></td>
<td>KML3</td>
<td>.625</td>
<td>.821</td>
</tr>
<tr>
<td></td>
<td>KML6</td>
<td>.611</td>
<td>.600</td>
</tr>
<tr>
<td>KM culture</td>
<td>KMC5</td>
<td>.584</td>
<td>.725</td>
</tr>
<tr>
<td></td>
<td>KMC6</td>
<td>.646</td>
<td>.728</td>
</tr>
</tbody>
</table>
### Table 4.9 (Continued)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Revised Measure Items</th>
<th>Varimax Solution</th>
<th>Communality</th>
</tr>
</thead>
<tbody>
<tr>
<td>KM technology</td>
<td>KMC7</td>
<td>.644</td>
<td>.729</td>
</tr>
<tr>
<td></td>
<td>KMT1</td>
<td>.772</td>
<td>.790</td>
</tr>
<tr>
<td></td>
<td>KMT2</td>
<td>.676</td>
<td>.741</td>
</tr>
<tr>
<td></td>
<td>KMT3</td>
<td>.690</td>
<td>.785</td>
</tr>
<tr>
<td></td>
<td>KMT4</td>
<td>.576</td>
<td>.757</td>
</tr>
<tr>
<td></td>
<td>KMT5</td>
<td>.659</td>
<td>.768</td>
</tr>
<tr>
<td></td>
<td>KMT6</td>
<td>.666</td>
<td>.767</td>
</tr>
<tr>
<td>KM measurement</td>
<td>KMM1</td>
<td>.653</td>
<td>.823</td>
</tr>
<tr>
<td></td>
<td>KMM2</td>
<td>.648</td>
<td>.710</td>
</tr>
<tr>
<td></td>
<td>KMM3</td>
<td>.735</td>
<td>.774</td>
</tr>
<tr>
<td></td>
<td>KMM4</td>
<td>.633</td>
<td>.766</td>
</tr>
</tbody>
</table>

Relevant SPSS outputs are shown in Appendix G.

3) Variable of Organizational Competency

According to the initial run of factor analysis with the constraint of the Eigenvalue ≥ 1, it resulted in 6 factors with a power of explanation equal to 77.854 percent of the total variance of the variable. The items belonging to Input-based Competency were allocated to two factors and the sixth factor consisted of items with factor loadings lower than an acceptable level. Referring to the literature review in the chapter three, the organizational competency was composed of four components. By statistical technique, the SPSS program can set the number of factors for extraction. The researcher made the decision to maintain only four factors in the scale and to run the second round of factor analysis. The fourth factor (transformation-based competency) had an Eigenvalue = 1.649.
From the second run of the factor analysis, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy or KMO statistics showed .931, which was greater than the acceptable level of .60, and the Bartlett’s Test of Sphericity value was significant (at p < .05); therefore the factor analysis was appropriate for the set of data.

The researcher took 17 measured items from a total of 52 items out of the scale since they were not allocated to the factors built upon the literature. Almost all items of managerial competency were kept as in the initial design. On the other hand, input-based competency had to take out 5 of the 10 items, and transformation-based competency had to take out 8 out of 14 items. Lastly, all 6 measure items of the output-based competency were kept as in the initial design stage.

The revised items in organizational competency scale are shown in Table 4.10. The revised scale explained 73.669 percent of total the variance of the organizational competency variable. In conclusion, the scale of organizational competency has been proven for its validity.

Table 4.10 Revised Measures in Organizational Competency Scale

<table>
<thead>
<tr>
<th>Factors</th>
<th>Measure Items</th>
<th>Varimax solution</th>
<th>Communality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial Competency</td>
<td>CMAN3</td>
<td>.686</td>
<td>.761</td>
</tr>
<tr>
<td></td>
<td>CMAN4</td>
<td>.770</td>
<td>.763</td>
</tr>
<tr>
<td></td>
<td>CMAN5</td>
<td>.724</td>
<td>.751</td>
</tr>
<tr>
<td></td>
<td>CMAN6</td>
<td>.665</td>
<td>.739</td>
</tr>
<tr>
<td></td>
<td>CMAN7</td>
<td>.639</td>
<td>.771</td>
</tr>
<tr>
<td></td>
<td>CMAN8</td>
<td>.771</td>
<td>.853</td>
</tr>
<tr>
<td></td>
<td>CMAN9</td>
<td>.579</td>
<td>.596</td>
</tr>
<tr>
<td></td>
<td>CMAN10</td>
<td>.768</td>
<td>.703</td>
</tr>
<tr>
<td></td>
<td>CMAN11</td>
<td>.784</td>
<td>.831</td>
</tr>
<tr>
<td>Factors</td>
<td>Measure Items</td>
<td>Varimax solution</td>
<td>Communality</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------</td>
<td>------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>CMAN12</td>
<td>.770</td>
<td>.795</td>
<td></td>
</tr>
<tr>
<td>CMAN13</td>
<td>.737</td>
<td>.774</td>
<td></td>
</tr>
<tr>
<td>CMAN14</td>
<td>.804</td>
<td>.852</td>
<td></td>
</tr>
<tr>
<td>CMAN15</td>
<td>.778</td>
<td>.814</td>
<td></td>
</tr>
<tr>
<td>CMAN16</td>
<td>.739</td>
<td>.807</td>
<td></td>
</tr>
<tr>
<td>CMAN17</td>
<td>.796</td>
<td>.689</td>
<td></td>
</tr>
<tr>
<td>CMAN18</td>
<td>.663</td>
<td>.533</td>
<td></td>
</tr>
<tr>
<td>CMAN19</td>
<td>.615</td>
<td>.814</td>
<td></td>
</tr>
<tr>
<td>CMAN20</td>
<td>.712</td>
<td>.783</td>
<td></td>
</tr>
<tr>
<td>CINPUT1</td>
<td>.742</td>
<td>.819</td>
<td></td>
</tr>
<tr>
<td>CINPUT2</td>
<td>.792</td>
<td>.846</td>
<td></td>
</tr>
<tr>
<td>CINPUT3</td>
<td>.673</td>
<td>.749</td>
<td></td>
</tr>
<tr>
<td>CINPUT4</td>
<td>.659</td>
<td>.806</td>
<td></td>
</tr>
<tr>
<td>CINPUT5</td>
<td>.654</td>
<td>.662</td>
<td></td>
</tr>
<tr>
<td>CTRAN8</td>
<td>.573</td>
<td>.666</td>
<td></td>
</tr>
<tr>
<td>CTRAN9</td>
<td>.711</td>
<td>.752</td>
<td></td>
</tr>
<tr>
<td>CTRAN10</td>
<td>.783</td>
<td>.755</td>
<td></td>
</tr>
<tr>
<td>CTRAN11</td>
<td>.648</td>
<td>.756</td>
<td></td>
</tr>
<tr>
<td>CTRAN12</td>
<td>.697</td>
<td>.782</td>
<td></td>
</tr>
<tr>
<td>CTRAN13</td>
<td>.572</td>
<td>.745</td>
<td></td>
</tr>
</tbody>
</table>
Table 4.10 (Continued)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Measure Items</th>
<th>Varimax solution</th>
<th>Communality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output-based competency</td>
<td>COUTPUT1</td>
<td>.696</td>
<td>.801</td>
</tr>
<tr>
<td></td>
<td>COUTPUT2</td>
<td>.763</td>
<td>.784</td>
</tr>
<tr>
<td></td>
<td>COUTPUT3</td>
<td>.603</td>
<td>.719</td>
</tr>
<tr>
<td></td>
<td>COUTPUT4</td>
<td>.657</td>
<td>.705</td>
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<td></td>
<td>COUTPUT5</td>
<td>.604</td>
<td>.700</td>
</tr>
<tr>
<td></td>
<td>COUTPUT6</td>
<td>.587</td>
<td>.683</td>
</tr>
</tbody>
</table>

Relevant SPSS outputs are shown in Appendix G.

4.2.6.2 Scale Reliability Test

The researcher conducted a Cronbach Alpha analysis to test the reliability of the scale for the dependent variable and two scales for the independent variables. The results are summarized in Table 4.11 below:

Table 4.11 Reliability of the Scales

<table>
<thead>
<tr>
<th>Variables</th>
<th>Scales</th>
<th>Number of Measure Items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent</td>
<td>Organizational performance</td>
<td>13</td>
<td>.712</td>
</tr>
<tr>
<td></td>
<td>Knowledge management</td>
<td>22</td>
<td>.966</td>
</tr>
<tr>
<td>Independent</td>
<td>Organizational competency</td>
<td>35</td>
<td>.981</td>
</tr>
</tbody>
</table>
These three scales had a reliability statistic higher than 0.70 at an acceptable level. This implies that the organizational performance scale, the knowledge management scale, and the organizational competency scale were proven for their reliability.

4.2.6.3 Summary of Scale Testing

The measurement items used in this study came from four sources as follows:

1) A proven KMAT questionnaire by Arthur Andersen and The American Productivity & Quality Center
2) A proven scale of Managerial competency by Boyatzis
3) A scale of organizational competencies in association with quality management implementation in Spanish private firms, a study of Ana Belen Escrig-Tena and Juan Carlos Bou-Llusar, and
4) Newly-constructed items by the researcher based on a review of the literature

According to the earlier-mentioned factor analysis, the researcher concluded that long-lasting proven scales such as 1) the Managerial Competency of Boyatzis and 2) the KMAT questionnaire of Anderson and APQC were robust and valid for application in a universal setting, while the newly-developed scales required more testing. If necessary to use the newly-developed scale, the user must keep in mind to reaffirm its validity and reliability in advance of usage. Comparison of scale validity is shown on the Table 4.12.

Table 4.12 Comparison of Scale Robustness

<table>
<thead>
<tr>
<th>Source of Measurement Items</th>
<th>No. of Items</th>
<th>No. of Items Just Kept</th>
<th>% Items Just Kept</th>
</tr>
</thead>
<tbody>
<tr>
<td>KMAT questionnaire, Arthur Andersen, and The American Productivity &amp; Quality Center</td>
<td>26</td>
<td>20</td>
<td>76.92%</td>
</tr>
<tr>
<td>Scale of managerial competency, Boyatzis</td>
<td>18</td>
<td>16</td>
<td>88.89%</td>
</tr>
</tbody>
</table>
Table 4.12 (Continued)

<table>
<thead>
<tr>
<th>Source of Measurement Items</th>
<th>No. of Items as in Initial Design</th>
<th>No. of Items Just Kept</th>
<th>% Items Just Kept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale of organizational competencies (in association with quality management implementation in the private sector), Ana Belen Escrig-Tena and Juan Carlos Bou-Llusar</td>
<td>23</td>
<td>12</td>
<td>52.17%</td>
</tr>
<tr>
<td>Newly-constructed for this study</td>
<td>14</td>
<td>9</td>
<td>64.29%</td>
</tr>
<tr>
<td>Total</td>
<td>81</td>
<td>57</td>
<td>70.37%</td>
</tr>
</tbody>
</table>

4.2.7 Statistical Analysis

Quantitative analyses using the SPSS program were conducted. The causal relationships among the variables were calculated by using Stepwise Multiple Regression, which is based on the Ordinary Least Square (OLS) to determine the relationships between the independent and dependent variables and to test the established hypothesis. Path Analysis was employed to determine the direct and indirect relationships among variables.

In addition, the researcher employed a t-test to measure the differences in organizational performance between the research university and teaching university, and employed a one-way between groups ANOVA to measure the differences in organizational performance between the autonomous public university, non-autonomous public university, and the private university.

4.3 Qualitative Method

4.3.1 Samples for In-Depth Interview

Sample size is an important consideration in qualitative research. Typically, researchers want to continue sampling until having achieved informational
redundancy or saturation—the point at which no new information or themes are emerging from the data.

Many scholars recommend using the stratified sampling, a method of sampling that involves the division of a population into smaller groups, known as strata, based on members’ shared attributes or characteristics. A random sample from each stratum is taken in a number proportional to the stratum's size when compared to the population. This improves the representativeness of the sample by reducing sampling error. However, when the sample size is less than about 30, a random sample will have a high chance of not being fully representative of the population.

Instead of using a fully random sample, in-depth interviews are usually done with people that are deliberately chosen to be as different as possible from each other. In-depth interviews need to ensure that many different types of respondents are interviewed. This is best done, not with random sampling, but with maximum-diversity sampling. Maria Krieger (in her white paper, “The Single Group Caveat,” Brain Tree Research & Consulting, 1991) advised that separate focus groups are needed for major segments, such as men, women, and age groups, and that two or more groups are needed per segment because any one group may be idiosyncratic. This implies that at least two samples from each category can be reasonably sure that it will be a good cross-section of the population.

As Sandelowski (1995: 61) pointed out, "determining adequate sample size in qualitative research is ultimately a matter of judgment and experience," and researchers need to evaluate the quality of the information collected in light of the uses to which it will be put, and the research method, sampling and analytical strategy employed. As specified in his study, the actual sample sizes for interview can range from five to sixty.

In this study, two rules will be applied to calculate the number of samples for each stratum. The former rule is proportion (at least ten percent of subgroup population) and the latter rule is at least two samples for each stratum. In this study, the types of university, which are classified as (1) autonomous public university (2) non-autonomous public university, and (3) private university, will be used as shared attributes of each stratum and the ten percent of the subgroup population belonging to each stratum will be maximum-diversity sampling. A summary of the samples for the in-depth interview is shown in Table 4.13:
Table 4.13 Samples for In-Depth Interview

<table>
<thead>
<tr>
<th>Types of University</th>
<th>Subgroup</th>
<th>Population of subgroup</th>
<th>No. of sample</th>
<th>Percentage of sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-autonomous public</td>
<td>Rajabhat</td>
<td>38</td>
<td>4</td>
<td>10.53%</td>
</tr>
<tr>
<td></td>
<td>Rajamangala</td>
<td>9</td>
<td>2</td>
<td>22.22%</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>15</td>
<td>2</td>
<td>13.33%</td>
</tr>
<tr>
<td>Autonomous public</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td></td>
<td>45</td>
<td>5</td>
<td>11.11%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>121</td>
<td>15</td>
<td>12.40%</td>
</tr>
</tbody>
</table>

A total fifteen Chief Knowledge Officers (CKOs) and designated members of KM teams from fifteen universities were interviewed in accordance with the well-prepared guidelines. In either subgroup, samples were selected on the basis of maximum diversity in terms of university size, orientation, and location.

4.3.2 Validity and Reliability

Qualitative validity and reliability had to be addressed to ensure the accuracy of findings from the interview. For validity, the representativeness, trustworthiness, authenticity, and credibility of the respondents were important, while the deliberately-prepared guidelines for the in-depth interview increased reliability.

The careful selection of the interviewees from different types of universities and university locations, as well as trustworthy and credible interviewees that were highly educated and held high positions at the university ensured of validity and reliability. In addition, the summary report of the interview was inspected by the interviewees as well.

Negative or discrepant information that ran counter to the study themes would be presented and triangulated different data sources of information in order to build a coherent justification. Methodological Triangulation was employed by comparing the
information from different sources, such as interviews and university publications, words and observations, quantitative findings and qualitative findings, etc.

4.3.3 Data Collection: In-Depth Interview

The in-depth interview is a popular qualitative research technique which involves conducting individual interviews with a small number of respondents to explore their perspectives, expectations, and experiences on a particular initiative, strategy, program or situation. In-depth interviews are useful for collecting detailed information about a person’s thoughts and behaviors or exploring new issues in depth. Interviews are often used to provide the context for other data and to offer a comprehensive picture of the program or project implementation and insights behind hidden problems or circumstances.

In-depth interviews can provide more detailed information than other data collection methods, such as the questionnaire survey, because the respondents tend to feel more comfortable or it is more convenient for them to have a face-to-face conversation. However, this technique faces some pitfalls and limitations, such as being prone to bias, being time-intensive, the relative dependability of the interviewer and interviewing techniques, and not being able to reach generalizations. As mentioned earlier, in-depth interview findings are rooted in small samples and are intentionally used as a supplement tool for other research methods.

The process of conducting an in-depth interview closely follows other research methods. It consists of planning, developing instruments, collecting data (field work), analyzing data, and reporting and disseminating the findings.

In this study, the researcher used the in-depth interview as a supplement tool in order to obtain more information in detail and to enhance the chance for questions and answer clarifications. Interviews can be conducted face-to-face or other media can be used, such as Skype or a chat room on the Internet. The procedures range from unstructured and open-ended questions to highly-structured and close-ended questions. The researcher employed the face-to-face interview in order to give the most respect to the interviewees. The standardized open-ended interview was used to obtain comparability of responses in the process of the data analysis.
The researcher prepared an interview guideline in order to insure that an essential and important agenda and issues were addressed. The guideline was reviewed by the panelist, who also reviewed the questionnaire in order to arrive at consistency and content validity. The interviews were conducted in a professional manner and exhibited a well-organized sequence of questions so that the researcher could retain consistency across all interviews.

In general, the interview consisted of three parts, beginning with the introduction, followed by the questions and answers in the prepared guideline, and lastly the closing session. The key messages in the introduction session related to the personal introduction, the identifying purpose, procedure, and duration of the interview, and confidentiality and consent. The second session was the most important and had to be carried out professionally. The final session was the time to ask for further comments, suggestions, or recommendations as well as to express gratitude to the interviewee. If a follow-up session in the future was necessary, the interviewee was informed in advance.

The guideline for the in-depth interview for this study is shown in Appendix F.

A total fifteen university representatives accepted the interview proposal; nine Chief Knowledge Officers (CKO) and six designated members of the KM teams. They represented total fifteen universities with the maximum diversity in several aspects as planned. None of the interviewees was required to disclose his or her name, position, or organization. Any inference leading to the identification of the interviewees was omitted in order to guarantee anonymity and confidentiality. The information, comments, and suggestions received at the interviews were used as supplementary data for this study during the period of the interpretation and discussion of the findings.
CHAPTER 5

DATA ANALYSIS

5.1 Data Collection

The data collection was carried out from June 2011 to July 2012. It took quite longer than planned because of the great flood occurring throughout most regions of Thailand during that year. The flood began in the North at the end of July and affected the central region from September. Bangkok and vicinity area were flooded from October. The situation was at the most severe stage during October and November. By the end of January 2012, most flooded areas had dried and cleaning and maintenance processes were begun.

Not different from other sectors, many universities were also affected by the great flood. It made them postpone the examination period of the first semester and also postpone the start date of the second semester in for educational year 2011. The university managements, the target sample of this study, were busy protecting their universities from the flood and some designated their institution’s premises as temporary shelters for the flood victims. Their faculty, staff, and students needed help and support. The researcher received several telephone calls from the respondents about a delay in response.

The postal system of Thailand was also affected by the flood. Roads and rails were partly under water. Many post offices were flooded and they stopped their operation for a couple of months. The researcher went to the central office of the Thailand Post and was informed that the mail would be kept in a safe place but that delivery had to be delayed. The last lot of questionnaires was returned to the researcher at the beginning of March, 2012.

Two questionnaires were distributed to each university by mail or by hand. One questionnaire was sent to the president of the university. The other was sent to the director of the bureau, institute, office or center in charge of knowledge
management and/or educational quality assurance. The questionnaires were sent out from the middle of June, 2011 to the beginning of July 2011 during the first round, and resent to certain universities during the second round of the 4th week of August, 2011 and during the third round of the 1st week of February, 2012.

Field trips to Bangkok and vicinity, two provinces in the North, two provinces in the Northeastern, one province in the Central, and lastly a province in the South were made from August, 2011 to July, 2012 in order to obtain more questionnaire feedback and to conduct on-campus interviews with the chief knowledge officer and designated KM committee members of the universities.

The total population was 121 universities. Each university received two questionnaires. Therefore 242 questionnaires were sent out. By the end of March, 2012, a total of 151 questionnaires (62.39 percent) were received from 104 universities (85.95 percent) by mail, fax, email, and by hand. By the end of July, a total of 15 interviews had been completely carried out.

5.2 Characteristics of the Respondents

The respondents’ demographic information for this study survey can be summarized from many perspectives, such as gender, age, retention, educational levels, types of job, and lastly degree of knowledge management involvement.

Table 5.1 Gender of Respondents

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>81</td>
<td>53.64%</td>
</tr>
<tr>
<td>Female</td>
<td>70</td>
<td>46.36%</td>
</tr>
<tr>
<td>Total</td>
<td>151</td>
<td>100%</td>
</tr>
</tbody>
</table>

From the gender perspective, the number of male and female personnel working in the universities in the position of middle management up to top
management (who were the target samples of this study) was not very different. The males held a bit more positions than the females.

**Table 5.2** Age and Retention of Respondents

<table>
<thead>
<tr>
<th>Age</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average age</td>
<td>49.3 years.</td>
</tr>
<tr>
<td>Average years of retention</td>
<td>15.7 years.</td>
</tr>
</tbody>
</table>

The average age of the respondents was 49.3 years, with an average retention of 15.7 years. This implies that the management of the university is senior personnel with a long period of experience at the current university.

**Table 5.3** Educational Level of Respondents

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor</td>
<td>8</td>
<td>5.30%</td>
</tr>
<tr>
<td>Master</td>
<td>79</td>
<td>52.32%</td>
</tr>
<tr>
<td>Doctoral</td>
<td>64</td>
<td>42.38%</td>
</tr>
<tr>
<td>Total</td>
<td>151</td>
<td>100%</td>
</tr>
</tbody>
</table>

The respondent’s education level was a master degree (52.32 percent), followed by a doctoral degree (42.38 percent) and a bachelor degree (5.30 percent). Approximately 95 percent of the respondents held postgraduate degrees. This implies that the respondents were reliable and tended to provide reliable responses, as Alwin and Krosnick noted.
Table 5.4 Position of Respondents

<table>
<thead>
<tr>
<th>Position</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>President</td>
<td>19</td>
<td>12.58%</td>
</tr>
<tr>
<td>Vice or Assistant President</td>
<td>54</td>
<td>35.76%</td>
</tr>
<tr>
<td>Dean or Deputy Dean</td>
<td>9</td>
<td>5.96%</td>
</tr>
<tr>
<td>Director</td>
<td>61</td>
<td>40.40%</td>
</tr>
<tr>
<td>Others</td>
<td>8</td>
<td>5.30%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>151</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The respondent’s position was director (40.40 percent), followed by vice/assistant president (35.76 percent), president (12.58 percent), dean/deputy dean (5.96 percent) and others (5.30 percent) respectively. Approximately 48 percent of the respondents held the position of top management of the university (including president, vice-president and assistant president). Approximately 95 percent of the respondents were a director or at the upper level of management. This implies that most universities assign the vice-president to be the major person responsible for knowledge management activities or chief knowledge officer (CKO). This is consistent with the finding from the in-depth interview and the review of university publications and websites.
Table 5.5 Degree of Knowledge Management Involvement of Respondents

<table>
<thead>
<tr>
<th>Degree of Involvement</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>KM major responsible person</td>
<td>89</td>
<td>58.94%</td>
</tr>
<tr>
<td>KM progress reporter</td>
<td>18</td>
<td>11.92%</td>
</tr>
<tr>
<td>KM participant</td>
<td>33</td>
<td>21.85%</td>
</tr>
<tr>
<td>KM participant in the past</td>
<td>9</td>
<td>5.96%</td>
</tr>
<tr>
<td>Non participant in KM</td>
<td>2</td>
<td>1.32%</td>
</tr>
<tr>
<td>Total</td>
<td>151</td>
<td>100%</td>
</tr>
</tbody>
</table>

The respondents were the major responsible person for KM (58.94 percent), followed by KM participants (21.85 percent), KM progress reporter (11.92 percent), KM participant in the past (5.96 percent), and Non-participant in KM (1.32 percent). The respondents were the target sample because approximately 71 percent of the respondents were active persons in KM implementation of the university and approximately 93 percent of the respondents were currently involved more or less in KM implementation.

Table 5.6 University Orientation of Respondents

<table>
<thead>
<tr>
<th>University Orientation</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>30</td>
<td>19.87%</td>
</tr>
<tr>
<td>Teaching</td>
<td>121</td>
<td>80.13%</td>
</tr>
<tr>
<td>Total</td>
<td>151</td>
<td>100%</td>
</tr>
</tbody>
</table>

The ratio of respondents working in research and teaching universities was about 1:4, while the ratio of sample universities classified by orientation in this study was about 1:5. This meant that means the respondents from research universities paid a bit more interest to replying to the questionnaire.
Table 5.7 University Type of Respondents

<table>
<thead>
<tr>
<th>University Type</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-autonomous public</td>
<td>75</td>
<td>49.67%</td>
</tr>
<tr>
<td>Autonomous public</td>
<td>20</td>
<td>13.25%</td>
</tr>
<tr>
<td>Private</td>
<td>56</td>
<td>37.08%</td>
</tr>
<tr>
<td>Total</td>
<td>151</td>
<td>100%</td>
</tr>
</tbody>
</table>

The respondents worked in non-autonomous public universities (49.67%), followed by private universities (37.08%) and autonomous public universities (13.25%). These numbers were close to the percentages of the university population classified by type in this study.

5.3 Characteristics of the Sample

The unit of analysis was “organizational level” or the university as a whole. If two responses from the same university were received, the average score of the responses was calculated and used as the representative score of that university. In this study there were 47 universities (45.19 percent) replying to two questionnaires and 57 universities (54.81 percent) replying to only one questionnaire. A total of 104 universities replied to the questionnaires but one of them had not yet submitted an internal audit report for educational year 2009 to the Commission of Higher Education. That response thus needed to be taken out of the analysis. The characteristics of the sample universities are summarized in Table 5.8.
Table 5.8 Characteristics of the Samples (103 cases)

<table>
<thead>
<tr>
<th>University categories</th>
<th>Questionnaire responses (Unit of analysis: University)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Distribution</td>
</tr>
<tr>
<td>University orientation</td>
<td>University</td>
</tr>
<tr>
<td>Research</td>
<td>University</td>
</tr>
<tr>
<td>University type</td>
<td>University</td>
</tr>
<tr>
<td>Non-autonomous Public</td>
<td>University</td>
</tr>
<tr>
<td>Autonomous public</td>
<td>University</td>
</tr>
<tr>
<td>Private</td>
<td>Grand total</td>
</tr>
</tbody>
</table>

The figures in Table 5.8 show that more than 80 percent of each category of university was included in the study. This implies that the data represented the target population of the study. Thus reliable and well-representative inputs were obtained.

5.4 Data Analysis and Results of the Study

5.4.1 Preliminary Check of the Data Set

To make sure that the data set fit the technique of multiple regression, the researcher had to check sample size, correlation coefficients, multicollinearity, singularity, outliers, and normality.

In this study, there were only 121 universities in the total population. The researcher received a response from 103 universities. The percentage of the responses at 85.12 percent from highly-educated respondents and the sample proportion to university types close to the population proportion ensured the representation and reliability of the data. Furthermore, when a small sample is involved, the R square value from running the multiple regression tends to be a rather optimistic overestimation of the true population (Tabachnick and Fidell, 2001: 147). The adjusted R square statistic corrects this value to provide a better estimation of the true
population value. Therefore the researcher used the adjusted R square instead of R square in the interpretation of the results. Importantly, the researcher assessed the statistical significance of the results in the ANOVA table. If “Sig” was lower than .05, the model reached statistical significance.

In Table 5.9: Correlation matrix and descriptive statistics, it can be seen that the correlation coefficients between the dependent variable and each independent variable were in between .10 and .558. The correlation between organizational performance and organizational competency was maximum, while the correlation between organizational performance and knowledge management leadership was minimum. Even though three correlation coefficients were lower than .30, as the generally-recommended level, the researcher decided to retain these variables, including university autonomy (r = .182), knowledge management leadership (r = .100), and knowledge management technology (r = .238) in order to be consistent with the framework of the study.

Table 5.9 Correlation Matrix and Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ORG. PERFORM</td>
<td>.323</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESEARCH</td>
<td>.461</td>
<td>.316</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUBLIC</td>
<td>.182</td>
<td>.510</td>
<td>.272</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AUTONOMY</td>
<td>.316</td>
<td>.059</td>
<td>-.019</td>
<td>.065</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KMPa</td>
<td>.100</td>
<td>.129</td>
<td>-.108</td>
<td>.130</td>
<td>.675</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KMLa</td>
<td>.313</td>
<td>.048</td>
<td>.041</td>
<td>.045</td>
<td>.623</td>
<td>.573</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KMca</td>
<td>.238</td>
<td>.031</td>
<td>.046</td>
<td>.007</td>
<td>.655</td>
<td>.475</td>
<td>.574</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KMTa</td>
<td>.346</td>
<td>-.018</td>
<td>.080</td>
<td>.072</td>
<td>.687</td>
<td>.528</td>
<td>.640</td>
<td>.638</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ORG.COMP</td>
<td>.558</td>
<td>.043</td>
<td>.088</td>
<td>.044</td>
<td>.690</td>
<td>.434</td>
<td>.646</td>
<td>.674</td>
<td>.693</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>39.1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>6.67</td>
<td>6.33</td>
<td>6.83</td>
<td>7.00</td>
<td>6.75</td>
<td>7.00</td>
</tr>
<tr>
<td>Minimum</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.00</td>
<td>1.50</td>
<td>2.33</td>
<td>2.33</td>
<td>2.00</td>
<td>3.70</td>
</tr>
<tr>
<td>Mean</td>
<td>34.1068</td>
<td>.1942</td>
<td>.6408</td>
<td>.1165</td>
<td>4.9951</td>
<td>4.5647</td>
<td>5.1974</td>
<td>5.0978</td>
<td>4.7464</td>
<td>5.4240</td>
</tr>
<tr>
<td>Std.Deviation</td>
<td>3.96532</td>
<td>.39750</td>
<td>.48212</td>
<td>.32240</td>
<td>.91747</td>
<td>1.02375</td>
<td>.88677</td>
<td>1.01617</td>
<td>1.08090</td>
<td>.62941</td>
</tr>
</tbody>
</table>

Where:

ORG. PERFORM = organizational performance
RESEARCH    = research-oriented university
PUBLIC      = public-type university
(both autonomous and non-autonomous)
AUTONOMY = university autonomy
KMPa = knowledge management process
KMLa = knowledge management leadership
KMCa = knowledge management culture
KMTa = knowledge management technology
KMMa = knowledge management measurement
ORG.COMP = organizational competency

For multicollinearity, Julie Pullant (2005: 142) has suggested that multicollinearity exists when r ≥ 0.9 between the independent variables. To ensure no problem of multicollinearity, the researcher checked the correlations between each pair of independent variables and found that no correlation coefficients was greater than .90, which was used as the threshold level. It can be concluded that no multicollinearity existed in the set of data.

Singularity occurs when one independent variable is actually a combination of other independent variables. The researcher was certain that during the stage of scale development, this kind of problem was prevented.

Tabachnick and Fidell (2005: 122) define outliers as those with standardized residual values above 3.3 or less than -3.3. The researcher used the SPSS program to remove the outliers from the analysis.

For normality, the researcher used the function in the SPSS program to check normality and linearity through residual scatterplots. The scatter plots from running the stepwise multiple regressions ensured the normality of the data set.

Relevant SPSS outputs are shown in Appendix G.

5.4.2 Results of the Analysis

In this study, the researcher ran stepwise multiple regressions 2 times. The first analysis was run in order to find the relationships between organizational performance as the dependent variable and the 9 independent variables, including organizational competency, 5 variables related to knowledge management, and 3 variables related to organizational characteristics. The results of the analysis showed that 4 variables, consisting of organizational competency (ORG.COMP), public-type university (PUBLIC), knowledge management technology (KMT), and research-
oriented university (RESEARCH), were significant determinants of organizational performance (ORG.PERFORM). The other 5 variables consisting of knowledge management process (KMP), knowledge management leadership (KML), knowledge management culture (KMC), knowledge management measurement (KMM), and lastly university autonomy (AUTONOMY) were not put into the model.

Organizational competency had the highest positive effect on the organizational performance of the university. The standardized coefficient was .683, followed by public-type university (standardized coefficient = .352), knowledge management technology (standardized coefficient = -.244) and lastly research-oriented university (standardized coefficient = .189). The model explained the variation of organizational performance at approximately 52.80 percent (adjusted R square = .528) and the model was statistically significant.

The second run of the analysis was carried out in order to find the relationships between organizational competency as the dependent variable and the 5 independent variables related to knowledge management. The results of the analysis showed that 4 variables, consisting of knowledge management process (KMP), knowledge management culture (KMC), knowledge management technology (KMT), and lastly knowledge management measurement (KMM), were significant determinants of organizational competency (ORG.COMP). The only variable of knowledge management leadership (KML) is not put in the model.

All four determinants had a positive effect on organizational competency. Knowledge management technology exhibited the highest impact on the organizational competency of the university. The standardized coefficient was .250, followed by knowledge management measurement (standardized coefficient is .247), knowledge management process (standardized coefficient = .232), and lastly knowledge management culture (standardized coefficient = .200). The model explained the variation of organizational competency at approximately 61.30 percent (adjusted R square = .613) and the model was statistically significant.

Relevant SPSS outputs are shown in Appendix G.
5.4.3 The Relationships Among Variables

In this study, the quantitative technique employed was the mean of the Ordinary Least Square (OLS) using the SPSS program. The data from the questionnaire survey and the CHE QA online system of the Commission of Higher Education were analyzed to determine the relationships between the dependent variable and the independent variables, and to test the established hypothesis of the study. Path analysis was also employed in order to determine the direct and indirect relationships among variables.

In addition, the researcher also conducted in-depth interviews with the chief knowledge officers and KM committee members in order to obtain greater understanding of the relationships among variables.

Hypothesis 1: The KM process, KM Leadership, KM culture, KM technology and KM measurement, organizational competency, the public-type university, the research-oriented university, and university autonomy directly affect organizational performance.

Table 5.10 Variables Directly Affecting Organizational Performance

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unstandardized Coefficients (b)</th>
<th>Standardized Coefficients (beta)</th>
<th>t</th>
<th>Sig.(t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>13.404</td>
<td></td>
<td>5.672</td>
<td>.000</td>
</tr>
<tr>
<td>ORG.COMP</td>
<td>4.302</td>
<td>.683</td>
<td>7.393</td>
<td>.000</td>
</tr>
<tr>
<td>PUBLIC</td>
<td>2.896</td>
<td>.352</td>
<td>4.893</td>
<td>.000</td>
</tr>
<tr>
<td>KMTa</td>
<td>-.952</td>
<td>-.244</td>
<td>-2.649</td>
<td>.009</td>
</tr>
<tr>
<td>RESEARCH</td>
<td>1.889</td>
<td>.189</td>
<td>2.639</td>
<td>.010</td>
</tr>
</tbody>
</table>

Note: R=.739   \( R^2 = .546 \)   Adjusted \( R^2 = .528 \)   F = 29.500   Sig. (F) = .000

Where:

ORG.COMP = organizational competency
PUBLIC = public-type university
KMTa = knowledge management technology
RESEARCH = research-oriented university
According to Table 5.10, it was found that 4 variables, consisting of organizational competency (ORG.COMP), public-type university (PUBLIC), knowledge management technology (KMT), and research-oriented university (RESEARCH), were significant determinants of organizational performance (ORG.PERFORM). The other 5 variables consisting of knowledge management process (KMP), knowledge management leadership (KML), knowledge management culture (KMC), knowledge management measurement (KMM) and lastly university autonomy (AUTONOMY) were not included in the model.

Organizational competency had the highest positive effect on the organizational performance of the university. The standardized coefficient was .683. This implies that organizational competency is the great driver of university performance. The second determinant was the public-type university. The standardized coefficient was .352. This implies that the public universities that receive funding from the government (including both non-autonomous public universities and autonomous public universities) tend to have better performance than the private universities. The third determinant was knowledge management technology. The standardized coefficient was -.244. This showed a negative relationship with organizational performance. This implies that the university oriented toward technology regarding knowledge management tends to have lower performance than the university not oriented toward technology. The justification of this effect will be elaborated later. The last significant determinant was the research-oriented university. The standardized coefficient was .189. This implies that the research university tends to have better performance than the teaching university. The model was able to explain the variation of organizational performance at approximately 52.80 percent (adjusted R square = .528) and the model was statistically significant.

Relevant SPSS outputs are shown in Appendix G.

The results of in-depth interview supported the SPSS findings. Most CKOs and KM committee members mentioned the over-investing of the budget in KM technologies, especially for the KM websites and huge computer servers for KM databases. Some KM websites had stood still since the first launch and some showed vacant pages with no inputs. Some KM databases were not created in a professional manner—user-friendly and easy to use for further analysis. Most provided
information was the pool of web links to internal or external sources of data. The internal sources were university policy, mission, vision, strategies, action plans, KM committee and structure, KM activities, educational standards and quality assurance, etc. The external sources were research papers, announcements of the Commission of Higher Education and associated agencies, relevant legislations, etc.

**Hypothesis 2**: The KM process, KM Leadership, KM culture, KM technology, and KM measurement indirectly, through organizational competency, affect organizational Performance.

**Table 5.11** Variables Indirectly Affecting Organizational Performance through Organizational Competency

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unstandardized Coefficients (b)</th>
<th>Standardized Coefficients (beta)</th>
<th>t</th>
<th>Sig.(t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>2.421</td>
<td></td>
<td>9.624</td>
<td>.000</td>
</tr>
<tr>
<td>KMMa</td>
<td>.144</td>
<td>.247</td>
<td>2.602</td>
<td>.011</td>
</tr>
<tr>
<td>KMTa</td>
<td>.155</td>
<td>.250</td>
<td>2.833</td>
<td>.006</td>
</tr>
<tr>
<td>KMPa</td>
<td>.159</td>
<td>.232</td>
<td>2.445</td>
<td>.016</td>
</tr>
<tr>
<td>KMCa</td>
<td>.142</td>
<td>.200</td>
<td>2.321</td>
<td>.022</td>
</tr>
</tbody>
</table>

**Note**: R=.793  R2 = .628  Adjusted R² = .613  F = 41.429  Sig. (F) = .000

Where:
- KMMa = knowledge management measurement
- KMTa = knowledge management technology
- KMPa = knowledge management process
- KMCa = knowledge management culture

According to Table 5.11, it was found that 4 variables, consisting of knowledge management process (KMP), knowledge management culture (KMC), knowledge management technology (KMT), and lastly knowledge management measurement (KMM), were significant determinants of organizational competency (ORG.COMP). Only the variable of knowledge management leadership (KML) was not included in the model.
All four determinants had a positive effect on organizational competency. Knowledge management technology had the highest impact on the organizational competency of the university. The standardized coefficient was .250. This implies that knowledge management technology is the great driver of university competency. The second determinant was knowledge management measurement. The standardized coefficient was .247. This implies that a specific set of indicators is required for the management of knowledge, to make use of or commercialize knowledge, and to allocate resources to increase the knowledge base. The third determinant was the knowledge management process. The standardized coefficient was .232. This implies that a well-defined process of sharing and transferring information, experiences and best practices among university personnel, as well as team-based learning are helpful for developing knowledge. The fourth determinant was knowledge management culture. The standardized coefficient was .200. This implies that the learning process should be designed to support either individual learning or group learning based on flexibility and to foster customer value as the major objective of knowledge management. The model explained the variation of organizational competency at approximately 61.30 percent (adjusted R square = .613) and the model was statistically significant.

Relevant SPSS outputs are shown in Appendix G.

The results of in-depth interview did not totally support the SPSS findings. All of the interviewees agreed that these five components were crucial to KM implementation and that organizational competency should be elevated, which would indirectly improve the university performance. Most CKOs and KM committee members ranked leadership and process as the most critical components. However, they mentioned insufficient participation of university president in KM activities. According to the open-ended question in the questionnaire survey, most of the respondents would like to see active participation of the university president as CKO by himself or herself. Assigning a vice-present to become a CKO with no real authority delegation in terms of budget allocation could lead to unsuccessful KM implementation. One third of the interviewees believed that information technology and communication (ICT) systems were crucial parts for KM implementation, competency development, as well as organizational performance improvement.
However, two-thirds believed that ICT systems were only a supporting device for assisting the faculty and support staff in working more closely.

### 5.4.4 Causal Relationships Among Variables

The path analysis technique helps the researcher to construct the causal relationships among the variables in the study. The results obtained from the multiple regressions can indicate the direct and indirect effects of the independents on the dependent variable.

In this study, four indirect relationships were revealed, as seen below:

- **KMPa** → ORG.COMP → ORG.PERFORM
  
  The indirect effect = .232 X .683 = .158

- **KMCa** → ORG.COMP → ORG.PERFORM
  
  The indirect effect = .200 X .683 = .137

- **KMTa** → ORG.COMP → ORG.PERFORM
  
  The indirect effect = .250 X .683 = .171

- **KMMa** → ORG.COMP → ORG.PERFORM
  
  The indirect effect = .247 X .683 = .169

The above diagrams shows that four of the five knowledge management aspects had an indirect effect on the organizational performance of the university through organizational competency. Only knowledge management leadership had no indirect effect. The four relationships showed positive effects. This means that the improvement of either the knowledge management process, knowledge management culture, knowledge management technology, or knowledge management measurement can indirectly lead to the improvement of university performance as a whole.

Comparing the indirect effects, the effects of knowledge management technology (.171) and of knowledge management measurement (.169) were very close and had more influence on university performance than the effect of the knowledge management process (.158) and of knowledge management culture (.137).

The researcher has summarized all of the relationships between the independent variables and dependent variable in Table 5.12:
Table 5.12 Direct, Indirect, and Causal Relationships with Organizational Performance

<table>
<thead>
<tr>
<th>Variables</th>
<th>Direct Relationship</th>
<th>Indirect Relationship</th>
<th>Causal Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORG.COMP</td>
<td>.683</td>
<td>.683</td>
<td></td>
</tr>
<tr>
<td>KMPa</td>
<td>.158</td>
<td>.158</td>
<td></td>
</tr>
<tr>
<td>KMCa</td>
<td>.137</td>
<td>.137</td>
<td></td>
</tr>
<tr>
<td>KMTa</td>
<td>-.244</td>
<td>.171</td>
<td>-.073</td>
</tr>
<tr>
<td>KMMa</td>
<td>.169</td>
<td>.169</td>
<td></td>
</tr>
<tr>
<td>PUBLIC</td>
<td>.352</td>
<td>.352</td>
<td></td>
</tr>
<tr>
<td>RESEARCH</td>
<td>.189</td>
<td>.189</td>
<td></td>
</tr>
</tbody>
</table>

Where:

1) The indirect relationship of Knowledge Management Process (KMPa) and Organizational Performance was calculated by .232 X .683 = .158.

2) The indirect relationship of Knowledge Management Culture (KMCa) and Organizational Performance was calculated by .200 X .683 = .137.

3) The indirect relationship of Knowledge Management Technology (KMTa) and Organizational Performance was calculated by .250 X .683 = .171.

4) The indirect relationship of Knowledge Management Measurement (KMMa) and Organizational Performance was calculated by .247 X .683 = .169.

Table 5.12 shows that there were a total of 7 variables having causal relationships with the dependent variable. There were four variables showing direct relationships and four others showing indirect relationships. Only knowledge management technology variable had both a direct and indirect relationship with organizational performance. The sum-up of the direct and indirect relationship can present the causal effect of either variable on the organizational performance.

Considering the causal relationships as listed in the above table, six out of seven relationships showed a positive direction and only one showed a negative direction. This implies that improvements in the four determinants, including organizational
competency (.683), knowledge management measurement (.169), knowledge management process (.158), and knowledge management culture (.137) can improve the overall performance of the university. The organizational competency had the most effect, followed by knowledge management measurement, knowledge management process, and knowledge management culture.

On the other hand, the variable of knowledge management technology showed a negative direct effect, together with a positive indirect effect, on organizational performance. It was revealed that the total causal relationships with organizational performance were negative. The causal relationship was -.073, with values quite close to zero. This may imply that high investment in knowledge management technology to reach real-time and comprehensive computerized systems may not improve the overall performance of the universities in the long run. High investment in hardware, software, and networking to collect valuable information and knowledge, as recognized as institutional memory, and a computerized system to help people keep connected, seemed to have an outstanding impact during the launch of KM projects or activities in the short-run.

The results of the open-ended question and the in-depth interview can help justify the negative effect of ICT on organizational performance. Since financial resources and budgets were scarce and insufficient for every activity of the university, over-investment in technology matters may consume partial money for the other activities or projects which may be indeed and may lead to more improvements in the university’s performance than knowledge management technology does. Furthermore, most CKO and KM members mentioned that the individual’s capacity and the organization’s capacity in terms of ICT skills should be prepared in advance in order to support the changing ways of dealing with data and knowledge in the organization. ICT infrastructure and advanced hardware and software need to be tailored to fit the level of computer skills of the university personnel, especially ICT technical staff that are in charge of administering the overall system. Optimal technology that fits the university people, infrastructure, and the real ICT needs should be considered rather than the most advanced or newest technology.

The public-type university can improve the overall performance of the university through enhancing the competitive position to recruit and retain highly-
qualified faculty members and management, exercising their reputation and public status to acquire more grants and projects from relevant public agencies, institutions, and the private sector. It is also possible to establish a tie or linkage with international agencies or foreign education institutions to set up a joint program or a joint research center.

The research-oriented university can improve the overall performance of the university through producing more research and innovations which can be commercialized, elevating the quality of publications to gain a leading role in a particular field, as well as exhibiting customer value in their products and services.

The relationships among variables in the analysis model based on the multiple regression results and the path analysis are presented in Figure 5.1 below.
5.4.5 Investigate Difference of Organizational Performance

**Hypothesis 3**: The organizational performance of the public university is different from that of the private university.

**Hypothesis 4**: The organizational performance of the autonomous-public university is different from that of the non-autonomous public university.

For Hypothesis 3 and 4, the researcher employed a one-way between groups analysis of variance in order to explore the impact of university types on
organizational performance, as measured by the Life Orientation Test. Samples were divided into three groups according to their types (autonomous public university, non-autonomous public university, and private university).

The Test of Homogeneity of Variances showed that Sig = .136 > .05; this means that the data set did not violate the assumption of homogeneity of variance. From the analysis of variance for in-between Groups, Sig = .000 < .05; this means that there was a significant difference somewhere among the mean scores of the organizational performance for the three groups.

From the Multiple Comparisons in-between Groups, three findings were found: 1) the mean score of organizational performance for the autonomous public university (M=36.08, SD=1.83) was significantly different from that of the private university (M=31.68, SD=4.31) 2) the mean score of organizational performance for the non-autonomous public university (M=35.33, SD=3.23) was significantly different from that of the private university (M=31.68, SD=4.31) and 3) the mean score of organizational performance for the autonomous public university (M=36.08, SD=1.83) was not significantly different from that of the non-autonomous public university (M=35.33, SD=3.23).

The effect size was calculated from the ratio between the sum of squares between groups and total sum of squares. In this study, sum of squares between group = 346.80 and total sum of squares = 1603.83. The effect size was .2162. Cohen (1988), as quoted in Pallant (2005: 219), classified .01 as a small effect, .06 as a medium effect, and .14 as a large effect. Therefore, in this study, the university type had a large effect on organizational performance. Approximate 22 percent of the variance of organizational performance was explained by university type.

Relevant SPSS outputs are shown in Appendix G.

In conclusion, it was found that the organizational performance of the public university (both autonomous and non-autonomous) was significantly different from that of the private university. The public universities tended to have better performance than private universities. However the organizational performance of the autonomous public university was not significantly different from that of the non-autonomous public university. The university type had a large effect on organizational performance.
Hypothesis 5: The organizational performance of the research university is different from that of the teaching university.

To investigate the difference in organizational performance between research and teaching universities, the researcher employed an Independent-sample t-test. It was found that the mean score of organizational performance of the research university (M=36.70, SD=1.78) was higher than that of the teaching university (M=33.48, SD=4.10).

According to Levene’s test for equality of variance, Sig = .014 < .05; this implies that the variances of these two groups were not the same. In the section of the t-test for equality of means, Sig (2-tailed) on the case of unequal variance = .000 < .05, implying that there was a significant difference in the mean scores of organizational performance between research and teaching universities.

The most commonly-used statistics for effect size is “eta squared,” which can be calculated from the ratio between t square and t square, plus the number of samples from group 1 and group 2 minus two. In this study, t = 5.358, N1 = 20, N2 = 83. The eta squared = .2213. Cohen (1988), as quoted in Pallant (2005: 209), classified .01 as a small effect, .06 as a medium effect, and .14 as a large effect. Therefore, in this study, the university orientation had a large effect on organizational performance. Approximate 22 percent of the variance in organizational performance was explained by university orientation.

Relevant SPSS outputs are shown in Appendix G.

In conclusion, it was found that the organizational performance of the research university was significantly different from that of the teaching university. The research universities tend to have better performance than teaching universities. The university orientation has a large effect on organizational performance.

5.5 Discussion of Findings

Referring to the path model of factors affecting organizational performance in Figure 5.1, there were one dependent variable and nine independent variables together with a total of fourteen relationships between variables.

The path revealed that seven variables were significant as hypothesized and the other two variables were not significant. Seven of the eight relationships had a
positive effect on organizational performance, while a relationship had a negative effect. The other six relationships were not significant, as hypothesized.

Among the four direct relationships, three of them showed a positive direction, while the other showed a negative direction. The negative one was not as same as the hypothesis. Among the four indirect relationships, all of them had a positive effect on organizational performance, and the magnitude of each relationship was not very different. The maximum was .250 and the minimum was .200.

The negative relationship between KM technology and organizational performance can be justified. First, financial resources and budgets are scarce and insufficient for every activity of the university. Over-investment in technology may consume part of the money for other matters which may be indeed and may lead to more improvements in university performance than technology does. Secondly, tacit knowledge sharing requires personal ties. The more advanced the technology is, the weaker the personal tie is. More justifications have been elaborated in the previous section.

The six relationships between the variables were not significant, as hypothesized. The justification for each pair of variables is as below:

1) The direct relationship between KM process and Organizational Performance

A relationship between these two variables was found in previous studies because they did not have an intermediate variable, namely Organizational Competency. However, they did in the private sector, where the core business processes such as production, procurement, and sales were addressed by knowledge management and directly affected the firm’s performance. In the setting of Thai universities, as found in the in-depth interviews, many universities did not implement knowledge management in core business processes, such as teaching and research development. Some universities implemented KM only with support processes, such as human resources, budget management, and strategic planning.

2) The direct relationship between KM leadership and Organizational Performance

A relationship between these two variables was found in previous studies because they did not have an intermediate variable, namely Organizational
Competency. In addition, three question items in the scale of KM leadership related to the following: 1) managing organizational knowledge was central to the university’s strategy 2) individuals were hired, evaluated and compensated for their contributions to the development of organizational knowledge and 3) leadership in KM activities and projects was exhibited among university administrators at all levels. These were removed at the stage of the scale validity test. This implies that these three matters were not successfully addressed by the university administrators. A transformational leader that provides followers with an inspiring mission and vision and gives them an identity, uses lateral and nontraditional thinking, uses participative decision-making, and promotes a cooperative and trustable work environment (Bass, 1985, 1990) may be needed in this kind of situation, where universities are forced to change policies and practices substantially. Victor et al. (2008) found that the influence of transformational leadership on organizational innovation and organizational performance depended on the level of organizational learning in an empirical study of pharmaceutical firms.

The researcher also received the same observations from the CKO and KM committee members’ interview—that leadership is crucial for new management tools such as knowledge management and competency-based human resource management. Actually, however, the university president as top management does not take role of CKO, but usually assigns one of the vice-presidents to do it instead. All of the above are justifications for why knowledge management leadership had no significant impact on organizational performance of the universities.

3) The direct relationship between KM culture and Organizational Performance

A relationship between these two variables was found in previous studies because they did not have an intermediate variable, namely Organizational Competency. In addition, at the stage of the validity test for the scale of KM culture, the items related to the climate of openness and trust permeating the university, and a culture of knowledge sharing, were removed. This implies that a sense of trust in the university administrators was not perceived by the university people in general and that the university administrators were not sufficiently concerned about establishing a culture of knowledge sharing within the department, across departments, and with external institutions and industries.
4) The direct relationship between KM measurement and Organizational Performance

A relationship between these two variables was found in previous studies because they did not have an intermediate variable, namely Organizational Competency. However, they did in the private sector, where the knowledge assets are commercialized and valuable in financial terms such as licenses or patent fees, sales growth, and marginal profit which can directly present as organizational performance. On the other hand, the valuation of knowledge assets is difficult and is rarely evaluated in the context of Thai universities.

5) The relationship between KM leadership and Organizational Competency

The results from the in-depth interview were opposite the statistical results. In the view of CKOs and KM committee members, leadership is crucial and plays a role in some transformation-based competencies, which were removed at the stage of the scale validity test. The items related to 1) the university improving its curriculum and student activities faster than before and faster than other universities 2) the university improving the process and content of its decision making through a participatory approach 3) the university improving its internal meetings and discussions based on an open and transparent approach 4) the university providing better evaluations of annual reports 5) the university increasing the flexibility of its work processes and allowing the personnel to take initiative and assimilate better ways of doing jobs and 6) the university facilitating the informal structures of the organization to improve communication efficiency between personnel. This implies that these six matters were not successfully addressed by the university administrators.

6) The relationship between University Autonomy and Organizational Performance

University autonomy was part of the conditions under the International Monetary Fund’s (IMF) loan package when Thailand faced the economic crisis in 1997. To minimize public expenditure, all state agencies, including universities, were encouraged to be self-sufficient and self-administrating. The “Autonomous University” can be described as a university not governed by the Office of The Higher Education Commission or they are self-governing under each university’s regulations. Sources
of revenue are from state subsidy and income from tuition fees, research, seminars, consultancy and other benefits, etc. As of February, 2010, there were fourteen autonomous public universities. The negative aspect of the autonomous university is the fear that it will become a private organization geared toward turning a profit; tuition fees would soar, so many of the youth from poor families would lose their educational opportunities while the positive aspect is that the public university would become independent from bureaucracy.

The autonomous public university in Thailand can be classified into 3 groups: 1) originally established as autonomous public university 2) later changed by reform bills and 3) Buddhist university. The first group consists of four universities including Suranaree University of Technology, Mae Fah Luang University, Walailak University, and University of Phayao. Suranaree University of Technology was the first autonomous university of Thailand in 1990. The existing eight public universities and two Buddhist universities gradually incorporated into autonomous status when their reform bills were approved by the cabinet and the parliament. Nowadays, there are thirteen additional draft bills of university reform remaining in the legislative process.

Based on the research findings, the new platform of self-governing education institutions still needs a longer period of time to pave the way for better organizational performance, as expected when the universities become independent from bureaucracy. New public management tools, such as empowerment, decentralization, managerial autonomy, and transformational leadership should be considered to be applied in the administration of the autonomous universities. In the long run, the dual personnel management system may deteriorate the morale of university people because a pair of faculty members, one a civil servant and the other a university employee, do the same job, hold the same educational degree, academic title and experiences but receive different performance appraisal and compensation packages. Thus the culture of knowledge sharing and transferring would be impeded.

5.5.1 Variables Directly Affecting Organizational Performance

5.5.1.1 Organizational Competency

In line with the review of the literature, this factor had the greatest effect (0.683) on the organizational performance of the Thai universities. The
combination of four competencies, comprised of managerial competency, input-based competency, transformation-based competency, and output-based competency, was a good predictor of university performance.

The university with managerial competency is the one whose administrators are competent managers, as Boyatzis suggested that they should have the following 12 competencies: 1) efficiency orientation 2) proactivity 3) diagnostic use of concepts 4) concern with impact 5) self-confidence 6) oral presentation 7) conceptualization 8) use of socialized power 9) managing group process 10) perceptual objectivity 11) self-control and 12) stamina and adaptability. In addition, the university administrators are the ones that emphasize accumulating valuable knowledge for the organization and are capable of seeking resources, competencies, or technologies as required. It can be concluded that the university expecting higher performance should develop the managerial skills and competencies for the present administrators and the successor.

The university with input-based competency is the one that is efficient in collecting critical knowledge from both within and outside the university under supervision for cost effectiveness. It is the university that is capable of engaging in the necessary expertise to address its interest. It is also keen on the establishment of experts and specialist networks and keeping in touch with them regularly. It can be concluded that the university expecting higher performance should emphasize collecting critical knowledge at a reasonably affordable cost as well as developing and maintaining a network of experts and specialists.

The university with transformation-based competency is the one whose personnel have been working together for a long time, are well-coordinated, voluntarily transmit and share useful information and knowledge to each other, and voluntarily devote time after normal working hours to accomplish their individual or group assignments. It is the case where the university promotes personnel participation in goals and means setting, arranges periodic activities and programs to sustain organizational loyalty, and lastly promotes the spirit of dialogue and acceptance of diverse opinions in order to stimulate creativity and learning. It can be concluded that the university expecting higher performance should emphasize the soft side of human resource management in terms of commitment and loyalty, tacit knowledge creation, and participatory management.
The university with output-based competency is the one that continually improves the quality and reliability of its graduates, curricula, research works and relevant academic services, improves conformance to educational standards and relevant regulations, improves reputation and image, and plays an important role in guiding society in specific fields. It is the case where highly qualified personnel can be attracted, developed, and maintained since the core competencies of the university are its human resources.

5.5.1.2 Knowledge Management Technology

Contrary to the proposed model for analysis, the factor of knowledge management technology had a negative direct effect (-.244) on the organizational performance of the university. Nowadays it is the era of information and communication technology, where new products are launched every hour on web-stores. Smart phones have replaced the role of the traditional telephone, the standard cell phone, as well as other communication devices such as copying and facsimile machines. It is generally accepted that this technology has eased the daily life of people.

Knowledge management is exceptional. It can be justified by the process of knowledge creation of the SECI model initiated by Takeushi and Nonaka. Both authors stated that most organizational knowledge is tacit knowledge and that knowledge creation requires the processes of socialization, externalization, combination, and internalization. The socialization process works more efficiently when face-to-face interaction is exhibited. Knowledge management based on technology-oriented infrastructure may lessen the chances of people to know each other, to learn from seeing and practicing together, as well as to feel the real need of customers and stakeholders. Personal commitment and ties to the group and overall organization may deteriorate because of technological applications. The observations from the in-depth interview on this matter were quite interesting. The respondents mentioned web-based technology, a common use for knowledge management implementation by many universities. The need for investment in a computer server and web design was perceived in general. The university website’s structure identified the web pages for knowledge management at the university level and at the department level, but when surfing further, little knowledge or even information was uploaded to the web of the particular university. This can be another reason for the negative impact of knowledge management technology on organizational performance.
Financial resources and budgets are scarce and insufficient for every activity of the university. Over-investment in technology may consume part of the money for the other matters which may lead to more improvements in university performance than technology does.

However, knowledge management technology had a positive indirect effect (.171) on organizational performance—the total causal relationship between knowledge management technology and organizational performance was still a negative number (-.073). This finding is in the same direction as that found in Huang’s study (2005), which indicated that innovation capital has an inverted U-shape relationship with firm performance; information technology capital had no significant impact on firm performance. This implies that knowledge management technology may yield a positive impact at an earlier stage and its impact decreases later to being neutral or even negative in the long run.

5.5.1.3 Public-Type University

According to the results of the analysis, public universities in Thailand tend to perform better than private universities. The variable of the public-typed university had the second large direct effect (.352) on organizational performance. It is because they are larger, more famous and more recognized than private universities; they are more capable of recruiting qualified faculties, management and support staff. They also take advantage of enrolling qualified students that are seeking a high-standard institution with lower tuition fees. In addition, the public universities gain reliability from employers and industries that usually give more credit to their graduates.

The public universities get all managerial resources by the government, such as financial support, scholarships, infrastructure development, textbooks and other educational material, as well as administration policy. These place them in a comfort zone where operational risks are minimized. In this way the public universities can conduct academic work with less financial pressure.

In rural areas of Thailand, the Rajabhat universities are major higher educational institutions located in nearly half of all of the provinces of Thailand. Rajamangala Universities of Technology are also important in terms of area of coverage. A total of 9 universities with 41 campuses support the high demand for
vocational and occupational education graduates. Both Rajabhat universities and Rajamangala Universities of Technology have gained a good recognition and provide plenty of opportunities to collaborate with local agencies, communities, and businesses as well.

Major public universities are in the process of changing. Approximately half of them have already incorporated into autonomous public universities. The rest are under legislative processes.

5.5.1.4 Research-Oriented University

This factor is a significant predictor of university performance. It had a direct positive effect (0.189) on the organizational performance. The research universities tend to have better overall performance than teaching universities. This is not surprising because the government of Thailand promotes a knowledge-based society and a creative economy, and the research universities can be good supporters of those goals. Moreover, it was found that the research universities are different from teaching universities in terms of faculty quality. The percentage of full-time faculty holding a degree of philosophy or doctoral degree is higher in research universities than in teaching universities. In the same direction, the percentage of full-time faculty holding academic positions (professor, associate professor, and assistant professor) is higher in research universities than in teaching universities.

As Afiouni (2007) has indicated, human resource initiatives alone are not enough to affect organizational performance. They need to be integrated within broader knowledge management initiatives to allow the organization to develop its human capital and to create value. The research universities are in a sound position in terms of enhancing their human resources based on the knowledge management system, and their human capital will create a comparative advantage or extraordinary performance for their organizations.

5.5.2 Variables Indirectly Affecting Organizational Performance

5.5.2.1 Knowledge Management Process

The knowledge management process had indirect effect (0.158) on the organizational performance through organizational competency. This reaffirms the previous literature—that the knowledge management process can lead to the
improvement of organizational effectiveness. This concerns how the organization can nurture, leverage, and motivate people, particularly knowledge workers, to improve performance, speed up innovation, and share their capacities to meet organizational objectives.

Nonaka and Takeuchi (1995) have stressed the importance of tacit knowledge and have placed great emphasis on establishing the conditions that encourage the exchange of tacit knowledge between individuals through a highly-interactive social process and direct interaction in a co-located, face-to-face work environment. The researcher included tacit knowledge value and the cooperative learning process (such as team-based learning) in the scope of the study and found that they are part of the knowledge management process.

The knowledge management process is important since it performs the role of a shared space, so-called “ba,” as Nonaka and Konno (1998) have indicated, where organizational members look for new ideas, transfer best practices and lessons learned, and work together across departments to create new knowledge. Knowledge must be embedded in the knowledge management process.

### 5.5.2.2 Knowledge Management Culture

Knowledge management culture had an indirect effect (.137) on the organizational performance of the universities. This is consistent with previous studies. The organizational culture ranges from obviously seen (such as artifact, uniform, routines) to “do it by heart” (such as shared value and trust). The organizational culture can either encourage or impede knowledge creation, knowledge sharing, and organizational learning (Schein, 1985). In the context of this study, it was found that customer value, flexibility, and self-learning responsibility were major components of the knowledge management culture, while a sense of openness and trust and facilitation of knowledge sharing were removed at the stage of the validity test of the scale.

These three components of knowledge management culture were aligned with the implications of the National Education Act 1999, which promotes student-centered learning (customer value), incorporatization (flexibility), and lifelong learning (self-learning). The National Education Act encourages the strengthening of the linkages and interactions between the universities and modern
economic sectors. Such implications include tailor-made, in-house training courses, technology transfer programs, and business incubator programs.

5.5.2.3 Knowledge Management Technology

Knowledge management technology had an indirect effect (.171) on the organizational performance. This can be explained in terms of the data and information collecting and processing. Timeline, accuracy, and accessibility of information are major outputs of technology support. However, human beings are better than the advanced technology in terms of creating knowledge because knowledge creation requires the interaction among knowledge workers to discuss, exchange, brainstorm, etc. A suitable level of technology support embedded in the knowledge management system is useful for speeding up the knowledge management processes and to disseminate critical knowledge to persons in need (such as work in remote areas).

One of the rationales for higher education reform in 1999, as specified in the National Education Act, was the development and impact of information and communication technology regarding education provision. The project of Thailand Cyber University, so-called TCU, was initiated in 2005 to extend educational opportunities to those in need and to promote lifelong learning. TCU makes use of advanced technology to disseminate knowledge in the form of e-learning to learners everywhere and whenever it is convenient for them to learn. Currently there are 550 online courses and 17 programs of study delivered by TCU. More than 80,000 learners enroll in the online courses, ranging from self-pack learning programs to master’s degree programs. TCU also benefits from networking technology to create academic and research cooperation in distance education, with 39 universities or institutions in Thailand and overseas.

5.5.2.4 Knowledge Management Measurement

Knowledge management measurement had an indirect effect (.169) on the organizational performance of the university. This reaffirms the work of previous studies and the observations from the in-depth interview of the CKOs and KM members. The university that sets up specific indicators to manage knowledge, sets up a knowledge link to financial results, and lastly sets up means of resource allocation for an increased knowledge base tends to have better performance than others.
The need for measurement of knowledge management follows a bell curve pattern through the life cycle of a business, consisting of 5 stages (Lopez et al., 2001). Stage 1: Enter and advocate; formal measurement rarely takes place. This emphasizes finding redundant efforts, discovering areas where knowledge is lost, and reducing the frustration of affected members of the organization. Stage 2: Explore and experiment; this emphasizes measuring organizational awareness of KM projects and programs, measuring the knowledge gap and the progress of activities compared to the plan, or comparing to alternative concepts. Stage 3: Discover and conduct pilots; formal implementation of knowledge management occurs here and it is the time to capture the lessons learned from the pilot projects that can be transferred to a larger scale of implementation. At this stage, it is suggested to measure the business value, the retention of knowledge, the cultural impact, the effectiveness of communities of practices, the effectiveness of project management, and finally the intended results. Stage 4: Expand and support; here knowledge management benefits have already been proved. It is suggested to measure knowledge management as a strategic organizational competency. It is necessary to assess the fitness of knowledge assets and culture in relation to the whole organization. Stage 5: Institutionalize knowledge management; knowledge management becomes part of the organization’s way of doing business and the measurement emphasizes monitoring the evolution of the knowledge culture and learning organization.

Knowledge management can be viewed according to the process approach. This is related to acquiring good inputs, providing efficient and effective transformation processes, and managing knowledge deliverables to optimize values by the customers and stakeholders. Appropriate measurements of those processes are needed.

Knowledge management measurement aligns with the delegated authority of the university council in the new management context. The university council takes overall accountability and represents the needs of all stakeholders. The council is responsible for setting the vision and direction of the university, formulating policies on research and teaching, overseeing strategic human resource management, allocating resources and budget, as well as evaluating the performance of university administrators, faculty, and functional units. Measuring, auditing, and
reporting on the performance of knowledge management implementation should be regularly carried out to ensure cost-effectiveness and good governance, which are of interest to the council.

5.6 Conclusion of Findings

Statistical analysis and path analysis helped the researcher to reveal the relationships between the organizational performance as the dependent variable and the nine independent variables; namely, organizational competency, knowledge management process, knowledge management leadership, knowledge management culture, knowledge management technology, knowledge management measurement, public-type university, research-oriented university, and lastly university autonomy. Six of them had positive effects on the organizational performance, one of them had a negative effect, and the other two variables had no effects. Four of them had a direct effect and the other four had an indirect effect. One variable had both a direct and indirect effect but in different directions.

Organizational competency had the highest positive effect in terms of direct relationship and total causal relationship. Therefore the university should emphasize improving its organizational competencies. Among the four types of organizational competencies, managerial competencies assumed a central position in developing and deploying the other three types of competencies. Additionally, input-based competencies, transformation-based competencies, and output-based competencies were conceptualized to be linked to each other, implying potential synergistic interactions among them. Transformational leaders are necessary for the universities in this era because they can provide the followers with an inspiring mission and vision and give them an identity. The transformational leaders do articulate, communicate, and implement a strategic vision and enact a beneficial relationship between the organization and the environment.

The public-type university had the second highest positive effect in terms of direct relationship and total causal relationship. Both the autonomous and non-autonomous public university tend to have better organizational performance than the private university. To elevate performance, public universities can utilize their
resources, reputation, and connections as well as economies of scale and scope by the establishment of teaching and research in multi-disciplines. The large public universities in Bangkok and major cities may gradually transform their interests from producing graduates to producing research and innovation in order to gain more academic recognition by customers in terms of cited publications and registered and commercialized intellectual property. Rajabhat Universities and Rajamangala Universities of technology have an advantage the number of enrolled students and area of coverage nationwide. These universities could improve their organizational performance by providing higher academic or professional services to local agencies, communities, and businesses in order to gain higher satisfaction and financial support and recognition at the community level, and then gradually enhance their work to the national level.

Knowledge management technology had the third highest effect in terms of direct relationship but the smallest effect in terms of total causal relationships. This factor exhibited negative a direct effect (-.244) and a negative causal effect (-.073), even though it showed positive effect (.250) on organizational competency. As mentioned earlier, knowledge management is a human-oriented process, and the implementing of technology to support data collection and processing as well as to facilitate accessibility should be done at an optimal level of investment and in line with the computer skill level of university people. This strategy can minimize the negative effect of knowledge management technology. Investment in human capital is more sustainable in the setting of the university since the faculty and students are the most important knowledge assets. Resistance to technological change has deteriorated the goodwill regarding technology in many cases. People should be motivated and inspired to gradually internalize the new technology through a participatory approach and by clearly expressing their mutual benefits.

The research-oriented university exhibited the fourth highest direct effect on, but the third highest causal relationship with, organizational performance. It is also found that the research universities were different from the teaching universities in terms of faculty degrees and academic positions—they had more chances to get research grants and consultancy fees as additional income for the faculty and the university.
The knowledge management process, knowledge management measurement, and knowledge management culture are in the same position—they had only an indirect positive effect on the organizational performance and the influences were lower than those of other factors. However, if consider their effects on organizational competency, four components, namely the knowledge management process, knowledge management culture, knowledge management technology, and knowledge management technology, had a positive relationship with organizational competency and at quite a balancing magnitude. This implies that knowledge management implementation should be built up on the four pillars of process, culture, technology and measurement with a balance of importance.
CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The four objectives of this study were to investigate the organizational performance of Thai universities, to investigate the major determinants of knowledge management, organizational competency, and organizational characteristics affecting organizational performance of Thai universities, to investigate the differences of organizational performance among autonomous public, non-autonomous public, private, research and teaching universities, and to recommend policy implications for enhancing the effectiveness of knowledge management and organizational competency in the Thai university context. All objectives were achieved through the analysis of data obtained from survey questionnaires, secondary data from the CHE QA online system belonging to the Commission of Higher Education, and lastly from the in-depth interview of chief knowledge officers and knowledge management committee members of particular universities.

The researcher employed a “one-way between groups analysis of variance” to explore the impact of university types on organizational performance, and it was found that the organizational performance of the public university (both autonomous and non-autonomous) was significantly different from that of the private university. The public universities in Thailand tend to exhibit better performance than private universities. However the organizational performance of the autonomous public university was not significantly different from that of the non-autonomous public university. The university type has a large effect on organizational performance.

The researcher employed an “independent-sample t-test” to investigate the difference in organizational performance between the research and teaching university, and it was found that that the organizational performance of the research
university was significantly different from that of the teaching university—the research universities tend to have better performance than teaching universities. The university orientation has a large effect on organizational performance.

The researcher employed the “stepwise multiple regression” technique to analyze the relationships between variables and used the path analysis to establish the direct and indirect effect of each determinant on organizational performance. It was found that seven determinants, namely organizational competency, public-type university, research-oriented university, knowledge management process, knowledge management culture, knowledge management technology, and knowledge management measurement, had either direct or indirect effects on organizational performance. However, two determinants, namely university autonomy and knowledge management leadership, had no effects on organizational performance.

In terms of direct effects, organizational competency had the strongest effect, followed by the public-type university, knowledge management technology, and the research-oriented university. Three of them showed a positive impact, except the case of knowledge management technology, which had a negative impact.

In terms of indirect effects, knowledge management technology had the strongest effect, followed by knowledge management measurement, knowledge management process, and knowledge management culture. All of the indirect effects had a positive impact on organizational performance.

In sum, the total causal relationships between the determinants and the organizational performance were established by the path analysis, the organizational competency still kept the post of highest influencer on organizational performance, followed by public-type university, research-oriented university, knowledge management measurement, knowledge management process, knowledge management culture, and lastly knowledge management technology. Six of them exhibited a positive direction, except for knowledge management technology, which exhibited a negative direction.

Unexpectedly, the relationship between knowledge management leadership and organizational performance, as well as the relationship between university autonomy and organizational performance, did not exist. The justification for leadership matters was that the Thai university context is different from the western setting, where the knowledge management scale was developed. The processes of
getting to the post of top management vary very much in Thai universities; some are elected by the council of faculty, some are directly elected by all faculty members, students, and other stakeholders. Some are the owners of the university, and some are invited to take a post as symbolic status. Different origins result in different performance. In general, the university is not a profit organization; therefore, the university’s goals and objectives can vary from place to place and sometimes no common goals are communicated throughout the organization.

Contrary to the observations from the open-ended question in the last part of the questionnaire and from the in-depth interview, leadership was the key success factor for knowledge management implementation and for organizational performance as well. In some cases, the respondents mentioned that the present university presidents had not performed effectively or consistently with the changing demands and environment. The new roles in managing diversified needs and inspiring people to participate in objectives and performance indicator settings were primary and frequently mentioned.

Regarding university autonomy, the justification for its insignificant effect on organizational performance was the small number of sample (only 12 universities) in the study. Moreover the autonomous universities could be classified into 3 groups: four of them were originally established as autonomous public universities, seven were later changed by reform bills, and lastly a Buddhist university. These are different by nature. According to the limitations of the statistical technique, if there are only a few samples with extreme values, they can dominate the average value of the whole sample.

Consistent with the findings from the in-depth interview of representatives of two autonomous universities, university autonomy as not perceived in a common way by stakeholders, especially young and experienced faculty members. Some perceived the incorporatization as challenges and opportunities, while the others felt insecure and afraid of higher workloads. Although many small changes occurred in the universities, the true benefits of autonomy were difficult to obtain. Although the dual personnel management system was able to mitigate the resistance to change at the earlier stage, it resulted in double standards in the workplace in the long run.
6.2 Contributions

This study employed three concepts related to organizational performance, organizational competencies, as well as knowledge management, and integrated them into the proposed model of analysis. The researcher aimed to establish the proven linkages among those theories in the context of specific organizations such as universities, upon which only a few studies have touched. This study was designed in order to provide contributions to theory, and policy implications as well.

6.2.1 Contribution to Theory

The model of analysis was derived from the integration of organizational performance in the framework of the Balanced Scorecard by Kaplan and Norton; organizational competencies by Lado and Wilson in association with managerial competency of Boyatzis; and lastly knowledge management by several scholars, such as Nonaka and Takeushi, Anderson, Davenport, Linsey, Holsapples and Joshi, Chong and Choi, and Jakawattanakul.

The empirical results of this study revealed that six variables had a positive effect on organizational performance, one variable had a negative effect, and two variables had no effect. In terms of direct effect, three variables had a positive effect on organizational performance while one variable had a negative effect. In terms of indirect effect, four variables had a positive effect on organizational performance. The results of the study confirmed the idea that organizational competency, organizational characteristics, and knowledge management have causal relationships with organizational performance.

The magnitude of each effect varied. It was suggested classifying the determinants into 3 categories: strong influencer, moderate influencer, and lastly low or neutral influencer. The strong influencers were organizational competency, public-type university, and research-oriented university. The moderate influencers were knowledge management measurement, knowledge management process, and knowledge management culture. The low or neutral influencers were knowledge management technology, knowledge management leadership, and university autonomy.

It was found that four of the five knowledge management factors had a positive effect on organizational competency. The magnitude of each effect was not
very different. This could imply that knowledge management implementation should be built up on the four pillars, namely knowledge management process, knowledge management culture, knowledge management technology, and lastly knowledge management measurement, in a balanced structure of importance. Process and culture is a shared space, the so-called “ba,” where knowledge is embedded as noted by the knowledge theory of Nonaka and Konno. Deliberately-designed knowledge management technology and measurement are necessary mechanisms to support the implementation of the knowledge management system and organizational competency.

6.2.2 Contribution to Policy Implication

From the results of analysis, it can be seen that the most critical determinant effect on organizational performance was organizational competency, which was based on four groups of competencies, namely input-based competency, transformation-based competency, output-based competency, and last but not least managerial competency. The managerial competency was in a central position in developing and deploying the other three types of competencies. The organization should emphasize the development of managerial skills on the part of the current management and successors at all levels. Competent people and other resources, well-defined processes and mechanisms, and a good quality of university deliverables should be coordinated properly by competent management in order to be efficiently and effectively converted to organizational performance.

In addition, the university expecting higher performance should emphasize collecting critical knowledge at a reasonably affordable cost as well as develop and maintain the network of experts and specialist, give priority to the soft side of human resource management in terms of commitment and loyalty, tacit knowledge creation, and participatory management, and lastly attract, develop and maintain highly qualified personnel with the organization since they are the core competencies of the university.

According to the results of study, it was found that the type and orientation of Thai universities were the major determinants of organizational performance. Public universities had an advantage in terms of resources, reputation, connections, area coverage, and the number of students and quality faculty. Research universities can
cope well with the new era of the knowledge-based society and the creative economy, which are prominent policies of the Thai government. Small private universities are stuck in the middle and need additional strategies and tools to pave a way to success.

Knowledge management was confirmed by the results of the analysis to play a supportive role in the improvement of organizational performance in the case of Thai universities. The indirect effect of the four factors on organizational performance through elevating organizational competency should be recognized by the university community. Customer value should be placed as a priority in the design of process, culture, technology and measurement. Tacit knowledge is important and embedded in a valuable faculty member that can move in and out from time to time. The university management should also emphasize to establish the flexible mechanism to recruit and retain qualified faculties and establish places in physical or virtual terms) for them to share knowledge and work together. Multi-discipline research and consultancy projects across departments or even across universities can take place so that the streamline of learning will be open and active.

A university can move its progress or be impeded by the choice of technology implementation. The results of the study revealed that knowledge management technology has a negative direct effect but a positive indirect effect on organizational performance. The total causal effect was a bit of a negative sign, close to neutral. Thus it can be implied that over-investment in technology in terms of hardware, software, and networks may deteriorate the positive effect of technology for organizational competency building.

6.3 Recommendations

The final objective of the study was to make recommendations on improving organizational performance, organizational competency, and knowledge management implementations. Based on the synthesis of the statistical analysis and qualitative findings from the responses to the open-ended question and the in-depth interview, observation of published information in university publications and websites, a review of the relevant literature, andLastly suggestive comments received during the dissertation proposal presented in the 4th Asian Public Administration Network
Doctoral Student Conference, hosted by NIDA on the 2nd September of 2010, the researcher proposes three recommendations as follows.

6.3.1 Managing Core Competencies of Universities

According to previous literature, as mentioned in the chapter 3, core competency is a specific factor that an organization sees as being central to the way it, or its employees, works. It is not easy to imitate, is able to be leveraged widely to many products and markets, and contributes to the end consumer's experienced benefits. It can take various forms, including technical/subject matter know-how, and a reliable process and/or close relationships with customers and suppliers. The core competencies drive the performance of the organization. In the context of universities, human resources are the most important source of core competencies and are a generator of achievements in terms of quality graduates, recognized publications, commercialized innovation, centers of professional service, etc.

The people in the universities can be classified into 3 groups; namely, management, faculty, and support staff. Most of the university administrators take the role of faculty as well. Three groups of people should collaborate, hand-in-hand, in order to improve organizational performance.

Competency-based human resource management should be a central strategy in dealing with human resource issues. A job competency model based on a multiple job approach should be implemented. The job competency model will help the organization define a set of common competencies for all jobs and the set of specific competencies needed for a specific job or job family. Four general competencies are: meaning competency, relation competency, learning competency, and change competency. Competency gaps should be identified and closed with appropriate means, and competency management should be incorporated with succession planning in order to prepare for future promotion.

Talent management is another approach to dealing with people with a high potential, who are not easy to recruit and retain with the organization. Some universities face the need to re-capture the knowledge of the talent after they moved to other jobs. Knowledge management is a practical means for transferring individual knowledge to organizational knowledge. However, talent management can be another
supplementary approach to addressing this kind of problem. Four strategies are generally recognized for talent management as follows:

1) Performance management: talented people tend to accept feedback directly from their boss, colleagues, and relevant stakeholders and use the feedback as an input for performance improvement. The performance should be evaluated fairly and based on objective indicators, such as the contribution to knowledge creation, the timely accomplishments of research and innovation, or the cost benefit ratio of the project.

2) Succession planning: talented people tend to work harder and more efficiently, and they tend to be self-governing and result-oriented; therefore they usually expect recognition and fast-track promotion. Agreed succession plans with clear milestones can be used as a mechanism to drive and retain talented individuals.

3) Leadership development: highly-qualified, talented faculty sometimes cannot perform as expected when taking the role of management. Management is an art combining science, experience, and instinct. A mentoring system should be implemented to stimulate the process of tacit knowledge sharing and transferring from the experienced management to the management trainees.

4) Compensation: a traditional compensation scheme is not suitable for talented individuals. The university should provide the talent with job opportunities or extra compensation, such as overseas conferences, or being a university representative of a high-level board of a governmental agency and state enterprise.

6.3.2 Commercializing and Reporting Knowledge Asset

Commercialization of knowledge assets is prominent in the private sector, such as licensing and franchising activities, but there are not many successful cases of this in universities. It was found that Thai universities lack the capability to commercialize and report their knowledge assets. Knowledge assets are intangible, but can be used in operating activities or be held for earning rent (tuition fees, consultancy fees, service fees in the case of universities) or be held for administrative purposes. Knowledge assets have been proven to affect organizational performance but are not directly measurable. Valuation of intangible assets is difficult because
there is no market price for reference. Management has no incentive to share information and sometimes an intangible asset represents a “secret” of the organization. However, in the private sector, the International Accounting Standard No. 38 has laid down the principles for intangible accounting and reporting. This standard recognizes advertising, training, and research and development activities as intangible assets. A particular firm registered on the stock market may presume a different value between the market capital of a stock and the book value of that firm as the value of the knowledge asset.

The Balanced Scorecard approach, which all Thai universities have adopted for performance measurement, can be a starting point for reporting knowledge assets. The number of active databases, their value of intellectual properties registered, and level of recognition by the public regarding university products and services should be considered to measure and report. Image and reputation are another side of the knowledge assets of the university. The university should improve its reputation or play an important role in guiding society in specific fields. For example, many universities in Thailand have established an institution for polling either economic or political matters, but only a few are recognised by the mass media. This can be explained in terms of trustworthiness and credibility, another form of knowledge asset valuation.

The university administrators should acquire and update the valuable knowledge, resources, competencies as well as the technologies that are required to cope with new challenges. The university administrators should be able to identify groups of stakeholders whose needs are not being met and use this information as the input for research and improvements. Being close to the user of the knowledge is the key. Each industry or even each company has its specific problem that awaits appropriate knowledge, either new or adaptive knowledge. Currently, most universities give low intention to serving the small enterprises, which may be the right place for gaining a practical view of the value of knowledge. A large number of small successes are preferable to a masterpiece of development that may never come true.

6.3.3 Implementing Knowledge Management Successfully

Knowledge management should be regarded as a university agenda. Although knowledge management is a part of educational quality assurance, many university
administrators view knowledge management just a voluntary project or a temporary assignment to a special work team. Such cases exhibit low rates of success. In contrast, knowledge management which is put into a permanent task of people at all levels together with existing routines can inspire the people to take active involvement on knowledge management system. The involvement of people at all levels will guarantee for system continuity and growth. Selective processes in which knowledge is the key should be carefully conducted for pilot implementation in order to obtain an example of a success story. Forums to share success stories and to give recognition to knowledge management contributors should be regularly arranged to streamline the importance of knowledge matters. Contribution to creating knowledge or facilitating knowledge sharing should be part of performance appraisal annually. Concrete indicators for measuring these contributions should be agreed on and prepared in advance.

Open up the people to cooperate when weak ties exist. Dialogues to address diverse topics by an informal group of people with common interests across the university should be supported by the management. A climate of openness and trust should permeate the university with the introduction of participatory management and setting up a new mindset for knowledge management. Knowledge is not depleted but grows when it is used and shared. The social media keep people connected, and the university needs to learn how to use the social media wisely.

The knowledge facilitator as a change agent is accountable for the deployment of top management policy to the practitioners. The knowledge facilitator must be keen, persuasive, trustful, and strategic-oriented. The university has to give priority to increasing the number and quality of these facilitators. A tailored training program for new facilitators should be arranged periodically.

The transformational role of the leader is required. Even though the results of the statistical analysis did not find an effect of knowledge management leadership on organizational competency or organizational performance, this issue was raised most frequently in the open-ended question and during the in-depth interview as the key driver for successful knowledge management implementation. The expected roles of the leader range from transactional leadership (such as budget allocation, follow-up and evaluation, and performance appraisal) to transformational leadership (such as
inspiring role models, diversification management, continuity management, restructuring, culture management, and strategic management).

6.4 Future Research

This study revealed that knowledge management can be recognized as one of the management tools to drive university performance through elevating organizational competencies. It also revealed that public universities tend to perform better than private universities, and research universities tend to perform better than teaching universities. Small private universities are in the most disadvantaged positions because they lack resources and opportunities. It would be interesting to find out how knowledge management can make small private universities more competitive.

In addition, after the other thirteen public university reform bills are approved by the parliament, the number of autonomous universities will be large enough for conducting comparative studies on the organizational performance between the autonomous and non-autonomous public universities.
BIBLIOGRAPHY


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Directory of Universities in the Study
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Directory of Universities in the Study

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1 Uthong Nok Street, Dusit,
Bangkok 10300 THAILAND
Tel: (66 2) 243 2246-7, 668 9868-76
Fax: (66 2) 243 2248
Website: www.srru.ac.th

Surindra Rajabhat University (SRRU)
186 Surin-Prasart Road, Muang,
Surin 32000 THAILAND
Tel: (66 44) 511 604, 521 389
Fax: (66 44) 511 631
Website: www.srru.ac.th

Thepsatri Rajabhat University (TRU)
321 Naraimaharat Road, Muang,
Lob Buri 15000 THAILAND
Tel: (66 36) 427 485-93, 422 607-9
Fax: (66 36) 422 610
Website: www.tru.ac.th

Ubon Ratchathani Rajabhat University (UBRU)
2 Ratchathani Road, Muang,
Ubon Ratchathani 34000 THAILAND
Tel: (66 45) 352 000
Fax: (66 45) 311 472, 311 465
Website: www.ubru.ac.th

Udon Thani Rajabhat University (UDRU)
64 Tahan Road, Muang,
Udon Thani 41000 THAILAND
Tel: (66 42) 211 040-59
Fax: (66 42) 241 418
Website: www.udru.ac.th

Uttaradit Rajabhat University (URU)
27 Injaimee Road, Muang,
Uttaradit 53000 THAILAND
Tel: (66 55) 411 096, 416 601-31
Fax: (66 55) 411 296
Website: www.uru.ac.th

Valaya-Alongkorn Rajabhat University (VRU)
1 Moo 20 Phaholyothin Road, Klongluang,
Pathum Thani 13180 THAILAND
Tel: (66 2) 529 0674-7
Fax: (66 2) 529 2580
Website: www.vru.ac.th
Yala Rajabhat University (YRU)
133 Tesaban 3 Road, Muang
Yala 95000 THAILAND
Tel: (66 73) 227 151
Fax: (66 73) 227 131
Website: www.yru.ac.th

Rajamangala University of Technology Isan (RMUTI)
Northeastern Campus (President’s Office)
744 Moo 6, Suranarai Road, Muang,
Nakhon Ratchasima 30000 THAILAND
Tel: (66 44) 242 978-9, 271 312-3
Fax: (66 44) 242 217
Website: www.nec.rit.ac.th

Kalasin Campus
62/1 Kasetsomboon Road, Muang,
Kalasin 46000 THAILAND
Tel: (66 43) 811 128
Fax: (66 43) 812 972
Website: www.ksc.rit.ac.th

Khon Kaen Campus
150 Srichan Road, Muang,
Khon Kaen 40000 THAILAND
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Fax: (66 43) 237 483
Website: www.kkc.rit.ac.th

Sakon Nakhon Campus
199 Moo 3, Phang Khon Road,
Sakon Nakhon 47160 THAILAND
Tel: (66 42) 734 723
Fax: (66 42) 734 723

Surin Campus
145 Surin-Prasat Road, Nokmuang, Muang, Surin 32000 THAILAND
Tel: (66 44) 511 022
Fax: (66 44) 511 022, 519 034
Website: www.surin.rit.ac.th

Rajamangala University of Technology Krungthep (RMUTK)
Bangkok Technical Campus
(President’s Office)
2 Nanglinji Road, Thung Maha Mek,
Sathon, Bangkok 10120 THAILAND
Tel: (66 2) 287 3211-25
Fax: (66 2) 286 3596
Website: www.btc.rit.ac.th

*Bophit Phimuk Maha Mek Campus*
878 Arkansongkroh Road,
Thung Maha Mek, Sathon,
Bangkok 10120 THAILAND
Tel: (66 2) 287 4670-2, 286 3613
Fax: (66 2) 286 8962
Website: www.bpm.rit.ac.th

*Phra Nakhon Tai Campus*
1635 Jarernkrung, Yannawa, Sathon,
Bangkok 10120 THAILAND
Tel: (66 2) 211 2056, 212 5700-1
Fax: (66 2) 211 2040
Website: www.sbk.rit.ac.th

*Rajamangala University of Technology Lanna (RMUTL)*

*Payap (Jedlin) Campus*  
*(President’s Office)*  
128 Huaykaew Road, Muang,
Chiang Mai 50300 THAILAND
Tel: (66 53) 221 576, 892 780
Fax: (66 53) 213 183
Website: www.north.rit.ac.th

*Payap (Jedyod) Campus*
95 Chiang Mai-Lampang Road, Muang, Chiang Mai 50300 THAILAND
Tel: (66 53) 414 250-2
Fax: (66 53) 414 253
Website: www.north.rit.ac.th

*Chiang Rai Campus*
99 Moo 10, Phan,
Chiang Rai 57120 THAILAND
Tel: (66 54) 729 600-7
Fax: (66 54) 729 606-7
Website: www.chrc.rit.ac.th

*Lampang Campus*
200 Moo 11, Pichai Road, Muang,
Lampang 52000 THAILAND
Tel: (66 54) 342 547-8
Fax: (66 54) 342 549
Website: www.lpc.rit.ac.th
Nan Campus
59 Moo 13, Faikaew, Phuphieng,
Nan 55000 THAILAND
Tel: (66 54) 710 259
Fax: (66 54) 771 398
Website: www.nan.rit.ac.th

Phitsanulok Campus
52 Moo 7, Bankrang, Muang,
Phitsanulok 65000 THAILAND
Tel: (66 55) 298 438
Fax: (66 55) 298 440
Website: www.plc.rit.ac.th

Tak Campus
41 Moo 7, Mai-Ngam, Muang,
Tak 63000 THAILAND
Tel: (66 55) 511 832
Fax: (66 55) 511 833
Website: www.tak.rit.ac.th

Lampang Agricultural Research and Training Center (LARTC)
202 Moo 11, Pichai, Muang,
Lampang 52000 THAILAND
Tel: (66 54) 342 551, 342 553
Fax: (66 54) 342 550
Website: www.lartc.rit.ac.th

Rajamangala University of Technology Phra Nakhon (RMUTP)
Thevet Campus (President’s Office)
399 Samsen Road, Dusit,
Bangkok 10300 THAILAND
Tel: (66 2) 282 9009-15
Fax: (66 2) 281 0075
Website: www.thewes.rit.ac.th

Bangkok Commercial Campus
86 Pitsanulok Road, Jitladda, Dusit,
Bangkok 10300 THAILAND
Tel: (66 2) 281 1842-3, 282 9101-2
Fax: (66 2) 281 0093
Website: www.bcc.rit.ac.th

Chotiwet Campus
168 Sri Ayutthaya Road, Dusit,
Bangkok 10300 THAILAND
Tel: (66 2) 281 0545, 282 8531-2
Fax: (66 2) 282 4490  
E-mail: chtwc@rit.ac.th  
Website: www.chtwc.rit.ac.th

**Chumphon Khet Udomsak Campus**
517 Nakhonsawan Road, Dusit,  
Bangkok 10300 THAILAND  
Tel: (66 2) 629 9153-7  
Fax: (66 2) 282 3718  
Website: www.ckus.rit.ac.th

**North Bangkok Campus**
1381 Piboonsongkram Road, Bangsue,  
Bangkok 10800 THAILAND  
Tel: (66 2) 913 2424  
Fax: (66 2) 585 0690  
Website: www.nbk.rit.ac.th

**Rajamangala University of Technology Rattanakosin (RMUTR)**

**Salaya Campus (President’s Office)**
96 Moo 3, Salaya, Phuttamonthon,  
Nakhon Pathom 73170 THAILAND  
Tel: (66 2) 889 4585-7 press 3001  
Fax: (66 2) 889 5014  
Website: www.salaya.rit.ac.th

**Bophit Phimuk Chakkawat Campus**
264 Chakkrawat Road, Sampanthawong,  
Bangkok 10100 THAILAND  
Tel: (66 2) 226 5925-6, 221 2896  
Fax: (66 2) 226 4879  
Website: www.bpc.rit.ac.th

**Poh-Chang Campus**
86 Triphet Road, Pranakorn,  
Bangkok 10200 THAILAND  
Tel: (66 2) 623 8790-9  
Fax: (66 2) 223 4014  
Website: www.pohchang.rit.ac.th

**Wang Klai Kangwon Campus**
Petchakasem 242 Road, Nongkae,  
Hua Hin, Prachuap Khirikhan 77110 THAILAND  
Tel: (66 32) 572 284-6, 532 552-3  
Fax: (66 32) 536 299, 532 511  
Website: www.kkw.rit.ac.th
Rajamangala University of Technology Srivijaya (RMUTSV)

Southern Campus
1 Ratchadamneon Nok Road, Bhoyang, Muang, Songkhla 90000 THAILAND
Tel: (66 74) 316 260-3
Fax: (66 74) 324 245
Website: www.south.rit.ac.th

Nakhon Si Thammarat Campus
109 Moo 2, Thung Song,
Nakhon Si Thammarat 80110 THAILAND
Tel: (66 75) 411 144, 420 558-9
Fax: (66 75) 411 745
Website: www.nstrc.rit.ac.th

Srivichai Campus
99 Moo 4, Thongnian, Khanom,
Nakhon Si Thammarat 80210 THAILAND
Tel: (66 75) 476 964-71
Fax: (66 75) 476 962
Website: www.svj.rit.ac.th

Faculty of Agriculture,
Nakhon Si Thammarat
133 Moo 5, Thung Yai,
Nakhon Si Thammarat 80110 THAILAND
Tel: (66 75) 479 496-7
Fax: (66 75) 479 490
Website: www.fan.rit.ac.th

Faculty of Science and Fisheries Technology
179 Moo 3, Maifad, Sikao,
Trang 92150 THAILAND
Tel: (66 75) 274 151-8
Fax: (66 75) 274 159
Website: www.fishtech.rit.ac.th

Rajamangala University of Technology Suvarnabhumi (RMUTSB)

Phra Nakhon Si Ayutthaya Huntra Campus (President’s Office)
60 Moo 3, Asia Road, Huntra,
Phra Nakhon Si Ayutthaya 13000 THAILAND
Tel: (66 35) 242 554
Fax: (66 35) 242 654
Website: www.huntra.rit.ac.th

Nonthaburi Campus
7/1 Nonthaburi 1 Road, Suanyai, Muang, Nonthaburi 11000 THAILAND
Tel: (66 2) 969 1369-74
Fax: (66 2) 525 2682
E-mail: webmaster@non.rit.ac.th
Website: www.non.rit.ac.th

Phra Nakhon Si Ayutthaya Wasukri Campus
19 U-Thong Road, Tha Wasuki,
Phra Nakhon Si Ayutthaya 13000 THAILAND
Tel: (66 35) 252 392
Fax: (66 35) 252 393
Website: www.wasukri.rit.ac.th

Suphan Buri Campus
450 Moo 6, Subhanburi-Chainat Road, Yanyao, Samchuk, Subhan Buri 72130
THAILAND
Tel: (66 35) 544 301-3
Fax: (66 35) 544 299-300
Website: www.suphan.rit.ac.th

Rajamangala University of Technology Tawan-Ok (RMUTTO)
President’s Office
Faculty of Agriculture,
Bangphra Campus, 43 Moo 6 Bangphra, Sriracha, Chonburi 20210 THAILAND
Tel: (66 38) 358 137
Fax: (66 38) 341 808-9
Website: www.bpagr.rit.ac.th

Bangphra Campus
43 Moo 6, Bangphra, Sriracha,
Chonburi 20210 THAILAND
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Fax: (66 38) 341 808-9
Website: www.bpagr.rit.ac.th

Chakrabongse Bhuvanath Campus
122/41 Vipavadeerangsit Road, Dindaeng, Bangkok 10400 THAILAND
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Fax: (66 2) 277 3693
Website: www.cpc.rit.ac.th

Chantaburi Campus
18/13 Moo 5, Pluang, Kaokitchagoot,
Chantaburi 22210 THAILAND
Tel: (66 39) 307 001-4
Fax: (66 39) 307 011
Website: www.chan.rit.ac.th
Uthen Thawai Campus
225 Payathai Road, Pathumwan,
Bangkok 10330 THAILAND
Tel: (66 2) 252 2736-8
Fax: (66 2) 252 7580
Website: www.uthen.rit.ac.th

Rajamangala University of Technology Thanyaburi (RMUTT)
President’s Office
Rangsit-Nakhonnayok Road,
Klong 6, Thanyaburi,
Pathum Thani 12110 THAILAND
Tel: (66 2) 549 4990-2
Fax: (66 2) 549 4993
Website: www.rmutt.ac.th

Pathum Thani Campus
243 Moo 1, Prachathipus, Thunyaburi,
Pathum Thani 12130 THAILAND
Tel: (66 2) 531 2988-9
Fax: (66 2) 531 2989
Website: www.ptc.rmutt.ac.th

III. Private University (45)

Assumption University (AU)
682 Ramkhamhaeng 24 Road, Hua Mak,
Bangkapi, Bangkok 10240 THAILAND
Tel: (66 2) 300 4553-62
Fax: (66 2) 300 4563
Website: www.au.edu

Bangkok Suvarnabhumi College (BSC)
489 Prachapatthana Road, Tubyaow,
Ladkrabang, Bangkok 10520 THAILAND
Tel: (66 2) 327 0156-8
Fax: (66 2) 327 0159
Website: www.bsc.ac.th

Bangkok Thonburi University (BTU)
16/10 Moo 2, Taweewattana,
Bangkok 10160 THAILAND
Tel: (66 2) 800 6800-5
Fax: (66 2) 800 6806
Website: www.bkkthon.ac.th
Bangkok University (BU)
40/4 Rama IV Road, Klong Toey,
Bangkok 10110 THAILAND
Tel: (66 2) 350 3500-99, 350 3635
Fax: (66 2) 249 6274, 240 1819
Website: www.bu.ac.th

Chalermkanchana College (CKC)
999 Moo 6, Ubon-Si Sa Ket Road,
Muang, Si Sa Ket 33000 THAILAND
Tel: (66 45) 617 971-2
Website: www.ckc.ac.th

Chaopraya University (CPU)
13/1 Moo 6, Paholyothin Road, Muang,
Nakhon Sawan 60240 THAILAND
Tel: (66 56) 334 714, 334 236
Fax: (66 56) 334 719
Website: www.cpu.ac.th

Chiang Rai College (CRC)
199 Moo 6, Paoadonchai, Muang.
Chiang Rai 57000 THAILAND
Tel: (66 53) 710 081-4
Fax: (66 53) 710 081
Website: www.crc.ac.th

Christian University of Thailand (CTU)
144 Moo 7, Phra Praton-Ban Paew Road
Don Yai Horm, Muang
Nakhon Pathom 73000 THAILAND
Tel: (66 34) 229 480-7
Fax: (66 34) 229 499
Website: www.christian.ac.th

College of Asian Scholars (CAS)
179/137 Prachasamosorn Road, Muang,
Khon Kaen 40000 THAILAND
Tel: (66 43) 246 536-8
Fax: (66 43) 246 539
Website: www.cas.ac.th

Dhurakij Pundit University (DPU)
110/1-4 Prachachuen Road, Laksi,
Bangkok 10210 THAILAND
Tel: (66 2) 954 7300-29 ext. 271
Fax: (66 2) 589 9606, 954 7904
Website: www.dpu.ac.th

**Dusit Thani College (DTC)**
900 Moo 6, Srinakarin Road, Nongbon, Pravet, Bangkok 10250 THAILAND
Tel: (66 2) 361 7805, 361 7811-3
Fax: (66 2) 361 7806
Website: www.dtc.ac.th

**Eastern Asia University (EAU)**
200 Rangsit-Nakornmayok Road,
Rangsit (Klong 5), Thanyaburi,
Pathum Thani 12110 THAILAND
Tel: (66 2) 577 1028-31
Fax: (66 2) 577 1023
Website: www.eau.ac.th

**E-Sarn University (ESU)**
311/1 Khon Kaen-Panjakiri Road, Muang,
Khon Kaen 40000 THAILAND
Tel: (66 43) 255 461
Fax: (66 43) 382 598
Website: www.esu.ac.th

**The Eastern University of Management and Technology (UMT)**
749/1 Chayangkoon Road, Muang,
Ubon Ratchathani 34000 THAILAND
Tel: (66 45) 283 770-2
Fax: (66 45) 283 773
Website: www.umt.ac.th

**The Far Eastern University (FEU)**
120 Mahidol Road, Muang,
Chiang Mai 50200 THAILAND
Tel: (66 53) 201 800-4
Fax: (66 53) 201 810
Website: www.feu.ac.th

**Hatyai University (HU)**
125/502 Polpichai Road, Hat Yai,
Songkhla 90110 THAILAND
Tel: (66 74) 425 000, 425 464-6
Fax: (66 74) 425 467
Website: www.hu.ac.th

**Huachiew Chalermprakiet University (HCU)**
18/18 Bang Na-Trad Road, Bangplee,
Samutprakan 10540 THAILAND
Institute of Technology Ayothaya (ITA)
109 Moo 5, Wattum,
Phra Nakhon Si Ayutthaya 13000 THAILAND
Tel: (66 35) 713 563-4
Fax: (66 35) 713 563-4
Website: www.ayothaya.ac.th

Kasem Bundit University (KBU)
1761 Pattanakarn Road, Suanluang,
Bangkok 10250 THAILAND
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Fax: (66 2) 321 4444
Website: www.kbu.ac.th

Krirk University (KRU)
43/1111 Ram-indra Road, KM. 1,
Bang Khen, Bangkok 10220 THAILAND
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Fax: (66 2) 552 3511
Website: www.krirk.ac.th

Mahanakorn University of Technology (MUT)
51 Cheum-Sampan Road, Nong Chok,
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Fax: (66 2) 988 4040
Website: www.mut.ac.th

Nakhon Ratchasima College (NMC)
290 Moo 2, Friendship Road, Muang
Nakhon Ratchasima 30000 THAILAND
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Fax: (66 44) 465 668
Website: www.nmc.ac.th

North Bangkok University (NBU)
6/999 Soi Phaholyothin 52, Saimai
Bangkok 10220 THAILAND
Tel: (66 2) 972 7200
Fax: (66 2) 972 7751
Website: www.northbkk.ac.th
North-Chiang Mai University (NCU)
169 Moo 3, Nong Keaw, Hangdong
Chiang Mai 50230 THAILAND
Tel: (66 53) 819 999
Fax: (66 53) 819 998
Website: www.northcm.ac.th

North-Eastern University (NEU)
199/19 Mitraphap Road, Muang
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Tel: (66 43) 222 959-61
Fax: (66 43) 226 823-24
Website: www.neu.ac.th

Panyapiwat Institute of Technology (PIT)
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Nonthaburi 11120, THAILAND
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Fax: (66 2) 832 2191

Pathumthani University (PTU)
140 Moo 4 Tiwanon Road, Ban Klang, Muang, Pathum Thani 12000 THAILAND
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Fax: (66 2) 979 6728
Website: www.ptu.ac.th

Payap University (PYU)
Superhighway Chiang Mai-Lampang, Road, Muang, Chiang Mai 50000 THAILAND
Tel: (66 53) 241 255, 851 478-86
Fax: (66 53) 241 983
Website: www.payap.ac.th

Phitsanulok University (PLU)
693 Mitraphap Road, Muang,
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Fax: (66 55) 259 565
Website: www.plc.ac.th

Rajapark College (RPC)
68 Soi Navasari 10, Ramkhamhaeng 21 Road, Bangkok 10310 THAILAND
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Rangsit University (RSU)
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Fax: (66 2) 997 2200
Website: www.rsu.ac.th

Ratchaphruek College (RC)
9 Moo 1, Nakhon-in Road, Bangkhanoon, Bang Kruai,
Nonthaburi 11130 THAILAND
Tel: (66 2) 432 6111
Fax: (66 2) 432 6107-8
Website: www.rc.ac.th

Ratchatani University (RTU)
487 Moo 4, Chayangkul Road, Muang,
Ubon Ratchathani 34000 THAILAND
Tel: (66 45) 312 176-7
Fax: (66 45) 312 178
Website: www.rtu.ac.th

Rattana Bundit University (RBU)
306 Soi 107, Lad Phrao Road, Bangkapi,
Bangkok 10240 THAILAND
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Fax: (66 2) 375 4489
Website: www.rbac.ac.th

Saint John’s University (SJU)
1110/5 Vipavadee-Rangsit Road, Chatuchak, Bangkok 10900 THAILAND
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Fax: (66 2) 512 2275
Website: www.stjohn.ac.th

Siam Technology College
46 Jaransanitwongse Road,
Bangkok Yai, Bangkok 10600 THAILAND
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Fax: (66 2) 864 1707
Website: www.siamtech-college.ac.th

Siam University (SU)
235 Phetkasem Road, Phasi Charoen
Bangkok 10163 THAILAND
Tel: (66 2) 457 0068, 457 0478-9
Fax: (66 2) 457 3982
Website: www.siam.edu
South-East Asia University (SAU)
19/1 Phetkasem Road, Nong Khaem
Bangkok 10160 THAILAND
Tel: (66 2) 807 4500-27
Fax: (66 2) 807 4528-30
Website: www.sau.ac.th

Southern College of Technology (SCT)
124/1 Thungsong-Huay Yod Road, Teewang, Tungsong,
Nakhon Si Thammarat 80110 THAILAND
Tel: (66 75) 538 030-3
Fax: (66 75) 538 030-3 ext. 102
Website: www.sct.ac.th

Sripatum University (SPU)
61 Phahon Yothin Road, Chatuchak,
Bangkok 10900 THAILAND
Tel: (66 2) 579 1111, 561 2222
Fax: (66 2) 561 1721
Website: www.spu.ac.th

Tapee College (TPC)
8/151 Soi Si Wichai 59, Muang,
Surat Thani 84000 THAILAND
Tel:/Fax: (66 77) 264 225, 204 431-2
Website: www.tapee.ac.th

Thai-Nichi Institute of Technology (TNI)
1771/1 Soi Pattanakarn 37,
Pattanakarn Road, Lanluang, Suanluang, Bangkok 10250 THAILAND
Tel: (66 2) 673 2600
Fax: (66 2) 673 2700
Website: www.tni.ac.th

Thonburi University (TRU)
29 Moo 3 Phetkasem Soi 10,
Nong Khaem, Bangkok 10160 THAILAND
Tel: (66 2) 809 0823-7
Fax: (66 2) 809 0832
Website: www.thonburi-u.ac.th

University of the Thai Chamber of Commerce (UTCC)
126/1 Vibhavadirangsit Road,
Bangkok 10320 THAILAND
Tel: (66 2) 697 6000
Fax: (66 2) 276 2126
Website: www.utcc.ac.th
Vongchavalitkul University (VU)
12 Mitraphap Highway, Naimuang, Muang, Nakhon Ratchasima 30000 THAILAND
Tel: (66 44) 203 778-84
Fax: (66 44) 203 785
Website: www.vu.ac.th
### University Rankings by Audited SAR Scores in Educational Year 2009

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<tr>
<th>Rank</th>
<th>University</th>
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Remarks:
1) SAR stands for Self-Assessment Report
2) The score is the average score of all performance indicators that each university arrives at from its self-evaluation; then it is re-evaluated by the audit subcommittee, and finally reported to the Commission of Higher Education.
3) N.A. stands for not applicable (due to incomplete information).
APPENDIX C

Question Items in the Study
APPENDIX C

Question Items in the Study

Section I  Demographic Information of Respondents and University Characteristics

1. Gender
2. Age
3. Retention
4. Educational levels
5. Types of job
   - Group 1: President
   - Group 2: Vice President / Assistant President
   - Group 3: Dean / Deputy Dean
   - Group 4: Director of Bureau, Office, Institution, or Center in charge of KM and/or Educational Quality Assurance
   - Group 5: Others
6. Degree of knowledge management involvement
   - Group 1: Major responsible person such as project or program leader
   - Group 2: Reporter of the progress of KM activities
   - Group 3: Participant in KM activities
   - Group 4: Used to be a participant in KM activities but not right now
   - Group 5: Never participated in KM activities
7. University orientation: 2 choices as follows:
   - Group 1: research university
   - Group 2: teaching university
8. University type: 3 choices as follows:
   - Group 1: non-autonomous public university
   - Group 2: autonomous public university
   - Group 3: private university
Section II Knowledge Management

The researcher extracted and modified the *KMAT questionnaire* that was developed by Arthur Andersen and The American Productivity & Quality Center (APQC). The KMAT questionnaire is structured in 5 parts as follows:

1) KM process: 5 items were modified from KMAT questionnaire as follows:

9. Knowledge gaps are systematically identified and well-defined processes are used to close them.

10. The university has developed a sophisticated and ethical intelligence gathering mechanism.

11. All members of the university are involved in looking for ideas in traditional and nontraditional places.

12. The university has formalized the process of transferring best practices, including documentation and lessons learned.

13. “Tacit” knowledge (what employees know how to do, but cannot express) is valued and transferred across the university.

The researcher constructed a new item for cooperative learning as follows:

14. The university promotes team-based learning including working groups, project teams or cross-functional task forces.

2) KM Leadership: 4 items were modified from the KMAT questionnaire as follows:

15. Managing organizational knowledge is central to the university’s strategy.

16. The university understands the revenue-generating potential of its knowledge assets and develops strategies for marketing and selling them.

17. The university uses learning to support existing core competencies and to create new ones.

18. Individuals are hired, evaluated, and compensated for their contributions to the development of organizational knowledge.

The researcher constructed 2 new items for leader involvement in KM activities and projects and job rotation as follows:

19. Leadership in KM activities and projects is exhibited among university administrators at all levels.
20. The university encourages job rotation of officials that hold managerial, academic, and operational positions.

3) KM culture: 5 items were modified from the KMAT questionnaire (the first item was separated into 3 items to identify the scope of knowledge sharing) as follows:
21. The university encourages and facilitates knowledge sharing within the department or school.
22. The university encourages and facilitates knowledge sharing across departments or schools within the university.
23. The university encourages and facilitates knowledge sharing with external institutions and industries.
24. A climate of openness and trust permeates the university.
25. Customer value creation is acknowledged as a major objective of knowledge management.
26. Flexibility and a desire to innovate drive the learning process.
27. Individuals take responsibility for their own learning.

4) KM technology: 6 items were modified from the KMAT questionnaire as follows:
28. Technology links all members of the university to one another and to all relevant external publics.
29. Technology creates an institutional memory that is accessible to the entire university.
30. Technology brings the university closer to its stakeholders.
31. The university fosters development of “human-centered” information technology.
32. Technology that supports collaboration is rapidly placed in the hands of individuals.
33. The university information systems can provide “real-time,” “integrated,” and “smart” information.

5) KM measurement: 4 items were modified from the KMAT questionnaire as follows:
34. The university has invented ways to link knowledge to financial results.
35. The university has developed a specific set of indicators to manage knowledge.
36. The university’s set of measures balance hard and soft indicators.
37. The university allocates resources toward efforts that measurably increase its knowledge base.

Section III Organizational Competency

1) Managerial Competencies

The first 18 items were partially extracted and modified from the measurement scale of *The Competent Manager*, developed by Boyatzis as follows:

38. The management enables the coordination of resources and skills across different departments and bureaus.
39. The management supports transfer of expertise and skills among different departments to accomplish multi-discipline research.
40. The management engages in more in-depth analysis.
41. The management examines more alternatives in decision-making which is based on facts and figures.
42. The management focuses on objectives, tasks, and achievements.
43. The management sets challenging goals and supports appropriate planning.
44. The management is concerned about the impact of power demonstration.
45. The management shows proactivity and takes responsibility for actions.
46. The management shows belief in self, values, and ideas.
47. The management is capable of oral presentation skills.
48. The management uses synthetic and creative thinking to develop further ideas and solutions.
49. The management is able to turn concepts into practical and useful tools.
50. The management develops networks and hierarchies of people and mobilizes them to achieve specific ends.
51. The management builds common goals and objectives and creates ways of working together and facilitates team work.
52. The management is able to identify the pros and cons of each alternative decision that could be made.
53. The management is able to control human behavior through the exertion of will.
54. The management has capability of sustaining prolonged stressful effort.
55. The management is able to change something or oneself to cope with unexpected disturbances in the environment.

The next 4 items were partially extracted and modified from *A Model for Evaluating Organizational Competencies*, developed by Ana Belen Escrig-Tena and Juan Carlos Bou-Llusar as follows:

56. The management continually acquires and updates valuable knowledge for the university.

57. The university knows the type of resource, competencies, and technologies required.

58. The university improves its curriculum to cope with the environment and trends of changes.

59. The university identifies groups of stakeholders whose needs are not being met.

1) Input-based competencies

The researcher constructed 5 new items as follows:

60. The university is efficient in collecting critical information and knowledge from within the university.

61. The university is efficient in collecting critical information and knowledge from outside the university.

62. The university considers the cost effectiveness of collecting critical information and knowledge from within the university.

63. The university considers the cost effectiveness of collecting critical information and knowledge from outside the university.

64. The university has established a database of faculty expertise and connections.

The next item was partially extracted and modified from *A Model for Evaluating Organizational Competencies*, developed by Ana Belen Escrig-Tena and Juan Carlos Bou-Llusar as follows:

65. The university had created a database of academic journals and research available to faculty, researchers, and students.

The researcher constructed a new item as follows:

66. The university enhances all faculty and personnel to improve computer skills and language proficiency.
The next 3 items were partially extracted and modified from *A Model for Evaluating Organizational Competencies*, developed by Ana Belen Escrig-Tena and Juan Carlos Bou-Llusar as follows:

67. The university improves its coordination with students and other stakeholders to discover the need for new products or services.

68. The university provides employees with adequate tools for students’ problem solving.

69. The university can collaborate with other organizations on research and development projects.

2) Transformation-based competencies

The following items were partially extracted and modified from *A Model for Evaluating Organizational Competencies*, developed by Ana Belen Escrig-Tena and Juan Carlos Bou-Llusar, except for statement no. 72, which was newly-constructed by the researcher as follows:

70. The university improves its curriculum and student activities faster than before and faster than other universities.

71. The university produces useful knowledge from an existing database.

72. The university improves the process and content of decision making by using a participatory approach.

73. The university improves internal meetings and discussions based on an open and transparent approach.

74. The university provides better evaluations of annual reports.

75. The university increases the flexibility of its work processes and allows the personnel to take initiative and assimilate better ways of doing their job.

76. The university facilitates the informal structure of the organization to improve communication efficiency between personnel.

77. Most of the personnel have been working together for a long time, which ensures that they are well-coordinated.

78. Most of the personnel voluntarily transmit and share useful information with each other.

79. If necessary, most of the personnel voluntarily devote time after normal working hours to accomplish their job.
80. The university promotes personnel participation in setting goals and how they are to be achieved.
81. The university has organized programs and activities to improve and maintain a high level of organizational loyalty.
82. There is an important spirit of dialogue and acceptance of diverse opinions in all areas of the university.
83. Besides educational quality, speed is also taken into account when designing or introducing new products or services to cope with the needs of students and other stakeholders.

3) Output-based competencies

The researcher constructed 4 new items as follows:

84. The university improves the quality of the curriculum, research, students/graduates, and technical services.
85. The university improves the reliability of its curriculum, research, students/graduates, and technical services.
86. The university improves conformance to educational standards and relevant regulations.
87. The university improves its reputation or plays an important role in guiding society in specific fields.

The next 2 items were partially extracted and modified from *A Model for Evaluating Organizational Competencies*, developed by Ana Belen Escrig-Tena and Juan Carlos Bou-Llusar as follows:

88. The university has a reputation to attract, develop, and maintain valuable personnel.
89. The university has built up a better image than that of other universities.

Section IV Organizational Performance

The researcher extracted data from the internal audit subcommittee’s report for educational year 2009 which had already been submitted to the Commission of Higher Education. Thirteen measures were extracted as follows:

1) Achievement performance
90. A system and mechanism for curriculum development and management. (indicator 2.1)

91. Level of satisfaction of employers, business operators, and graduate users. (indicator 2.11)

92. The percentage of students or alumni that were granted awards in terms of academic, professional, morality, ethics, sports, health, art & culture or the environment at the national or international level within the 5 recent years. (indicator 2.12)

93. The level of achievement to convey organizational indicators and targets to the individual level. (indicator 7.9)

2) Customer performance

94. The percentage of research and innovations published or registered as intellectual property or patented or utilized at the national or international level in proportion to the number of full-time faculty. (indicator 4.4)

95. The percentage of full-time faculty that are granted awards in terms of academic or professional at the national or international level. (indicator 7.7)

3) Internal process performance:

96. An identification of philosophy or vision followed by strategies and implementation plans. Indicators should be set up to observe the progress of these plans. (indicator 1.1)

97. A system and mechanism to support full-time faculty research for teaching & learning development. (indicator 2.8)

98. A development of systems and mechanisms to support the conduct of research and innovations (indicator 4.1)

99. Effectiveness of the database system for teaching and learning and research activities. (indicator 7.5)

4) Learning and growth performance

100. A knowledge management system for research and innovations. (indicator 4.2)

101. The university development for transformation into a learning organization. (indicator 7.3)

102. A system and mechanism for human resource management to develop and maintain qualified and efficient personnel. (indicator 7.4)
APPENDIX D

Questionnaire in English Version
An Analysis of Knowledge Management, Competency and Organizational Characteristics Affecting Organizational Performance of Thai Universities: Perspective of University Administrators

This questionnaire is a part of the dissertation for the Degree of Doctor of Philosophy (Development Administration), School of Public Administration, National Institute of Development Administration (NIDA). The dissertation has three objectives: (1) to establish knowledge of the mechanism to create and utilize a knowledge base leading to producing competent human resources and high-performing organizations; (2) to establish knowledge of the causal relationships among knowledge management factors, organizational competency factors, and the organizational characteristics affecting the organizational performance of Thai universities; and (3) to provide policy recommendations related to knowledge management and competency-based human resource management for universities and relevant agencies.

The data from this questionnaire will be kept confidential and used for academic purposes only.

Terms and definitions

“University” means public or private higher-education institutions where students can seek academic degrees and where academic research is carried out.

“Knowledge management” means on-going processes to create, transform, transfer/exchange, and apply/utilize knowledge in order to improve jobs, human resources, and organizational operations.

“Management” means president, vice-president, assistant president, dean, deputy dean, director of bureau, office, center or institute

“Refereed journal” means journal listed as nationally or internationally-recognized journal database or approved databases by the Commission of Higher Education such as SCI, INSPEC, ScienceDirect, ERIC PUBSCIENCE, etc.

Instructions

1. The questionnaire contains a total of 7 pages (including this cover page). Please answer every question. Your input will be kept confidential. The dissertation findings will be presented in view of the universities in Thailand overall. There will be no reporting on individual universities.

2. Your answer in Section 2 and 3 will be treated as an overall evaluation of knowledge management and university operations and administration from 2009 to the present. Please consider carefully before answering each question.

Thank you for your kind cooperation and for devoting your valuable time to completing this questionnaire.
Questionnaire

An Analysis of Knowledge Management, Competency and Organizational Characteristics Affecting Organizational Performance of Thai Universities: Perspective of University Administrators

Section 1 : Demographic data of the respondent

Please place the mark (X) for your answer to the following questions:

1.1 Gender
- □ Male
- □ Female

1.2 At present you are .................. years old (please specify in number)

1.3 You have been working in this university for ............... years (please specify in number)

1.4 Highest level of education
- □ Not graduated
- □ Bachelor
- □ Master
- □ Doctoral

1.5 Your present position is
- □ President
- □ Vice-president, Assistant President
- □ Dean, Deputy Dean
- □ Director of bureau, division, center, institute or equivalent level
- □ Others, please specify

1.6 Degree of knowledge management involvement
- □ Major responsible person such as project/program leader or advisor
- □ Reporter of the progress of knowledge management activities
- □ Participant in knowledge management activities
- □ Used to be a participant in knowledge management activities but not right now
- □ Never participated in knowledge management activities

1.7 University orientation
- □ Research university
- □ Teaching university

1.8 University type
- □ Non-autonomous public university
- □ Autonomous public university
- □ Private university
**Additional explanation**

The following statements in Section 2 and 3 of the questionnaire are statements concerning the operational behavior and activities related to knowledge management activities and the operations management of the university as a whole. The researcher would like to know the extent to which your university and your university management have implemented the relevant operations and activities in the following questions. Please provide a score for the appropriate extent.

- 7 means this statement occurs at most
- 1 means this statement occurs at least
### Section 2 Knowledge Management

Please read the following statements and then evaluate the extent to which your university has implemented knowledge management (KM). Please place the mark (X) for your answer to each question.

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<thead>
<tr>
<th>Item</th>
<th>Statements</th>
<th>at most</th>
<th>7</th>
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<tr>
<td>2.1</td>
<td>Knowledge gaps are systematically identified and well-defined processes are used to close them across the university.</td>
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<td>2.2</td>
<td>The university has developed a sophisticated and ethical intelligence-gathering mechanism.</td>
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<td>2.3</td>
<td>All members of the university are involved in looking for ideas in traditional and nontraditional places.</td>
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<td>2.4</td>
<td>The university has formalized the process of transferring best practices, including documentation and lessons learned.</td>
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<td>2.5</td>
<td>“Tacit” knowledge (what employees know how to do, but cannot express) is valued and transferred across the university.</td>
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<td>2.6</td>
<td>The university promotes team-based learning, including working groups, project teams, or cross-functional task forces.</td>
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<td>2.7</td>
<td>Managing organizational knowledge is central to the university’s strategy.</td>
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<td>2.8</td>
<td>The university understands the revenue-generating potential of its knowledge assets and develops strategies for marketing and selling them.</td>
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<td>2.9</td>
<td>The university uses learning to support existing core competencies and to create new ones.</td>
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<td>2.10</td>
<td>Individuals are hired, evaluated, and compensated for their contributions to the development of organizational knowledge.</td>
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<td>2.11</td>
<td>Leadership in KM activities and projects is exhibited among university administrators at all levels.</td>
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<td>2.12</td>
<td>The university encourages job rotation of officials that hold managerial, academic, and operational positions.</td>
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<td>2.13</td>
<td>The university encourages and facilitates knowledge sharing within the department or school.</td>
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<td>2.14</td>
<td>The university encourages and facilitates knowledge sharing across departments or schools within the university.</td>
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<td>2.15</td>
<td>The university encourages and facilitates knowledge sharing with external institutions and industries.</td>
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<td>2.16</td>
<td>A climate of openness and trust permeates the university.</td>
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<td>2.17</td>
<td>Customer value creation is acknowledged as a major objective of knowledge management.</td>
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<td>2.18</td>
<td>Flexibility and a desire to innovate drive the learning process of the university.</td>
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<td>2.19</td>
<td>Individuals take responsibility for their own learning.</td>
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<td>2.20</td>
<td>Technology links all members of the university to one another and to all relevant external public.</td>
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<td>2.21</td>
<td>Technology creates an institutional memory that is accessible to the entire university.</td>
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<td>2.22</td>
<td>Technology brings the university closer to its stakeholders.</td>
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</table>
2.23 The university fosters development of “human-centered” information technology.

2.24 Technology that supports collaboration is rapidly placed in the hands of individuals.

2.25 The university information systems can provide “real-time,” “integrated,” and “smart” information.

2.26 The university has invented ways to link knowledge to financial results.

2.27 The university has developed a specific set of indicators to manage knowledge.

2.28 The university’s set of measures balance hard and soft indicators.

2.29 The university allocates resources that measurably increase its knowledge base.

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**Section 3: Organizational Competency**

Please read the following statements and then evaluate the extent to which your university or your university management performs or behaves. Please place the mark (X) for your answer to each question:

3.1 The management enables the coordination of resources and skills across different departments and bureaus.

3.2 The management supports the transfer of expertise and skills among different departments to accomplish multi-discipline research.

3.3 The management engages in more in-depth analysis.

3.4 The management examines more alternatives in decision-making which is based on facts and figures.

3.5 The management focuses on objectives, tasks, and achievements.

3.6 The management sets challenging goals and supports appropriate planning.

3.7 The management is concerned about impact of power demonstration.

3.8 The management shows proactivity and takes responsible for actions.

3.9 The management shows belief in self, values, and ideas.

3.10 The management is capable of oral presentation skills.

3.11 The management uses synthetic and creative thinking to develop further ideas and solutions.

3.12 The management is able to turn concepts into practical and useful tools.

3.13 The management develops networks and hierarchies of people and mobilizes them to achieve specific ends.

3.14 The management builds common goals and objectives and
<table>
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<th>Item</th>
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<th>at least</th>
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<tr>
<td>3.15</td>
<td>The management is able to identify the pros and cons of each alternative decision that could be made.</td>
<td>7</td>
<td>6</td>
<td>5</td>
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<tr>
<td>3.16</td>
<td>The management is able to control human behavior through the exertion of will.</td>
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<tr>
<td>3.17</td>
<td>The management has the capability of sustaining prolonged stressful effort.</td>
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<tr>
<td>3.18</td>
<td>The management is able to change something or oneself to cope with unexpected disturbances in the environment.</td>
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<tr>
<td>3.19</td>
<td>The management continually acquires and updates valuable knowledge for the university.</td>
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<tr>
<td>3.20</td>
<td>The university knows the type of resources, competencies and technologies required.</td>
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<tr>
<td>3.21</td>
<td>The university improves its curriculum to cope with the environment and the trend of changes.</td>
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<td>3.22</td>
<td>The university identifies groups of stakeholders whose needs are not being met.</td>
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<tr>
<td>3.23</td>
<td>The university is efficient in collecting critical information and knowledge from within the university.</td>
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<tr>
<td>3.24</td>
<td>The university is efficient in collecting critical information and knowledge from outside the university.</td>
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<tr>
<td>3.25</td>
<td>The university considers the cost effectiveness of collecting critical information and knowledge from within the university.</td>
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<tr>
<td>3.26</td>
<td>The university considers the cost effectiveness of collecting critical information and knowledge from outside the university.</td>
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<tr>
<td>3.27</td>
<td>The university has established a database of faculty expertise and connections.</td>
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<tr>
<td>3.28</td>
<td>The university had a database of academic journals and research available to faculty, researchers, and students.</td>
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<td>3.29</td>
<td>The university encourages all faculty and personnel to improve their computer skills and language proficiency.</td>
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<td>3.30</td>
<td>The university improves its coordination with students and other stakeholders to discover the need for new curricula or services.</td>
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<td>3.31</td>
<td>The university provides staff with adequate tools for students’ problem solving.</td>
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<td>3.32</td>
<td>The university can collaborate with other organizations on research and development projects.</td>
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<td>3.33</td>
<td>The university improves its curriculum and students’ activities faster than before and faster than other universities.</td>
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<td>3.34</td>
<td>The university produces useful knowledge from an existing database.</td>
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<td>3.35</td>
<td>The university improves the process and content of its decision making with a participatory approach.</td>
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<td>3.36</td>
<td>The university improves internal meetings and discussions based on an open and transparent approach.</td>
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<td>3.37</td>
<td>The university provides better evaluations of annual reports.</td>
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<td>3.38</td>
<td>The university increases the flexibility of its work processes and allows the personnel to take initiative and assimilate better ways of doing their job.</td>
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<tr>
<td>3.39</td>
<td>The university facilitates an informal structure of the</td>
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<td>3.40</td>
<td>Most of the personnel have been working together for a long time, which ensures that they are well-coordinated.</td>
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<tr>
<td>3.41</td>
<td>Most of the personnel voluntarily transmit and share useful information to each other.</td>
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<tr>
<td>3.42</td>
<td>If necessary, most of the personnel voluntarily devote time after normal working hours to accomplish their job.</td>
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<td>3.43</td>
<td>The university promotes personnel participation in setting goals and how they are to be achieved.</td>
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<td>3.44</td>
<td>The university has organized programs and activities to improve and maintain a high level of organizational loyalty.</td>
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<td>3.45</td>
<td>There is an important spirit of dialogue and acceptance of diverse opinions in all areas of the university.</td>
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<td>3.46</td>
<td>Beside educational quality, speed is also taken into account when designing or introducing new curricula or services to cope with the needs of students and other stakeholders.</td>
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<tr>
<td>3.47</td>
<td>The university improves the quality of its curriculum, research, students/graduates, and technical services.</td>
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<tr>
<td>3.48</td>
<td>The university improves the reliability of the curriculum, research, students/graduates, and technical services.</td>
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<td>3.49</td>
<td>The university improves its conformance to educational standards and relevant regulations.</td>
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<td>3.50</td>
<td>The university improves its reputation or plays an important role in guiding society in specific fields.</td>
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<td>3.51</td>
<td>The university has a reputation of attracting, developing, and maintaining valuable personnel.</td>
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<td>3.52</td>
<td>The university has built up a better image than that of other universities.</td>
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**Section 4:**

Please discuss your opinion or the guidance you would give regarding how to develop the knowledge management of the organization successfully.

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APPENDIX E

Questionnaire in Thai Version
การวิเคราะห์การจัดการความรู้ ความสามารถและคุณลักษณะขององค์กร ที่ส่งผลต่อสมรรถนะองค์กรของมหาวิทยาลัยในประเทศไทย:
มุมมองของผู้บริหารมหาวิทยาลัย

An Analysis of Knowledge Management, Competency, and Organizational Characteristics, Affecting Organizational Performance of Thai Universities

แบบสอบถามนี้เป็นส่วนหนึ่งของการวิจัยในการศึกษาระดับปริญญาเอกของคณาจารย์สถาบันการศึกษา สาขาการบริหารการพัฒนา หลักสูตรนานาชาติ สถาบันบัณฑิตพัฒนบริหารศาสตร์ (นิสิต)

การวิจัยนี้มีวัตถุประสงค์เพื่อสร้างความรู้ความเข้าใจในกลไกการสร้างและใช้ประโยชน์จากฐานความรู้เพื่อผลิตทรัพยากรมนุษย์ที่มีความสามารถและองค์กรที่มีสมรรถนะสูง เพื่อสร้างความรู้ความเข้าใจเกี่ยวกับความสัมพันธ์เชิงเหตุผล (Causal relationships) ระหว่างปัจจัยด้านการจัดการความรู้ ด้านความสามารถขององค์กร ด้านคุณลักษณะขององค์กร ที่ส่งผลต่อสมรรถนะองค์กรของมหาวิทยาลัยในประเทศไทย และเพื่อจัดทำข้อมูลและข้อเสนอแนะเกี่ยวกับการจัดการความรู้และการบริหารทรัพยากรมนุษย์ร่างความสามารถสำหรับมหาวิทยาลัยและหน่วยงานที่เกี่ยวข้อง

ข้อมูลที่ได้รับจากแบบสอบถามนี้จะเก็บไว้เป็นความลับและนำไปปรับความเพื่อประโยชน์ทางวิชาการ โดยตรงเท่านั้น

คำศัพท์และคำนิยาม

"มหาวิทยาลัย" หมายถึง สถาบันที่จัดการศึกษาในระดับอุดมศึกษาทั้งของภาครัฐและเอกชนที่ดำเนินการสอนและวิจัยในประเทศไทย

"การจัดการความรู้" หมายถึง กระบวนการที่เป็นวงจรต่อเนื่องที่เกิดขึ้นจากการสร้าง ประมวล เผยแพร่แลกเปลี่ยน และนำความรู้ไปประยุกต์ใช้เพื่อพัฒนางาน พัฒนาองค์กร ยกระดับและปรับปรุงการดำเนินงานขององค์กร

"ผู้บริหาร" หมายถึง อธิการบดี รองอธิการบดี ผู้ช่วยอธิการบดี คณบดี รองคณบดี ผู้อำนวยการ สำนัก/กอง/ศูนย์/สถาบัน

"refereed journal" หมายถึง วารสารที่ปรากฏในฐานข้อมูลวารสารที่เป็นที่ยอมรับระดับชาติหรือระดับนานาชาติหรือในฐานข้อมูลที่สกว. เช่น ฐานข้อมูล SCI INSPEC ScienceDirect ERIC PUBSCIENCE เป็นต้น

ข้อแนะนำสำหรับการตอบแบบสอบถามนี้

a. แบบสอบถามนี้มีทั้งหมด 7 หน้า (รวมหน้าที่ด้านบน) กรุณาตอบคำถามทุกข้อ คำถามทุกข้อของท่านจะถูกเก็บไว้เป็นความลับ โดยจะมีการรวบรวมเฉพาะผลการวิจัยที่แสดงถึงภาพรวมของมหาวิทยาลัยในประเทศไทยเท่านั้น ไม่มีการรายงานผลเป็นรายมหาวิทยาลัย

b. ในการตอบแบบสอบถามในส่วนที่ 2 และ 3 กรุณาพิจารณาให้ข้อมูลภาพรวมของการจัดการควบคุม และการบริหารจัดการภายในของมหาวิทยาลัยที่ดำเนินการระหว่างปี พ.ศ. 2552 จนถึงปัจจุบัน

ขอขอบพระคุณท่านผู้บริหารมหาวิทยาลัยและคณาจารย์ทุกท่านที่ท่านมีการตอบแบบสอบถามนี้
แบบสอบถามสำหรับการวิจัย
เรื่อง การวิเคราะห์การจัดการความรู้ ความสามารถและคุณลักษณะขององค์กรที่ส่งผลต่อสมรรถนะองค์กรของมหาวิทยาลัยในประเทศไทย: มุมมองของผู้บริหารมหาวิทยาลัย

ส่วนที่ 1 ข้อมูลเกี่ยวกับผู้ตอบแบบสอบถาม

โปรดทำเครื่องหมายข้างเคียง (X) สำหรับคำตอบของท่านในแต่ละคำถามต่อไปนี้

1.9 เพศ
☐ ชาย ☐ หญิง

1.10 ปัจจุบันท่านอายุ ................. ปี (โปรดระบุเป็นตัวเลข)

1.11 ท่านทํางานในมหาวิทยาลัยนี้เป็นระยะเวลา ................... ปี (โปรดระบุเป็นตัวเลข)

1.12 ระดับการศึกษาสูงสุด
☐ ต่ํากว่าปริญญาตรี ☐ ปริญญาตรี ☐ ปริญญาโท ☐ ปริญญาเอก

1.13 ตำแหน่งหน้าที่ในปัจจุบัน
☐ อธิการบดี ☐ รองอธิการบดี ผู้ช่วยอธิการบดี ☐ คณบดี รองคณบดี ☐ ผู้อํานวยการสํานัก ผู้อํานวยการกอง ผู้อํานวยการสถาบัน หรือเทียบเท่า ☐ อื่นๆ โปรดระบุ.................................................................

1.14 ระดับการมีส่วนร่วมในการดําเนินโครงการ/กิจกรรมการจัดการความรู้ของมหาวิทยาลัย
☐ เป็นผู้รับผิดชอบหลัก หรือเป็นหัวหน้าโครงการ/กิจกรรม หรือเป็นฝ่ายบริหารโครงการ/กิจกรรม ☐ เป็นผู้รับผิดชอบแนวทางการดําเนินโครงการหรือการดําเนินกิจกรรม ☐ เป็นผู้เข้าร่วมโครงการหรือกิจกรรม ☐ เคยมีส่วนร่วมในการดําเนินโครงการหรือกิจกรรมในอดีต แต่ปัจจุบันไม่มีส่วนร่วมแล้ ☐ ไม่เคยเข้าร่วมดําเนินโครงการหรือกิจกรรมทั้งในอดีตจนถึงปัจจุบัน

1.15 การกิจลักษณะของมหาวิทยาลัยที่ท่านสังกัดอยู่
☐ มหาวิทยาลัยที่เน้นการวิจัย (research university) ☐ มหาวิทยาลัยที่เน้นการผลิตบัณฑิต (teaching university)

1.16 ประเภทของมหาวิทยาลัยที่ท่านสังกัดอยู่
☐ มหาวิทยาลัยของรัฐ (non-autonomous public university) ☐ มหาวิทยาลัยในกํากับของรัฐ (autonomous public university) ☐ มหาวิทยาลัยเอกชนสถาบันเอกชน/วิทยาลัยเอกชน (private university)

คําอธิบายเพิ่มเติม
ข้อความต่อไปนี้ในส่วนที่ 2 และ 3 ของแบบสอบถาม เป็นข้อความที่เกี่ยวกับพฤติกรรมการดําเนินงานและกิจกรรมการจัดการความรู้และการบริหารจัดการมหาวิทยาลัยโดยภาพรวม ผู้วิจัยต้องการทราบว่ามหาวิทยาลัยของท่าน/ผู้บริหารมหาวิทยาลัยได้ดําเนินงานและกิจกรรมต่างๆ มากน้อยเพียงไฉน ในแต่ละคำถาม

โดยการให้คะแนนจาก 1 ถึง 7 ที่นี้
• คะแนน 7 หมายถึง ข้อความนั้นเกิดขึ้นมากที่สุด
• คะแนน 1 หมายถึง ข้อความนั้นเกิดขึ้นน้อยที่สุด
ส่วนที่ 2 การจัดการความรู้
โปรดอ่านข้อความต่อไปนี้และประเมินว่ามหาวิทยาลัยของท่านมีการดำเนินการจัดการความรู้ (Knowledge Management – KM) ในระดับใด โปรดทำเครื่องหมายจากzahl (X) สำหรับคำตอบของท่านในแต่ละคำถามต่อไปนี้

<table>
<thead>
<tr>
<th>ข้อที่</th>
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<th>มากที่สุด</th>
<th>น้อยที่สุด</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>มหาวิทยาลัยมีการวิเคราะห์อย่างเป็นระบบเพื่อปิดช่องว่างความรู้ (knowledge gap) และใช้กระบวนการที่กำหนดขึ้นอย่างชัดเจนในการปิดช่องว่างเหล่านั้น</td>
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<td>2.2</td>
<td>มหาวิทยาลัยมีกลไกในการรวบรวมความรู้อย่างเป็นระบบและมีจริยธรรม</td>
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<td>2.3</td>
<td>บุคลากรทุกคนของมหาวิทยาลัยมีส่วนร่วมในการตรวจสอบแนวทางความคิดใหม่ ๆ ทั้งในและนอกกระบวนการทางภายนอก</td>
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<td>2.4</td>
<td>มหาวิทยาลัยมีกระบวนการวิเคราะห์แบบปฏิบัติที่ดี (best practice) ที่จะนำไปจัดทำเป็นเอกสารและบทเรียนที่ได้เรียนรู้ (lesson learned)</td>
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<td>2.5</td>
<td>มหาวิทยาลัยเห็นคุณค่าและสนับสนุนการทบทวนความรู้ (tacit knowledge) ที่ไม่แจ้งชัด ซึ่งเป็นความรู้ที่ฝังอยู่ในตัวบุคลากรแต่ละคนและยังไม่ถูกกำหนดเป็นเอกสาร</td>
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<td>2.6</td>
<td>มหาวิทยาลัยส่งเสริมการเรียนรู้เป็นทีม (team-based learning) ผ่านคณะทำงาน คณะผู้กำหนดโครงการ และคณะทำงานพิเศษ ประกอบด้วยบุคลากรจากหน่วยงานต่าง ๆ ของมหาวิทยาลัย</td>
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<td>2.7</td>
<td>มหาวิทยาลัยสนับสนุนการพัฒนาผู้เรียน (job rotation) ของบุคลากรภายในสายงาน ทั้งในระดับบริหาร วิชาการและสนับสนุน</td>
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<td>2.8</td>
<td>การจัดการความรู้ (knowledge management) ถือเป็นหนึ่งในกลยุทธ์สำคัญของมหาวิทยาลัย</td>
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<td>2.9</td>
<td>มหาวิทยาลัยมีความเข้าใจถึงศักยภาพในการสร้างรายได้จากสินทรัพย์ทางความรู้ (knowledge asset) และพัฒนาการยุทธศาสตร์ทางการตลาดและการขยายสินทรัพย์เหล่านั้น</td>
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<td>2.10</td>
<td>มหาวิทยาลัยใช้การเรียนรู้เพื่อสนับสนุนความสามารถหลัก (core competencies) ที่มีอยู่และเพื่อสร้างสรรค์ความสามารถหลักใหม่ ๆ</td>
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<td>2.11</td>
<td>การว่าจ้าง การประเมินผลงาน และการให้ผลตอบแทนแก่บุคลากรจะพิจารณาเกี่ยวกับความเร่งด่วนของบุคลากรในการสร้างองค์ความรู้เกี่ยวกับมหาวิทยาลัย</td>
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<td>2.12</td>
<td>ผู้บริหารทุกระดับของมหาวิทยาลัยแสดงการหูให้ในกิจกรรม และโครงการเกี่ยวกับการจัดการความรู้</td>
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<td>1</td>
</tr>
</tbody>
</table>
2.13 มหาวิทยาลัยมีการเสริมสร้างบรรยากาศ/สภาพแวดล้อมในการทำงานที่เอื้อให้เกิดการแบ่งปันความรู้ (knowledge sharing) ของบุคลากรในคณะหรือหน่วยงานเดียวกัน

2.14 มหาวิทยาลัยมีการเสริมสร้างบรรยากาศ/สภาพแวดล้อมในการทำงานที่เอื้อให้เกิดการแบ่งปันความรู้ (knowledge sharing) ของบุคลากรข้ามคณะหรือข้ามหน่วยงานแต่ยังภายในมหาวิทยาลัย

2.15 มหาวิทยาลัยมีการเสริมสร้างบรรยากาศ/สภาพแวดล้อมในการทำงานที่เอื้อให้เกิดการแบ่งปันความรู้ (knowledge sharing) ของบุคลากรของมหาวิทยาลัยกับสถาบันภายนอกและภาคธุรกิจอุตสาหกรรม

2.16 มีการเสริมสร้างบรรยากาศของความเปิดเผย (openness) และความไว้เนื้อเชื่อใจ (trust) ปรากฏให้เห็นทั่วทั้งมหาวิทยาลัย

2.17 มหาวิทยาลัยมีการส่งเสริมการติดต่อกับผู้มีส่วนได้เสีย (stakeholders) ของมหาวิทยาลัยมากยิ่งขึ้น

2.18 การเรียนรู้ถือเป็นความรับผิดชอบของบุคลากรทุกคนของมหาวิทยาลัย

2.19 มีการสร้างความรู้เชิงลึกของบุคลากรทุกคนของมหาวิทยาลัย

2.20 มีการสร้างความรู้เชิงลึกของบุคลากรทุกคนของมหาวิทยาลัย

2.21 มีการสร้างความรู้เชิงลึกของบุคลากรทุกคนของมหาวิทยาลัย

2.22 มีการสร้างความรู้เชิงลึกของบุคลากรทุกคนของมหาวิทยาลัย

2.23 มีการสร้างความรู้เชิงลึกของบุคลากรทุกคนของมหาวิทยาลัย

2.24 มีการสร้างความรู้เชิงลึกของบุคลากรทุกคนของมหาวิทยาลัย

2.25 ระบบข้อมูลสารสนเทศของมหาวิทยาลัยเป็นระบบที่มีความยืดหยุ่น (flexibility) และความพร้อมในการสร้างแนวคิดใหม่ตามบริบทและเกิดสิ่งที่ต้องการ

2.26 มหาวิทยาลัยกำหนดวิธีในการเชื่อมโยงความรู้เกี่ยวกับผลการดำเนินงาน
<table>
<thead>
<tr>
<th>ข้อที่</th>
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<th>น้อยที่สุด</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.27</td>
<td>มหาวิทยาลัยกำหนดตัวชี้วัดสำหรับการจัดการความรู้ไว้โดยเฉพาะ</td>
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<tr>
<td>2.28</td>
<td>ตัวชี้วัดของมหาวิทยาลัยมีความสมบูรณ์ระหว่างตัวชี้วัดที่ค่าน้อยเป็นตัวเงินได้ง่าย (hard indicator) และตัวชี้วัดที่ค่าน้อยเป็นตัวเงินได้ยาก (soft indicator)</td>
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<tr>
<td>2.29</td>
<td>มหาวิทยาลัยจัดสรรทรัพยากรให้กับกิจกรรมต่างๆที่ทำให้ฐานความรู้ (knowledge base) ของมหาวิทยาลัยเพิ่มพูนขึ้นอย่างเห็นได้ชัด</td>
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ส่วนที่ 3 ความสามารถขององค์กร

โปรดอ่านข้อความต่อไปนี้และประเมินว่ามหาวิทยาลัยของท่านหรือผู้บริหารมหาวิทยาลัยโดยภาพรวมมีการบริหารจัดการหรือแสดงพฤติกรรมในระดับใด โปรดทำเครื่องหมายยากราพ (X) สำหรับคำตอบของท่านในแต่ละคำถาม

<table>
<thead>
<tr>
<th>ข้อที่</th>
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<th>น้อยที่สุด</th>
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</thead>
<tbody>
<tr>
<td>3.1</td>
<td>ผู้บริหารสามารถประสานให้เกิดการใช้ทรัพยากรและทักษะฝีมือของคณะและหน่วยงานต่างๆภายในมหาวิทยาลัย</td>
<td>7</td>
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<tr>
<td>3.2</td>
<td>ผู้บริหารสนับสนุนการถ่ายทอดความเชี่ยวชาญเฉพาะและทักษะฝีมือระหว่างคณะต่างๆในการดำเนินงานวิจัยที่เกี่ยวข้องกับหลักสูตรวิชา (สาขาวิชา)</td>
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<td>3.3</td>
<td>ผู้บริหารมีส่วนร่วมในการวิเคราะห์ข้อมูล</td>
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<td>3.4</td>
<td>ผู้บริหารพิจารณาทางเลือกต่างๆในการตัดสินใจเห็นด้วยของข้อเท็จจริงและข้อเสนอ</td>
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<tr>
<td>3.5</td>
<td>ผู้บริหารมุ่งเน้นการทำแผนงานให้บรรลุวัตถุประสงค์ การวางแผน และผลสัมฤทธิ์</td>
<td>7</td>
<td>1</td>
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<td>3.6</td>
<td>ผู้บริหารตั้งเป้าหมายที่ทำให้และมีการวางแผนและปรับสมรรถนะการดำเนินงานอย่างเหมาะสม</td>
<td>7</td>
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<td>3.7</td>
<td>ผู้บริหารให้เรียนรู้ผลกระทบที่อาจเกิดขึ้นจากการใช้อำนาจในการบริหาร</td>
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<td>3.8</td>
<td>ผู้บริหารแสดงให้เห็นถึงการทำงานเชิงรุกและมีความรับผิดชอบต่อการดำเนินงาน</td>
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<td>3.9</td>
<td>ผู้บริหารมีความเข้าใจตนเอง คุณค่าและความคิด</td>
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<td>3.10</td>
<td>ผู้บริหารมีวิชาชีพและทักษะในการนำเสนอผลงาน</td>
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<td>3.11</td>
<td>ผู้บริหารใช้ความคิดเชิงสร้างสรรค์และสร้างสรรค์ในการพัฒนา</td>
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<td>ข้อที่</td>
<td>ข้อความ</td>
<td>มากที่สุด</td>
<td>น้อยที่สุด</td>
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<td>3.12</td>
<td>ผู้บริหารสามารถเปลี่ยนแปลงความคิดให้เป็นเครื่องมือที่นำไปใช้ ประโยชน์ในการปฏิบัติงานได้จริง</td>
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<td>3.13</td>
<td>ผู้บริหารสร้างเครือข่ายและระบุบุคลากรทุกกลุ่มชั้นในสายการบังคับบัญชาเพื่อให้ดำเนินงานได้บรรลุเป้าหมาย</td>
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<td>3.14</td>
<td>ผู้บริหารตั้งเป้าหมายและวัตถุประสงค์รวมและสร้างสรรค์การ ทำงานร่วมกันและส่งเสริมการทำงานเป็นทีม</td>
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<td>3.15</td>
<td>ผู้บริหารสามารถระบุยังชั่วชีวิตของการตัดสินใจในแต่ละ ทางเลือก</td>
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<td>3.16</td>
<td>ผู้บริหารสามารถควบคุมพฤติกรรมของบุคคลโดยการแสดงออก ให้เห็นถึงความตั้งใจอย่างเต็มที่</td>
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<td>3.17</td>
<td>ผู้บริหารสามารถทำงานภายใต้ภาวะความเครียดเป็น ระยะเวลาต่อเนื่องยาวนาน</td>
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<td>3.18</td>
<td>ผู้บริหารสามารถปรับเปลี่ยนและเริ่มต้นอย่างขั้นตอนหรือระบบแผนเพื่อ วัตถุประสงค์ที่คาดการณ์ไม่ได้ในสภาพแวดล้อมการทำงาน</td>
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<td>3.19</td>
<td>ผู้บริหารมีการจัดการอย่างดีเนื่องจากมหาวิทยาลัยมีองค์ความรู้ ใหม่ๆที่จำเป็นและมีคุณค่า</td>
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<td>3.20</td>
<td>มหาวิทยาลัยรู้ว่าต้องการทรัพยากร ความสามารถ และ เทคโนโลยีประเภทใดบ้าง</td>
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<td>3.21</td>
<td>มหาวิทยาลัยพัฒนาหลักสูตรให้เหมาะสมกับสภาพแวดล้อมและ ตอบรับกับแนวโน้มของความเปลี่ยนแปลง</td>
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<td>3.22</td>
<td>มหาวิทยาลัยมีการจัดหาความต้องการของผู้มีส่วนได้เสียบางกลุ่มที่ ยังไม่ได้รับการตอบแทน</td>
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<td>3.23</td>
<td>มหาวิทยาลัยเก็บรวบรวมข้อมูลและความรู้สำคัญจากภายใน มหาวิทยาลัยได้อย่างมีประสิทธิภาพ</td>
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<td>3.24</td>
<td>มหาวิทยาลัยเก็บรวบรวมข้อมูลและความรู้สำคัญจากภายนอก มหาวิทยาลัยได้อย่างมีประสิทธิภาพ</td>
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<td>3.25</td>
<td>มหาวิทยาลัยคำนวณประสิทธิผลและความคุ้มค่า (cost effectiveness)ของการเก็บรวบรวมข้อมูลและความรู้สำคัญจาก ภายในมหาวิทยาลัย</td>
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<td>3.26</td>
<td>มหาวิทยาลัยคำนวณประสิทธิผลและความคุ้มค่า (cost effectiveness)ของการเก็บรวบรวมข้อมูลและความรู้สำคัญจาก ภายนอกมหาวิทยาลัย</td>
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<td>3.27</td>
<td>มหาวิทยาลัยมีฐานข้อมูลความเชี่ยวชาญเฉพาะด้านและ ความเชี่ยวชาญกับองค์กรหรือช่องทางของความจำเป็นต้องๆ</td>
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<td>ข้อที่</td>
<td>ข้อความ</td>
<td>มากที่สุด</td>
<td>→ น้อยที่สุด</td>
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<td>3.28</td>
<td>มหาวิทยาลัยจัดให้มีฐานข้อมูลวารสารและงานวิจัยเชิงวิชาการให้คณาจารย์, นักวิจัย, และนักศึกษา.</td>
<td>7</td>
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<td>3.29</td>
<td>มหาวิทยาลัยส่งเสริมให้คณาจารย์และบุคลาการทั้งหมดพัฒนาทักษะการใช้คอมพิวเตอร์และการสื่อสารด้วยเทคโนโลยี</td>
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<td>3.30</td>
<td>มหาวิทยาลัยมีการปรับปรุงประสานงานกับนักศึกษาและผู้มีส่วนได้ส่วนเสียต่างๆเพื่อให้ทราบความต้องการเกี่ยวกับหลักสูตรหรือบริการทางวิชาการในมอ.</td>
<td>5</td>
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<td>3.31</td>
<td>มหาวิทยาลัยจัดให้มีเครื่องมือที่เพียงพอในการแก้ปัญหาให้แก่นักศึกษา.</td>
<td>4</td>
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<td>3.32</td>
<td>มหาวิทยาลัยมีความร่วมมือกับองค์กรที่เกี่ยวข้องในการทำงานวิจัยและพัฒนาต่างๆ.</td>
<td>3</td>
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<td>3.33</td>
<td>มหาวิทยาลัยมีการปรับปรุงหลักสูตรและกิจกรรมสำหรับนักศึกษาให้สอดคล้องกับผลการวิจัยของนักศึกษา.</td>
<td>2</td>
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<td>3.34</td>
<td>มหาวิทยาลัยส่งเสริมความรู้ที่เป็นประโยชน์จากฐานข้อมูลที่มีอยู่.</td>
<td>1</td>
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<td>3.35</td>
<td>มหาวิทยาลัยมีการปรับปรุงกระบวนการและเนื้อหาในการตัดสินใจเพื่อให้สอดคล้องกับการพัฒนาที่เกิดขึ้น.</td>
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<td>มหาวิทยาลัยมีการปรับปรุงกระบวนการประชุมและบริการทางวิชาการให้มีประสิทธิภาพมากยิ่งขึ้น</td>
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<td>3.37</td>
<td>มหาวิทยาลัยมีการปรับปรุงประสิทธิภาพในการดำเนินงานประจำปี.</td>
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<td>3.38</td>
<td>มหาวิทยาลัยเพิ่มความยืดหยุ่นในการทำงานและเปิดโอกาสให้บุคลาการเรียนรู้และการทำงานของตนเองให้ดียิ่งขึ้น.</td>
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<tr>
<td>3.39</td>
<td>มหาวิทยาลัยส่งเสริมให้มีการรวมกลุ่มอย่างไม่เป็นทางการเพื่อบรรบกิจการและสื่อสารระหว่างบุคลาการให้มีประสิทธิภัยยิ่งขึ้น.</td>
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<td>3.40</td>
<td>บุคลาการทั้งหมดของมหาวิทยาลัยมีการดำเนินงานร่วมกันเป็นระยะเวลารวมทั้งการพัฒนาและปรับปรุงกิจการที่มีอยู่</td>
<td>2</td>
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<td>3.41</td>
<td>บุคลาการทั้งหมดของมหาวิทยาลัยมีการดำเนินงานร่วมกันเป็นระยะเวลารวมทั้งการพัฒนาและปรับปรุงกิจการที่มีอยู่</td>
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<td>3.42</td>
<td>มหาวิทยาลัยมีการส่งเสริมการรวมกลุ่มของบุคลาการในการรวม และบูรณาการกิจการที่มีอยู่</td>
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<td>3.43</td>
<td>มหาวิทยาลัยมีการส่งเสริมการรวมกลุ่มของบุคลาการในการรวม และบูรณาการกิจการที่มีอยู่</td>
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<td>3.44</td>
<td>มหาวิทยาลัยได้ดำเนินโครงการและกิจกรรมเพื่อพัฒนาและ</td>
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<td>ข้อที่</td>
<td>ข้อความ</td>
<td>มากที่สุด</td>
<td>น้อยที่สุด</td>
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<td></td>
<td>รักษาความภักดีต่อองค์กรให้อยู่ในระดับสูงอย่างต่อเนื่อง</td>
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<td>3.45</td>
<td>มหาวิทยาลัยส่งเสริมค่านิยมในเรื่องการสนทนาจะสุข (Dialogue) และการยอมรับความเห็นที่แตกต่างในทุกหน่วยงานภายในมหาวิทยาลัย</td>
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<td>3.46</td>
<td>นอกจากนี้ยังด้านมาตรฐานทางศึกษาแล้ว มหาวิทยาลัยได้ดำเนินถึงความรวดเร็วในการพัฒนาหลักสูตรหรือบริการทางวิชาการใหม่ ๆ เพื่อให้เกิดความต่ำกว่าการของนักศึกษาและจะมีส่วนได้เสียอื่น ๆ</td>
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<tr>
<td>3.47</td>
<td>มหาวิทยาลัยปรับปรุงคุณภาพของหลักสูตรงานวิจัย นักศึกษาบัณฑิต และบริการทางวิชาการ</td>
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<td>3.48</td>
<td>มหาวิทยาลัยปรับปรุงความเชื่อถือได้ (reliability) ของหลักสูตรงานวิจัย นักศึกษาบัณฑิต และบริการทางวิชาการ</td>
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<td>3.49</td>
<td>มหาวิทยาลัยปรับปรุงการดำเนินงานให้สอดคล้องกับมาตรฐานทางการศึกษาและกฎระเบียบที่เกี่ยวข้อง</td>
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<td>3.50</td>
<td>มหาวิทยาลัยมีการดำเนินงานเพื่อกระตุ้นชื่อเสียงหรือมีบทบาทสำคัญในการขับเคลื่อนในสาขาเฉพาะทาง</td>
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<td>3.51</td>
<td>มหาวิทยาลัยมีชื่อเสียงในระดับที่สามารถส่งผู้พัฒนาและวิทยา ให้ชื่อถูกต้องที่มีคุณค่า มีความรู้ความสามารถ</td>
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<td>3.52</td>
<td>มหาวิทยาลัยประสบผลสำเร็จในการสร้างภาพลักษณ์ให้โดดเด่น เหลือกว่ามหาวิทยาลัยอื่น</td>
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ส่วนที่ 4 โปรดให้ข้อคิดเห็นหรือแนวทางในการพัฒนาการจัดการความรู้ขององค์กรให้ประสบผลสำเร็จ

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APPENDIX F
Guideline for In-depth Interview
Guideline for In-Depth Interview

There are two levels of interviewees in this study.

1. Management level as chief knowledge officer (CKO) of the university
2. Operational level as knowledge management committee member (KM member) of the university

Questions for CKO

1. How long have you been responsible for knowledge management at the university level? As a CKO, what are your major roles? And what is the linkage between the CKO and the university’s top management (including president, vice-present, and assistant president)?
2. How does the leadership of the university’s top management affect knowledge management implementation, organizational competency, and organizational performance? And to what extent do they gain trust and recognition?
3. What are the major objectives of the university to developing a knowledge management system (KMS)? And what are the key indicators for measuring success?
4. How do you ensure that the KM implementations at all levels align and meet the common objectives? And what are the linkages between the KM activities at the university level and the KM activities at lower levels?
5. In your university, are the KM matters mandatory or voluntary? Routines or projects?
6. As this dissertation focuses on the five components of the KM system, comprising (1) the KM process, (2) KM leadership, (3) KM culture, (4) KM technology, and (5) KM measurement, please help rank the importance of these components in your view or from your experience at your university.
7. Do you suggest any other components?
8. What kinds of KM activities or projects require ICT resources? [ICT stands for information and communication technology].
9. Has your university formulated a mechanism to commercialize the knowledge asset into a new product or service? Please elaborate on the processes.
10. What were the weaknesses or problems at the stage of KMS initiation, KMS implementation, and KMS maintenance?

11. In this dissertation, organizational competency is defined as a set of organization-specific resources and capabilities that bestow the organization’s competitive advantage. Do you see any objective evidence that knowledge management has affected the organizational competency of your university? And what is that evidence?

12. Do you see any objective evidence that knowledge management has affected the overall performance of your university? And what is that evidence?

13. Do you see any objective evidence that organizational competency has affected the overall performance of your university? And what is that evidence?

14. Do the annual performance appraisals of university management, faculty, or support staff partially refer to KM involvement or organizational competency improvement?

15. Do you think managerial autonomy affects organizational competency and organizational performance? Why?

Questions for KM members

1. How long have you been on a knowledge management committee at the university level? And what are your major roles?

2. How does the leadership of the university’s top management affect knowledge management implementation, organizational competency, and organizational performance? To what extent do they gain trust and recognition?

3. What are the major objectives of the university to developing a knowledge management system? What are the key indicators for measuring success?

4. How do you ensure that the KM implementations at all levels align and meet the common objectives? And what are the linkages between the KM activities at the university level and the KM activities at lower levels?

5. In your university, are the KM matters mandatory or voluntary? Routines or projects?

6. As this dissertation focuses on the five components of KM system comprising (1) the KM process, (2) KM leadership, (3) KM culture, (4) KM technology,
and (5) KM measurement, please help rank the importance of these components in your view or according to your experience at your university.

7. Do you suggest any other components?

8. What kinds of KM activities or projects require ICT resources? [ICT stands for information and communication technology].

9. Has your university formulated a mechanism to commercialize the knowledge asset into a new product or service? Please elaborate on the processes.

10. What were the weaknesses or problems at the stage of KMS initiation, KMS implementation, and KMS maintenance?

11. Do the annual performance appraisals of university management, faculty, or support staff refer to KM involvement or organizational competency improvement?

12. Do you think that managerial autonomy affects organizational competency and organizational performance and why?
APPENDIX G
SPSS Outputs
Table G.1: KMO and Bartlett's Test – Organizational Performance

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Table G.2: Factor Analysis – Organizational Performance

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Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization
a Rotation converged in 6 iterations
Total Variance Explained 60.506 percent

Table G.3: Reliability Statistics – Organizational Performance

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Table G.4: Factor Analysis – Knowledge Management (Eigenvalue ≥ 1)

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Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization
a Rotation converged in 7 iterations
Total Variance Explained 73.134 percent

Table G.5: KMO and Bartlett's Test – Knowledge Management

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | .947 |
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Table G.6: Factor Analysis – Knowledge Management (Extract 5 factors)

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Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization
a  Rotation converged in 10 iterations
Total Variance Explained 76.034 percent

Table G.7: Reliability Statistics – Knowledge Management

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Table G.8: Factor Analysis – Organizational Competency (Eigenvalue ≥ 1)

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<td>.459</td>
<td>.470</td>
<td>.360</td>
<td>.356</td>
<td>-.080</td>
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<td>.286</td>
<td>.803</td>
<td>.088</td>
<td>-.035</td>
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<td>.740</td>
<td>.251</td>
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<td>CTRAN12</td>
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<td>.354</td>
<td>.187</td>
<td>.677</td>
<td>.141</td>
<td>.214</td>
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</table>
Extraction Method: Principal Component Analysis  
Rotation Method: Varimax with Kaiser Normalization 
   a  Rotation converged in 7 iterations 
Total Variance Explained 77.854 percent

### Table G.9: KMO and Bartlett's Test – Organizational Competency

<table>
<thead>
<tr>
<th>Kaiser-Meyer-Olkin Measure of Sampling Adequacy.</th>
<th>.931</th>
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<tr>
<td>Bartlett's Test of Sphericity</td>
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<tr>
<td>Approx. Chi-Square</td>
<td>6884.076</td>
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<tr>
<td>df</td>
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<td>Sig.</td>
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### Table G.10: Factor Analysis – Organizational Competency (Extract 4 factors)

<table>
<thead>
<tr>
<th>Rotated Component Matrix(a)</th>
<th>Component</th>
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<tr>
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<td>CMAN4</td>
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<td>CMAN12</td>
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<td>------</td>
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<td>COUTPUT3</td>
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<td>CINPUT9</td>
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<td>CINPUT2</td>
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<td>CINPUT4</td>
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<td>CINPUT5</td>
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<td>CMAN1</td>
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<td>CTRAN8</td>
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<td>CTRAN13</td>
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</table>

Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization
a Rotation converged in 7 iterations
Total Variance Explained 73.669 percent
Table G.11: Reliability Statistics – Organizational Competency

<table>
<thead>
<tr>
<th>Cronbach's Alpha</th>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
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<tr>
<td>.981</td>
<td>.982</td>
<td>35</td>
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Normal P-P Plot of Regression Standardized Residual

Figure G.1 Normal P=P Plot of Regression Standardized Residual for Organizational Performance
Figure G.2: Scatterplot for Organizational Performance
Figure G.3: Normal P-P Plot of Regression Standardized Residual for Organizational Competency
Figure G.4: Scatterplot for Organizational Competency
Table G.12: Stepwise Multiple Regression on Organizational Performance

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>95% Confidence Interval for B</th>
<th>Correlations</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>13.547</td>
<td>2.841</td>
<td>5.296</td>
<td>.000</td>
<td>9.411</td>
<td>20.683</td>
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<tr>
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<td>0.539</td>
<td>0.835</td>
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<td>4.564</td>
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<tr>
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<td>(Constant)</td>
<td>14.113</td>
<td>2.481</td>
<td>5.887</td>
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<td>19.035</td>
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<td>0.455</td>
<td>0.712</td>
<td>.000</td>
<td>2.300</td>
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<td>0.818</td>
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<td>0.844</td>
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<td>5.496</td>
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<td>-2.821</td>
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<td>(Constant)</td>
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<td>8.715</td>
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<td>0.823</td>
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<td>.000</td>
<td>-1.865</td>
<td>-1.658</td>
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<td>2.896</td>
<td>0.592</td>
<td>0.893</td>
<td>.000</td>
<td>1.722</td>
<td>4.071</td>
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* Dependent Variable: ORG.PERFORM

Table G.13: Model Summary(e) – Organizational Performance

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.558(a)</td>
<td>.311</td>
<td>.304</td>
<td>3.30746</td>
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<tr>
<td>2</td>
<td>.694(b)</td>
<td>.482</td>
<td>.472</td>
<td>2.88166</td>
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<tr>
<td>3</td>
<td>.717(c)</td>
<td>.514</td>
<td>.499</td>
<td>2.80580</td>
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<tr>
<td>4</td>
<td>.739(d)</td>
<td>.546</td>
<td>.528</td>
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a Predictors: (Constant), ORG.COMP
b Predictors: (Constant), ORG.COMP, PUBLIC
c Predictors: (Constant), ORG.COMP, PUBLIC, KMTa
d Predictors: (Constant), ORG.COMP, PUBLIC, KMTa, RESEARCH
e Dependent Variable: ORG.PERFORM
Table G.14: Stepwise Multiple Regression on Organizational Competency

<table>
<thead>
<tr>
<th>Coefficient(s)</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>95% Confidence Interval for B</th>
<th>Correlations</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>R</td>
<td>R Square</td>
<td>Adjusted R Square</td>
<td>Std. Error of the Estimate</td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Zero-order</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>.693(a)</td>
<td>.481</td>
<td>.476</td>
<td>.45578</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KMMa</td>
<td>.756(b)</td>
<td>.571</td>
<td>.562</td>
<td>.41639</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>KMTa</td>
<td>.780(c)</td>
<td>.608</td>
<td>.596</td>
<td>.40002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KMPa</td>
<td>.793(d)</td>
<td>.628</td>
<td>.613</td>
<td>.39144</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

a: Predictors: (Constant), KMMa
b: Predictors: (Constant), KMMa, KMTa
c: Predictors: (Constant), KMMa, KMTa, KMPa
d: Predictors: (Constant), KMMa, KMTa, KMPa, KMCa
e: Dependent Variable: ORG.COMP

Table G.15: Model Summary(e) – Organizational Competency

<table>
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<th>Model</th>
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<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Lower Bound</th>
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<th>Zero-order</th>
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<td>.756(b)</td>
<td>.571</td>
<td>.562</td>
<td>.41639</td>
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<tr>
<td>3</td>
<td>.780(c)</td>
<td>.608</td>
<td>.596</td>
<td>.40002</td>
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<tr>
<td>4</td>
<td>.793(d)</td>
<td>.628</td>
<td>.613</td>
<td>.39144</td>
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</tr>
</tbody>
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a: Predictors: (Constant), KMMa
b: Predictors: (Constant), KMMa, KMTa
c: Predictors: (Constant), KMMa, KMTa, KMPa
d: Predictors: (Constant), KMMa, KMTa, KMPa, KMCa
e: Dependent Variable: ORG.COMP

Table G.16: Descriptive Statistics Classified by University Types

<table>
<thead>
<tr>
<th>ORG.PERFORM</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>95% Confidence Interval for Mean</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Lower Bound</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Upper Bound</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomously Public</td>
<td>12</td>
<td>36.0833</td>
<td>1.83196</td>
<td>.52884</td>
<td>34.9194</td>
<td>37.2473</td>
<td>33.00</td>
</tr>
<tr>
<td>Public</td>
<td>54</td>
<td>35.3333</td>
<td>3.22724</td>
<td>.43917</td>
<td>34.4525</td>
<td>36.2142</td>
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<td>31.6757</td>
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<td>.39071</td>
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</table>

Table G.17: Test of Homogeneity of Variances

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<tr>
<th>ORG.PERFORM</th>
<th>Levene Statistic</th>
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<th>df2</th>
<th>Sig.</th>
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<tr>
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Table G.18: ANOVA for in-between Groups

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<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>346.800</td>
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<td>173.400</td>
<td>13.794</td>
<td>.000</td>
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<tr>
<td>Within Groups</td>
<td>1257.025</td>
<td>100</td>
<td>12.570</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>1603.825</td>
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</tbody>
</table>

Table G.19: Multiple Comparisons in-between Groups

Dependent Variable: ORG.PERFORM

<table>
<thead>
<tr>
<th>(I) GROUP</th>
<th>(J) GROUP</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomous</td>
<td>Public</td>
<td>.75000</td>
<td>1.13150</td>
<td>.786</td>
<td>-1.9420 - 3.4420</td>
</tr>
<tr>
<td></td>
<td>Private</td>
<td>4.40766(*)</td>
<td>1.17782</td>
<td>.001</td>
<td>1.6055 - 7.2098</td>
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<tr>
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<td>Autonomous</td>
<td>-7.5000</td>
<td>1.13150</td>
<td>.786</td>
<td>-3.4420 - 1.9420</td>
</tr>
<tr>
<td></td>
<td>Private</td>
<td>3.65766(*)</td>
<td>.75665</td>
<td>.000</td>
<td>1.8575 - 5.4578</td>
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<tr>
<td></td>
<td>Autonomous</td>
<td>-4.40766(*)</td>
<td>1.17782</td>
<td>.001</td>
<td>-7.2098 - -1.6055</td>
</tr>
<tr>
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<td>Public</td>
<td>-3.65766(*)</td>
<td>.75665</td>
<td>.000</td>
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* The mean difference is significant at the .05 level.

Table G.20: Group Statistics

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<th>Orientation</th>
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<th>Std. Deviation</th>
<th>Std. Error Mean</th>
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Table G.21: Independent Samples Test

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<th>ORG.PERFORM</th>
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<th>t-Test for Equality of Means</th>
</tr>
</thead>
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<tr>
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<td>F</td>
<td>Sig.</td>
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<tr>
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</tr>
<tr>
<td>Equal variances not assumed</td>
<td>5.358</td>
<td>.000</td>
</tr>
</tbody>
</table>
BIOGRAPHY

NAME
Mr. Panuwong Kumpirarusk

ACADEMIC BACKGROUND
MSISE, 2001
University of Southern California
(Royal Thai Government Scholarship)
MBA, 1999
Thammasat University
B.E. in Industrial Engineering
Chulalongkorn University

PRESENT POSITION
Cabinet and Parliament Liaison Assistant
for Ministry of Industry
Standards Officer, Professional Level
Thai Industrial Standards Institute
Ministry of Industry

EXPERIENCES
Project Planner/Engineer
Thai Copper Industries (Public) Co., Ltd.
Production Control Engineer
Toyota Motor Thailand Company Limited