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THESIS

TRANSFORMATION PROCESS TO A LEARNING ORGANIZATION

SITTHINATH SANPANICH

A Thesis Submitted in Partial Fulfillment of

the Requirements for the Degree of

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Sitthinath Sanpanich 2012: Transformation Process to a Learning Organization. Doctor of Engineering (Industrial Engineering), Major Field: Industrial Engineering, Department of Industrial Engineering. Thesis Advisor: Associate Professor Kongkiti Phusavat, Ph.D. 216 pages.

The purpose of the research is to find the process of transforming the organization to a learning organization (LO) in Thailand. The researcher attempt to answer: What are the success characteristics that push forward a learning organization? Also, develop a process for moving towards a learning organization and develop a management tool for building a learning organization.

The finding base on literature review of a LO from 1990-2008 grouping and ranking by survey questionnaire from Thai companies both manufacturing and service sectors. The conceptual model of a LO characteristics are constructed and asked to top management or executive of national quality award recipients companies in Thailand. The results are from primary data: questionnaires and interviews. The researcher uses the qualitative concept and grounded theory to analyze the data from the surveys and uses non-parametric statistical techniques to analyzed primary data. The results from the questionnaires and the interviews are the success characteristics of a learning organization.

Surveyed companies have a strong background of knowledge management, innovation, and intellectual capital. Any organization be able to look at these characteristics for building their own process to a LO. The output from this research is a management tool for creating a learning organization.

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Student's signature Thesis Advisor's signature

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Sitthinath Sanpanich

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LIST OF ABBREVIATIONS

AEC	Asian Economic Community
ASEAN	Association of South East Asian Nations
BEST	Building talent Enterprise-wide, Supported by the Organization's leaders fostering a Thorough learning culture
BSC	Balanced Score Card
CRM	Customer Relation Management
GCI	Global Competitive Index
GSP	Gas Separation Plant
IC	Intellectual Capital
ICT	Information and Communication Technology
IMD	International Institute for Management and Development
KIBS	Knowledge Intensive Business Service
KM	Knowledge Management
LO	Learning Organization
OL	Organizational Learning
TQA	Thailand Quality Award
TQC	Thailand Quality Class
MAKE	Most Admired Knowledge Enterprise
MBNQA	Malcolm Baldrige National Quality Award
MIS	Management Information System
NESDB	National Economics and Social Development Board
NQA	National Quality Award
OEM	Original Equipment Manufacturer
O&M	Operation and Maintenance
SCADA	Supervisory Control and Data Acquisition
SMEs	Small and Medium Enterprises
TPM	Total Productive Maintenance
WEF	World Economic Forum

TRANSFORMATION PROCESS TO A LEARNING ORGANIZATION

INTRODUCTION

Becoming a learning organization and effective learning about how to create and innovate new markets, products, services and process is seen by top management, executives, directors, and managers as critical in attaining competitive advantage in an increasingly complex and unpredictable environment change which has always implicitly underpinned strategic success (Bill Richardson, 1995; Watkins and Marsick, 1993; Dibella and Nevis, 1998; Marquardt, 2002;). Organizational learning has long ago become an explicit strategic issue how organization-wide learning strengthens productivity improvement and innovatory activity in fast changing and multi-influence business situations. Top management of the firm always quest for excellence and they want to know how to achieve excellence and how to maintain it. This research is not only reply the quest from most organizational stakeholders embrace the value of building and sustaining a learning organization but also present an essential management tools to ensure continuous learning for viable and having long-term competitiveness capability.

For regional scale, the establishment of the ASEAN Economic Community by 2015, and to transform ASEAN into a region with free movement of goods, services, investment, skilled labor, and free flow of capital. The Asian Economic Community (AEC) envisages the following key characteristics: (a) a single market and production base; free flow of goods, free flow of services, free flow of investment, free flow of capital, free flow of skilled labor etc. (b) a highly competitive economic region; competition policy, consumer protection, intellectual property rights, infrastructure development, taxation, and E-commerce (c) a region of equitable economic development; SME's development, initiative for asean integration into the global economy and (d) a region fully integrated into the global economy; coherent approach

towards external economic relations, enhanced participation in global supply networks.

Weakness of Thailand Competitiveness from Global Competitiveness Report of the WEF (World Economic Forum) and World Competitiveness Report from IMD (International Institute for Management and Development)

National competitiveness from WEF is the set of institutions, policies, and factors that determine the level of productivity of a country and the sustainable level of prosperity that can be earned by an economy. The competitiveness composed of 12 pillars, Institutions, Infrastructure, Macroeconomic environment, Health and primary education, Higher education and training, Goods market efficiency, Labor market efficiency, Financial market development, Technological readiness, Market size, Business sophistication, and Innovation. In 2011 Thailand GCI (Global Competitiveness Index) is ranked 39th out of 142 countries; some weakness related to this research is *property rights in Institutions pillar, secondary education enrollment in Higher education and training pillar*, *capacity for innovation-company spending on R&D-University and Industry collaboration in R&D-Utility patents granted/million population from Innovation pillar.*

Compare to another institute of worldwide competitiveness ranking; World competitiveness from IMD is the ability of nations to create and maintain an environment, which sustains the competitiveness of enterprises and their ability to compete domestically and internationally. In 2011 Thailand, ranked 27th dropping one rank from year 2010 but moving up five ranks compare to year 2007 ranked 33rd. IMD criteria composed of 4 pillars; Economic Performance , Government Efficiency, Business Efficiency, and Infrastructure which ranked 10th, 23rd, 19th, and 47th respectively. Thailand weakness appears in Infrastructure (the worst Pillar) ranked 47th out of 59 countries. Detail of weakness in Infrastructure is composed of Basic Infrastructure, Technological Infrastructure, Scientific Infrastructure, Health Environment, and Education. Scientific Infrastructure concerns this research in the area of *Intellectual Property Rights, Knowledge Transfer, and Innovative Capacity*. The measurement unit of IPR is Intellectual property rights are adequately enforced,

Knowledge Transfer is highly developed between companies and universities, and Innovative Capacity of firms to generate new products, processes and/or services is high. Meanwhile IMD World Competitiveness Yearbook 2011 shown that the weaknesses of Thailand in Scientific Infrastructure; *Total R&D personnel in business per capita , Patent applications , Patent applications per capita , Patent granted to residents , Intellectual property rights , Knowledge transfer , and Innovation capacity.*

Moreover, Thai companies appear to have weakness in learning and knowledge management as shown by NESDB (Office of the National Economic and Social Development Board) report has drafted the Direction of the Eleventh Plan with the participation of all stakeholders at community, region, and national levels. One of the risks that confronting Thailand from the draft are: *the development based on knowledge and advanced technology, strengthening production of goods and services based on knowledge, and develop human resources*. Suggested development strategies; Strategy of promoting the just societies, *Strategy of developing human resources to promote lifelong learning society, Strategy of creating the knowledge-based economy and enabling economic environment towards sustainability* (NESBD, 2011).

This research is the continuing study of 'Developing an Assessment Model for a learning organization' (Phusavat, K. et al, 2010) which the researcher grouped the purpose characteristics of a LO to four areas: top management, organizational infrastructures, organizational culture, and expectation. The researcher repeated the same methodology of finding success characteristics of a LO from KIBS in Finland to Thai companies.

Only Will from top management alone could not lead the entire organization maintains a passionate and enthusiastic commitment to continuous improvement through continuous learning. Thai companies need to prepare themselves for weaknesses on learning and knowledge management practices. Thai companies familiar with the jargon Knowledge Management and learning organization for decade, but level of absorption and embedded these internally to the system is far from international competitiveness ranking. Recommended from NESDB for creating

the knowledge-based economy also accelerate need of promoting Innovation and Intellectual Capital in the organization, will ensure the consistency and coherence of these elements as well as their implementation and proper coordination among relevant stakeholders.

Knowledge Management, Innovation, Intellectual Capital, and learning organization: subjects of management integration will be presented as part of a process to design, build, and sustain learning within an organization.

Knowledge Management comprises a range of strategies and practices used in an organization to identify, create, represent, distribute, and enable adoption of insights and experiences which comprise knowledge, either embodied in individuals or embedded in organizations as processes or practices. Every organization already has knowledge management even more or less.

Innovation is the creation of new and better products, processes, technologies, or ideas that are accepted by customers, governments, and society. Innovation appears in three part of the model: Intellectual agility in Human Capital, Innovation Capital, and in KM as strategic planning process and assembly/transfer relevance knowledge.

Intellectual Capital conventionally refers to the difference in value between tangible assets (physical and financial) and market value. Another meaning is all factors critical to an organization's future success that are not shown in the traditional balance sheet. IC is commonly conceptualized as divided into two main components: Human capital (attitudes, skills and competences of people in the organization) and Structural capital (Relational Capital and Organizational Capital). Organizational Capital is divided to Innovation Capital and Process Capital (Edvinsson and Malone, 1997).

Learning Organization "is a company that effectively and collectively and continually transforms itself for better management and use of knowledge; empower people within and outside the organization to learn as they work; and utilizes technology to maximize both learning and production" (Marquardt, 2002).

Fortunately, the organizations that apply National Quality Award will gain benefit and advantage by analyzing themselves in KM and Innovation (Criteria for Performance Excellence, 2011-2012). As the structure of Intellectual Capital, is composed of Human Capital, Customer Capital, Process Capital, and Innovation Capital. Human capital (criteria 5), process capital (criteria 6), and customer capital (criteria 3) are investigated and analyzed only Innovation Capital is left for management to consider the quantity and quality of Intellectual Property (Copyright, Trademark) and Other Intangible (Patent, Trade Secret, Knowledge, and Know-how) concerning trend and value from its measurement.

Research Questions

This study attempts to answer the following questions:

What are the characteristics that push forward a learning organization?

Sub questions:

1. To what extent are purpose characteristics of a learning organization present in studied companies?

2. Are the characteristics of a learning organization in manufacturing difference from service sector?
   Hypothesis:
   The characteristics of a learning organization in manufacturing are as same as in service sector.

3. Are the characteristics of a learning organization in TQA same as in TQC companies?
   Hypothesis:
   The characteristics of a learning organization in TQA are as same as in TQC companies.

4. Are the median of eight characteristics, of a learning organization in TQA and TQC companies, the same?
   Hypothesis:
   The median of purpose characteristics is the same in TQA and TQC companies.

Problem Statement

Enormous changes in the economic environment caused by globalization and technology has forced companies to transform themselves significantly in order to survive in a new world and its new economy. Without continual learning, profit and product will no longer be possible. Unless an organization continuously adapts to the environment via speedy, effective learning, it will suffer and die. The rise of technologies and the shifting to network organizations and the emergence of a global society all require new ways of thinking about the unprecedented opportunities and challenges we encounter. A number of enterprises have been successful at particular aspects of becoming knowledge-based organizations, but very few have succeeded in marshaling the human, technological, and relationship resources to recreate themselves for the new era.

The eight most significant forces that will change the business world and necessitate company-wide learning in the 21st century. Globalization and the global economy, Technology, Radical transformation of the work world, Increased customer influence, *Emergence of knowledge and learning as major organizational assets*, Changing roles and expectations of workers, Workplace diversity and mobility, and Rapidly escalating change chaos (Marquardt, 2002).

In Thailand, *Emergence of knowledge and learning as major organizational assets* is lacking and less practice in manufacturing and service industry due to Thailand has internal problems in pursuing an effective industrial upgrading strategy. First, education is a major problem. Education in Thailand was designed to produce people who could work efficiently in production processes. They focused mainly on building employees' ability to work according to instructions given by their supervisors or blueprints. Therefore, it was suitable for early phase of country's industry where firms were either imitators of foreign products, or OEM (Original Equipment Manufacturers) of multinational corporations. When Thailand is attempting to move up the value chain from imitators to innovators, the education system must be able to build and support persons with creativity and higher learning

ability. Second, the quality and quantity of science and engineering graduates in Thailand are inadequate. This is a serious problem for a country which desires to be a learning and knowledge-based economy. Furthermore, Thailand is losing part of its competitiveness due to a mismatch of increasing real wages and increases in labor productivity. The increasing in labor productivity is lower than the real wages increase, in 2012, Thai government will increase minimum daily wage to 300 baht and minimum monthly salary of bachelor degree to 15,000 baht without linkage and studying to labor productivity increases. Thailand will lose part of its competitiveness due to the underachievement in education, compared with its Asian neighbors (Table 1). Third, Thailand National Innovation System (NIS) is weak and fragmented. Innovation stakeholders such as Government agencies, Private firms, Universities, Research organizations, and so on are not so efficient in performing their expected roles. For example, Thailand lacks of capability in reverse engineering and industrial designs, which are the basics for technological learning of successful organizations, are limited. In Thailand, policymakers paid attention only “linear model of innovation” to enhancing R&D capabilities of universities and public research institutes, and hoped that these organizations would automatically transfer the results of R&D to the private sector. (Intarakumnerd P., Lecler Y. 2010)

Thailand also has remarkable weakness in learning within an organization starting from school up to university and industry level. From Global Competitiveness Report 2009, among 9 countries in Asia (Singapore, Japan, Hong-Kong, Taiwan, Malaysia, Korea, China, Thailand, and Indonesia rank 2,9,11,13,21,24,26,39,46 respectively) Table 1. Thailand got lowest average score in quality of primary education, education system, math and science education, management school, internet at school, availability of research and training and extent to staff training. Also lowest average score in innovation, quality of scientific research institutions, company spending on R&D, University-Industry collaboration in R&D, government procurement of advanced technology products, and availability of scientists and engineers. All of the weakness mentioned above, reflex the worrisome of learning and training situation in Thailand.

Ministry of Industry and Office of Small and Medium Enterprises Promotion, Thailand raised the problems to most of Thai companies mainly SMEs are as follows:

Learning Problem: Lack of learning and development

Cooperation from Government Problem: Difficult to approach source of knowledge from government agencies, university, state institute and state enterprise

Information Problem: Limitation or Difficult to find information for benchmarking, Lack of information for long term production planning

International Knowledge Problem: Limitation from studying International Trade Agreement

Capital Problem: Lack of capital for investment in R&D for new products development

Labor Problem: Lack of effective employee or creativity employee and team for innovation

High Technology Problem: Lack of state of the art technology for competitive advantage

Quality Problem: Lack of quality improvement continuously, Innovation Problem: Lack of continuation from previous innovation, Cooperation Problem: Lack of clusters cooperation

Management Problem: Lack of innovation management skill, Budget Problem: Less incentive attraction to staff or team

Marketing Strategy Problem: Less support from government to find markets for new products

Strategic Problem: Limitation from setting new business alliance

Thai companies have to confront general negative consequences: Concentration on training with less learning development, National Innovation System is weak and fragmented, deficient for new processes and products development to the market, lack of leadership strategic development program for innovation, strengthening competitors local and global. More competitors entering to local market, frequent political disruptions and short-lived governments are major obstacles to the continuation of serious policy implementation, Mismatch between increases real wages and increases labor productivity (Intarakumnerd and Lecler, 2010).

Table 1 Thailand weakness in Learning – Education and Innovation (University-Industry collaboration in R&D) from WEF 2009

Global Competitiveness Report 2009 **Overall Ranking** **Primary and Higher education**	**Singapore** **2**	**Japan** **9**	**Hong Kong** **11**	**Taiwan** **13**	**Malaysia** **21**	**Korea** **24**	**China** **26**	**Thailand** **39**
Primary education enrollment	96.8	100	93.5	98	94.1	98.8	99.4	90.1
Secondary education enrollment	103	100.9	82.1	100.3	68.7	97.2	78.2	77
Tertiary education enrollment	63.6	58	56.6	83.8	36.5	98.1	24.5	45
Average	87.8	86.3	77.4	94.03	66.43	98.03	67.37	70.7
Quality of primary education	6.1	5.1	4.9	5.7	5.0	5.0	4.7	3.5
Quality of the education system	5.9	4.4	4.8	4.9	5.1	3.9	4.0	3.6
Quality of math and science education	6.4	4.9	5.3	5.8	5.0	5.2	4.7	4.2
Quality of management schools	5.6	4.3	5.2	5.1	5.0	4.5	4.3	4.1
Internet access in schools	6.3	4.9	6.1	6.1	5.2	6.2	5.7	4.5
Availability of research and training	5.2	5.5	5.3	5.2	5.3	4.6	4.5	4.1
Extent to staff training	5.4	5.3	4.7	4.6	5.2	4.3	4.2	4.1
Average	5.84	4.91	5.19	5.34	5.11	4.81	4.59	**4.01**
Innovation								
Capacity for innovation	4.3	5.8	3.5	4.7	4.3	4.3	4.2	3.2
Quality of scientific research institutions	5.5	5.5	4.6	5.2	4.9	4.8	4.3	3.9
Company spending on R&D	4.9	5.9	3.7	5.0	4.7	4.8	4.2	3.0
University-Industry collaboration R&D	5.5	5.1	4.7	5.2	4.9	4.7	4.5	4.2
Procurement of advance technology	5.4	4.1	4.2	4.5	4.9	4.1	4.4	3.6
Availability of scientists and engineers	5.3	5.8	4.5	5.5	4.9	4.9	4.6	4.3
Average	5.15	5.37	4.20	5.02	4.77	4.60	4.37	**3.70**
Utility patents granted/million pop.	125.6	352.9	60.4	355.7	7.2	240.6	2.0	**0.7**

OBJECTIVES

The objectives of this research are as follows:

1. To identify success characteristics of a learning organization
2. To create a process for moving towards a learning organization
3. To develop a management tool for Thai companies

The characteristics of a learning organization from literature review and survey from learning organization in Thailand results suppose to be success factors of a learning organization. A process for moving towards a learning organization will assist Thai companies turning to be a learning organization. To develop a management tool for Thai companies for ensuring continuous learning, sustaining and for improving performance and especially solving the general problem of Thai companies that confront negative consequences as stated in problem statement at large.

Management tool from the study constitute of principal component of characteristics of a learning Organization, knowledge management, innovation, and intellectual capital. Since, national quality award criteria is composed of a strong measurement in Knowledge Management and Innovation. The questions concerning in Innovation can be found in every category of the award criteria. The criteria of the award help strengthen the organizations competitiveness by

- Improving organizational performance practices, capabilities, and results
- Facilitating communication and sharing of information on best practices among U.S. organizations of all types
- Serving as a tool for understanding and managing performance and for guiding planning and opportunities for learning

Knowledge Management, Intellectual Capital, and learning organization or a triad of future management integration (McElyea, 2002) will create an organization that is dynamic and perpetuating new knowledge to improve competitive advantage and facilitate organizational learning. If this triad of management tool equipped with

innovation it will appears to be the necessary elements for future organizational success of management tool integration.

Definition of terms

TQA

TQA of Thailand Quality Award is the most prestige award in Thailand. The award is similar to MMNQA (Malcolm Baldrige National Quality Award) of USA. The score requirement is above 650 from total 1,000 points

TQC

TQC (Thailand Quality Class) is the runner-up of Thailand Quality Award. The score requirement is between 350 and 650 from total 1,000 points.

MBNQA

MBNQA (Malcolm Baldrige National Quality Award) is the most prestige, quality award in the USA. The award named after ministry of finance who died from helicopter accident in the beginning year 1987. MBNQA adopted by many countries around the world for example ABEA (Australian Business Excellence Award) 1988, SQA (Singapore Quality Award) 1989, JQA (Japan Quality Award) 1994, and EQA (European Quality Award) 1995. The seven criteria of Baldrige for Performance Excellence Framework are Leadership, Strategic Planning, Customer Focus, Measurement-Analysis and Knowledge Management, Workforce Focus, Operations Focus and Results.

Vision/Mission/Policy

A vision statement or a picture of the company in the future moreover, vision statement is an inspiration, the framework for all of the strategic planning and strategic to knowledge. A vision statement may apply to an entire company or to a single division of that company. Whether for all or part of an organization, the vision statement answers the question, “Where do we want to go?” A mission statement is a

brief description of a company's fundamental purpose. In addition, Policy is a planned or agreed course of action usually based on particular principles.

Leadership

Leadership is the art of motivating a group of people to act towards achieving a common goal. Three meaning of leadership; the position or function of a leader, the ability to lead and an act or instance of leading, guidance and direction. Top management demonstrates his/her leadership to all people for the progress of a learning organization and organizing a group of people to achieve a common goal.

C-level employee

C-level is an adjective used to describe high-ranking executive titles within an organization.*C*, in this context, stands for *Chief*. C-level titles include for example: CEO (Chief Executive Officer), CIO (Chief Information Officer), CFO (Chief Financial Officer), and CKO (Chief Knowledge Officer)

Knowledge Sharing

Knowledge sharing is an effective activity through which knowledge (i.e. information, skills, or expertise) is exchanged thru informal network among people, friends, or members of a family, a community and where people from different levels within the organization exchange ideas. This term is also essential in Knowledge Management field.

Knowledge Transfer

The organization uses any kind of tools and technology for example information technology, hardware, software, internet, intranet, web-board, website etc. effectively to foster communication and learning among staff or specialized knowledge developed in part of an organization to spread of knowledge to a wider group such as another part of the organization or business customers. Knowledge transfer is a prerequisite for knowledge sharing for competitive advantage, performance, and profitability.

Internal and External Support

The support of the organization from inside (manager, leader, supervisor) and outside (coach, mentor, guru, consultant) for coaching, mentoring, teaching and consulting, in general or specific areas to enhance knowledge and skills needed. Managers of the organization view themselves as internal teachers and facilitators of the learning process. While consultant, coach, guru, mentor etc. are external teachers and facilitators from outside.

Cross-Functional Management

A group of employees who have different functions within an organization and who work together as a team to achieve an objective for example a cross functional team to solve the company problems. Cross-Functional Management is one of the importance principles in TQM and essential characteristics for TQA and MBNQA companies. Cross-Functional Teams are used to accomplish tasks and solve the problems together effectively that cut across work areas or departments. Organizations need first to establish a clear learning organization vision grounded in meeting a real business need and make certain the organization can create and sustain a culture to support these goals.

Communication

Communication is the activity of conveying meaningful information from sender to receiver. Communication in the organization is opened or closed, formal or informal and cross levels or between departments. Business information is shared with all people within the organization. Managers and supervisors share information openly. Policy deployment and two ways communication make participative policymaking. The organization's policy is supporting process innovation and uses technology effectively to foster communication and learning among staff for example Information Communication Technology and Efficiency CoP (Community of Practice).

Continuous Improvement

A continuous improvement is an ongoing effort to improve products, services, or processes these efforts can seek “incremental” improvement over time or “breakthrough” improvement all at once. A learning organization continuously put effort for improving every part of continuous improvement is always supported by top management through the famous activities like small group activities Kaizen, Quality Control Circle (QCC) all series of ISO, and TQM. Continuous improvement is the importance principle of TQM philosophy and embedded in criteria of national quality award.

Continuous Learning

Continuous learning is learning how to learn. Typically, this involves developing skills in reflection, which is the ability to continually inquire and think about experience to draw conclusions and insights. It also involves the ability to conceptualize the learning process. Continuous learning is often associated with the concepts of systems thinking and organizational learning. Continuous learning is NOT about continually taking courses – it’s about developing skills in reflection and inquiry – it’s about learning how to learn so that your life and work experiences become your own learning lab. Organizations and other environments are changing rapidly. Therefore, it’s extremely important to continually be aware of those changes, and to be reflecting on them and learning from them, as well (Carter McNamara).

High Performance Expectation

The organization set strategic goals and tracks both financial and nonfinancial(intellectual capital) indicators to determine goal and expect achievement-linking; performance like productivity and quality improvement program, quality of working life and fastness of learning and transforming organizational knowledge into stakeholders value, and activities to rewarding system. In a high-performance expectation, employees are required to learn more knowledge and skills. Lifelong learning itself is, ‘continuous learning from daily experiences and opportunities’ and a vital managerial skill is, ‘the ability to translate knowledge into action that results in desired performance’ (Schermerhorn et al. 2011).

Innovation

There are essentially four types of innovation identified in the Oslo Manual for measuring innovation: *product innovation*; *process innovation*; *marketing innovation* and *organisational innovation*.

Product Innovation

This involves a good or service that is new or significantly improved. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics. In the education sector, a product innovation can be a new or significantly improved curriculum, a new educational software, etc.

Process Innovation

Process innovation involves a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software. In education, this can for example be a new or significantly improved pedagogy.

Marketing Innovation

Marketing innovation involves a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing. In education, this can for example be a new way of pricing the education service or a new admission strategy.

Innovation and Creativity

Innovation is turning a creative idea into something of value and profit. In addition, Innovation is a complex thinking process used to transform creative ideas into useful products, services, marketing, and organizational. While creativity is, a thinking skill used to develop new ideas and solutions. Moreover, creativity is the

ability to produce something new, to generate unique approaches and solutions to issues or problems and opportunities.

Intellectual Capital

Intellectual capital is viewed as the intangible assets that financially contribute to a company. IC consists of Structural Capital and Human Capital. Structural Capital consists of Customer Capital and Organizational Capital and Organizational Capital consists of Innovation Capital and Process Capital (Edvinsson and Malone 1997).

The Five Disciplines – Terms

Team Learning

Team learning is the process of increasing individual and collective capacity to take effective action and create the desired future of the team. The ability of a group of people to suspend their assumptions and freely think together. That involves dialogue in the true meaning of the word, as a flow of meaning.

Shared Vision

If the members of a group truly share their pictures of the future, if they are excited about what they are creating together, then they will act out of inner motivation and will voluntarily go out of their way to contribute.

Mental Models

The ability to separate the map from the territory. Being capable of identifying previously hidden mental models or assumptions, bringing them out in the open, and working with them. Going beyond simply holding on to one's beliefs as absolute, examining which models one is actually operating on.

Personal Mastery

On a personal basis, developing one's vision, one's abilities, one's foucus of energy. A spiritual inner drive to pursue mastery, to be the best that one can be.

System Thinking

The ”fifth discipline”. The ability and practice of consistently examining the whole system or environmental scanning and awareness of big picture, rather than just trying to fix isolated problems. Using the conceptual framework and tools of systems thinking to clarify the full patterns and to understand how to change them most effectively.

Research Time Line

- Starting course work from first semester of 2007 to second semester of 2008
- Duo Program (Thailand-Finland) Scholarship November 2008-February 2009
- Literature Review November 2008-December 2011
- Questionnaire and Interview January – December 2011
- Confirm Result January 2012

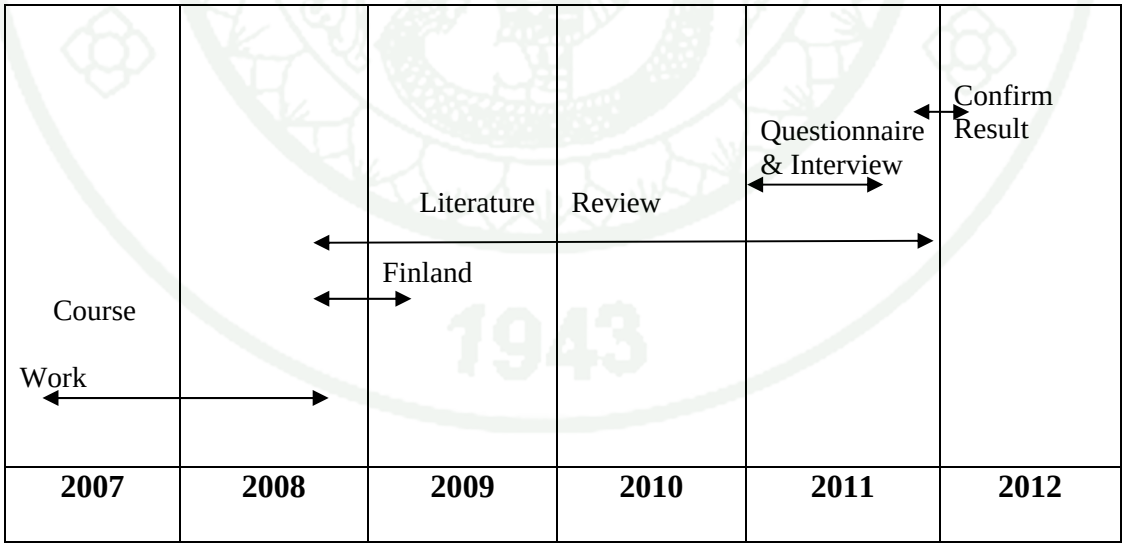


Figure 1 Research Time Line

LITERATURE REVIEW

The terminologies organizational learning and a learning organization are used interchangeably and still in that way up to now in some articles. In 1990s, the organizational learning became the descriptive branch and dealt mostly with the learning processes in the organization. This branch had its roots in social and cognitive psychology with a strong academic focus. While a learning organization became the prescriptive branch with a practical focus (Sun and Scott, (2003), it's often written by practitioners and or consultants (Anders Örtenblad 2001).

The three most mentioned phrases in the subject area have to be clarified in definition of "Learning organization, "A or the learning organization" (authors using the prefixes "a" or "the" in front of the term learning organization as they saw it as a noun), and "Organizational Learning".

'Learning organization' is a concept and a subject for the study and research. 'A learning organization' is a living representative of the image of 'learning organization': or even what might be possible in our own organization. The definitions of 'A learning organization' fell into three types rooted: the present participle type (e.g. living organism and continuously learning or transforming), the gerund type (e.g. climate, culture, a powerful learning environment) and the integrated type (covering the characteristics of both the present participle and the gerund type) (Sun, H.C. 2003). A learning organization is a form of the organization, mostly tend to describe that most knowledge exists inside the individual or the organization while 'Organizational learning' is generally defined as 'a process' or would be processes going on of learning in the organization (Anders Örtenblad 2001). Another distinguish is 'A learning organization' needs some efforts or activities to be a learning organization while 'Organizational learning' is existing with no efforts. Every organization has 'Organizational learning' but not necessary 'a learning organization'.

Definition of a learning organization

Organizations need to be highly adaptable and continue to improve if they want to prosper and take the lead in a fast-paced, competitive and unpredictable world. One of the major recommendations concerns “a learning organization” (Sun 2003). Some definitions of “a learning organization” by Baker and Camarata (1998) a learning organization provides a stimulating climate for its members in which they continually strive for new approaches to the acquisition of knowledge. Kim (1992), “a learning organization is one that consciously manages its learning processes through an inquiry-driven orientation among all its members”. Marquardt (1996), “a learning organization learns powerfully and collectively and is continually transforming itself, to better collect, manage and use knowledge for corporate success. It empowers people within and outside the company to learn as they work”. Marsick and Watkins (1999), “the learning organization is a living, breathing organism that creates the space that enables people and system to learn, to grow, and to endure”. Pedler et al. (1991), “a learning company is an organization that facilitates the learning of all its members and continuously transforms itself”. A definition by David Skyrme “Learning organizations are those that have in place systems, mechanisms and processes, that are used to continually enhance their capabilities and those who work with it or for it, to achieve sustainable objectives – for themselves and the communities in which they participate”. From a well known learning organization guru, Senge (1990), stated that “Organizations where people continually expand their capacity to create the results they truly desire, where new and expensive patterns of thinking are nurtured, where collective aspiration is set free and where people are continually learning how to learn together”. While Garvin (1993) defines a corporation as a learning organization “if it skilled at five main activities: systemic problem solving, experimentation with new approaches, learning from their own experience and past history, learning from the experiences and best practices of others, and transferring knowledge quickly and efficiently throughout the organization”.

The Distinctive Aspects between Organizational Learning and Learning Organizations

The terms organizational learning and learning organization has been used interchangeably in the past (Ortenblad, 2001). As a result, confusion has attended the use of these terms Burgoyne (1999) and Kiechel (1990). However, attempts have been made to clarify and distinguish the two concepts (Argyris, 1999; Argyris and Schon, 1996; DiBella, 1995; Easterby-Smith and Araujo, 1999; Finger and Brand, 1999; Griego et al., 2000; Marquardt, 1996; Marsick and Watkins, 1994; West and Burnes, 2000; Yang, Watkins, and Marsick, 2004; Tsang, 1997). Three normative distinctions between organizational learning and the learning organization have been identified in the literature (Ortenblad, 2001). First, organizational learning is viewed as a process or set of activities, whereas the learning organization is seen as a form of organization (Tsang, 1997). Second, some authors hold the view that learning takes place naturally in organizations, whereas it requires effort to develop a learning organization (Dodgson, 1993). Third, the literature on organizational learning emerged from academic inquiry, while the literature on the learning organization developed primarily from practice (Easterby-Smith, 1997). Finally, Ortenbald (2001) suggests that two additional factors should be added to the list to help differentiate the two concepts: distinctions based on who learns (Cook and Yanow, 1993; Jones, 1995; Kim, 1993) and on the location of the knowledge (Blackler, 1995).

In organizational learning, knowledge is viewed as residing in individuals, while it is viewed as residing in individuals and in the organizational memory in learning organizations. Organizational learning is a process, which answers the question of ‘how’; that is, how is learning developed in an organization? Meanwhile, learning organization is a collective entity, which focuses on the question of ‘what’; that is, what are the characteristics of an organization? (Smith, 2008)

In organizational learning, the focus is on individual learners, whereas in the learning organization, it is on learners at the individual, group, and organizational levels. Understanding the individual learning process and the team learning is a good starting point to understand the organizational learning. The five perspectives of

organizational learning presented by Wang and Ahmed, (2003): “The focus of five organizational learning needs to incorporate the perspective of creativity and radical innovation as a strategic orientation to sustained competitive advantage, on top of five perspectives of organizational learning”.

Five perspectives of Organizational Learning

1. Individual learning by staff training and development
2. Systematic by enhancement of information processing and problem solving capability
3. Culture and metaphor by creation and maintenance of learning culture collaborative team working, employee empowerment and involvement, etc.
4. Knowledge management by facilitation of interaction and strengthening of knowledge base
5. Continuous improvement by the adoption of TQM practices

To understand organizations as learning systems, Edwin C. Nevis et al. (1995) tried to answer the question. “How can you tell if your company is, indeed, a learning organization? What is a learning organization anyway and how can you improve the learning organization? The conclusions of those questions came up to three learning-related factors, which are important for their success: well-developed core competencies that serve as launch points for new products and services or innovation, an attitude of human capital that supports continuous improvement in the business’s value-added chain, and the ability to fundamentally renew, revitalize, or innovate. In an organizational learning process, they arrived at a three-stage model: knowledge acquisition (the development or creation of skills, insights, relationships), knowledge sharing (the dissemination of what has been learned), and knowledge utilization (the integration of learning so it is broadly available and can be generalized to new situations”. A model of organizations as learning systems as explained by Edwin is composed of two parts, learning orientations and facilitating factors. “Learning orientations are the values and practice that reflect where learning takes place and the nature of what is learned. Facilitating factors are the structures and processes that

affect how easy or hard it is for learning to occur and the amount of effective learning that takes place" Nevis et al. (1995).

Organizational Learning and Knowledge Management

The organizations that learn fastest and use knowledge most effectively are most likely to become and remain leaders (Pemberton and Stonehouse, 2000; Smith, 2008). The concepts of KM are integrally linked with organizational learning (OL), and both play a role in the operation of establishment of a learning organization. It is generally accepted that there is a hierarchical relationship between data, information, knowledge, and wisdom, with data seen as a primary or raw form, information being a processed form that gives usefulness to data, and knowledge being the result of judicious application of information (Rowley, 2006; Bajaria, 2000).

KM is the process that helps organizations find, select, organize, disseminate, and transfer important information and expertise necessary for activities such as problem solving, dynamic learning, strategic planning, and decision-making (Gupta et al, 2000). Polanyi (1958) firstly defined tacit and explicit categorizations of knowledge. More than thirty years later Nonaka and Takeuchi (1995) promote the concept of tacit and explicit knowledge, and propose a process model that is based on the concept of knowledge spiral. Tacit knowledge is converted to explicit knowledge in order to be shared by one person and back again to tacit knowledge in order to be shared by another person, and the continuing sequential process of socialization, externalization, combination, and internalization (SECI). The SECI model is widely accepted and has served as the foundation for many other concepts over the past decade (Hoe, 2006); (Pun and Marcia, 2011)

Types of Knowledge other than Tacit and Explicit Knowledge are as follows:

- Shallow and Deep Knowledge or surface knowledge indicates minimal understanding of the problem area. For example, shallow knowledge of pretty presenters and deep knowledge of mechanics about the automobile engine at the motor show.

- Knowledge as Know-How, knowledge based on know-how, or accumulated lesson of practical experiences, is what is needed for building expert systems. Know-how distinguishes an expert from a novice. Experts represent their know-how in terms of heuristics and heuristics compiled hindsight. Know-how is not book knowledge; it is practical experiences.
- Reasoning and Heuristics, human reasons in a variety of ways: Reasoning by analogy: relating one concept to another, formal reasoning: using deductive or inductive methods. Case Base reasoning: Judgment from his/her own experiences case by case
- Common Sense as Knowledge: It is a collection of personal experiences and facts acquired over time and the type of knowledge that humans tend to take for granted.
- From Procedural to Episodic Knowledge: Procedural Knowledge is an understanding of how to do a task or carry out a procedure, Declarative Knowledge is information that experts can easily discuss. It is shallow knowledge that is readily recalled, because it is simple, uncomplicated information. This type often resides in short term memory, the part of the brain that retains information for brief periods of time, Semantic Knowledge is a deeper kind of knowledge. It is highly chunked knowledge that resides in long-term memory. Such knowledge may have been there for years like vocabulary, facts and relationships. Episodic Knowledge is knowledge based on experiential information, or episodes. Each episode is chunked in long-term memory. The more experts explain or verbalize their knowledge, the more semantic or episodic it is. (Elias M. Awad, Hassan M. Ghaziri. Knowledge Management, 2004 Prentice Hall)

There is knowledge management and organizational learning in all organization. What is specific knowledge management in a learning organization? “In a learning organization, Knowledge management should be able to carry out the following basic activities:

1. Create new knowledge (generate from organizational learning)

2. Make use of external resources to obtain knowledge (from organizational infrastructures)
3. Integrate and apply external knowledge
4. Combine knowledge with production, operation, and services
5. Lay out knowledge in forms of documentation, data, or software
6. Use incentives to boost knowledge growth
7. Transfer new knowledge to other units in the organization
8. Evaluate the value of knowledge to organizational development

In a learning organization, the corporate manpower can be transformed into the corporate mind power. The employee first feel what they need to learn; second, to identify what they have already learned; and third, to feel the need to share with other about what they have learned. And the mastery of each sharing function is fundamental to enhancing the performance of knowledge management in a learning organization" (Hong, 1999).

The role of Organizational Learning, Knowledge Management and Innovation

Over the past century, the popular words were 'Productivity', 'Efficiency', and 'Quality'. Nevertheless, cost cutting efficiency and quality are no longer enough to remain competitive. Continuous innovation is now required (Nth Degree Software, Inc.). Three main drivers' application of KM in innovation, first basic driver is to create, build, and maintain competitive advantage through utilization of knowledge and through collaboration practices. Second driver is that knowledge is a resource used to reduce complexity in the innovation process, and managing knowledge as resource will consequently be of significant importance. Third is the integration of knowledge both internal and external to the organization, thus making it more available and accessible (Plessis, 2005). The value proposition of the role of knowledge management in innovation process is as follows.

Knowledge management assists in:

1. Creating tools, platforms and processes for tacit knowledge creation, sharing and leverage in the organization, which plays an important role in the innovation process

1. Converting tacit knowledge to explicit knowledge

2. Identifying gaps in the knowledge base and provides processes to fill the gaps in order to aid innovation

3. Building competencies required in the innovation process

4. Steady growth of the knowledge base through gathering and capturing of explicit and tacit knowledge

Knowledge management provides:

1. Platforms, tools and processes to ensure integration of an organization's knowledge base

2. Organizational context to the body of knowledge in the organization

3. A knowledge-driven culture within which innovations can be incubated

Knowledge management ensures

1. The availability and accessibility of both tacit and explicit knowledge used in the innovation process using knowledge organization and retrieval skills and tools, such as taxonomies (Kess, 2007)

2. The flow of knowledge used in the innovation process

In addition, knowledge management facilitates collaboration in the innovation process. Organizational learning is also a facilitator of innovation. Knowledge management allows collaboration across organizational boundaries through online collaboration forums as well as organizational tools and platforms such as intranet. It is necessary for organizations to promote effective organizational learning and knowledge management in order to reach their goals with regard to innovation.

Knowledge Management and Intellectual Capital relationship

KM and IC should be integrated to maximize organizational effectiveness (Wiig, 1997). KPMG Consulting (2001) describes the knowledge management as "a collective phrase for a group of processes and practices used by organizations to increase their value by improving the effectiveness of the generation and application of intellectual capital." However, the relationship between KM and IC is complex and so is its management. In order to manage effectively such a relationship, it is imperative to understand where and how the accumulated IC is reflected in managing KM activities in organizations.

IC stems from the wide recognition that knowledge is important to organizations (Dumay, 2009). IC and KM serve different purposes and include the whole range of intellectual activities from knowledge creation to knowledge leverage (Zhou and Fink, 2003). IC represents the stock of knowledge at a particular time (Bontis, 2004), which has been accumulated through knowledge flow activities which is KM processes (Shih et al, 2010). Ramirez et al. (2007) view IC management and KM as a set of managerial activities aiming at identifying and valuing the knowledge assets of an organization as well as leveraging these assets through the creation and sharing of new knowledge.

Schiuma and Lerro (2008) add that improving organizational flows and management techniques for the purpose of creating knowledge assets is the most important IC management activity. KM and IC are believed to be closely coupled. When KM activities are used to develop and maintain IC, it becomes a resource of sustainable competitive advantage (Seleim and Khalil, 2007). On the other hand, when IC is properly utilized and exploited, it increases the absorptive capacity of the organization, which, in turn, facilitates its KM processes. In addition, Cortini and Benevene, (2010) assert that knowledge can add value to organizations through intangible assets which is IC.

Nevertheless, there is little understanding of how organizations actually create and accumulate IC by dynamically managing knowledge (Marr et al., 2003; Nonaka et al., 2000). Issac et al. (2009) advocate the need for developing a model relating the antecedent conditions that are necessary for the effective management of IC. Also, Zhou and Fink (2003) argue for a theoretical relationship between IC and KM, since IC plays an important role in the KM processes, which, in turn, facilitate the development and accumulation of IC.

Roos et al., (1997) trace the theoretical roots of IC to two different streams of thought: strategic stream and measurement (tactical) stream. The strategic stream focuses on the creation and use of knowledge as well as the relationship between knowledge and value creation. In the measurement stream, however, KM focuses on the tactical and operational implementations of the knowledge-related activities that facilitate knowledge capture, creation, transfer and use that, consequently, accumulate IC (Zhou and Fink, 2003; Wiig, 1997). Conceivably, the socialization, externalization, combination, and internalization (SECI) model (Nonaka and Takeuchi, 1995; Nonaka and Konno, 1998) is a more fitting theoretical foundation for understanding the KM-IC relationship. The SECI model outlines different interactive spaces (Ba), in which tacit knowledge can be made explicit.

Innovation and Intellectual Capital Relationship

In the intensification of globalization and the arrival of the real knowledge based economy, innovation is more and more substantial for sustainable corporate profit and economic growth. One of the preconditions to bring about innovation is the capability for differentiation. The other is the management to produce differentiated products and services in the way they meet the potential needs of the market. Since the origin of differentiation lies in the accumulation of the intellectual assets, the intellectual assets based management effectively utilize those is essential for innovation. Innovation is composed of the ability to differentiate products or services and to be accepted by customers. Innovation is not only technological progress, but it also means the renewal of business models too. The important elements of innovation

are creation of new knowledge and wisdom, which usually exist in intangible assets (Sumita, 2008).

Some Models of a learning organization

Peter Senge Model (The Fifth Disciplines, 1990)

A learning organization exhibits five main disciplines: systems thinking, personal mastery, mental models, a shared vision, and team learning.

Systems thinking. The idea of the learning organization developed from a body of work called systems thinking. This is a conceptual framework that allows people to study businesses as bounded objects. Learning organizations use this method of thinking when assessing their company and have information systems that measure the performance of the organization as a whole and of its various components. Systems thinking state that all the characteristics must be apparent at once in an organization for it to be a learning organization. If some of these characteristics are missing, then the organization will fall short of its goal. However O'Keeffe believes that the characteristics of a learning organization are factors that are gradually acquired, rather than developed simultaneously.

Original idea of systems thinking came from System Dynamics ,which is a professional field that deal with the complexity of systems. This work of Jay W. Forrester, an american computer engineer and system scientist who is considered to be the founder of the field of Systems thinking. Same as people are always refer to Nonaka, Tacit Knowledge, instead of Polanyi, M., (1966) who is considered to be the first who use the term Tacit Knowing.

System Dynamics is the necessary foundation underlying effective thinking sysems; it deals with how things change through time, which covers most of what people find important, it involves interpreting real life systems into computer simulation models that allow one to see how the structure and decision-making policies in a system create its behavior. This shows the linking between the field of Industrial Engineer in System Dynamics and the field of psychological and human

behavior of System Thinking in a Learning Oraganization. The main difference is that the field of Industrial Engineer, an engineer would never try to design by simply thinking and depending on intuition. The engineer would use computer simulations to anticipate the behavior of a design, and would build prototype systems to demonstrate performance. In this research the data collected from the organization is quite small number, getting information by questionnaire and interview is applied and the prototype of the model came from the opinion of selected target group instead of computer simulation.

Personal mastery. The commitment by an individual to the process of learning is known as personal mastery. There is a competitive advantage for an organization whose workforce can learn quicker than the workforce of other organizations. Individual learning is acquired through staff training and development; however learning cannot be forced upon an individual who is not receptive to learning. Research shows that most learning in the workplace is incidental, rather than the product of formal training; therefore it is important to develop a culture where personal mastery is practiced in daily life. A learning organization has been described as the sum of individual learning, but there must be mechanisms for individual learning to be transferred into organizational learning.

Mental models. The assumptions held by individuals and organizations are called mental models. To become a learning organization, these models must be challenged. Individuals tend to espouse theories, which are what they intend to follow, and theories-in-use, which are what they actually do. Similarly, organizations tend to have ‘memories’ which preserve certain behaviors, norms and values. In creating a learning environment it is important to replace confrontational attitudes with an open culture that promotes inquiry and trust. To achieve this, the learning organization needs mechanisms for locating and assessing organizational theories of action. Unwanted values need to be discarded in a process called ‘unlearning’. Wang and Ahmed refer to this as ‘triple loop learning.’

Shared vision. The development of a shared vision is important in motivating the staff to learn, as it creates a common identity that provides focus and energy for

learning. The most successful visions build on the individual visions of the employees at all levels of the organization, thus the creation of a shared vision can be hindered by traditional structures where the company vision is imposed from above. Therefore, learning organizations tend to have flat, decentralized organizational structures. The shared vision is often to succeed against a competitor, however Senge states that these are transitory goals and suggests that there should also be long term goals that are intrinsic within the company.

Team learning. The accumulation of individual learning constitutes Team learning. The benefit of team or shared learning is that staff grows more quickly and the problem solving capacity of the organization is improved through better access to knowledge and expertise. Learning organizations have structures that facilitate team learning with features such as boundary crossing and openness. Team learning requires individuals to engage in dialogue and discussion; therefore team members must develop open communication, shared meaning, and shared understanding. Learning organizations typically have excellent knowledge management structures, allowing creation, acquisition, dissemination, and implementation of this knowledge in the organization.

Learning Organization Characteristics

In 1991, Michael Pedler, John Burgoyne, and Thomas Boydell developed the eleven characteristics of the learning organization.

1. Learning Approach to Strategy
2. Participative Policy Making
3. Informating (The process that translates descriptions and measurements of activities, events and objects into information by doing so, these activities become visible to the organization).
4. Formative Accounting and Control
5. Internal Exchange
6. Reward Flexibility
7. Enabling Structures

8. Environmental Scanning
9. Inter-Company Learning
10. Learning Climate
11. Self-Development for all members

In 1994, Marquardt & Reynolds identified 11 characters that learning organizations should have. These 11 characters are:

1. Appropriate structure

This element includes a flat, streamlined, holistic structure. Such a structure maximizes contact, information flow, local responsibility, and collaboration within and outside the organization.

2. Corporate learning culture

This element represents a corporate culture where learning is highly valued, where risks are encouraged and rewarded, and all have responsibility for their own learning and the learning of others. This is the organizational validation of efforts in the inner sphere of a global learning organization

3. Empowerment

This element includes capacity and power. Empowerment is given as close as possible to the point of interaction with the customer or client. Empowerment permits learning to happen through responsibility.

4. Environment scanning

This is a description of comprehensive and considered scanning of the environment. Environmental scanning is done both within and outside the organization. Industry related, economic, political, and social data that will benefit the organization are the product of this effort.

5. Knowledge creation and transfer

This element includes the continual creation of knowledge and the ongoing circulation process. In organizations that transfer information best, knowledge is gathered, coded, stored, and disseminated quickly and seamlessly across functions, levels, borders, and cultures.

6. Learning technology

Learning technology includes all information technology. It specifically includes information technology, which increases information collection, analysis and distribution, and knowledge and skill development.

7. Quality

This is the commitment to continuous improvement. It also includes the continuous learning needed to attain total quality. Another dimension of quality in successful global learning organizations is the commitment of all employees to have personal mastery in areas beneficial to the organization.

8. Strategy

This element comprises conscious and deliberate planning from leadership and key structures within organizations to make learning, in its broadest sense, a “prime business” of the organization in which learning is seen as a principal driver.

9. Supportive atmosphere

Successful learning organizations do not neglect the development, growth, needs, and concerns as well as dreams of their individual employees. Employees are viewed as an important component of organizational strategy and operations. They are valued and nurtured.

10. Teamwork and networking

Learning organizations are committed to teamwork and team learning. Employees seek ways to work collaboratively with units of the organization and to network whenever possible with the resources outside the organization through global alliances, informal relationships, and so forth.

11. Vision

Vision is organization wide consensus and support for the future directions. It includes the mission, values, and beliefs of the organization. The common vision must be shared by and challenging to everyone in the organization.

According to Bennett & O'Brien (1994), they found the twelve key factors, which influence an organization's ability to learn and change. These factors are as follows:

1. Strategy/vision: An organization and its members must have a vision of where they want to go so that they can anticipate what they need to learn to get there. They must develop a broad strategy for reaching their goal so that they know if their learning is moving the organization toward their vision. Furthermore, if learning organization is to become integral to the company, the vision and strategy must support and promote it.

2. Executive Practices: Moving outward from that visionary core, the next building block consists of the practices of executives. What do the leaders say and do to support the vision of organizational learning? Do they hold people accountable for continuous learning and improvement? Do they inspire the rest of the organization to follow them toward the vision?

3. Managerial Practices: For any permanent change to occur, managers, those who support and supervise the day-to-day work of individuals and teams, must behave in accordance with the principles of continuous learning. In companies that take learning seriously, managers support their staffs' attempts to grow and develop. They help people integrate what they have learned. They also share the resulting insights and innovations with the executives, who can use this information to explore further improvements.

4. Climate: Supportive management practices feed into and are fed by another factor that affects continuous learning: the organization's climate. This is the sum of the values and attitudes of everyone in the organization regarding the way people are supposed to behave as they go about their business. A learning organization adopts a climate of openness and trust; people are unafraid to share their ideas and speak their minds. Barriers between managers and employees are eliminated and ideally, everybody works together to support the collective well-being.

5. Organization/Job Structure: An organization's structure can support continuous learning by allowing for fluid job descriptions that respond to the changing demands of the external environment, as well as to the needs of the

organization itself. Practices such as rotating assignments and using self-directed, cross-functional work teams promote this flexibility. Bureaucratic policies and rules that inhibit or impede the flow of information must be kept to a minimum.

6. Information Flow: Learning-oriented companies use advanced technology to obtain and distribute information. Their computer systems promote easy communication among employees and ensure that all workers get company data relevant to their jobs.

7. Individual and Team Practices: Information is important in part, because of its impact on individual and team practices in a learning organization. Shared knowledge can be a terrific asset. Organizations thrive when individuals and teams share learning, when they see mistakes as learning opportunities and not as reasons to blame or punish, when they take responsibility for their own learning , and when they discuss problems honestly, and work toward solutions.

8. Work Processes: An organization may encourage learning through its vision. Through its information systems and so on, but does it actually incorporate the use of work processes that encourage continuous learning. For instance, does the company teach and practice some systematic problem-solving techniques? Does it promote learning from others through benchmarking studies?

9. Performance Goals/Feedback: The focal point of any business that intends to succeed must be its customers-what they want and need. Learning for the sake of learning is fruitless in the business world. The value of learning lays in its ability to help the organization better serve its customers.

10. Training/Education: Obviously, structured training and education efforts play a key role in transforming and organization/s practices. In a learning organization, formal training programs focus on helping people learn from their own and others' experience and become more creative problem solvers. Individual development-planning tools are available to everyone.

11. Individual/Team Development: Learning organizations seek ways to encourage their employees to develop individually, but at the same time, they promote the development of entire teams. Organizations can learn only if teams learn collectively, forming 'communities of practice' that continuously reinvents their work.

12. Rewards/Recognition: The reward-and-recognition-system must support and encourage individual and organizational learning. This can take many forms, from honoring individual employees who take risks to offering a profit-sharing plan that benefits everyone when the organization learns and grows.

Two years following the above-cited research, Watkins & Marsick (1996) developed a model of the learning organization around seven action imperatives that can be interpreted in terms of what must change to help schools become learning organizations. The seven action imperatives are as follows:

1. Creating continuous Learning Opportunities. This means that learning is ongoing, strategically used, and grows out of the work itself. Administrators and teachers have many opportunities to consciously look at what they are learning from new initiatives. They can look at results as opportunities to learn why an initiative was not successful; and they can initiate projects to experiment with change. They can make it attractive for faculty members to serve as mentors. They can find ways to use technology better to help faculty gain new skills. Schools might also find ways to provide time, money, and other incentives for professional development.

2. Promoting Inquiry and Dialogue. The key to this imperative is a culture in which people ask questions freely, are willing to put difficult issues on the table for discussion, and are open to giving and receiving feedback at all levels. Strategies to implement this action imperative include the use of dialogue and questioning in meetings and learning sessions.

3. Encouraging Collaboration and Team Learning. The relevant action imperative for this level focuses on the spirit of collaboration and the skills that underpin the effective use of teams. People in schools frequently form groups, but they are not always encouraged to bring what they know to the general table. Strategies to implement this action imperative might include support for the effective functioning of teams that cross-levels and groups.

4. Creating Systems to Capture and Share Learning. Technology-based strategies that are used for this purpose focus on the use of software to capture ideas

across dispersed teams and divisions and computerized documentation of changes in a particular area.

5. Empowering People toward a Collective Vision. The primary criteria for success with this action imperative are the degree of alignment throughout the organization around the vision, and the degree to which everyone in the organization actively participates in creating and implementing the changes that follow from the vision.

6. Connecting the organization to its Environment. Schools must function at both global and local levels. Schools can use benchmarking to see what other schools are doing to achieve excellence and to solve similar problems, and can scan their environment for new trends by using computer data based. Technology enables people in schools to move beyond their walls.

7. Providing Strategic Leadership for Learning. Leaders who model learning are the key to the learning organization. They think strategically about how to use learning to move the organization in new directions. School leaders can routinely discuss development plans and opportunities with faculty and staff members, can make information available regarding opportunities for learning, and can seek resources to support faculty development.

The ten-pillar ideal learning organization model by Bryan T. Phillips (2003)

Key elements in the process of transformation into a learning organisation are honest dialogue and facilitative leadership. These are two pillars of the following ten-pillar learning organisation model developed from a synthesis of the research into learning organisations across the field. It is derived from the work of major thinkers and writers in the fields of organisational learning and the learning organisation, including Senge, Garvin, Argyris and Pedler, and attempts to outline the ideal learning organisation:

1. Will. The entire organization maintains a passionate and enthusiastic commitment to continuous improvement through continuous learning.

2. Leadership. Leadership is continually mindful that the vision is understood and shared at all levels and removes obstacles where necessary. It is facilitative,

coaching, and supportive of personal development and continually expands its own capabilities. It has an active concern for all members, values their contribution and is prepared to listen and act accordingly. It thinks systemically, is keenly aware of current reality and organizes its structure appropriately.

3. Strategic thinking and vision. Strategic leadership maintains the clarity and acceptance of the strategic direction, setting realistic goals that take into account the competitive position. Employees are encouraged to become systems-thinkers. Automation is employed to improve performance and work conditions.

4. Communication. Free and open communication pervades the entire organization and barriers removed that threaten to impede it. Members are continually apprised of the competitive position. Open dialogue at all levels encourages the sharing of ideas, knowledge and insights. An atmosphere of trust prevails.

5. Learning and development. A continuous learning philosophy based both on individuals and teams, and learning by doing, is actively promoted, valued and provided for. The acquisition of innovative ideas and knowledge is facilitated, feedback loops evaluate its usefulness, and new technology is embraced to foster learning and development. Personal experience is valued and members are encouraged to accept personal responsibility for their own learning.

6. Innovation and decision making. An innovation mindset prevails throughout where members manage their own decision making. Initiative and experimentation are encouraged in a psychologically safe environment. Accountable mistakes are seen as an opportunity to learn, and are accepted as a by-product of the search for continuous improvement. New technology is understood and welcomed, not misunderstood and feared. External influences are used to stimulate innovation and insight.

7. Change management. Challenge and change are regarded without suspicion and the means to respond are provided. The core knowledge base is continually questioned and evaluated, and mutual support coexists with allowance made for the transience of employees.

8. Intellectual capital and knowledge management. All employees are encouraged to share responsibility for the development of intellectual capital. Continuous adjustments are made as new information arrives, its diffusion facilitated

and systems ensure that it is added to the core knowledge base. Tacit knowledge is willingly and readily transferred. Benchmarking provides for the adoption and adaptation of best practice.

9. Measurement and assessment. Measurement and assessment are accepted as necessary indicators of changes in attitude, behavior, performance and commitment to continuous improvement. They are used for comparison between individuals and across teams, and the analysis of processes, procedures and performance. A sense of competition is nurtured, a receptiveness to challenging established norm encouraged, and a desire to benefit from continuous improvement stimulated.

10. Reward and recognition. Incentives improve performance, strengthen motivation, encourage personal learning and advancement and foster job satisfaction. New work patterns are provided for, and individuals rewarded for their effort, recognized for their talent and genuinely valued for their contribution.

The characteristics/behaviors of all 22 models from 1990-2008 are shown in appendix B listed by year and name of the authors. The characteristics glossary of LO from literature review shown in appendix C listed from A-Z.

Example of Process for creating Knowledge Management in the organization

Phase 1. Infrastructure evaluation

Step 1. Analyzing existing infrastructure

Step 2. Aligning KM and business strategy

Phase 2. KM System analysis, design, and development

Step 3. Designing the KM architecture, and integrating existing infrastructure

Step 4. Auditing and analyzing existing knowledge

Step 5. Designing the KM team

Step 6. Creating the KM blueprint

Step 7. Developing the KM system

Phase 3. Deployment

Step 8. Deploying with results-driven incremental methodology

Step 9. Leadership issues, manage change culture and rewarding system

Phase 4. Metrics for performance evaluation

Step 10. Analysis of returns on investment (ROI) and evaluate performance

Source: The Knowledge Management Toolkit: The Orchestrating IT, Strategy, and Knowledge Platforms, 2nd edition, 2002 Prentice Hall

Example of Process for creating a Learning Organization from practitioner

Jack Welch, former Chairman and CEO of GE (1981-2001), and his business laboratory create the following 11 steps (Emphasized in action at each step)

1. Prepare and make sure that financially sound before embarking on developing a learning organization
2. Set a definitive strategic direction, and make sure that the vision is articulated throughout the organization
3. Make sure that there is a stated set of values to guide the company
4. Established an environment of trust and openness
5. Create a “Boundary less organization”

6. Make speed, flexibility, and innovation a reflex

7. Make sure that everyone in your organization is encouraged to seek out the best ideas from anywhere

8. Implement a best practices program; importing the best ideas should be a process, not simply a mindset

9. Reward behaviors and actions that promote a learning culture

10. Establish processes and an infrastructure for converting learning

11. Use companywide initiatives to spread the gospel

Example of Process for creating a learning organization from researcher, consultant and instructor

Michael J.Marquardt, a researcher; consultant; and instructor, wrote how to build a learning organization in 2002. He started with five subsystem; Learning, Organization, People, Knowledge, and Technology. (Emphasized on subject: Function Oriented)

1. Learning
   1.1 Level of learning (Individual, Group/Team, Organizational)
   1.2 Skill of learning (Systems thinking, Mental models, Personal mastery, Self-directed learning, Dialogue)
   1.3 Type of learning (Adaptive, Anticipatory, Action)
2. Organization
   2.1 Vision of Organization
   2.2 Culture of Organization
   2.3 Strategy of Organization
   2.4 Structure of Organization
3. People (Stakeholders)
   3.1 Managers/Leaders
   3.2 Employees
   3.3 Customers
   3.4 Business Partners/Alliances
   3.5 Suppliers

3.6 Communities

4. Knowledge
   - 4.1 Acquisition
   - 4.2 Creation
   - 4.3 Storage
   - 4.4 Analysis and Data Mining
   - 4.5 Transfer and Dissemination
   - 4.6 Application and Validation
5. Technology
   - 5.1 Managing Knowledge
   - 5.2 Enhancing Learning

View from practitioner to a learning organization is focus on processes or more organizational learning concept. While the view from researcher/consultant process to learning organization is trying to spotlight the functions and characteristics in the organization.

Example of Process for creating a learning organization from Thai researcher, consultant, and instructor

1. Training top management/leader what is a learning organization
2. Top management commitment
3. Define learning organization project team
4. Further studying LO, KM, Change management, How to think, Coaching, EQ development, Information technology, Psychology etc.
5. Learn how to learn training
6. Separate group for learning project
7. Articulate executive training
8. LO success measurement

Source: Learning Organization & Knowledge Management Vorapat Poocharoen, Ph.D.

Example of Process for creating Learning Organization and Knowledge Management in the organization from Thai researcher, consultant, and instructor

1. Computer System
2. Club and Forum System
3. Child centered education
4. Story telling
5. Organizational knowledge encyclopedia
6. Team working
7. Small Group Activities
8. Communities of Practices (CoP)
9. Learning Society
10. Games
11. Coaching System
12. Mentoring System
13. Job Rotation and Transfer
14. Change Management
15. System Thinking Training
16. EQ Training

Source: Learning Organization and Knowledge Management, Vorapat Poocharoen Ph.D.

This process could be grouped to Instructors, Learners, and Courses, which facilitated by organizational infrastructure and organizational culture of learning environment.

MATERIALS AND METHODS

Materials

The research materials were collected through interviews, opinion surveys, and searching from secondary data and information. The questionnaires were distributed by mail directly attention to top management of the focus group. The replied questionnaires came back to researcher by stamped mail with address directly to the department of Industrial Engineering, International Graduate Program, Kasetsart University.

The interviews were conducted by interview in person at site. In case of unavailable to top management, he will assign concerning or people in charge taking care for replying the questionnaire. Secondary source of data and information from books, magazine, newspaper, and website are also useful for the completion of the replied questionnaire. The survey questionnaire method is likert scale and statistical analysis is non-parametric using SPSS

Research Design

To find the right characteristics, top management should know what characteristics are suitable and how to apply appropriately to their organization. Creating a learning organization requires an understanding of the learning organization concept, characteristics, and its relationship to desired organizational performance outcomes (Constantine et al., 2005).

The study intends to develop and propose a baseline conceptual model for characteristics of “a learning organization” in Thailand National Quality Award companies. This proposed model aims to assist any organization in determining whether it learns the right things as the recognized award recipient companies. The conceptual model was developing by the applications from literature review.

For this research, 22 models of learning organization with 156 characteristics raised by researchers, academics, consultants, and practitioners from 1990 to 2008.

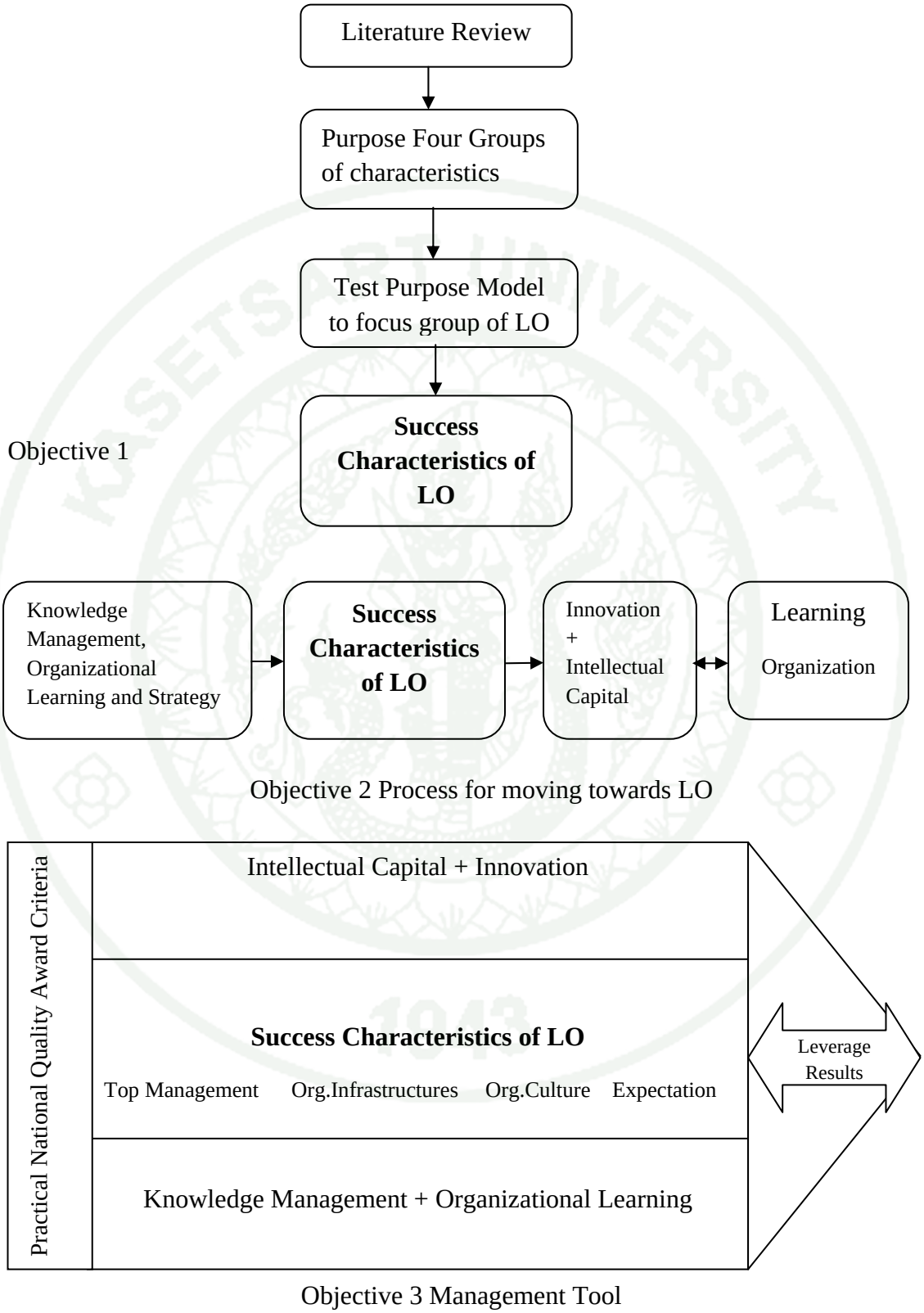


Figure 2 Conceptual Research Model

Methods

The methods involve extensive literature reviews, an application of the Grounded Theory to help categorize key features that reflect organizational learning, and group discussions on the features' relevancy. The data collection is based on document reviews and interviews.

It is important to note that based on extensive literature reviews, there is no specific group or formal category universally accepted for classifying the key features of a learning organization. Despite the relevant areas that were commonly cited include: (1) top management, (2) organizational infrastructures, (3) organizational culture, and (4) expectation. The first area deals with the activities and responsibilities expected from top management. The second area addresses whether organizational functions support policies and objectives on becoming a learning organization. The third area focuses on building and sustaining organizational culture that supports the drive towards a learning organization. Finally, the last area contains the expectation in which an organization attempts to become a learning unit. Within each area, many subjects can be used to indicate or reflect whether an organization is a learning entity.

In this study, national quality award recipients companies are selected and represented keys feature as a learning organization.

The evaluation criteria of national quality award comprise of seven major aspects: leadership, strategic planning, customer focus, measurement-analysis-KM; workforce focus; process management; and results. In receiving the awards, the organizations proved their capability of integrating all the organizational management tools involved in the seven areas in a very effective manner. The total points of scoring system used with the criteria are 1,000. There is no limitation on the number of the awards granting each year. The applicants who receive the assessing score higher than 650 will grant the Thailand Quality Award. For the scores between 351 and 650 will grant the Thailand Quality Class. Learning organization is directly linked to category 4 (Measurement, Analysis, and Knowledge Management), which is

composed of measurement, analysis, and improvement of organizational performance and management of information, knowledge, and information technology.

Measurement, analysis, and knowledge management are critical to the effective management of the organization and to a fact-based, knowledge-driven system for improving performance and competitiveness. Measurement, analysis, and knowledge management serve as a foundation for the performance management system. It is the "brain center" for the alignment of the organization's operations with its strategic objectives. Central to such use of data and information are their quality and availability. Furthermore, since information, analysis, and knowledge management might themselves be primary sources of competitive advantage and productivity growth, this category includes such strategic considerations (Criteria for Performance Excellence 2011-2012).

The organization has to measure, analyzes, reviews, and improves its performance by data and information at all levels all parts of the organization. The questions in performance measurement (performance measures: comparative data: customer data: measurement agility), performance analysis and review and performance improvement (best-practice sharing: future performance: continuous improvement and innovation).

In Management of information, knowledge, and information technology, the organization has to describe how to build and manage its knowledge assets and how the organization ensures the quality and availability of needed data, information, software, and hardware for workforce, suppliers, partners, collaborators, and customers. Within the response, the organization has to answer all of the questions of data, information and knowledge management, and management of information resources and technology.

Design for Questionnaire in Thailand

Research Objective 1

Methods

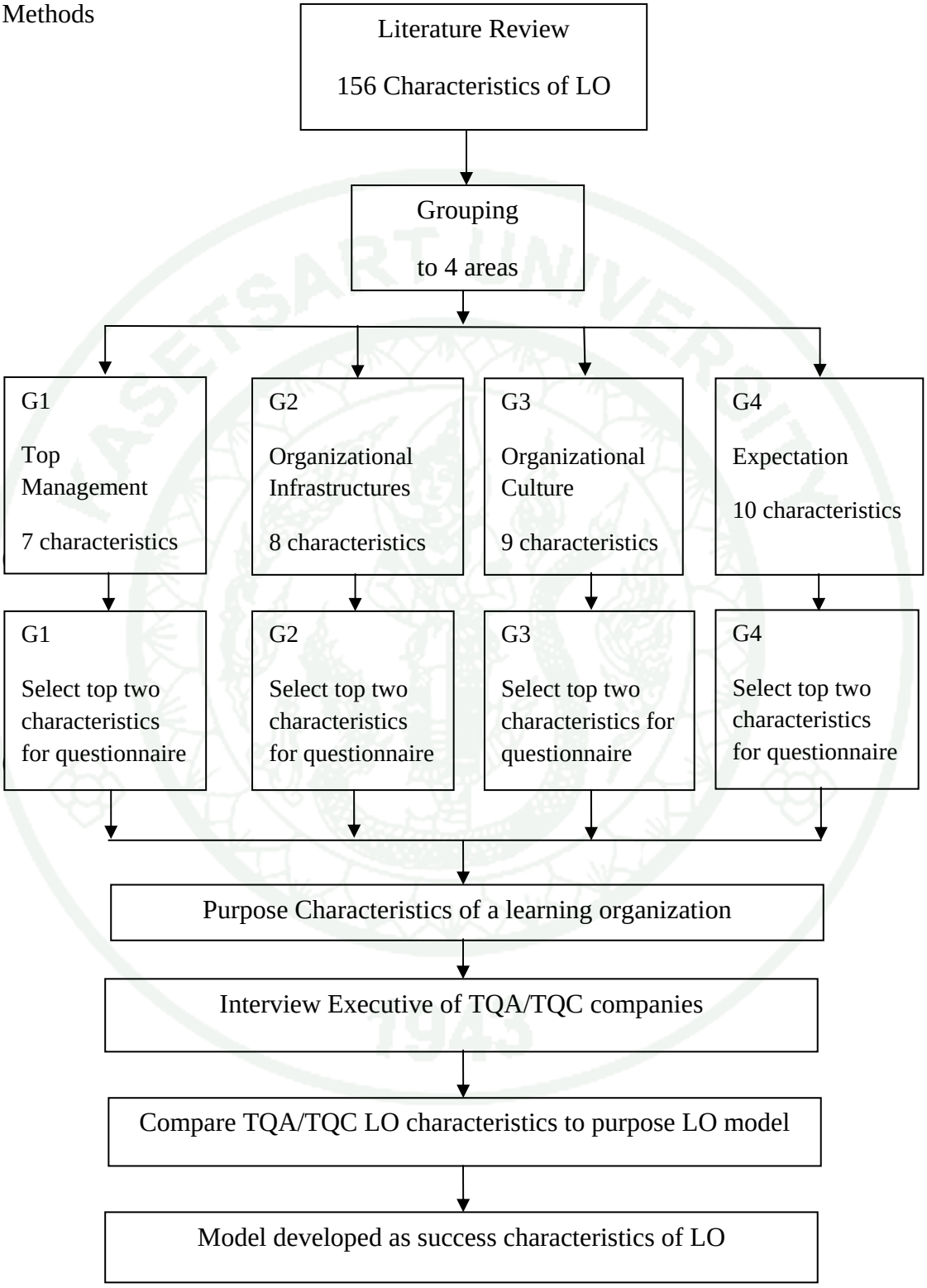


Figure 3 Methods of Research Objective 1

The key features of a LO developed from Table 2 as an initiative concept to set purpose characteristics of a LO in TQA/TQC companies. The proposed model consists of four groups as shown in Table 3.

Methods for Research Objective 1 (Figure 3)

1. Grouping 156 characteristics from literature review to 4 areas same methodology of finding characteristics of KIBS in Finland, (Phusavat et al., 2010)
2. Selecting characteristics to 4 groups for pilot companies
3. Pilot companies selecting top 5 in each group as shown in Table 3 (Ranking by top management of pilot companies)
4. Selecting top two of each group as conceptual model of LO for questionnaire from the ranking
5. Interview top management or executive of TQA/TQC companies
6. Compare companies LO model to purpose model
7. LO characteristics developed

Method for research sub question 1

By directly asking for the opinion of 26 organizations' top management that they accept the purpose eight characteristics or not and whether they would like to delete or add some characteristics: this part of open-ended question is on part three of the questionnaire.

Method for research sub question 2 and 3

The Mann-Whitney Test is one of the most powerful of the non-parametric tests for comparing two populations. It is used to test the null hypothesis that two populations have identical distribution functions against alternative hypothesis that the two distribution functions differ only with respect to location (median), it at all. The Mann-Whitney Test does not require the assumption that the differences between the two samples are normally distributed. In many applications, the Mann-Whitney Test is used in place of the two sample t-test when the normally assumption is questionable. This test can apply when the observations in a sample of data are ranks, that is, ordinal data rather than direct measurements.

Method for research question 4

The Kruskal-Wallis Test is the non-parametric test equivalent to the one-way ANOVA in parametric test and an extension of the Mann-Whitney Test to allow the comparison of more than two independent groups. We use this test to compare three or more sets of scores that come from different groups: in this case, we test for eight groups of characteristics.

Table 3 is the result of ranking from Table 2 by Top management and executive of Thai Manufacturing and Service pilot companies. They are pointing out that Top management group: vision/mission/strategy, Organizational group: Knowledge Sharing and Transfer, Internal and External Support, Organizational group: Cross Functional Management, Communication, and Expectation group: Continuous learning, and High performance expectation. Tone of their opinions is manufacturing and service-based economies. This ranking is preparation stage of questionnaire design before asking top management of NQA companies.

For analysis plan, the tools for collecting data are the survey questionnaires by using Likert 5 level as a scale of measurement; 5 strongly agree, 4 agree, 3 neutral, 2 disagree and 1 strongly disagree. The number of questionnaire is 40 items. By focusing to the Thailand Quality Award and Thailand Quality Class companies from 2002 to 2009, the researcher expects to analyze return questionnaires and information from some interviews of 3 TQA and 23 TQC companies, as the population or sources of the primary data. Supplementary questions are open-end questions. Secondary data: supplementary, books, magazines, newspaper and information from website are also useful for support primary data and analysis the characteristics.

Table 2 Key Features of 'A Learning Organization' developed from Appendix B

Group	Subject
Top Management	Vision/Mission/Policy
	Learning Strategy
	Shared Vision
	Commitment
	Decision Making
	Empowerment
	Leadership
Organizational Infrastructures	Training/Learning and development
	Internal and External Support thru Consultant/Coach/Guru/Master
	Knowledge Sharing and Transfer Facilities
	Linkage with External Environment
	Inter-company Learning
	Measurement/Assessment System
	Rewarding System
Organizational Culture	Learning Climate
	Tolerance of Mistakes
	Openness to New Ideas
	Awareness of Big Pictures
	Teamwork Climate and Networking
	Cross Functional/Problem Solving
	Communication/Continuous Learning

Table 2 (Continued)

Group	Subject
Expectation	Participative Policy on Decision Making
	Self Development Opportunities
	Personal Mastery
	Adaptation of the Mental Model
	Building Shared Visions
	Team Learning
	System Thinking
	High Performance Expectation
	Information Sharing and Collaboration
	Employee Characteristics

Part three of the questionnaire, top management of NQA companies response the survey whether they accept or reject the purpose characteristics model. The researcher asked them to add more characteristic and delete any characteristic according to their opinions.

Table 3 Key Features of 'A Learning Organization' Developed from Pilot companies

Group	Subject
Top Management	Vision/Mission/Policy
	Leadership
	Decision Making
	Empowerment
	Commitment
Organizational Infrastructures	Knowledge Sharing/Transfer
	Internal and External Support thru
	Consultant/Coach/Guru/Master
	Training/Skill/Development
	Measurement/Assessment System
	Rewarding System
Organizational Culture	Cross Functional/Problem Solving
	Communication
	Learning Climate
	Teamwork Climate
	Awareness of Big Pictures
Expectation	Continuous Learning
	High Performance Expectation
	Participative Policy on Decision Making
	Self Development Opportunities
	Employee Characteristics

Validity

The researcher ranked the top five key features of a learning organization from Table 3 by asking top management of 30 organizations in Thailand. The researcher selected these organizations together with Director of Department of Industrial Promotion, Ministry of Industry for manufacturing in various sectors, Managing Director of the Bank in Security Exchange of Thailand for banking and service industry after a pilot test by the same questionnaire for validity and reliability.

Table 4 Summary of methodology and procedure

Topics	Activities	Finding
Characteristics of a LO	Literature review and Grounded Theory	Many models presented a number of characteristics without grouping
To find essential characteristics of a LO	Purpose four groups of characteristics	Classify four groups of characteristics
To find top five of each group	Ranking top five characteristics of each group from pilot companies	Classify top five characteristics of each group
To confirm essential characteristics of a LO in NQA companies	Select top two of each group for questionnaire	G1: Vision/Mission/Policy and Leadership G2: Knowledge Sharing/ Transfer and Internal/External support G3: Cross-functional and commitment G4: Continuous Improvement and High Performance Expectation

Definition of characteristics in questionnaire

Vision/Mission and Policy

Vision/Mission and Policy of the organization is holistic approach, create climate and function support to the learning organization with expected result scenario planning. Organizations need firstly to establish a clear learning organization vision grounded in meeting a real business need and make certain the organization can create and sustain a culture to support these goals. Senge (1990), stated that 'building shared vision' especially of a future desired state creates tension that leads to learning.

Leadership

Top management demonstrates his/her leadership to all people for the progress of a learning organization and organizing a group of people to achieve a common goal. Leadership makes significant progress and impacts on learning. (Philip Hallinger, 2011)

Knowledge Sharing Facilities

Knowledge sharing is an effective activity through which knowledge (i.e. information, skills, or expertise) is exchanged through informal network among people, friends, or members of a family, a community and where people from different levels within the organization exchange ideas.

Knowledge Transfer Facilities

The organization uses any kind of tools and technology effectively to foster communications and learning among staff or specialized knowledge developed in part of an organization to spread of knowledge to a wider group such as another part of the organization or business customers.

Internal and External Support

Managers of the organization view themselves as internal teachers and facilitators of the learning process. While consultant, coach, guru, mentor etc. are external teachers and facilitators from outside.

Cross-Functional Management

Cross Functional Teams are used to accomplish tasks and solve the problems together effectively that cut across work areas or departments. Organizations need first to establish a clear learning organization vision grounded in meeting a real business need and make certain the organization can create and sustain a culture to support these goals.

Communication

Communication in the organization is opened or closed, formal or informal and cross department. Relevant information is shared with all people within the organization. The organization uses technology effectively to foster communication and learning among staff. Example of communication: top-down, bottom-up, meeting, email, web board, innovation process etc.

Continuous Learning

Ongoing learning process is essential to incorporate the lessons learnt (from the results of already implemented changes) into a continuous improvement program. Continuous improvement is an ongoing effort to improve products, services, and processes. These efforts can seek ‘incremental’ improvement over time or "breakthrough" improvement all at once. A learning organization continuously puts effort for improving every part of the firm relative to all of its deliverables to its customers.

High Performance Expectation

The organization set strategic goals and tracks both financial and nonfinancial indicators to determine goal achievement linking performance like productivity and quality improvement program and activities to rewarding system. In a high-performance expectation, employees are required to learn more knowledge and

skills. Lifelong learning itself is, ‘continuous learning from daily experiences and opportunities’ and a vital managerial skill is, ‘the ability to translate knowledge into action that results in desired performance’ (Schermerhorn et al. 2011).

Research Objective 2

To create a process for moving towards a learning organization

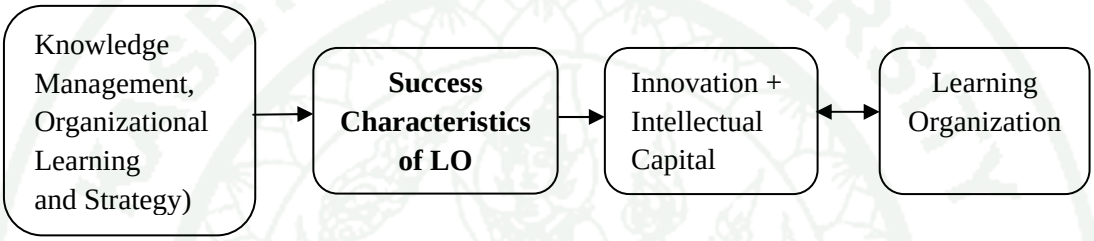


Figure 4 Conceptual research model objective 2

Methods

From TQA interview:

1. Thai Acrylic Fiber Co.,Ltd.

Interviewee: Mr. A.K. Maheshwari, CEO Date: Feb 14, 2011

Vision:

- Be a world leader in Acrylic Fiber
- Business and achieve Customer
- Delight through Excellence in all Spheres of Activities

Mission: To create value for all stakeholders

Value:

- Customer is the focus of everything we do
- Employee respects and regards to the right of individual; he must has an honor and elegant also
- We do business with honesty and we must strive for a good businessperson

- We must work safety with good hygiene, good environmental management and improving and correcting continuously in all matters of environment

Key indicators: QCDIPSM (Quality-Cost-Delivery-Innovation-Productivity-Safety-Morale)

Learning through activities:

- TQM (Total Quality Management)
- TPM (Total Productive Maintenance)
- Best Practices
- TAF(Thai Acrylic Fiber) 'Open House Communication Session'

Key of success:

- Define clearly Vision, Policy, and Strategy
- 'Share Vision Session' meeting for management level
- Leadership commitment and support
- 'Systematic analytical' skill training to employees
- Learning Organization
- Cross Functional Team

Success Factor:

- Priority to human resources
- Effective communication
- Team work

Results from being a learning organization:

- Creating better value for all stakeholders
- Stay ahead of competition

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics: It is all right

Recommendation:

- Learning all the time
- Continuous Improvement

Innovation Management: Culture + People + Knowledge = Innovation

Intellectual Capital: Disclose in annual report

World-class Recognitions for Organization Performance Excellence:

- First & the only winner of Japan Quality Medal in S.E. Asia
- Winner of Deming Application Prize
- The first winner of Thailand Quality Award
- Winner of International Asia Pacific Quality Award
- Winner of Special Award for TPM Achievement
- Winner of National Award for Safety
- Certified company in ISO 9001:2000, ISO 14001, OHSAS 18001 and SA8000

2. SCG Paper (Public) Co.,Ltd.

Correspondent: Mr. Wichan Jitpukdee, Sustainable Development Director

Business Philosophy:

- Adherence to fairness
- Belief in the value of the individual
- Dedication to excellence
- Concern for social responsibility

Vision: To be a leading paper company in Asia in the area of profitability, business growth, create value added to stakeholders, and social responsibility

Mission: Concentrate to be a leading, printing and writing, paper company in Asia by quality, customer satisfaction, and long-term benefit to stakeholders

Success factors:

- Consistently produce good quality of products
- Keep good long term relation and sincere to customers
- Service that directly satisfied customer target group

KM is the importance factor of the organization to create value added to stakeholder, support and maintain the organizational competitiveness sustainable and Knowledge Sharing and Transfer leading to Excellence.

These happen due to the individual learning and organizational learning, organizational innovation and value creation to the employees.

Learning must embedded in the operation of the organization and the employees for example; daily management, problem solving and root cause, knowledge sharing and transfer among employees, research and development and external learning (from customers, suppliers, partners and benchmarking).

These learning could happen due to the leader of the organization giving value and creating good relationship among the employees for example, the leader's intention in supporting the achievement of the employees, supporting in knowledge sharing and transfer among employees to responding customers need, and creating new innovation from accumulation of organizational learning and employees which leading to "intellectual capital"

The structure of Thai Paper Company Limited KM is linking to the KM system of Siam Cement's Paper and Packaging business. Thai Paper Company Limited had sent the representative to "KM working team" which has the following duties:

- Collection and selection professional knowledge and techniques in the paper industry operations and process, in addition, there are "sub KM working team" to review and define the necessary knowledge including the standardized for training and examining.
- Sourcing the data base system for data management for user convenience and maintain the data up-to-date, safety through the network via web base.
- Define the criteria and competency of the operators and let them select and consider the new knowledge to the organization.

KM of the company is including the sourcing and collecting, exchanging or sharing and transferring, using the skills and experience of the employees' knowledge which working at any process in the organization, from best practices and research and development in Siam Cement from the past to present including the external knowledge.

In the view of activities, the organization supports employees to transfer their knowledge and gain benefit from practical that knowledge. The real examples are the knowledge sharing and transfer of TPM (Total Productive Maintenance), QCC (Quality Control Circle) activities twice a year, daily morning meeting, activities board, OJT (On the job training), E-classroom training, weekly meeting, problem

solving group presentation, web base practice of subsidiary company, seminar from outside or public training.

Result from being a learning organization:

- Work-life balanced
- High value added products
- Business Growth

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics: Add Retaining staff in organizational function

Recommendation: No

Innovation Management: All the time by management team and staff

Intellectual Capital: Only Intangible Asset shown in annual report: Goodwill, software

Not clarified Human Capital, Process Capital, Innovation Capital, and Customer Capital in annual report

3. PTT Rayong Gas Separation Plant:

Interviewee: Mr. Perapong Adsawashewin, Assistant Managing Director

Date: Feb 2, 2011

Eleven Core Values:

Strategic Leadership (1-2-5-11)

Executive Excellence (3-4-6-10)

Learning Organization (7-8-9)

1. Visionary Leadership
2. Social Responsibility
3. Valuing Employees & Partners
4. Customer Driven Excellence
5. Focus on Future
6. Agility
7. Organization & Personal Learning
8. Managing for Innovation
9. Management by Fact
10. Focus on Results & Creating Value
11. Systems Perspective

Management Tools

- GSP House
- BSC (Balanced Score Card)
- MIS →KM
- Cross-Functional Team
- TPM (Total Productive Maintenance)

No readymade 'management tools' for organization but organization has to choose and adapt tools to fit to their own. No one knows and understands your organization better than you are.

Result from being a learning organization: Sustainability in self-development and business growth

Opinion on characteristics of a learning organization: Accept the conceptual model

Add more characteristics:

- Create learning culture for all level development
- Mental development for striving in learning (Mental Model)
- Generous to other and learning together with public consciousness (Team Learning)

Recommendation:

- By declare a learning organization, top management has to show and practice his/her commitment in learning and development not only speech or wording.
- The organization has to set a concrete foundation of learning management system including culture of the organization.
- Cause of failure in a learning organization is come from top management him/herself.

Human Capital:

- Overall Customer Satisfaction
- Customer Satisfaction by topics
- Customer Satisfaction by group of employee
- Employee loyalty
- Absent rate

- Turnover rate
- Training as career plan
- Training hour
- Training hour of management team
- Training expense
- Training expense for management team
- Employee job rotation
- Competency evaluation
- Management team training expense
- Quantity of gas delivered per employee
- Employee growth rate
- Evaluation of employee skill
- Evaluation from KPI
- Fill in Rate
- Retention Rate
- Remuneration benchmarking
- Working environment and labor law

Process Capital:

- Pipeline Utilization
- Daily Accumulate Deviation Percentage
- Energy Loss/Gain
- O&M Expense per Pipeline Kilometer
- Platform O&M Cost
- Pipeline Emergency Training
- Pipeline Mean Time Between Failure
- Equipment Mean Time To Repair
- SCADA Performance
- Natural Gas Billing Performance
- Warehouse Response Time
- Spare Part Dead Stock
- Standard System Status

- QSHE Performance
- Individual KM
- Suggestion QCC Cost Reduction
- Number of Substandard Report
- ICT Response Time

Customer Capital:

- Overall Customer Satisfaction to Quality of Service
- Customer Satisfaction to Quality of each Service
- Customer Satisfaction to Maintenance
- Customer Satisfaction for Billing
- Customer Satisfaction for Invoicing
- Customer Satisfaction for Receipt, Tax Invoice and collecting system
- Overall Customer Satisfaction to Quality of Natural Gas
- Customer Satisfaction to Quality of each type of Natural Gas
- Overall Customer Satisfaction to Customer Complaints
- Number of Complaints
- Customer Retention
- Brand Loyalty
- Positive Referral
- Customer Meeting Actual to Plan

4. PTT Gas Transmission Pipeline:

Correspondent: Mr. Chakree Buranganond, Assistant Managing Director

Date: Feb 2, 2011

Vision: (PTT) Thai Premier Multinational Energy Company

Vision: (GTP) Operation Excellence

Mission:

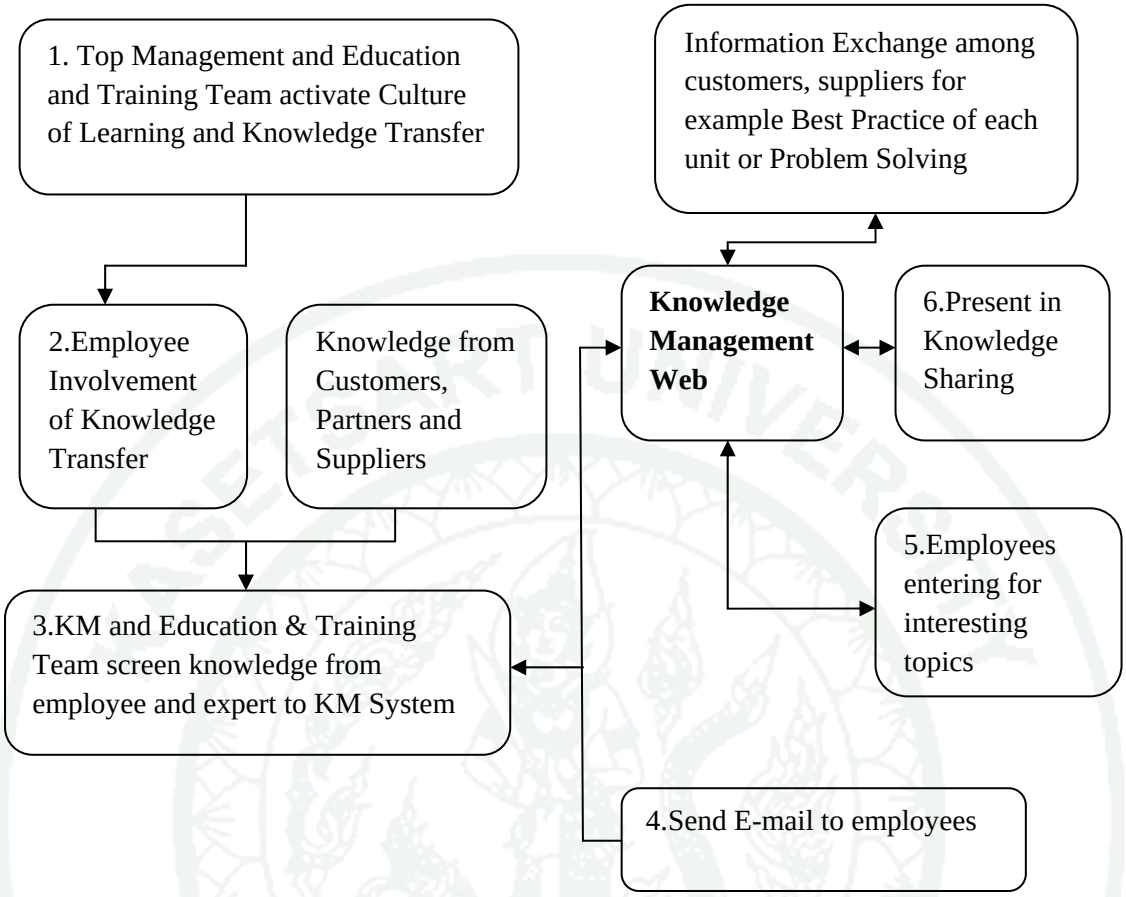
- Excellence in Customer focus
- Excellence in Process Control
- Excellence in Community Relation Development Process
- Excellence in Employee Development Process

- Excellence in Resources Management Optimization

Culture:

- Create Synergy
- Performance Excellence
- Promote Innovation
- Responsibility to social and environment
- Integrity & Ethics
- Trust & Respect

The organization was starting with continuous improvement and operational excellence was occurring from key success factors such as “excellent leadership, consistent of direction toward excellence, continuous improvement, and commitment of all staffs, open mind, and speed”. The achievements are communication excellence, learning organization, and operation excellence. The overall organizational performance (Key Performance Index or KPI) and daily operations performance (Key Activity Index or KAI) are tracked and recorded. GTM will review the cause and analyzed Infinite loop in case of mission misunderstanding. GTM will improve and deploy action plans and procedure to workforce in all divisions.



Collecting Process and Knowledge Transfer Pipeline of KM

Successful KM model of the organization

Result from being a learning organization:

- Improved overall working system
- Reduced cycle time
- Improved quality of working life

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics: It is all right

Recommendation: No

Innovation Management: PTT Blue Innovation

Intellectual Capital: Intangible assets shown in annual report

Human Capital:

- Employee Loyalty survey

- Absent rate
- Employee Engagement and Benchmarks (Hewitt model)
- Employee satisfaction
- Employee satisfaction to skill and knowledge development
- Employee satisfaction to top management
- Employee satisfaction to salary and welfare
- Quality of working life
- Average training hours/year
- Average training hours/year for leadership development
- Core Competency of management team
- Leadership Competency of management team
- Core Competency of employee
- Job satisfaction from KPI evaluation
- Actual number of employee to manpower position
- Fill in rate
- Retention rate
- Employee Skill evaluation
- Proportion of Potential Pool and Key Position
- Proportion of management team from internal recruitment
- Proportion of Senior/Specialist
- Working environment indicators
- Safety training hours
- Loss Time Injury Frequency (LTIF)

Process Capital:

- Pipeline Utilization
- Loss Elimination
- Percentage of daily accumulate deviation
- SCADA performance
- SCADA Backup Site Transition Time
- Energy Balance

- Pipeline PM Effectiveness
- Gas flow per fuel
- Natural Gas Billing performance
- Warehouse response time
- Dead stock spare part
- Productivity Result

Customer Capital:

- Customer Satisfaction to NG
- Customer Satisfaction to NG delivery
- Customer Satisfaction to Preventive Maintenance
- Customer Satisfaction to Billing
- Customer Satisfaction to Quality
- Customer Satisfaction to Invoice
- Customer Satisfaction to Documents system
- Customer Satisfaction to Complaint and Problem Solving
- Number of Complaint
- Customer Education and Retention
- After Sales Services
- Image of company benchmark to international company

Summary of key common subjects in four TQA companies

Vision/Strategy

Culture

Communication

Knowledge Management

Organizational Learning

Innovation

Intellectual Capital

TPM

Learning Organization

High Performance Organization

Continuous Improvement and Learning

Find documents from literature review to support the model Figure 4

"Knowledge management is not a standalone process. It is closely bound up with the inputs of organizational learning and strategy that govern its nature and scope" (Rastogi, 2000). This statement is the same as Thai Acrylic Fiber practicing all the time.

"LO and KM are dependent on each other, and KM can be regarded as a subsystem of LO; changes in KM results in change in the organization and vice versa. The strong relationship between them is clear, and the process to become a LO must include KM". (L. Aggestam, 2006).

"It is often impossible to distinguish between an organizational learning program and a continuous improvement program. What we have presented here is a set of ideas and techniques to enhance learning and continuous improvement in organizations, rather than a cookbook of ideas" (Locke, E. A., & Jain, V. K., 1995) This statement from Locke, is the same as Mr.Shah of Thai Acrylic Fiber had mentioned about TAF designed its own system. It emphasizes that KM and OL is always hand in hand.

"Sustained strategic commitment and a corporate culture that is conducive to knowledge performance are vital for success in Knowledge Management". (Arun Hariharan, Bharti Infotel Group, 2002) This statement means to success in KM the organization has to provide a corporate culture and strategic commitment for encouraging imperative knowledge performance.

Research Objective 3

To develop a management tool

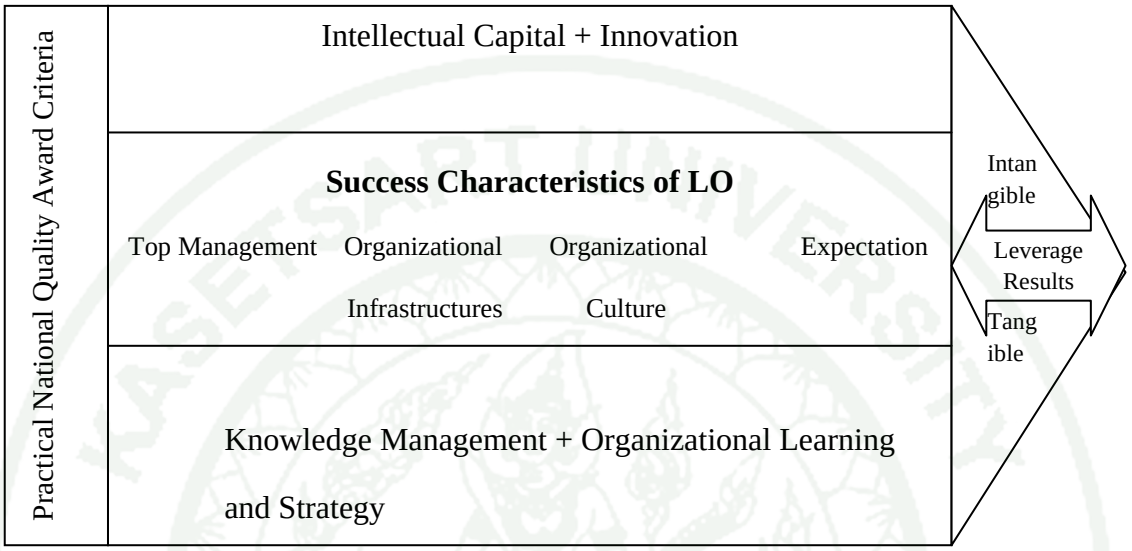


Figure 5 Management Tool from Research Objective 3

Methods

1. Investigate KM, OL and strategy
2. Practice National Quality Award
3. Practice success characteristics of LO
4. Manage Innovation and IC from practicing NQA
5. Measure tangible and intangible results
6. Review the whole process for improvement
7. Continuous learning from management tool

Process for creating a Learning Organization

Step 1. Preparation stage, practice Knowledge Management, Organizational Learning by Leadership strategy in the organization

Step 2. Practice National Quality Award's criteria

Step 3. Focus in KM and OL

Collection and transfer of workforce knowledge

Transfer of relevant knowledge from and to Stakeholders

Perform Best Practices all the time

Assembly and transfer of relevant knowledge for use in Innovation and strategic planning processes

Step 4. Apply result of characteristics of a LO plus (Appendix C)

Step 5. Practice Innovation Management from questions (Appendix G) and Innovation Process (Appendix H)

Step 6. Investigate result from result criteria (category no.7) to obtain both tangible and intangible result

Step 7. Review the whole process for leveraging tangible and intangible results

RESULTS AND DISCUSSION

Results

What are the characteristics that push forward a learning organization? Is shown in Table 19

Result of Research Sub questions:

The questionnaire is composed of three parts: part one is an explanation of the questionnaire, part two is composed of 40 items of questionnaire, and part three is the open-ended questionnaire. The author sent 26 sets of questionnaires to the top management of TQA and TQC companies. TQA and TQC companies replied twenty sets of questionnaires. TQA companies replied 100%, while TQC companies replied 73.91%. All of the service sector and education replied 100%, while manufacturing sectors replied 76.47%. Figure 6 is showing a Graphic represent total response rate of the questionnaire.

From part three, of 20 sets returned questionnaires, all of them agree and accept the eight characteristics of the purpose learning organization characteristics; none of them rejects the purpose conceptual characteristics of a learning organization in TQA and TQC companies. From the replied questionnaires, total agrees (Strongly agree and agree) of the eight characteristics are Mission and Policy 93%, Leadership 97%, Knowledge Sharing and Transfer 85%, Internal External Support 83%, Cross Functional Management 85%, Communication 92%, Continuous Improvement 90%,and High Performance Expectation 88%. Summary of total agrees on eight characteristics of a learning organization as shown in Table 7. The answer of research question 1: the eight characteristics of a learning organization present in TQA and TQC are quite high; maximum 97%, minimum 83% and median 89%.

Table 5 Number of TQA/TQC companies and Respondents of Questionnaires

Award Type	Organizations	Respondents
TQA	3	3 (100%)
TQC	23	17 (73.91%)

Table 6 Type of Industry and Questionnaire Respondents

Industry Sector	Organizations	Respondents
Manufacturing:		
Oil & Gas/Grease/Refinery	4	2
Chemical (Fiber/Paper/Chemical)	5	4
Foods	2	2
Construction	2	2
Auto-parts	1	-
Electronics	1	1
Printing	1	1
Packaging	1	1
Service:		
Retail	5	5
Hospital	3	1
Education	1	1
Total	26 (100.00%)	20 (76.92%)

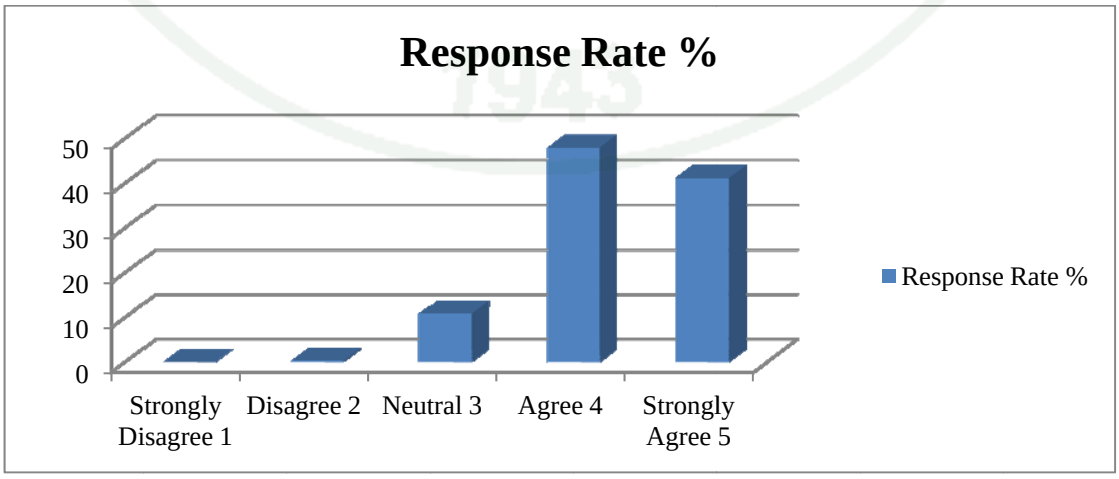


Fig 6 Graphic represent total response rate of questionnaire

Research Question 1: To what extent are purpose characteristics of a learning organization present in studied companies?

From replied survey questionnaire the percentage of total, agree upon eight characteristics is quite high (83%-97%) as shown in Table 8

Table 7 Percentage of Total Agree correspond to eight characteristics

Characteristics Agree	**Strongly Agree**	**Agree**	**Total**
Mission/Policy	47%	46%	93%
Leadership	70%	27%	97%
Knowledge Sharing/Transfer	35%	50%	85%
Internal/External Support	26%	57%	83%
Cross-Functional Management	26%	59%	85%
Communication	41%	51%	92%
Continuous Improvement	48%	42%	90%
High Performance Expectation	35%	53%	88%

To answer the research sub question 2, 3 and 4

Statistical Analysis Techniques, Non-parametric test is applied to this observation due to the data collected from Likert scale are ordinal scale: they have an inherent order or sequence, but one cannot assume that the respondent means that the difference between agreeing and strongly agreeing is the same as between agreeing and being undecided. Non-parametric tests can also be applied when the observation in a small sample of data. When treated as ordinal data, Likert responses can be analyzed using non-parametric tests, such as the Mann-Whitney test, the Wilcoxon signed-rank test, and the Kruskal-Wallis test.

Table 8 Comparison of Parametric and Non-Parametric Test

Parametric Test	Non-Parametric Test
• Normal Distribution • Large amount of Data • Data in Interval Scale • Z and t Test for comparing 2 groups of population • Chi-Squared Goodness of Fit Test whether or not two samples may reasonably be assumed to come from the same distribution • F-Test used in ANOVA (analysis of variance) used to compare three or more samples. It is used to test the null hypothesis that all populations have identical distribution functions against the alternative hypothesis	• Not Normal Distribution • Small amount of Data • Data in Ordinal Scale • Mann-Whitney Test for comparing 2 groups of population • Kolmogorov-Smirnov Test whether or not two samples may reasonably be assumed to come from the same distribution • Kruskal-Wallis Test and Median Test used to compare three or more samples. It is used to test the null hypothesis that all populations have identical distribution functions against the alternative hypothesis

Source: Statistics analysis, Vanichbancha, 2008.

Sub-question 2: Are the characteristics of a learning organization in manufacturing difference from service sector?

Hypothesis:

H_o: The characteristics of a learning organization in Manufacturing are as same as in Service sector

H_1: The characteristics of a learning organization in Manufacturing are difference from Service sector

The Mann-Whitney Test is one of the most powerful of the non-parametric test for comparing two populations. It is used to test the null hypothesis that two populations have identical distribution functions against the alternative hypothesis that the two distribution functions differ only with the respect to location (median), if at all. In this case, to determining if the mean of two groups are difference from each other: Manufacturing and Service Sector

Table 9 Mann-Whitney Test for Manufacturing and Service Sector

Sector	N	Mean Rank	Sum of Ranks
1	5	7.50	37.50
2	15	11.50	172.50

Table 10 Mann-Whitney Test Statistics

Statistics	Agree
Mann-Whitney U	22.500
Wilcoxon W	37.500
Z	-1.331
Asymp. Sig. (2-tailed)	.183
Exact Sig. [2*(1-tailed Sig.)]	.197[a]

Table 11 Two-Sample Kolmogorov-Smirnov Test

Most Extreme Differences	Agree
Absolute	.533
Positive	.000
Negative	-.533
Kolmogorov-Smirnov Z	1.033
Asymp. Sig. (2-tailed)	.236

Input Organization column Service Sector (1) N = 5

Manufacturing Sector (2) N = 15 Total of 20 organizations

Input Total Agree is composed of strongly agree and agree from replied questionnaires.

Result from SPSS:

Mann-Whitney Test: asymptotic significance two tails = 0.183 > 0.05

Two-Sample Kolmogorov-Smirnov Test: asymptotic significance two tails = 0.236 > 0.05

We accept H_o or the characteristics of a learning organization in Manufacturing are as same as in Service sector.

Sub-question 3: Are the characteristics of a learning organization in TQA same as in TQC companies the same?

Hypothesis:

H_o: The characteristics of a learning organization in TQA are as same as in TQC companies.

H_1: The characteristics of a learning organization in TQA are difference from TQC companies.

Again, the Mann-Whitney Test is one of the most powerful of the non-parametric test for comparing two populations. It is used to test the null hypothesis that two populations have identical distribution functions against the alternative hypothesis that the two distribution functions differ only with the respect to location (median), if

at all. In this case, to determining if the mean of two groups are difference from each other: TQA and TQC group.

Table 12 Mann-Whitney Test for TQA and TQC

Sector	N	Mean Rank	Sum of Ranks
1	3	12.17	36.50
2	17	10.21	173.50

Table 13 Mann-Whitney Test Statistics

Statistics	Agree
Mann-Whitney U	20.50
Wilcoxon W	173.50
Z	-.5381
Asymp. Sig. (2-tailed)	.59
Exact Sig. [2*(1-tailed Sig.)]	.616

Table 14 Two-Sample Kolmogorove-Smirnov Test for TQA and TQC

Most Extreme Differences	Agree learning
Absolute	.412
Positive	.412
Negative	-.196
Kolmogorov-Smirnov Z	.658
Asymp. Sig. (2-tailed)	.780

Input Organization column TQA (1): N = 3 and TQC (2): N = 17

Input Agree Learning is composed of strongly agree and agree from replied questionnaires.

Result from SPSS:

Mann-Whitney Test: asymptotic significance two tails = 0.591 > 0.05

Two-Sample Kolmogorov-Smirnov Test: asymptotic significance two tails = 0.780 > 0.05

We accept H_o or the characteristics of a learning organization in TQA are as same as in TQC companies.

Sub-question 4: Are the median of eight characteristics of a learning organization in TQA and TQC companies equal.

Hypothesis:

H_o: The median of eight characteristics of a learning organization are the same in TQA and TQC companies.

H_1: The median of eight characteristics of a learning organization are difference in TQA and TQC companies.

From this question the researcher, check all of eight characteristics of a learning organization. The Kruskal-Wallis Test is a non-parametric test used to compare three or more samples. It is used to test the null hypothesis that all populations have identical distribution functions against the alternative hypothesis that at least two of the samples differ only with respect to location (median), if at all. In this case, checking the entire eight characteristics median has identical distribution. Moreover, the researcher uses a Median non-parametric test to test the null hypothesis that the medians of the populations from which two samples are drawn as identical. The data in each sample are assigned into two groups, one consisting of data whose values are higher than the median value in the two groups combined, and the other consisting of data whose values are at the median or below. A Pearson's chi-square test is used to determine whether the observed frequencies in each group differ from expected frequencies derived from a distribution combining the two groups.

Table 15 Kruskal-Wallis Test Ranks

Characteristics	N	Mean Rank
1	1	7.00
2	1	8.00
3	1	2.50
4	1	1.00
5	1	2.50
6	1	6.00
7	1	5.00
8	1	4.00
Total	8	

Table 16 Kruska-Wallis Test Statistics

Statistics	Total Agree
Chi-Square	7.000
Degree of Freedom	7
Asymp. Significance	0.429

Table 17 Median Test

Statistics	Total Agree
N	8
Median	89.000
Chi-Square	8.000
Degree of Freedom	7
Asymp. Significance	0.333

Input eight characteristics:		**Input Score of Total Agree**
Mission/Policy	= 1;	93
Leadership	= 2;	97
Knowledge Sharing and Transfer	= 3;	85
Internal External Support	= 4;	83
Cross-Functional Management	= 5;	85
Communication	= 6;	92
Continuous Improvement	= 7;	90
High Performance Expectation	= 8;	88

From Kruskal-Wallis Test: asymptotic significance = 0.429 > 0.05

From Median Test: asymptotic significance = 0.333 > 0.05

Median = 89

We do not reject H_o or we accept and conclude that the median of eight characteristics of a learning organization are the same in TQA and TQC companies

Reliability

Reliability Test for the statistics case processing summary valid N = 20 companies Cronbach's alpha 0.953, N = 40 items of questionnaires which is showing that the reliability is quite high.

Discussion

The finding indicates that the highest score of characteristic is Leadership (97 %). The result still supports various theoretical arguments that advocate for organizational leaders to create a learning culture that encourages innovation, continuous learning, and intellectual growth. Leadership development needed before an organization can fruitfully initiate efforts to become a learning organization (Prewitt, 2002). The lowest score is Internal and External Support (83%). This characteristic indicates that internal and external support is a basic requirement especially from top management point of view.

Table 18 Purpose Characteristics and Agree Percentage from TQA/TQC companies

Characteristics	**Total Agree**	**Group**
Leadership	97%	Top Management
Mission/Policy	93%	Top Management
Communication	92%	Organizational Culture
Continuous Improvement	90%	Expectation
High Performance Expectation	88%	Expectation
Knowledge Sharing/Transfer	85%	Organizational Facilities
Cross-Functional Management	85%	Organizational Culture
Internal/External Support	83%	Organizational Facilities

Even though customer focus or customer orientation is one of the national quality award criteria, it is not considered as a characteristic of a learning organization. None of the model in table 1 mentioned customer focus. Also from Parast, et al. (2011), their study shows that customer orientation is not significant predictor of business performance same as (Prajogo, 2005), customer focus scale was deleted due to poor loading on its latent variable. These researches also support that

the seven criteria of TQA and characteristics of a learning organization in TQA/TQC companies are not the same. Even Leadership is the same, Mission and Policy is similar to strategy, and high performance expectation is close to results.

The characteristics of a learning organization in manufacturing and service sector are the same; supported by the comparative analysis of TQM practices and quality performance between manufacturing and service firms research. “TQM construct based on the MBNQA criteria is valid across both industry sectors, and its relationship with quality performance also indicates insignificant difference between the two sectors” (Prajogo, 2005). However, some sectors contain both physical and non-physical mechanisms to the same measure. For example, the construction industry contains a large portion of physical components in its product, which by nature, can be linked to manufacturing although it was classified as service in some study. In manufacturing sector, the key determinant in achieving high quality product is process management while in service sector is people management as a significant predictor. There is no significant difference among the score of TQA / TQC group.

Appendix Table is showing the summary of replied questionnaires (open-ended part)

1. Opinion in model acceptation
2. Added characteristics from their opinions
3. Results from being a learning organization
4. Recommendation from top management

Added characteristics from practitioners’ first group are TQA criteria: Benchmarking, Commitment and Engagement, and Management by fact. Second group are Organizational Function: Monitoring & Evaluation, Personal Learning, Internal & External Audit, and Retaining Staff. Monitoring & Evaluation and KM Assessment can be found in KM area and Personal Learning or Individual Learning can be found in OL area. Mental Development is mentioned in Five Disciplines. Lastly, Lifelong Learning is learning perspective requires that we change mindsets. Mindsets grounded in seeing learning as an important part of human lives will be an integral part of the future.

Table 19 Characteristics that push forward a learning organization

Top Management	Organizational Infrastructures	Organizational Culture	Expectation
Vision/Strategy	Knowledge Sharing/Transfer	Cross-Functional Management	Continuous Learning
Leadership	Internal/External Support	Communication	High Performance
Expectation	Monitoring	Learning Culture	Mental Model
Benchmarking	Evaluation	Recognition	Team Learning
Management by fact	Personal Learning	Mental Development	
Lifelong learning	Knowledge Identification	Engagement	
Commitment	Exchange Knowledge to and from		
	KM Assessment		
	Internal/External Audit		
	Retention Staff		

Result from Research Objective 2

1. All of them agree on purposed characteristics model of a LO
2. They add team learning, mental development, learning culture, and retaining staff
3. Organizational learning and strategy together with KM is a prerequisite for a LO
4. All of them agree that intellectual capital comes after innovation (same as criteria of NQA)
5. Success characteristics of a LO will accelerate the organization to learn fast
6. All of them have intellectual capital report disclose to shareholders. Thai Acrylic Fiber just practices IC from Birla Group lately.

Result from Research Objective 3

Second round interview at Thai Acrylic Fiber Co.,Ltd.
Interviewee: Mr.Rituraj Shah, Joint President and Head Manufacturing
Date: Jan 27, 2012
Objective 2 and 3 Process for moving towards LO and Management Tool

TAF has own TQM model and will not copy any model from books. TAF prefer no jargon, no fad and fashion of management tool. TAF will keep things as simple as possible for employees to understand or learn quickly. For the question, how do you start to be a learning organization? He replied that TAF follows Birla group culture and chairperson who drives vision and strategy of TAF. Vision of TAF is a world leader in acrylic fiber, low cost and best service for customer delight. TAF perform benchmarking continuously. Comment on process for moving towards LO, Mr.Shah said that he would start with KM plus organizational learning and strategy. Strategy is very important because it relates to vision from top management. He confirmed that success characteristics are essential to the company and he will use them. For the question of Innovation and Intellectual Capital, which one comes first? He replied that Innovation come first and follows by Intellectual Capital. For the question: Will the company learn fast from practice these characteristics? He replied

that of course and he will practice all of them. For the question, will you use this management tool to assist? He replied that yes but not fix to only this model. He will use it as a reference. He also add another characteristics ‘dream’ and ‘communication’ for top management and ‘speed of deliver’ to expectation group of characteristics (which is already in high performance expectation). For the name of the group: he suggested that Organizational Infrastructures should be ‘Structure Process and System’ and Organizational Culture should be ‘Organizational Engagement of Employee’ and Expectation should be ‘High Performance Organization’

Qualitative Discussion

Definition of the fifth discipline is covered all of the discipline definition. (The practice of training people to obey rules or a code of behavior; the controlled behavior resulting from such training; activity that provides mental or physical training.) While the characteristic is, emphasize in typical of a particular person, place, or thing and focus at a feature or quality belonging typically to that person, place, or thing and serving to identify them. Some of replied questionnaires from the companies are mixing between characteristics and disciplines. Many of books and articles use the five disciplines interchange with characteristics, but not in this research paper. As already known, the fifth disciplines of Peter Senge represent the disciplines or behaviors of a learning organization. Smith, Peter., (2008) refers essay of Revans from 1969, and Garrat (1987) is the first to propose a learning organization concept not Peter Senge. However, some characteristics are developed from the five disciplines.

Other than disciplines and characteristics of the model, they are also called characters, behaviors, key factors, action imperatives, pillars, principles etc. The researcher skips the five disciplines from the questionnaire in order to find the new characteristics from the entrepreneurs and the practitioners in the organization.

The understanding of a learning organization characteristics of the people are based on perceptions and original sources of idea

Not surprisingly, why there are so many characteristics of a learning organization from practitioner, academics, consultants, gurus etc. First, they try to find the characteristics of a learning organization, which correspond to their knowledge and background, see Table 1 Next, they try to collect the characteristics that cover all essentials point for creating a learning organization. Finally, they found there are so many processes and tools that would facilitate approaching a learning organization. For example, the researcher collected 22 models of a learning organization and 156 of characteristics from 1990-2008 average of seven characteristics per model.

Reification problem of a learning organization

From the study, a number of models from those of practitioners, consultants, researchers, top management of entrepreneur, and students, engaged in organizational related fields of interest. “Since 2000 academic and managerial interest in the concepts of organizational learning and learning organization started to wane slightly and the suspicion that both OL and LO are simply a fashion has increased, as have the critical voices around it.” (Peter A.C. Smith, 2008). The editorial colleagues of ‘The Learning Organization’ mentioned that “The LO is more like a story than a subject, we abandon the idea of the LO altogether on the grounds that it was an imaginative idea that has run its course. And indeed may be harmful, still no general accepted LO template to provide executives with a compelling case for implementation and this implies that the LO is not practical, and hence not pragmatic.” Learning Organization is a very slippery concept, it all sound great in principle, but getting to actually do anything is rather hard (Sohal, A., Morrison, M., 1995)

Learning Organization is an ideal and means a desirable state (Tsang, 1997). The organizations may not know what a learning organization look is like but they desire to reach from some direction (Jones and Hendry, 1994). In conclusion, a learning organization is an ideal, desirable, unreachable, and demands activity. Undoubtedly, such a number of desirable characteristics shown in learning characteristics models for example ability to share and reuse content, ability to blend learning, ability to transfer knowledge, and effective organization etc.

Understand the models by grouping the added characteristics from the questionnaire

All of the learning organization models, which composed of characteristics, have their own origin, even they are composed of three or twelve characteristics. Many characteristics of a learning organization had been created due to the background and origin source of idea of the top management or interviewees; for example from twenty replied questionnaires, they added 17 more characteristics, which demonstrated their personal opinions in a learning organization. Added characteristics can be classified to seven groups of origin idea of the interviewees as Organizational Learning group, Knowledge Management group, the five disciplines group, TQA criteria and purpose model (Top management, Organizational Function, Organizational Culture, and Expectation) as shown in Figure 5.

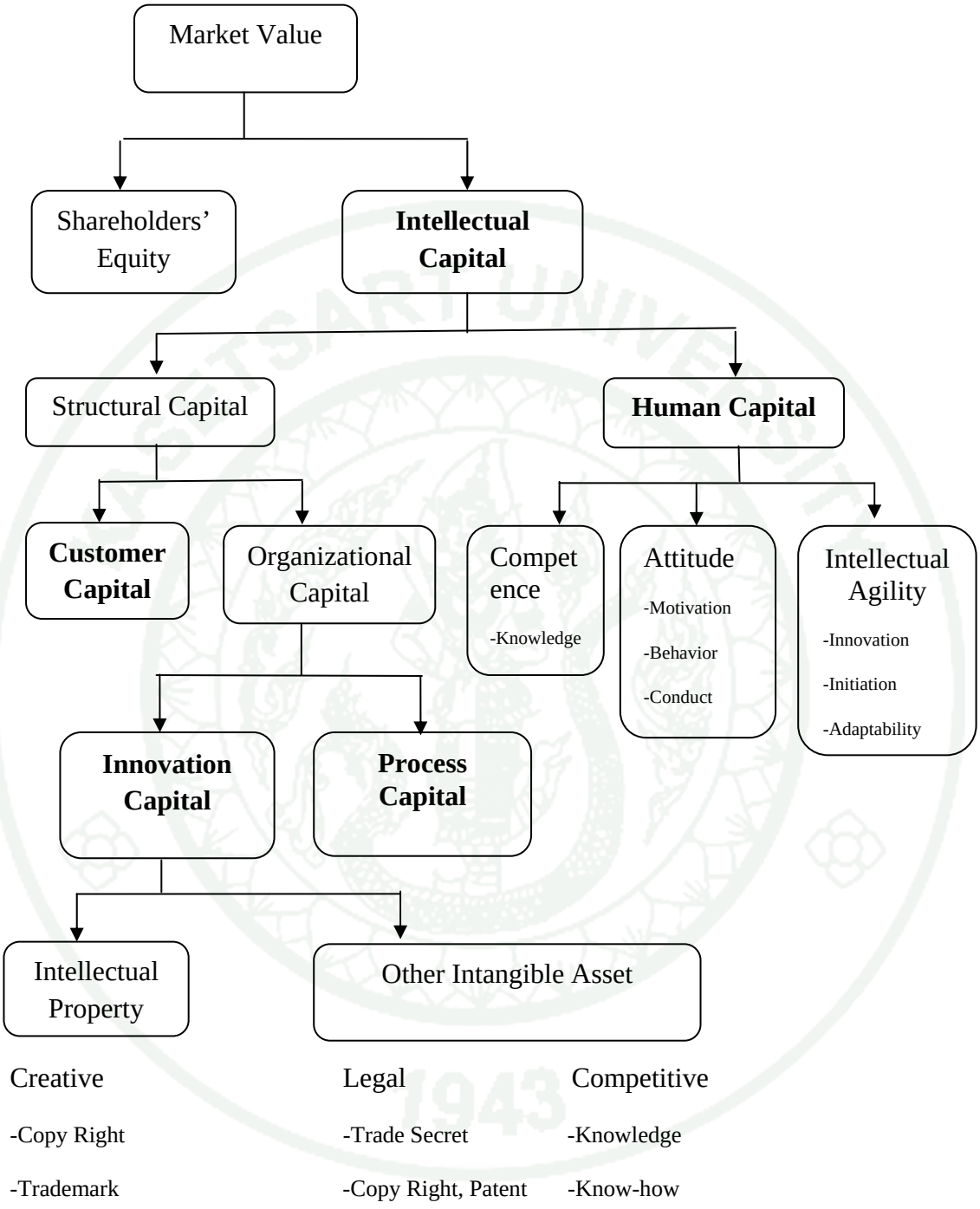


Figure 7 Structure of Market Value and Intellectual Capital

Source: Adapt from Edvinsson and Malone (1997)

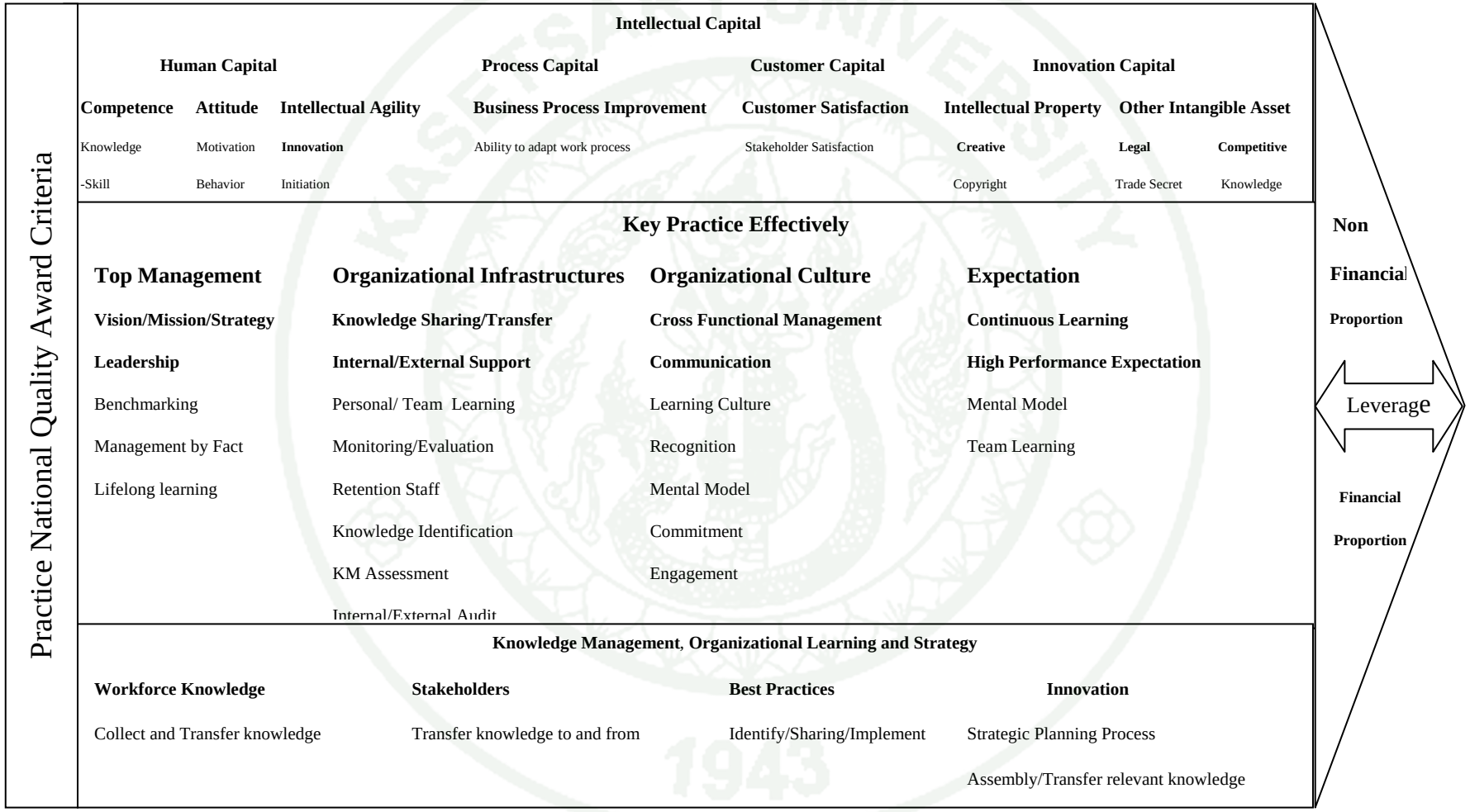


Figure 8 Management Tool: Output from the research objective 3

Table 20 Management Tool: Application of the Model

Activities	Output
1.An organization practice the integration of KM, OL and strategy to improve organizational performance for the benefit of shareholders and stakeholders	Performance of the organization
2.Practice NQA criteria in seven categories: leadership, strategic planning, customer focus, measure-analysis KM, workforce focus, operations, and results	Award received or feedback report for improvement, learning fast and leading to a LO
3.Practice Innovation Management starting from answering 14 questions from NQA criteria Appendix G and Practice Innovation Process Appendix H	LO and innovation management practice
4.Practice IC Management starting from summarized of collection items companies interviewed Appendix D	IC management practice
5.Disclose IC report attached to annual report (This step is an option, some organizations use IC report internally)	IC report for shareholders
6.Use IC report, benchmark to the same industry or business, watching the trend and continuous improvement to each component of IC	Improve Organizational Performance
7.Leverage financial (tangible) and non-financial (intangible) assets Intellectual Capital = Market Value – Book Value Market Value = No. of shares x Price (at any time) Book Value = Total asset-Intangible-Liabilities Intangible asset = Goodwill + Patent (Normally display in annual report)	Leverage tangible and intangible and gain more benefit to shareholders and stakeholders

Intellectual Capital accounts are still in experimental and should not subjected to strict regulation. The Organization should design its own capital category fitness to its use. Confidential information to the competitiveness should not publish. Some is reserved for Top Management and Shareholders internal discussions.

Reliability of the model

Feedback from company (Entech Associate Co.,Ltd.)

Business: Import and sales measuring devices in manufacturing

Employees: 100 Date: Jan 3, 2012

Interviewee: Mr.Sopon Nanasombat, CEO and Mr. Paiboon Onpattanasin, MD

1. Morale of top management is the most important

2. Top management must use intellectual or wisdom to solve the problems

3. The importance of knowledge triangle:

    3.1 Learner

    3.2 Course or subject

    3.3 Instructor

The company agrees and accepts the output of the model and will use as a tool for building a learning organization and will practice intangible part in the future.

Feedback from company (Bumrungrad International)

Business: Hospital

Establish: 1980 Employees: 3,000

Interviewee: Mr.Piboon Taraputhi, Human Resource Director Date: Jan 26, 2012

Success characteristics of LO are useful but Bumrungrad does not use them all.

Bumrungrad Hospital focuses on financial report rather than intellectual capital report.

The transformation process to LO and management tool are useful.

Bumrungrad Hospital, got TQC in 2008, would like to practice this management tool for next time contest.

Feedback from Thai Acrylic Fiber Co.,Ltd.

Business: Acrylic Fiber

Establish: 1987 Employees: 464

Interviewee: Mr. Rituraj Shah, Joint President and Head Manufacturing Date: Jan 27, 2012

Success characteristics of LO are essential for any organization to practice LO.

TAF would like to add 'dream' and 'communication' under top management group and 'speed delivered' under expectation group. TAF perform best practice in process monitoring and control, TPM, and continuous improvement. In case of transformation process to LO, TAF starts with clear vision, policy, and strategy. Top management commitment and communication to employee are very important for successful to any project. Skill in systemic analysis and analytical skill development are part of the result from practicing organizational learning and knowledge management. Critical success factors of TAF are employee involvement and continuous improvement. Mr. Shah noticed that the transformation model and management tool are fine and all right in case of well-equipped subjects. *Both of them are good for the company that is looking for NQA but in case of TAF, he will use it as a reference but not a bible.*TAF does not prefer cookbook, no jargons around, not fad and fashion words. TAF always design its own practice model (example of TAF TQM model).

Credibility to top management of TAF comment on second interview

1. TAF is the company that applies NQA only one time and received TQA first company in Thailand.
2. President Shah, an engineer, hand-on management, assessor of TQA, coach, master, mentor, internal consultant, one of the top management of TAF at present who has been practiced and trained, taught management team and employees for more than 15 consecutive years.
3. Birla group of company has a good reputation in visionary, strategy and productive management style: TAF won a large number of productivity and quality awards for decade.
4. TAF blends knowledge management, organizational learning and strategy homogenously by its own management system. The commitment from top management of TAF, is striving for best performance according to the vision: World class in acrylic fiber manufacturing, low cost and best service for customers delight. TAF benchmark all of these three activities all the time for checking the process and performance of the operations.
5. TAF would not like to copy from cookbook, brand name tool, no jargons, and no fad and fashion management tool. TAF makes subjects to train the employees and keep things simple, designs the system in house by management and staff of TAF.

Validity of research output

Content and Construct Validity by comparing MAKE and BEST award Table 20 category by category to management tool (research output), the contents of management tool from research output are fully equipped in the model. Showing the content validity fulfill by the purpose model and more substantial than BEST award. Even the award is serving, as a tool for understanding and managing performance and for guiding planning and opportunities for learning, management tool (output) is a set of knowledge package for improving process/procedure or solving the problems or improving performance as well.

Comparing international knowledge and learning awards to Management Tool Integration

MAKE Awards

The Global **M**ost **A**dmired **K**nowledge **E**nterprises (MAKE) research program was established in 1998 by The KNOW Network (a global community of knowledge-driven organization dedicated to networking, benchmarking and sharing best practices leading to superior performance). To identify and recognize those organizations, which are creating shareholder/stakeholder wealth by transforming new as well as existing enterprise knowledge into superior products/services/solutions.

A panel of Global Fortune Global 500 senior executives and leading knowledge management, intellectual capital, innovation, organizational learning experts selects the Global MAKE Winners (MAKE Report, 2010). The eight knowledge performance dimensions, which form the MAKE framework and are the visible drivers of value creation:

- Creating an enterprise knowledge-driven culture
- Developing knowledge workers through senior management leadership
- Developing and delivering knowledge-based products/services/solutions
- Maximizing enterprise intellectual capital
- Creating an environment for collaborative enterprise knowledge sharing
- Creating a learning organization
- Delivering value based on stakeholder knowledge
- Transforming enterprise knowledge into shareholder/stakeholder value

The Global MAKE study is a measure of the rate at which an organization is transforming its tacit and explicit corporate knowledge into new enterprise intellectual capital and increase shareholder value. Global MAKE winners are creating enterprise intellectual capital and shareholder value over four times as fast as their competitors-supported by trends in innovation capability, market capitalization, return on assets and revenues, brand value etc.

ASTD BEST Awards

BEST (**B**uilding talent **E**nterprise-wide, **S**upported by the organization's leaders fostering a **T**horough learning culture) by ASTD (The American Society for Training & Development) since 2003, recognize organizations that demonstrate enterprise-wide success because of employee learning and development. They use the learning function as a strategic business tool to get results. These award-winning companies have invested in learning, created an engaging learning environment, found new ways to deliver via social media tools, and created a culture where innovation thrives. The BEST Awards Winner's Circle includes small and large private, public, and not-for-profit organizations from around the world. Award winners demonstrate that they are excellent in many aspects of the learning function:

- Learning has an enterprise-wide role: involved in the executive team, creating solutions to business issues, and setting organizational strategy
- Learning has value in the organization's culture: learning opportunities for employees, C-level involvement, learning for growth of the organization, and innovation
- Learning links to individual and organizational performance: alignment with the business, efficiency, measurement of the effectiveness of learning, and success with non-training solutions for business needs
- Investment is made in learning and performance initiatives

The difference of award and tool

The criteria of the award assists strengthen competitiveness by

- The criteria of the award improving organizational performance practices, capabilities, and results
- Facilitating communication and sharing of information on best practices among organizations of all types
- Serving as a tool for understanding and managing performance and for guiding planning and opportunities for learning

Tool is a set of knowledge package for improving process/procedure or solving the problems or improving performance. Relation of tool and award is TQM and MBNQA, TQM is a management tool, an integrative of philosophy and concept. MBNQA is Malcolm Baldrige National Quality Award, which apply the criteria of the award from TQM.

MAKE and BEST awards are the guide for investigate the level or concentration of knowledge and learning and development activities and environment in the organization; they act like a meter for measurement. While the output from the research is starting as a management tool composed of KM, OL and strategy, success characteristics of LO, Innovation, and Intellectual Capital. Each subject is acting as a tool, by integrate all of them both tangible (financial result) and intangible (non-financial result) are performance of the organization.

Applications of the management tool

Even the management tool is composed of OL, KM, Strategy, and success characteristics of a LO follow by innovation and intellectual capital at the end of the process. The model may look sophisticated to SMEs but it is still reachable and applicable to all of companies that have an intention to striving for a learning organization.

SMEs that earned any ISO, as a foundation or prerequisite, are recommended to practice process for moving towards a LO. While the rest may starting to practice this management tool partially, by skipping innovation and intellectual capital part at the beginning or try to practice innovation management and intellectual capital management gradually.

Learning is still the best spell for SMEs. They can utilize management tool to reduce these main problems: Learning problem, information problem, capital problem, labor problem, productivity and quality problem, innovation problem, intellectual capital problem, cooperation problem, management problem, strategic problem, cross-functional and teamwork problem. (Ministry of Industry and The Office of Small and Medium Enterprises Promotion, Thailand)

Table 21 Comparison of MAKE-BEST and Management Tool Integration

NO.	MAKE	BEST	MANAGEMENT TOOL
1.	Creating an enterprise knowledge-driven culture	Learning has value in the organization's culture	LO and KM practiced in the organization
2.	Developing knowledge workers through senior management leadership	Learning has an enterprise-wide role: involved in the executive team, Executive involvement	Individual, Team and Organizational learning are supported by leaders at all levels
3.	Developing and delivering knowledge-based products/services/solutions	Learning has value in the organization's culture: innovation	Innovation processes and products for markets
4.	Maximizing enterprise IC		Benchmarking IC to best in class, Self diagnosis IC trend

Table 21 (Continued)

NO.	MAKE	BEST	MANAGEMENT TOOL
5.	Creating an environment for collaborative enterprise Knowledge Sharing	Learning opportunities for employee	Organizational Infrastructures, Knowledge Sharing and Transfer
6.	Creating a LO	Setting organizational strategy	LO is practiced and developed
7.	Delivering value based on stakeholder knowledge		Knowledge Sharing from and to stakeholders
8.	Transforming enterprise knowledge into		Organizational Performance from knowledge base and learning to shareholder/stakeholder value

CONCLUSION AND RECOMMENDATION

Conclusion

To know the right characteristics for improving the organization is beneficial for further continuous learning and improvement to the right track and success as the award winner recipients. The purposed transformation process to a learning organization consists of KM and OL together with leadership strategy; four groups of success characteristics: top management, organizational infrastructures, organizational culture, and expectation; innovation and intellectual capital. Each area also contains relevant subjects that can be used for future assessment. Benchmarking is important to investigate the performance of the process that transform from vision to strategy of the organization (Shah, 2012). It was found that the NQA and assessment process could produce much wider benefits than quality. Self-assessment using the national quality award criterion for performance excellence has become a widespread practice suggests that NQA assessment typically results in improvements to managerial processes (Ford, M.W., and J.R. Evans. 2001).

It provided the practical organizations, recognized the potential and transferability of the learning process involved for better business result. To build a learning organization, any organization manufacturing or service can apply purposed model of characteristics as a starting guideline.

The leaders of the organization have to create a learning culture that fosters innovation, continuous learning, and intellectual growth. Leadership development needed before an organization can fruitfully initiate efforts to become a learning organization (Rastogi, 2000), (P. Vorapat, 2004). The organization needs first to establish a clear vision of a learning organization and make certain the organization can create and sustain a culture to support these goals. The success or failure of the program is belonging to organizational leadership undoubtedly.

Twenty years of brand ‘learning organization’ has arrived. Practitioners, consultants, researchers, and students are engaged in LO or organizational-related fields of interest. Most of them are trying to find substantial characteristics of LO by

interpreted the concept in their own fashion. “With all deference to ambiguity, there must be some limits.” (Ortenblad, 2007). The researcher picked up 22 models of LO from 1990-2008 altogether of 156 characteristics and tried to analyze each characteristic where are the origins or the source of idea by thinking over carefully. To become a learning organization, an organization has to consider knowledge as an asset (Hidding, Catterall, 1998). All of the characteristics came from concept of Knowledge Management, Organizational Learning, TQA criteria or TQM and of course, from conceptual purpose characteristics model. From replied questionnaire (open-ended part), executive of the organization responded some additional characteristics and all of them are able to appoint according to the origin idea as shown in Appendix Table A1.

From four building blocks of characteristics the organization can pick up from characteristics list (Appendix B), add or design their own characteristics correspond to the block and practice their own learning organization. No right or wrong, small or large number of characteristics items. This is quite subjective derived from different points of view of practitioners, consultants, academics, and researchers.

For new comers who interested in a learning organization, it seems that the concept of a learning organization is quite clear enough into practice. However, it is also blurry and formless and needs critical attention. A learning organization is best thought of as a journey, not a destination (P.West 1994), a philosophy, not a program (Sololmon 1994). A learning organization has a lot to offer to the reform and restructuring of organizations, as the attitude that learning is ‘a sustainable resource, not a limited commodity’ (May 1994). It must be recognized that the visioning process is ongoing, not a one-time event (O’Neil 1995). However, building a good learning organization require a huge effort and time consume. The organization needs realistic imaginary of a well-trained leader together with possible characteristics within the anatomy of a learning organization.

Benefits of the research to industrial engineering

Early Definitions of Industrial Engineering

Industrial engineering directs the efficient conduct of manufacturing, construction, transportation, or even commercial enterprises of any undertaking, indeed in which human labor is directed to accomplishing any kind of work.

"Industrial engineering is the engineering approach applied to all factors, including the human factor, involved in the production and distribution of products or services" (Maynard, 1953). Another definition "Industrial engineering is the design of situations for the useful coordination of men, materials and machines in order to achieve desired results in an optimum manner. The unique characteristics of Industrial Engineering center about the consideration of the human factor as it are related to the technical aspects of a situation, and the integration of all factors that influence the overall situation." (Lehrer, 1954)

Traditionally, a major aspect of industrial engineering was planning the layouts of factories and designing assembly lines and other manufacturing paradigms.

Industrial engineering IIE (Institute of Industrial Engineering) official definition

Industrial engineering is concerned with the design, improvement and installation of integrated systems of people, materials, information, equipment and energy. It draws upon specialized knowledge and skill in the mathematical, physical, and social sciences together with the principles and methods of engineering analysis and design, to specify, predict, and evaluate the results to be obtained from such systems.

Lately definition of Industrial Engineering

Industrial engineering is a branch of engineering dealing with the optimization of complex processes or systems. It is concerned with the *development, improvement, implementation and evaluation of integrated systems of people, money, knowledge, information, equipment, energy, materials, analysis and synthesis, as well as the mathematical, physical and social sciences together with the principles and methods*

of engineering design to specify, predict, and evaluate the results to be obtained from such systems or processes. Its underlying concepts overlap considerably with certain business-oriented disciplines such as operations management, but the engineering side tends to emphasize extensive *mathematical* proficiency and usage of quantitative methods.

Industrial Engineering may also be known as Operations Management, Management Science, Operations Research, Systems Engineering, or Manufacturing Engineering, usually depending on the viewpoint or motives of the user. While the term originally applied to manufacturing, the use of “Industrial” in “Industrial Engineering” can be somewhat misleading. The Institute of Industrial Engineering has been considering changing its name to Institute of Industrial & Systems Engineering. At present, there are departments of Industrial Engineering and Industrial & Systems Engineering, faculty of engineering in the university.

The various topics of concerns to industrial engineers include Just-In-Time, in so-called lean manufacturing systems, industrial engineers work to eliminate wastes of time, money, materials, energy, and other resources. In popular cost and waste reduction techniques Six-Sigma, industrial engineers named as green belt, black belt, and or champion depends on the role and responsibility in the organization according to the program. Industrial engineers also act as financial engineering developing financial algorithm or loan system, as materials planning and control inventory management, warehousing, and distribution management in supply chain management and shortening lines or queues at a bank, hospital, airline or any line of counter service. Industrial engineers typically use computer simulation along with extensive mathematical tools and modeling and computational methods for system analysis, evaluation, and optimization.

Most of the National Quality Award’s processes criteria like waste and cost reduction or lean management, productivity improvement, quality improvement, and International Standard Organization, all of these activities in the organization usually handle by industrial engineers. This research assists industrial engineers directly and indirectly whatever they are called (management science, financial engineering,

engineering management, supply chain management, process engineering, operations research, systems engineering, ergonomics, cost and value engineering, quality engineering, facilities planning, the engineering design process, and productivity management consultant).

Organizational development is one of the purpose of a learning organization and measured by business result both tangible and intangible assets. This learning organization must be equipped with concrete foundation of knowledge management and innovation according to tight national quality award criteria. Intellectual Capital of a learning organization is disclosed by composition of human capital, process capital, innovation capital, and customer capital, which are award criteria. Finally, financial result (tangible) and non-financial result (intangible) will be shown. In general, the organization demonstrates only book value or financial result in the annual report. To find intellectual capital of the organization, the organization usually subtracts market value from book value.

Recommendation

Contribution and the value of this research can be directly applied to any organization that would like to strive for excellence especially SME's. First, the benefit of research characteristics in a learning organization results indicate that individual motivation to learn, innovate, cross functional team, and to build organization culture practices have a significant level of influence on any organization learning sustainability. Second, management tool integration is fully equipped with knowledge management and organizational learning, learning organization practice, innovation, and IC in one tool. Third, any organization that would like to try for this management tool is suggested to apply or study and practice the criteria of national quality award as a prerequisite. "Even if you do not win, the feedback is invaluable; and even if you do not apply, the self-assessment will do wonders for your organization" by C.W. Russ Russo, Quality Progress Magazine (2001). This is very important according to the details of the award criteria are linking to knowledge management, innovation, and IC. Fourth, there are many methods of measuring IC with advantage and disadvantage presented in each method. Fifth, there are various industrial sectors of award recipients for example, manufacturing, construction, electronics, chemicals, auto-parts, foods, service (retail), hospital, and education. This is a good example for the organization even they would like to apply for the award winner or just want to practice from the criteria. The organizations should utilize the result from this study to be a guideline to build "a learning organization" on their own.

All industries of SMEs in manufacturing and service sector are recommended to apply management tool. They can look at the success case in various industries: automotive, chemicals, printing, paper, oil and gas, foods, constructions, retails, or even education from the NQA recipients companies. Before they had achieved the awards, some of them were SMEs before but the difference is the preparation of the organization from strategic management of top management or leadership and continuous learning is still the admired spell.

Limitations of the research

The researcher sent the questionnaire to selected group population of national quality award recipients 26 organizations (2002-2009). This selected group is quite small number compared to MBNQA award recipients since 1987. However, the number of recipients will increase due to the increasing number of applicants and recipients each year.

Top management of the organizations are always busy; the researcher could not ask many questions as would like to. Time limitation and limited survey items are challenging for setting the questionnaires that linking to a learning organization. The researcher designed and tested the questionnaires to maximize the outcome that replied from top management at minimize time.

The consistent and attitude about striving for excellence of top management at present and former top management at the period of awarded year may difference. This situation reflects the variance of long-term strategic leadership and top management commitment of the organization. Nevertheless, the learning organizational structure and infrastructure for continuous improvement and high performance expectation of each organization will guarantee overall performance of the awarded organization.

The research output model: Management Tool Integration is showing the transformation process to a learning organization from concrete foundation from knowledge management, organizational learning together with strategy from leadership, innovation and intellectual capital in the organization that applied for national quality award or just practice its criteria. This research is not spotlight or focused on Innovation management and Intellectual Capital Management especially measurement, which is out of scope. However, any organization is able to earn benefit from the model by benchmarking human capital, process capital, innovation capital, and customer capital to the clearinghouse or investigate the trend of each capital internally.

LITERATURE CITED

Ahmed A.S. Seleim, Omar E.M. Khalil, (2011). Understanding the knowledge management-intellectual capital relationship: a two-way analysis. **Journal of Intellectual Capital**. 12(4): 586 – 614.

Amrik Sohal and Michael Morrison, 1995. Is there a link between total quality management and learning organization?, **The TQM Magazine**, 7(3): 41-44.

Anders Örtenblad, 2001. On differences between organizational learning and learning organization, **The Learning Organization,** 8(3): 125 – 133.

Andrew Mayo, 2007. What are the characteristics of a true learning organization?, **Strategic HR Review**, 6(2): 4.

Arash Shahin, Mohamed Zairi, 2007. Corporate governance as a critical element for driving excellence in corporate social responsibility, **International Journal of Quality & Reliability Management**, 24(7): 753 – 770.

Argyris, C., & Schön, D. 1978. Organizational learning: **A theory of action perspective, Reading**, Mass: Addison Wesley.

Argyris, C. 1993. Knowledge for action: **A guide to overcoming barriers to organizational change**. San Francisco: Jossey-Bass.

Argyris, C. and Schon, D. 1996. Organisational Learning II: **Theory, Method and Practice**, Addison-Wesley, Reading, MA.

Argyris, C. 1999, On Organizational Learning, Blackwells, Oxford.

Arun Hariharan, Bharti Infotel Group. 2002. Knowledge Management: A Strategic Tool, **Journal of Knowledge Management Practice**, December

Bajaria, H.J. 2000, Knowledge creation and management: inseparable twins, **Total Quality Management**, 11(4): 562-73.

Barker, R.T., Camarata, M.R. 1998. The role of communication in creating and maintaining a learning organization: predictions, indicators and disciplines, **Journal of Business Communication**, 35(4): 443-67.

Bennet, J.K., and O'Brien, M.J. 1994. The building blocks of the learning organization. **Training**, 31(6): 41-49.

Bersin,. J, (2008). **The High-Impact Learning Organization**, Bersin & Associate Executive Summary, V.1.0

Bill Richardson, 1995. Learning contexts and roles for the learning organization leader, **The Learning Organization,** 2(1): 15 – 33.

Blackler, F. 1995. Knowledge, knowledge work and organizations: an overview and interpretation', *Organization Studies*, 1(6): 1021-46.

Bontis N., Serenko A,. 2004. Meta-review of knowledge management and intellectual capital literature: citation impact and research productivity rankings. **Knowledge and Process Management** 11(3): 185–198.

Bryan T. Phillips, 2003. A four-level learning organisation benchmark implementation model, **The Learning Organization**, 10(2): 98-105.

Burgoyne, J. 1999. Design of the times, **People Management**, 5(11): 38-44.

Carter McNamara, MBA, PhD, **Authenticity Consulting LLC**. Adapted from the Field Guild to Leadership and Supervision.

Catherine L. Wang, Pervaiz K. Ahmed, 2003. Organisational learning: a critical review, **The Learning Organization,** 10(1): 8 – 17.

Choong, K. 2008. Intellectual capital: definitions, categorization and reporting models, **Journal of Intellectual Capital**, 9(4): 609- 638.

Constantine Kontoghiorghes, Susan M. Awbrey, Pamela L. Feurig, 2005. Examining the Relationship between Learning Organization Characteristics and Change Adaptation, Innovation, and Organizational Performance, **Human Resource Development Quarterly**, 16(2): 185-211.

Cook, S.D.N. and Yanow, D. 1993. Culture and organizational learning, **Journal of Management Inquiry**, 2(4): 373-390.

Cortini, M., Benevene, P. 2010. Interaction between structural and human capital in Italian NPO: leadership, organizational culture and human resource management, **Journal of Intellectual Capital,** 11(2): 123-139.

Daniel I. Prajogo, 2005. The comparative analysis of TQM practices and quality performance between manufacturing and service firms, **International Journal of Service Industry Management,** 16(3): 217 – 228.

David A. Garvin, Amy C. Edmondson, and Francesco Gino, 2008. “Is your’ a learning organization”, **Harvard Business Review Articles**, March 1, 2008

DiBella, A. 1995. **Developing learning organizations: A matter of perspective.** Proceedings of the 1995 Academy of Management Meeting, 287-290.

Dodgson, M. 1993. Organizational learning: A review of some literatures. **Organization Studies**, 14: 375-394.

Dumay, John C. 2009. Intellectual capital measurement: a critical approach, **Journal of Intellectual Capital**, 10(2): 190 – 210.

Easterby-Smith, M. and Araujo, L. 1999, **Organizational Learning and the Learning Organization:** Developments in Theory and Practice, Sage, London.

Edvinsson, L., and M.S. Malone, 1997, **Intellectual Capital**, Piatkus, London.

Edwin A. Locke, Vinod K. Jain, 1995. ORGANIZATIONAL LEARNING AND CONTINUOUS IMPROVEMENT, **International Journal of Organizational Analysis**, 3(1): 45 – 68.

Edwin C. Nevis, Sohail Ghoreishi, Janet M. Gould, 1995. Understanding Organizations as Learning Systems. **Sloan Management Review**

Edwin A. Locke, Vinod K. Jain, 1995 ORGANIZATIONAL LEARNING AND CONTINUOUS IMPROVEMENT, **International Journal of Organizational Analysis**, 3(1): 45 – 68.

El-Korany, A. 2007. A knowledge management application in enterprises, **International Journal of Management and Enterprise Development**, 4(6): 693- 702.

Elias M. Awad & Hassan M. Ghaziri, **Knowledge Management**, Pearson Prentice Hall, New Jersey, 2004, p.33

.

Finger, M. and BuÈrgin Brand, S. 1999, The concept of the learning organization applied to the transformation of the public sector: conceptual contributions for theory development, in Easterby-Smith, M., Burgoyne J. and Araujo L. (Eds),

Organizational Learning and the Learning Organization: Developments in Theory and Practice, Sage, London, :130-56.

Ford, M.W., Evans, J.R., 2001. Baldrige Assessment and Organizational Learning: The need for Change Management, **Quality Management Journal** 8(3): 9-25.

Garcia-Morales et al., 2008. Influence of transformational leadership on organizational innovation and performance depending on the level of organizational learning in the pharmaceutical sector. **Journal of Organizational Change Management** 21(2): 188-212.

Gardiner, Penny and Whiting, Peter. 1997. Success factors in learning organizations: and empirical study**. Industrial and Commercial Training**. 29(2): 41-48.

Garrat, B. 1987, **The Learning Organization**, Fontana Paperbacks, London.

Garvin, D.A. 2000, Learning in Action. **A Guide to Putting the Learning Organization to Work**. Harvard Business School P*ress*, Boston, MA.

Garvin, D.A. 1993, Building a learning organization. **Harvard Business Review**. 71(4): 78-91.

Griego, O. V., Geroy, G. D., & Wright, P. C. 2000. Predictors of learning organizations: A human resource development practitioner's perspective. **The Learning Organization**. 7(1): 5–13.

Going, Charles Buxton, **Principles of Industrial Engineering,** McGraw-Hill Book Company, New York, 1911, Pages 1-3

Goh, Swee C. 2003. Improving organizational learning capability: lessons from two case studies, **The Learning Organization**. 10(4): 216 – 227.

Gupta, B., Iyer, L.S. and Aronson, J.E. 2000. Knowledge management: practices and challenges, **Industrial Management & Data Systems.** 100(1): 17-21.

Henry M. Bwisa, 2008. **How to write a statement problem**, *Your Proposal writing companion,* November 2008

Hidding, G.J. and Catterall, S.M. 1998. Anatomy of a learning organization: turning knowledge into capital at Andersen Consulting. **Knowledge and Process Management** 5(1): 3–13.

Hoe, S.L. 2006. Tacit knowledge, Nonaka and Takeuchi SECI model and informal knowledge processes, **International Journal of Organisation Theory and Behaviour**, 9(4): 490-502.

Hoehn, W. 2003. Managing organizational performance: **Linking the Balanced Scored to a process improvement technique**, Proceeding of the 4th Annual International Symposium in Industrial Engineering on Performance-based Management, Kasetsart University, : 1-12.

Intarakumnerd, P. Lecler, Y. 2010, **Industrial Development in Thailand**: Industrial Policies, Firms Agglomeration and Land Management, Lyon, France: IRASEC.

Intarakumnerd, P. Lecler, Y. 2010. **Sustainability of Thailand's Competitiveness**, ISEAS (Institute of Southeast Asian Studies) Publishing

JC Hong, 1999. Knowledge management in the learning organization, **The Leadership and Organization Development Journal**, 20(4): 207-215.

Jay W. Forrester, 2010. System Dynamics: The Foundation Under Systems Thinking, **Sloan School of Management**, Revised from a paper of June 8, 1999

Jim Grieves, Brian P. Mathews, 1997. Healthcare and the learning service, **The Learning Organization**, 4(3): 88 – 98.

Joe Marshall, Simon Smith. Learning organization and organizational learning 2009: What have we learned?, **Management Services**, Summer 2009

Jones, M. 1995. Organisational learning: collective mind or cognitivist metaphor?, Accounting, **Management & Information Technology**, 5(1): 61-77.

Jones, A.M. and Hendry, C. 1994. The learning organization: adult learning and organizational transformation, **British Journal of Management**, 5(6): 153-162.

Judy Oliver, 2009. Continuous improvement: role of organisational learning mechanisms, **International Journal of Quality & Reliability Management**, 26(6): 546 – 563.

K.C. Chan, 1994. Learning for Total Quality: An Action Learning Approach**, The Learning Organization,** 1(1): 17 – 22.

Kess, Pekka. 2007. **A company external knowledge taxonomy**, Doctor of Engineering Thesis International Graduate Program, Kasetsart University

Kiechel, W. 1990. **The organization that learns**. Fortune, : 133–136.

Kim, D. 1992. **Toward Learning Organizations: Integrating Total Quality Control and System Thinking**, *Pegasus Communication*, Cambridge, MA.

Lena Aggestam, 2006. Learning organization or knowledge management – which came first, the chicken or the egg? **Information Technology and Control**, 35(3A):

Lehrer, Robert N. 1954. The Nature of Industrial Engineering, **The Journal of Industrial Engineering**, 5(1): 4.

Locke E.A., Jain, V.K. 1995 Organizational Learning and Continuous Improvement: **The International Journal of Organizational Analysis**,Vol.3, No.1, pp. 45-68

Marquardt, M. J. 1996. **Building the Learning Organization**, New York: McGraw-Hill.

Marquardt, M., & Reynolds, A. 1994. **The global learning organization**. Burr Ridge, IL: Irwin Professional.

Marquardt, M. J. 2002. **Building the learning organization: mastering the 5 elements for corporate learning (2nd ed.)**. Palo Alto, CA: Davies-Black Pub.

Marr, B., Gupta, O., Pike, S., & Roos, G. 2003. Intellectual capital and knowledge management effectiveness, **Management Decision**, 41(8), 771-781.

Marsick, V. J., Watkins, K. 1999. **Facilitating Learning Organizations: Making Learning Count**. Aldershot, England: Gower Publishers.

May, S. 1994. Beyond 'Super Secretary' Courses. **Canadian Journal of University Continuing Education** 20(2): 45-54.

Maynard, H.B. 1953. **Industrial Engineering**, Encyclopedia Americana, Americana Corporation.

McElyea, B. 2002. Knowledge Management, Intellectual Capital, and Learning Organizations: A Triad of Future Management Integration. **Futurics,** 26(1&2): 59-65.

Milè Terziovski, Andrea Howel, Amrik Sohal, Michael Morrison, (2000) "Establishing mutual dependence between TQM and the learning organization: a multiple case study analysis", **The Learning Organization,** 7(1): 23 – 32.

Nonaka, I. 1994. A dynamic theory of organizational knowledge, **Organization Science**, 5: 14-37.

Nonaka, I. and Takeuchi, H. 1995. **The Knowledge Creating Company***:* How Japanese Companies Create the Dynamics of Innovation, Oxford University Press, Oxford, London.

Nonaka, I., Konno, N. 1998. The concept of `ba': building foundation for knowledge creation, **California Management Review**, 40(3): 40-54.

Nonaka, I., Toyama, R., Konno, N. 2000 SECI, ba and leadership: a unified model of dynamic knowledge creation, **Long Range Planning**, 33(1): 5-34.

Parast, M. Mahour, Adams G. Stehpanie, Jones C. Erick, 2011. Improving operational and business performance in the petroleum industry through quality management, **International Journal of Quality & Reliability Management**, 28(4): 426-450.

O'Neil, J. 1995. On Schools as Learning Organizations. **Educational Leadership**, 52(7): 20-23.

Örtenblad, Anders. 2001. On differences between organizational learning and learning organization, **The Learning Organization**, 8(3): 125 – 133.

Pedler, M., Burgoyne, J. and Boydell, T. 1991. **The Learning Company**: A strategy for sustainable development, London: McGraw-Hill Book Company.

Pemberton, J. D., & Stonehouse, G. H. 2000. Organizational learning and knowledge assets– an essential partnership. **The Learning Organization,** 7(4): 184-193.

Peter A.C. Smith, 2008. The Learning Organization turns 15: a retrospective, **The Learning Organization,** 15(6): 441 – 448.

Peter Y.T. Sun, John L. Scott, 2003. Exploring the divide – organizational learning and learning organization, **Learning Organization, The**, 10(4): 202 – 215.

Phillip Hallinger, 2011. Leadership for learning: lessons from 40 years of empirical research, **Journal of Educational Administration**. 49(2): 125-142.

Phusavat, K. et al., 2010. Developing an assessment model for a learning organization, **International Journal of Innovation and Learning**, 8(2): 107-126.

Pemberton, J.D. and Stonehouse, G.H. (2000). Organisational learning and knowledge assets: an essential partnership, **The Learning Organization**, 7(4): 184-193.

Polanyi, M. 1958. **Personal Knowledge**, University of Chicago Press, Chicago, IL.

Polanyi, Michael. 1966. **The Tacit Dimension**. London, Routledge. (University of Chicago Press. ISBN 978-0-226-67298-4. 2009 reprint)

Poocharoen, W. **Learning Organization & Knowledge Management**. 4th edition, ISBN: 974-92667-8-1, Arayachon Co.,Ltd. Bangkok, Thailand

Prajogo, I. Daniel, 2005. The comparative analysis of TQM practices and quality performance between manufacturing and service firms, **International Journal of Service Industry Management,** 16(3):

Plessis, M.d. 2005. Drivers of knowledge management in the corporate environment, **International Journal of Information Management** 25, 193–202.

Prewitt, V. 2002. Wisdom in the workplace. **Performance Improvement Quarterly**, 15(1): 84-98.

Prewitt, V. 2003. Leadership development for learning organizations, **Leadership & Organization Development Journal**, 24(2): 58-61.

Pun, Kit Fai and Marcia Nathai-Balkisson, 2011. Integrating knowledge management into organizational learning: A review of concepts and models, **The learning organization,** 18(3): 203-223.

Ramírez Yolanda Córcoles, Jesús F. Santos Peñalver, Ángel Tejada Ponce, 2011. Intellectual capital in Spanish public universities: stakeholders' information needs, **Journal of Intellectual Capital**, 12(3): 356 – 376.

Raphaella Prugsamatz, 2010. Factors that influence organization learning sustainability in non-profit organizations, **The Learning Organization,** 17(3): 243 – 267.

Revans, R. 1945. **Plans for Recruitment, Training and Education in the Mining Industry**, Mining Association of Great Britain, London.

Revans, R.W. 1982a. **The nature of action learning**, in The Origins and Growth of Action Learning, Chartwell-Bratt, London.

Richard Ross, Bryan Smith, Charlotte Roberts, Art Kleiner. 1994. **The Fifth Discipline Field book**: Strategies and Tools for Building a Learning Organization New York: Currency Doubleday, p. 51

Rostogi, P., 2000. Knowledge management and intellectual capital – the new virtuous reality of competitiveness. **Human Systems Management**, 19: 39-49.

Roberta Hill, Tony Bullard, Phillip Capper, Kathryn Hawes, Ken Wilson, 1998. Learning about learning organisations: case studies of skill formation in five New Zealand organisations, **Learning Organization, The**, 5(4): 184 – 192.

Roo, J., G. Roos, Edvinsson L., and N.C. Dragonetti. 1997. **Intellectual Capital**: Navigating in the Business Landscape. New York: Macmillan.

Rowley, J. 2006. What do we need to know about wisdom?, **Management Decision**, 44(9): 1246-1257.

Senge, Peter. 1990. **The Fifth Discipline**: The Art and Practice of the Learning Organization New York: Doubleday.

Schermerhorn, J, Davidson, P, Poole, D, Simon, J, Woods, P and Chau, S. 2011, **Management Foundations and Applications**, 1st edition, John Wiley & Sons, Milton.

Smith, Peter. 2008. The Learning Organization Turns 15: a retrospective, **The Learning Organization**, 15(6): 441-448.

Sumita, Takayuki. 2008. Intellectual assets based management for innovation, **Journal of Intellectual Capital**, 9(2): 206-227.

Sohal, A. and Morrison M. 1995. Is there a link between TQM and Learning Organizations?, The TQM Magazine, 7(3): 41-44.

Solomon, C.M. 1994. HR facilitates the learning organization concept, **Personnel Journal**, 73(11): 56.

Stephen C. Bushardt, Cherie Fretwell, Patti Byrd Cumbest, 1994. Continuous Improvement through Employee Training: A Case Example from the Financial Services Industry, **The Learning Organization**, 1(1): 11 – 16.

Steven W. Pool, 2000. The learning organization: motivating employees by integrating TQM philosophy in a supportive organizational culture, **Leadership & Organization Development Journal,** 21(8): 373 – 378.

Su-Chao Chang, Ming-Shing Lee, 2007. A study on relationship among leadership, organizational culture, the operation of learning organization and employees' job satisfaction, **The Learning Organization,** 14(2): 155 – 185.

Sumita, T. 2008. Intellectual assets based management for innovation: Lessons from experiences in Japan, **Journal of Intellectual Capital** 9(2): 206-227.

Sun, H.C. 2003. Conceptual clarifications for 'organizational learning', 'learning organization' and 'a learning organization'. **Human Resource Development International.** 6(2): 153-166

Traver, I. and Wilcock, A. 2006. Identification of overseas vendor selection criteria used by Canadian apparel buyers: Is ISO9000 relevant? **Journal of Fashion Marketing and Management**. 10(1): 56-70.

Tannenbaum, S. 1997, Enhancing continuous learning: diagnostic findings from multiple companies, **Human Resource Management**, 36(4): 437-452.

Tsang, E. 1997. Organizational learning and the learning organization: A dichotomy between descriptive and prescriptive research. **Human Relations**, 50(1): 73-89.

Uma Jogulu, 2011. Leadership that promotes organizational learning: both sides of the coin, **Development and Learning in Organizations**, 25(4): 11 – 14.

Vana Prewitt, 2003. Leadership development for learning organizations, **Leadership & Organization Development Journal,** 24(2): 58 – 61.

Watkins, Karen E. & Marsick, Victoria J. (Eds.). 1996. **In Action: Creating the Learning Organization**. Alexandria, VA: ASTD Press.

West, P. 1994. The Learning Organization: Losing the Luggage in Transit? **Journal of European Industrial Training**, 18(11): 30-38.

WEST, P., BURNES, B. 2000. Applying organizational learning: lessons from the automotive industry. **International Journal of Operations & Production Management**, 20(10): 2000: 1236-1251.

Wiig, K. 1997. Integrating intellectual capital and knowledge management, **Long Range Planning,** 30(3): 399-405.

Yang, B., Watkins, K.E. and Marsick, V.J. 1998, **Examining construct validity of Dimensions of the Learning Organization Questionnaire**, in Torraco, R. (Ed.), Proceedings of the 1998 Annual Academy of Human Resource Development Conference, Academy of Human Resource Development, Oak Brook, IL, pp. 83-90.

Zhou, A.Z., Dieter Fink, 2003. The intellectual capital web: A systematic linking of intellectual capital and knowledge management, **Journal of Intellectual Capital**, 4(1): 34 – 48.

APPENDICES

Appendix A

List of TQA/TQC companies

Appendix A

TQA/TQC 2002-2009 Industrial Sector and Number of Employees

Remark: * TQC in 2009 and TQA in 2010

	TQA/TQC	Name	Year Awarded	Type of Industry	No. of Emp.
1	TQA 1	Thai Acrylic Fiber	TQA 2002	Fiber	464
2	TQA 2	Thai Paper	TQA 2003	Paper	630
3	TQA 3	PTT Natural Gas Separation Plant	TQA 2006 TQC 2004 TQC 2005	Oil & Gas	296
4	TQA 4 *	PTT Natural Gas Piping System	TQA 2010 TQC 2007 TQC 2008 TQC 2009	Oil & Gas	336
5	TQC 1	Thai Carbon Black	2002/2003	Chemicals	307
6	TQC 2	Dana Spicer Thailand	2002/2004	Auto-parts	196
7	TQC 3	Siam Cement	2002/2003	Construction	600
8	TQC 4	CU Continuing Study Center	2002/2003	Education	110
9	TQC 5	Siam Packaging	2002/2003	Packaging	192
10	TQC 6	Siam Mitsui	2003	Chemicals	211
11	TQC 7	Thai Olefins	2004	Chemicals	493
12	TQC 8	C.P. Seven Eleven Public	2004	Retails	26,833
13	TQC 9	CPAC	2004	Construction	1,345
14	TQC 10	Spansion (Thailand)	2004	Electronics	1,320
15	TQC 11	C.P. Retail & Marketing (Frozen Foods)	2005	Retails	4,000
16	TQC 12	C.P. Retail & Marketing (Bakery)	2005	Retails	1,800
17	TQC 13	Chaiboon Brothers	2005	Printing	600
18	TQC 14	CP All Public	2006	Retails	60,000
19	TQC 15	Counter Service	2006	Service	159
20	TQC 16	Prince Songkhla Hospital	2007	Hospital	4,052
21	TQC 17	Thai Lube Base	2008	Oil & Grease	133
22	TQC 18	Bumrungrad Hospital	2008	Hospital	3,000
23	TQC 19	Prince Royal Ta-Pan-Hin Hospital	2008	Hospital	266
24	TQC 20	Bangkok Produce Public Co.,Ltd.	2009	Animal Foods	5,314
25	TQC 21	Thai Oil Public Co.,Ltd.	2009	Oil Refinery	851
26	TQC 22	Charoen Pokhapan Foods Co.,Ltd.	2009	Animal Foods	190

Appendix B

Learning Organization Characteristics/Behaviors

Appendix B

Learning Organization Characteristics/Behaviors (1990-2008)

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1. **Peter Senge (1990)**
   - Personal mastery, individual
   - Mental models, individual
   - Building Shared vision, group
   - Team learning, group
   - System thinking (The Fifth Discipline)
2. **Pedler et al (1991)**
   - Learning approach to strategy
   - Participative policymaking
   - Formative accounting and control
   - Internal exchange
   - Reward flexibility
   - Enabling structures
   - Workers as environmental scanners
   - Inter-company learning
   - Learning climate
   - Self-development opportunities
3. **Garvin (1993)**
   - Systematic Problem Solving
   - Experimentation with new approaches
   - Learning from their own experience and past history
   - Learning from the experiences and best practices of others
   - Transferring quickly and efficiently throughout the organization
4. **Marquardt & Reynolds (1994)**
   - Appropriate structure
   - Corporate learning culture
   - Empowerment
   - Environment scanning

Knowledge creation and transfer

Learning technology

Quality

Strategy

Supportive atmosphere

Teamwork and networking

Vision

5. **Bennett & O'Brien (1994)**

Strategy/vision

Executive Practices

Climate

Organization/Job Structure

Information Flow

Individual and Team Practices

Work Processes

Performance Goals/Feedback

Training/Education

Individual/Team Development

Rewards/Recognition

6. **Peter Senge, Art Kleiner, Charlotte Roberts, Richard Ross, and Bryan Smith (1994)**

- People feel they are doing something that matters—to them personally and to the larger world.
- Every individual in the organization is somehow stretching, growing, or enhancing his or her capacity to create.
- People are more intelligent together than they are apart.
- The organization continually becomes more aware of its underlying knowledge base—particularly the store of tacit, unarticulated knowledge in the hearts and minds of employees.
- Visions of the direction of the enterprise emerge from all levels.
- Employees are invited to learn what is going on at every level of the organization, so they can understand how their actions influence others.

- People feel free to inquire about each other's (and their own) assumptions and biases.
- People treat each other as colleagues. Mutual respect and trust are evident in the way they talk to each other and work together, no matter what their position may be.
- People feel free to try experiments, take risks, and openly assess the results. No one is censured for making a mistake.

7. **Redding and Catalanello (1994)**

   Learn from the Past
   Anticipate Future Scenarios
   Develop Strategic Vision
   Focus on Immediate Business Issue
   Encourage Experimentation
   Encourage Cross Fertilization
   Institutionalizing Change
   Provide Opportunities for Reflection
   Question Underlying Assumptions
   Generalize Insights Across the Organization
   Learning to learn techniques

8. **Sarala and Sarala (1996)**

   Philosophy and values
   Structure and processes
   Leading and decision-making
   Organizing the work
   Training and development
   Internal and external interactions

9. **Tannenbaum (1997)**

   Learning opportunities
   Tolerance of mistakes
   High performance expectations

Openness to new ideas

Policies and practices support training

Awareness of big picture

Satisfaction with development

10. Gardiner and Whiting (1997)

Self-development

Learning Strategy

Learning Climate

Participation in policymaking

Use of information

Empowerment

Leadership and structure

Links with external environment

11. Watkins and Marsick (1998)

Continuous learning

Dialogue and inquiry

Team learning

Embedded system

Empowerment

Leadership

Financial performance

Knowledge performance

12. Dibella and Nevis (1998)

Scanning Imperative

Performance Gap

Concern for Measurement

Organizational Curiosity

Climate of Openness

Continuous Education

Operational Variety

Multiple Advocates

Involved Leadership

Systems Perspective

13. Garvin (2000)

Establish a Learning Environment

Gather Intelligence

Learn from Experience

Provide Experimentation Opportunities

Develop Learning Leaders

14. orth et al.(2000)

Employee development and continuous learning

Information sharing and collaboration

Team building and shared purpose

15. Griego et al.(2000)

Training and Education

Rewards and recognition

Information flow

Individual and team development

Vision and strategy

16. Goh, C. S., Ryan, J. P., (2002)

Clarity of Mission/Vision

Leadership Commitment and Empowerment

Experimentation and Rewards

Transfer of Knowledge

Teamwork and Group Problem Solving

17. Marquardt, (2002)

Learning Dynamics

Organizational Transformation

People Empowerment

Knowledge Management

Technology Support for Learning

18. Bryan T. Phillips, (2003)

Will

Leadership

Strategic thinking and vision

Communication

Learning and Development

Innovation and Decision Making

Change Management

Intellectual Capital and Knowledge Management

Measurement and Assessment

Reward and Recognition

19. **Sudharatna, Y., Li, L., (2004)**

Cultural values

Leadership commitment

Empowerment

Communication

Knowledge transfer

Employee characteristics

Performance upgrading

20. **Bersin,. J, (2008)** *High Impact Learning Dimensions*

Organization learning culture

Learning integrated with performance management

Expertise in career development programs

Strong centralized L&D organization

Ability to share and reuse content

Ability to blend learning with other forms of training

Expertise in collaborative learning strategies and programs

Expertise in performance consulting

Expertise in coaching Creating and enforcing content development standards

Ability to build high-impact learning and learning on demand

21. **Constantine, et al. (2005)** proposed important features

Open communications

Risk taking

Support and recognition for learning

Resources to perform the job

Teams

Rewards for learning

Training and learning environment

Knowledge management

22. David A. Garvin, Amy C. Edmondson, and Francesco Gino, (2008)

Building Block Model of Learning Organization

Building Block 1 Supportive Learning Environment

Psychological Safety

Appreciation of Differences

Openness to New Ideas

Time of Reflection

Building Block 2 Concrete Learning Processes and Practices

Experimentation

Information Collection

Analysis

Education and Training

Information Transfer

Building Block 3

Leadership That Reinforces Learning

Appendix C

List of Characteristics of LO from literature review A-Z

Appendix C

Characteristics of a learning organization A-Z

A

Ability to blend learning with other forms of training

Ability to build high-impact learning and learning on demand

Ability to share and reuse content

Analysis

Anticipate Future Scenarios

Appreciation of Differences

Appropriate structure

Awareness of big picture

C

Change Management

Clarity of Mission/Vision

Climate (learning)

Climate of Openness

Communication 2

Concern for Measurement

Continuous Education

Continuous learning

Corporate learning culture

Cultural Values

D

Develop Learning Leaders

Develop Strategic Vision

Dialogue and inquiry 2

E

Education and training

Empowerment 5

Embedded system 2

Employees are invited to learn what is going on at all level

Employee development and continuous learning

Employee characteristics

Enabling structures

Encourage Experimentation

Encourage Cross Fertilization

Environment scanning

Establish a Learning Environment

Every individual stretching, growing, or enhancing his/her capacity to create

Executive Practices

Experimentation

Experimentation and Rewards

Experimentation with new approaches

Expertise in career development programs

Expertise in collaborative learning strategies and programs

Expertise in performance consulting

Expertise in coaching creating and enforcing content development standards

F

Financial performance 2

Focus on Immediate Business Issues

Formative accounting and control

G

Gather Intelligence

Generalize Insights across the Organization

H

High Performance Expectation

I

Individual and Team Development 2

Individual and Team Practice

Information flow 2

Information collection

Information sharing and collaboration

Information Transfer

Institutionalizing Change

Intellectual Capital and Knowledge Management

Inter-company learning

Internal and External Interactions

Internal Exchange

Innovation and Decision Making

Involved Leadership

K

Knowledge Creation and Transfer

Knowledge Management 2

Knowledge Transfer

Knowledge Performance 2

L

Leadership 3

Leadership and Structure

Leadership Commitment

Leadership Commitment and Empowerment

Leading and Decision Making

Leadership that reinforces learning

Learn from experience

Learn from the past

Learning approach to strategy

Learning Climate 2

Learning Dyamics

Learning and Development

Learning from their own experience and past history

Learning from the experiences and best practices of others

Learning Opportunities

Learning Technology

Learning to Learn Techniques

Learning Strategy

Learning integrated with Performance Management

Links with external environment

M

Measurement and Assessment

Mental Model

Multiple Advocates

O

Openness to New Idea

Organization/Job Structure

Organization becomes more aware of its underlying knowledge

Organizational Curiosity

Organizational Transformation

Organizational Learning Culture

Organizing the work

Open Communications

Openness to new idea

Operational Variety

P

Participative policymaking 2

People Empowerment

People feel they are doing something that matters to them and to larger world

People is somehow stretching, growing, or enhancing his/her capacity to create

People are more intelligent together than they are apart

People feel free to inquire about each other’s assumptions and biases

People treat each other as colleagues

People feel free to try experiments

Performance Goals/Feedback

Performance Gap

Performance upgrading

Personal Mastery

Philosophy and values

Provide Experimentation Opportunities

Provide Opportunities for Reflection

Policies and practices support training

Psychological Safety

Q

Quality

Question Underlying Assumptions

R

Resources to perform the job

Rewards and Recognition 3

Rewards for learning

Rewards flexibility

Risk Taking

S

Satisfaction with development

Scanning Imperative

Self development

Self-development opportunities

Shared Vision

Strategy

Strategy/Vision

Strategic thinking and vision

Strong centralized L&D organization

Structure and Process

Support and Recognition for Learning

Supportive Atmosphere

System Thinking

System Perspective

Systematic Problem Solving

T

Teams

Team Learning

Team Building and shared purpose

Team Learning 2

Teamwork and Group Problem Solving

Teamwork and networking

Technology Support for Learning

Time of Reflection

Tolerance of mistakes

Training and Education 2

Training and Development

Training and learning environment

Transfer of Knowledge

Transferring quickly and efficiently throughout the organization

U

Use of Information

V

Vision

Vision from all levels

Vision and Strategy

W

Will

Workers as environmental scanners

Work Processes

Appendix D

Example of Intellectual Capital Items

Appendix D

Intellectual Capital

Human Capital

Basic Data

Number of employee (full-time)

Number of employee (part-time)

Number of researchers

Number of consultants

Number of Instructors/Trainers

Number of Master Degree employee

Number of PhD. Employee

Number of postdoctoral degree employee

Number of co-supervised Master/PhD. Thesis

Number of staff requested for training outside

Variety in age of employee composition

Development plan for employee continuous improvement

Sharing of knowledge (% of researcher/consultant are

Member of at least one professional community

Staff with more than one degree

Ratio of women employee %

Women in senior position %

Expenditure for personnel development

Labor Turnover

Resignation Rate %

Labor Turnover Rate %

Relocation of employees within organization

Education and Training

Employee in-service training %

In-house training days

External organization training days

Training participation rate %

Expenditure for training per employee

Quality of Work Life Balance

Number of Tele-working employee

Employee on maternity leaves

Employee on religious leaves

Number of sick leaves days/year

Number of business leaves days/year

Number of vacation days/year

Bonus (Time of monthly salary)

Organizational Capital

Structural Capital

Capital Investment (% of operating revenues)

Quality auditors

Certified areas by authorized certification authority

Error-free payment transaction

Timely publishing magazine, newsletter on time

Number of literature to public on line

Number of hit rate to organization website

Researchers/Consultants per all employee %

Income

Contracted Researcher per in-house Researcher

Innovation Capital

Number of Research visit

Internal R&D Expenditure

Staff resources utilized for innovative projects

Staff suggestions for improvement

Benefit from staff suggestion system

Relational Capital

Customer Capital

Number of Customer satisfaction

Number of Customer complaint

Success case of customer to overall approach %

Failure case of customer to overall approach %

Number of customer

Number of new customer entering this year

Number of customer request for technical assistance

Number of seminar provided for customer

Number of customer attended the seminar

Number of press release

Number of press conference

Research cooperation projects with external partners

Award from Government

Award from Private Organization

Results

Commercial Results

Total Operating Revenue

Number of Research result turn to commercial

Income generated by in-house Researcher/Consultant

Income generated by subcontract Researcher/Consultant

Number of new customer

Number of customer leaving

Number of project from government

Number of project from private industry

Number of coordination project with network

Research Results

Publications in peer-reviewed journal

Publications in peer-reviewed journal per researcher

Publication in conference, trade journal and books per researcher

Patent granted

National patent application

International patent application

Teaching assignment per researcher

Appendix E

Questionnaire in Thailand

Appendix E

Questionnaire for TQA/TQC in Thailand

Group 1: Top Management

Mission/Policy

1. All employees know that they are working in a knowledge-driven org. even we do not state in a mission or policy.
2. Mission and Policy of the org. is a holistic approach: create climate and function support to the learning environment in the org. with expected result.
3. Policy and mission of the org. is simply a corporate knowledge-driven enterprise culture.
4. The Org. promotes effective individual and team learning through the integrated use of people/hardware/software.
5. Top management gives precedence to shared vision of the employee, which transform to mission of the org.

Leadership

6. Leaders generally support requests for learning opportunities and training.
7. Leadership of top management is very essential for knowledge-driven org.
8. Empowerment is one of the tools from top management to support an OL.
9. Leaders at all levels mentor and coach those they lead.
10. Leaders continually look for opportunities to learn.

Group 2: Organizational Function

Knowledge Sharing and Transfer

1. The Org. has a system of sharing, transfer knowledge efficiently, and reviews from time to time.
2. The Org. has a wide range of mechanisms for sharing experience between staff in different teams, departments and locations.
3. Staff is encouraged to share information using electronic media such as the internet, intranet, bulletin boards etc.
4. People at all levels of the org. are expected and encouraged to draw lessons from their work and to transfer this learning to the other parts of the org.
5. The Org. has mechanisms for ‘remembering’ the experience of its current and previous work through development of easily accessible databases, resource/information centers and data retrieval systems.

Internal and External Support

6. Training by external speakers do not meet the requirements of each department.
7. The Org. facilitates and encourages the employee to find any information related to their work from outside.
8. Highly skilled employees are transferring an internal knowledge continuously to other employees.
9. The Org. has a system for the employees who have been assigned to external training, come back and teach employees for broader knowledge.
10. The Org. has a learning system of bringing instructor or trainer from outside to train the employees efficiently.

Group 3: Organizational Culture

Cross-Functional Management

1. The Org. has a mechanism of cross-functional problem solving and its work efficiently.
2. The level of people' knowledge in each department is a barricade for cross-functional activity team.
3. The Org. has a learner-centered environment for skill development and transfer of best practices across the enterprise.
4. The Org. provides a program of cross-functional team to solve all kinds of work related problems from all departments.
5. Cross-functional teamwork in the org. encourages people from different departments to work together to solve the specific problems.

Communication

6. The Org. is creating an environment for collaborative knowledge sharing.
7. Manager always keeps employee informed and up to date.
8. Manager is able to indentify employee's body language how they are feeling.
9. The Org. uses two-way communication on a regular basis, such as suggestion system and electronic bulletin boards.
10. The Org. is master at communicating a shared vision to everyone who has a stake in the success of the organization.

Group 4: Expectation

Continuous Improvement

1. The Org. is shifting from training to continuous learning activities.
2. Continuous improvement in the org. is also the development of people and therefore creating a learning culture.
3. Business result of the org. this year is better than last year due to the fruitfulness from continuous learning process.
4. The OL effectiveness is achieved through the employees that are continually learning how to learn together.
5. A focus on OL has great potential to build the collaboration and continuous improvement programs that promote org. performance.

High Performance Expectation

6. The Org. is fast learning from competitors, customers, and partners.
7. Human Productivity of the employee is higher than last year.
8. Products or services of the org. are always above customers' expectation and satisfaction.
9. The Org. is always looking for a better quality of working life.
10. The Org. is transforming enterprise knowledge into shareholder/stakeholder value.

Appendix F

Replied Questionnaires and Open-ended Question/Answer

Appendix F

Replied Questionnaires and Open-ended Question/Answer

Company 1

Type: Manufacturing

Products: Oil and Gas

Established: 1978

No. of Employees: 336

Vision: (PTT) Thai Premier Multinational Energy Company

Vision: (GTP) Operation Excellence

Mission:

- Excellence in Customer focus
- Excellence in Process Control
- Excellence in Community Relation Development Process
- Excellence in Employee Development Process
- Excellence in Resources Management Optimization

Culture:

- Create Synergy
- Performance Excellence
- Promote Innovation
- Responsibility to social and environment
- Integrity & Ethics
- Trust & Respect

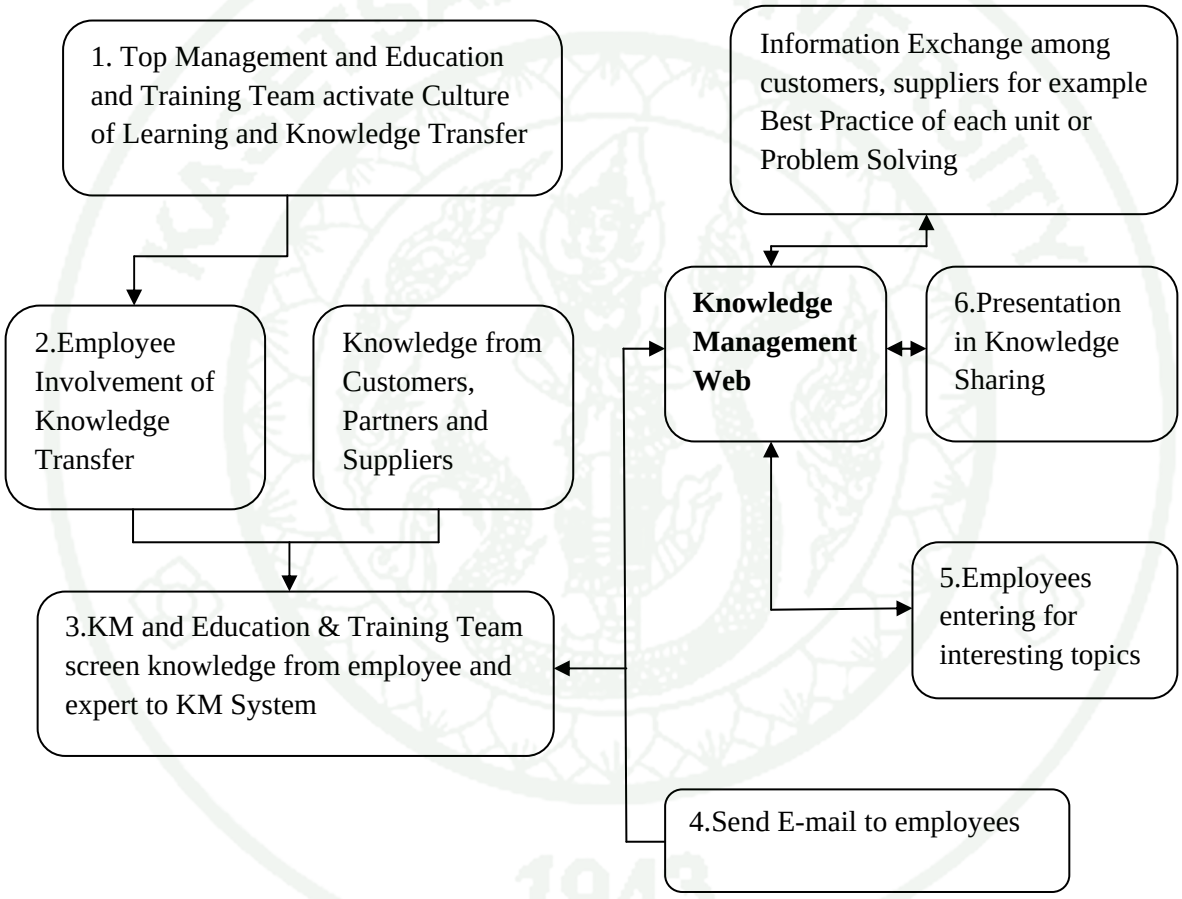
The organization was starting with continuous improvement and operational excellence was occurring from key success factors such as “excellent leadership, consistent of direction toward excellence, continuous improvement, and commitment of all staffs, open mind, and speed”.

The achievements are communication excellence, learning organization, and operation excellence.

The overall organizational performance (Key Performance Index or KPI) and daily operations performance (Key Activity Index or KAI) are tracked and recorded.

GTM will review the cause and analyzed Infinite loop in case of mission misunderstanding.

GTM will improve and deploy action plans and procedure to workforce in all divisions.



Collecting Process and Knowledge Transfer Pipeline of KM

Successful KM model of the organization

Result from being a learning organization:

- Improved overall working system
- Reduced cycle time
- Improved quality of working life

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics: It is all right

Recommendation: No

Innovation Management: PTT Blue Innovation

Intellectual Capital: Intangible assets shown in annual report

Human Capital:

- Employee Loyalty survey
- Absent rate
- Employee Engagement and Benchmarks (Hewitt model)
- Employee satisfaction
- Employee satisfaction to skill and knowledge development
- Employee satisfaction to top management
- Employee satisfaction to salary and welfare
- Quality of working life
- Average training hours/year
- Average training hours/year for leadership development
- Core Competency of management team
- Leadership Competency of management team
- Core Competency of employee
- Job satisfaction from KPI evaluation
- Actual number of employee to manpower position
- Fill in rate
- Retention rate
- Employee Skill evaluation
- Proportion of Potential Pool and Key Position
- Proportion of management team from internal recruitment
- Proportion of Senior/Specialist
- Working environment indicators
- Safety training hours
- Loss Time Injury Frequency (LTIF)

Process Capital:

- Pipeline Utilization
- Loss Elimination
- Percentage of daily accumulate deviation
- SCADA performance

- SCADA Backup Site Transition Time
- Energy Balance
- Pipeline PM Effectiveness
- Gas flow per fuel
- Natural Gas Billing performance
- Warehouse response time
- Dead stock spare part
- Productivity Result

Customer Capital:

- Customer Satisfaction to NG
- Customer Satisfaction to NG delivery
- Customer Satisfaction to Preventive Maintenance
- Customer Satisfaction to Billing
- Customer Satisfaction to Quality
- Customer Satisfaction to Invoice
- Customer Satisfaction to Documents system
- Customer Satisfaction to Complaint and Problem Solving
- Number of Complaint
- Customer Education
- Customer Retention
- After Sales Services
- Image of company benchmark to international company

Company 2

Type: Manufacturing

Products: Animal Foods

Established: 1989

No. of Employees: 5,314

Philosophy: Benefit to the Countries that we invest

Benefit to the People of those Countries

Benefit to our company

Purpose: Sustain the Leading Agro Industry & Foods Company

Vision: Produces Fresh Chicken and Ready Meal Products and Provides Customer Services at the International Level to fulfill the Mission HESTSECT. BKP and other 97 Subsidiary Companies will move together to attain the CPF's Kitchen of the World Vision.

Mission:

- Healthy
- Education
- Safety
- Tasty
- Security
- Environment
- Customer & Market Focus

Value:

- Embrace Change
- Master Learning & Sharing
- Innovation
- Integrity & Honesty
- Result Oriented with Follow Up and Coaching
- Dedicate to Countries

Continuous collecting knowledge from the meeting in all departments as knowledge of value chain and approved by management team; approved and email to employees for organizational learning in each level.

Benefit of KM: problem solving in process, satisfy needed of personal due to rapid change in business, value added to the job, sharing and transfer knowledge to stakeholders through website, meeting, and annual report etc.

Success Story: Eighty years of knowledge and experience accumulation

INNOVACO Continuous Improvement activities

- Innovation
- Valuable
- Applicable
- Creativity

- Organizational Learning & Teaching

Communication

- Cross-Functional Team
- Interpreted outside language (TQA criteria language and Company language)
- Employees trained each other (Brotherly Style)

Strategic Location closing to

- Raw Materials in Saraburi
- Labor Force about 5,000 employees living nearby
- Natural Gas piping line for Energy
- Water Intake from Pasak river
- Transportation
- Result: Working as a team and going to the same direction and integration
- Opinion on characteristics of a learning organization: Accept the conceptual model

Result from being a learning organization:

Working as a team, striving for the same goal, and integrated to be one

Opinion on characteristics of a learning organization: Accept the conceptual model

Add more characteristics: Benchmarking (World-class organization)

Recommendation: No

Innovation Management: Co-Generation Project, Biogas Project, and Bio-Diesel Project

Awards for Innovation

2010 Thailand's Most Innovative Company Award from the Faculty of Commerce and Accountancy, Chulalongkorn University, and Krungthep Turakij Newspaper

2009 Thailand's Most Innovative Company Award from the Faculty of Commerce and Accountancy, Chulalongkorn University, and Krungthep Turakij Newspaper

2008 “ASHRAE Technology Award” under the Industrial Facilities or Processes category from the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), USA

Intellectual Capital: Intangible assets shown in annual report

Human Capital:

- Loyalty
- Employee retention
- Employee turnover rate
- Salary increase from concept 2 high 1 low
- Ratio of handicap employee
- Leadership social responsibility
- Engineer and Scientist new graduate employed
- Satisfaction of wage and welfare
- Number of training courses
- Number of training hours
- Number of knowledge in KM
- Earning capability per employee
- Environment aspect in safety that satisfied
- Incident frequency rate
- Incident severe rate

Process Capital:

- Effectiveness of 2 high 1 low concept
- Number of standard system that control production standard
- Number of standard improvement by labor law and environment
- Number of defective reduction from external audit of standardize system
- Preparation of protection equipment at risky point for emergency
- Number of emergency training as planned
- Raw materials Just In Time performance
- Stock value
- Production effectiveness
- Production Cost
- Machine Breakdown rate
- State of the art machinery number
- Percentage of Network Availability
- Performance of IT
- Saving from Lean and Six Sigma Program

- Number of Innovation

Customer Capital:

- Overall customer satisfaction
- Result of customer satisfaction survey to new product development
- Customer complaint
- Percentage of improvement from Voice of Customer
- Service rate in minute
- New market penetration and sales volume from new market
- Repurchase of customer
- Continuous purchasing rate
- Number of customer visit
- Thailand CP Brand awareness
- CP freshmart channel outlet

Company 3

Type: Manufacturing

Product: Oil Refinery

Established: 1961

No. of employees: 851

Vision: A leading fully integrated Refining & Petrochemical Company in Asia Pacific

Mission: To be a top performance refinery in result and return on investment, moving toward excellence organization that promote teamwork, innovation and trust for sustainability

Value: POSITIVE

- Professionalism
- Ownership and Commitment
- Social Responsibility
- Integrity
- Teamwork and Collaboration
- Initiative
- Vision Focus
- Excellence Striving

Three Principles:

1. High Performance Organization
2. Good Corporate Governance
3. Corporate Social Responsibility

Competitive Advantage:

1. Knowledge transfer from Shell (Thailand) Company Limited
2. Benefit from selective of high technology in changing crude oil to light oil

Shared Vision: by employees

Knowledge Management:

1. Capture: Key Knowledge Capture
2. Organizing: Key Knowledge Organizing
3. Storing: Key Knowledge Storing
4. Sharing: Knowledge Sharing
5. Applying/Innovating: Knowledge Applying/Innovating

Knowledge System and Employee Development:

1. Career Path from individual competency
2. Succession Planning from career model and career planning

Innovation Management: Disclose

Intellectual Capital: Intangible assets shown in annual report

Remark: Not reply questionnaire

Human Capital:

- Employee Satisfaction
- Loyalty
- Employee competency
- Human Productivity
- Production hour to production capacity
- Availability to production capacity
- Employee turnover rate
- Number of instructor
- Incident frequency record
- Rate of fire accident
- Occupational index
- Environment and Safety index

- Benchmark of wage and welfare in the same business

Process Capital:

- Data backup to plan
- Server Reliability
- Energy consumption and energy waste index
- Rate of system readiness
- Average rate of compressor usage

Customer Capital:

- Overall CS
- Overall CS of major customer
- Overall CS of refinery customer
- Overall CS of export customer
- CS to quality of product and service
- CS to quality of product and service of major customer
- CS to quality of product and service of refinery customer
- CS to quality of product and service of export customer
- CS to operation
- CS to billing
- CS to sales department
- Respond rate of customer request
- Customer growth rate
- Products sales growth rate
- Time to be customer

Company 4

Type: Manufacturing

Product: Foods

Established: 1963

No. of employees: 190

Vision: Kitchen of the World

Mission:

- Produce good safety products and traceability
- Excellence Service for customer satisfaction
- Create innovation and use proper technology for maximize efficiency with low cost
- Systematic human resource development by competency
- Responsibility for social, environment and the nation

CPF Way:

- Embrace Change
- Master Learning & Sharing
- Innovation
- Integrity & Honesty
- Result Oriented
- Dedicate to countries

CPF Training Center: Knowledge Management and Global Learning

CPF KM since 2006: Three types of Knowledge at CPF

Common Knowledge: general knowledge for all employees and interesting people from

Media of the Organization

Technical Knowledge: knowledge from expertise, best practices and lesson learned; sources of knowledge are from experts, small group activities, suggestion systems and meetings

Business Intelligence: knowledge from strategic planning which is improved and updated due to competitive in the market and changing environment

Define: Knowledge Center General Information

Create: Expertise Team and Team Creator

Capture: VDO-Manual-Coaching

Transfer: Small Group Activity-5 Minutes talk-Website KM

Applied: Best Practice

Learning: Innovation-Customer-Productivity

Results from being ‘a learning organization’:

The organization is continuously enthusiastic in new searching and learning with embrace change, making the organization adapt to change in time and continuously leading in animal foods business.

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics: It is all right

Recommend and Suggestion:

- Culture setting for people alignment
- All kinds of analysis and evaluation by fact

Intellectual Capital: Intangible assets shown in annual report

Human Capital:

- Employee Satisfaction
- Employee loyalty
- Employee growth rate
- Result of leader development
- Turnover rate
- Employee health and occupational
- Percentage of employee working

Process Capital:

- Overall Equipment Effectiveness (OEE)
- Time to check product trace back
- Energy consumption in Production
- Emergency training plan
- Number of efficiency and cost reduction project

Customer Capital:

- CS to product, delivery, service
- CS to section
- Customer complaint
- Number of customer visit
- Number of guest visit

Company 5

Type: Manufacturing

Product: Oil & Grease

Established: 1993

No. of employees: 133

Vision: To be a leading company, producing lube base oil and specialty in Asia Pacific

Mission:

- To produce superior quality lube base oils and specialty consistent with changing market needs
- To treat business associates as our partners in order to improve mutual economic and competitive rewards
- To remain committed to quality, safety, occupational health and the environment
- To conduct business in a transparent and ethical manner
- To encourage teamwork and participation in organization development and to focus on employee development to attain professional excellence

Value:

- Professionalism
- Ownership and Commitment
- Social Responsibility
- Integrity
- Teamwork and Collaboration
- Initiative
- Vision Focus
- Excellence Striving

The organization has KM policy both explicit and tacit knowledge for the success of searching, collecting, and transferring inside an organization, for continuous learning and development. KM working team has responsibility in searching and collecting information and knowledge from their own departments.

<table>
<tr><td colspan="2">Organization Learning Process
Employee</td></tr>
<tr><td colspan="2">Knowledge Management</td></tr>
<tr><td>Intranet
• Announcement, Policy
• Procedure
• Abnormal Incident Report
• Corporate Governance Hand Book
• Knowledge Sharing
• Knowledge from retired employees
Training
• QSHE, Technical and Non-Technical
• OJT and Training Module
Library
• Engineering documents
• Books and Journals

Information Boards
• Activities/Projects
• Newsletter
Other activities
• Cross-Functional Team Meeting
• QCC and Suggestion Systems
• Knowledge Transfer</td><td>Internet
• Case Study
• Stock moving and marketing
• World Business
• Safety news
• Management Standard
• Laws and Regulations

Outside Training
• QSHE, Technical and Non-Technical
• Seminar and Conference
• Observed activities
• Study Tours

Government/Public/Private Enterprises
• Meeting
• Public documents
• Manual
• Standard and Procedure documents
• Rules and Regulations documents</td></tr>
<tr><td>Internal Knowledge</td><td>External Knowledge</td></tr>
</table>

Result from being a learning organization:

- Trend of productivity is continuously increasing
- People working as a team by using diverse knowledge
- Improve and create innovation
- Storage specific knowledge for applying

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics: It is all right

Recommendation: From questionnaire, Cross-functional teamwork in the organization encourages people from different departments to work together to solve specific problems. This statement is depending on each organization's culture.

Intellectual Capital:

Human Capital:

- Employee Satisfaction and loyalty
- Training hours/year
- Turnover of refinery operator
- Turnover of employee
- Basic lubricant product per employee
- Number of instructor that come from employee
- Number of working hours to capability
- Incident frequency rate
- Occupational index
- Environment and safety index
- Number of grievance that proceed
- Wage and Welfare survey benchmark to same business

Process Capital:

- Succession rate of backup data
- Sever Reliability
- Number of fire accident
- Severe from unplanned shutdown
- Production rate compare to production plan
- Utilization of vacuum refinery to plan
- Plant Productivity
- Plant Utilization
- Utilization of basic lubricant oil
- Energy consumption benchmark to other refinery plant
- Production waste rate
- MTBF (Mean Time Between Failure) of pump and compressor
- Readiness of refinery plant
- Start up and Shut down time

Customer Capital:

- CS to product
- CS to competitor
- Customer Complaint
- Sales of products from customer

Company 6

Type: Manufacturing

Product: Ethane and LPG

Established: 1978

No. of employees: 296

Eleven Core Values:

Strategic Leadership (1-2-5-11)

Executive Excellence (3-4-6-10)

Learning Organization (7-8-9)

1. Visionary Leadership
2. Social Responsibility
3. Valuing Employees & Partners
4. Customer Driven Excellence
5. Focus on Future
6. Agility
7. Organization & Personal Learning
8. Managing for Innovation
9. Management by Fact
10. Focus on Results & Creating Value
11. Systems Perspective

Management Tools

- GSP House
- BSC (Balanced Score Card)
- MIS →KM
- Cross-Functional Team
- TPM (Total Productive Maintenance)

No readymade 'management tools' for organization but organization has to choose and adapt tools to fit to their own. No one knows and understands your organization better than you are.

Result from being a learning organization:

Sustainability in self-development and business growth

Opinion on characteristics of a learning organization: Accept the conceptual model

Add more characteristics:

- Create learning culture for all level development
- Mental development for striving in learning (Mental Model)
- Generous to other and learning together with public consciousness (Team Learning)

Recommendation:

- By declare a learning organization, top management has to show and practice his/her commitment in learning and development not only speech or wording.
- The organization has to set a concrete foundation of learning management system including culture of the organization.
- Cause of failure in a learning organization is come from top management him/herself.

Intellectual Capital:

Human Capital:

- Overall Customer Satisfaction
- Customer Satisfaction by topics
- Customer Satisfaction by group of employee
- Employee loyalty
- Absent rate
- Turnover rate
- Training as career plan
- Training hour
- Training hour of management team
- Training expense
- Training expense for management team
- Employee job rotation
- Competency evaluation
- Management team training expense
- Quantity of gas delivered per employee
- Employee growth rate
- Evaluation of employee skill

- Evaluation from KPI
- Fill in Rate
- Retention Rate
- Remuneration benchmarking
- Working environment and labor law

Process Capital:

- Pipeline Utilization
- Daily Accumulate Deviation Percentage
- Energy Loss/Gain
- O&M Expense per Pipeline Kilometer
- Platform O&M Cost
- Pipeline Emergency Training
- Pipeline Mean Time Between Failure
- Equipment Mean Time To Repair
- SCADA Performance
- Natural Gas Billing Performance
- Warehouse Response Time
- Spare Part Dead Stock
- Standard System Status
- QSHE Performance
- Individual KM
- Suggestion QCC Cost Reduction
- Number of Substandard Report
- ICT Response Time

Customer Capital:

- Overall Customer Satisfaction to Quality of Service
- Customer Satisfaction to Quality of each Service
- Customer Satisfaction to Maintenance
- Customer Satisfaction for Billing
- Customer Satisfaction for Invoicing
- Customer Satisfaction for Receipt, Tax Invoice and collecting system
- Overall Customer Satisfaction to Quality of Natural Gas
- Customer Satisfaction to Quality of each type of Natural Gas
- Overall Customer Satisfaction to Customer Complaints
- Number of Complaints
- Customer Retention
- Brand Loyalty

Company 7

Type: Service

Product: Hospital Care

Established: 1980

No. of employees: 3,000

Vision: World Class Medicine World Class Service

Mission: We provide world class healthcare with care and compassion

Guiding Principles/Core Values:

- We are guided by our primary goal of satisfying our customers
- We are committed to our staff's welfare and development
- We continually improve the quality of everything we do
- We strive for professional excellence and innovation in all we do
- We embrace cultural diversity with Thai hospitality
- We strive to make everything we do "World Class"
- We are trusted, honest, and ethical in all our dealings
- We work as a team and share what we know
- We are a good corporate citizen
- We operate in an environmentally responsible manner

Remark: Not reply questionnaire

Intellectual Capital:

Human Capital:

- Employee Engagement
- Employee Turnover Rate
- Career Ladder
- Percentage of Attendance in Orientation Program
- Percentage of Management Training
- Number of Staff passed Training Program
- Needle Stick Injuries Rate

Process Capital:

- Effectiveness of Infection Control System
- Hand Hygiene Compliance
- Compliance with Fire Safety Management
- Information System Unscheduled Down Time
- Information System Response Time
- Waiting Time for Payment in OPD
- Turn Around Time of Radiology Result
- Completeness of Plant Operations Work Order
- Fill Rate of Medical Supply

Customer Capital:

- Customer Satisfaction
- Customer Dissatisfaction
- Customer Complaint Rate
- Customer Loyalty

Company 8

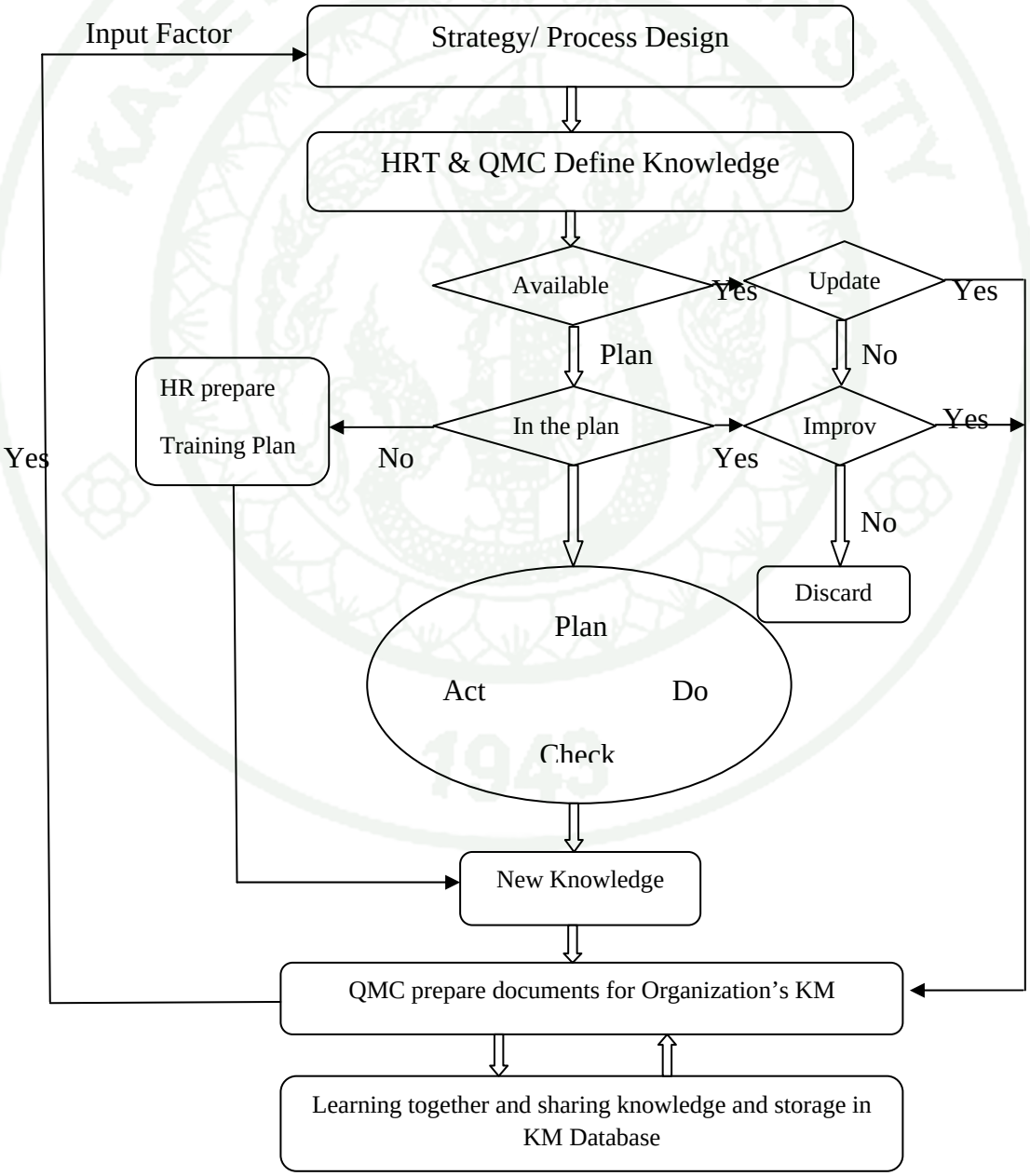
Type: Service

Product: Hospital Care

Established: 1976

No. of employees: 266

KM Model:



Result from being a learning organization:

- The organizational learning is more objective and efficient
- Develop competitive advantage of people both continuous learning and working capability
- The organization achieve target with more sustainability

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics:

- Monitoring
- Evaluation

Recommendation: No

Intellectual Capital:

Human Capital:

- Employee Satisfaction
- Employee Satisfaction to Organization and Welfare
- Rate of Happiness employee
- Rate of absent more than 6 days/year
- Rate of trained employee
- Competency evaluation
- Rate of employee pass probation
- Turnover rate
- Rate of physical check and vaccine
- Accidental rate

Process Capital:

- Number of service procedures that correction requested from external unit
- Result of medicine inspection from third party
- Rate of readmit after 28 days
- Rate of readmit from emergency within 48 hours
- Rate of readiness for operation within 30 minutes
- Outpatient cycle time
- Patient safety goal
- Medicine distortion
- Unexpected case rate
- Staff hand wash rate
- Disease control rate within 24 hours

- Efficiency of billing and inventory turnover
- Number of Best Practice that public relation

Customer Capital:

- Inpatient/Cousin Satisfaction
- Outpatient/Cousin Satisfaction
- People in community Satisfaction
- Customer Satisfaction to health promotion program
- Rate of discontinue customer
- Number of customer complaint
- Rate of new customer from former customer
- Repeat service rate
- Number of volunteer minded people

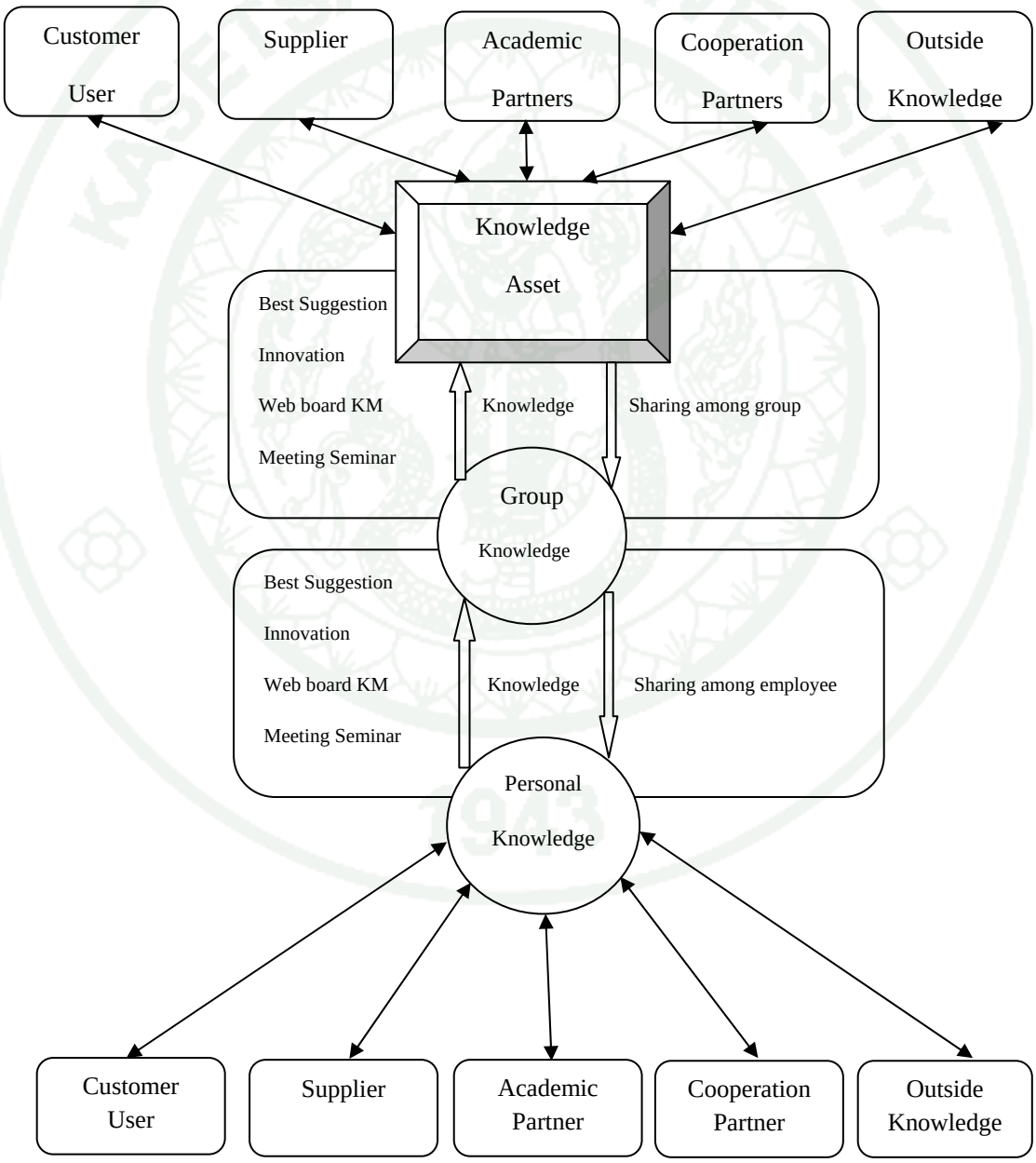
Company 9

Type: Service

Product: Hospital Care

Established: 1982

No. of employees: 4,052



KMP: Knowledge Management Process

Remark: Not reply questionnaire

Information from secondary data:

- Academic matter development and culture creation by KM
- Exchange knowledge by CoP (Community of Practice)
- CPG (Clinical Practice Guideline) for nursing development by all participants; this is reverse process from practical nursing back to the theory
- KMP (Knowledge Management Process) managed by Knowledge management development committee

KM tools:

- PCT (Patient Care Team)
- CoP (Community of Practice)
- After Action Review
- Peer Assist
- Best Suggestion
- Knowledge Asset
- Knowledge Sharing Day
- Best Practice thru KM web board (virtual)
- Meeting/seminar (reality)

Success KM Strategy:

- CKO (Chief Knowledge Officer) fully support KM
- Knowledge Management development committee
- Human in the organization understand KM
- Outside in, invite expert/lecturer from outside for lecturing
- Inside Out, Seminar/lecturing outside by Organization's expert
- Development human to be lecturer and facilitator
- Promote CoP in each subject
- Create communication thru multi channels
- Integrated KM to be a process of daily work and human development continuously

Intellectual Capital:

Human Capital:

- Overall Employee Satisfaction
- Overall Employee Dissatisfaction
- Overall incentive increasing rate

- Number of employee and budget support abroad training
- Number of employee and budget support master degree continuing study
- Expertise position
- Number of nurse per bed
- Physical risk and protection activity

Process Capital:

- Labor Productivity
- Labor Cost Competitiveness
- Bed occupied
- Number of inpatient admit date
- Outpatient waiting time
- Percentage of Outpatient Medical Error
- Inventory Turnover
- Receivable Turnover

Customer Capital:

- Inpatient Satisfaction
- Outpatient Satisfaction
- Emergency patient Satisfaction
- Inpatient Dissatisfaction
- Outpatient Dissatisfaction
- Overall percentage of return patient
- Percentage of recommended patent from former patient

Company 10

Type: Service

Product: Retails

Established: 1988

No. of employees: 60,000

Corporate Philosophy: Through happy employees, we desire to see smiles from customers

Vision: We serve convenience to all communities

Mission: To create customer engagement with quality services and products assortment by “Harmony” management and to enhance good relation with society and community

Result from being a learning organization: Process improvement of new service innovation, new products and business model

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics:

- Add Personal Learning: to find whether people in the organization are eager to learn and can they learn together.
- Personal Learning is the starting point of Organizational Learning.

Recommendation: The most importance of key success in TQM and TQA is top management and executive management team.

Innovation Management: Innovation in service, Improvement of work process and innovation

Promote Innovation Culture, and Innovation create Intelligence-Value added is achievable

Intellectual Capital: Not mentioned and disclose in annual report

Company 11

Type: Service

Product: Service

Established: 1994

No. of employees: 159

Vision: Counter Service will be number one in agent of facilities payment business thru point of service in Thailand with excellent service, impress and value creation to the customers

Mission:

- Develop management and service system by state of the art technology for maximum efficiency
- Concentrate in service point expansion and get to the customer nation wide
- Searching for variety of payment service and precise at the customers need
- Develop innovation for value added to the customers
- Effective Human Resources Development by reinforce learning, improve quality of life and happiness to all levels of employees
- Treat all stakeholders fairly

Culture:

- Achievement Orientation
- Customer Service Orientation
- Integrity
- Organizational Commitment
- Teamwork and Cooperation

Value: Love (Work, Customers, Morales, Organization, and Team)

Result from being a learning organization: Enhance employee competency

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics: Add Knowledge Identification

Recommendation: No

Company 12

Type: Manufacturing

Product: Frozen Foods

Established: 1988

No. of employees: 4,000

Vision: World-leading Company in producing and distributing frozen foods

Mission:

- Emphasize in production and service development frozen foods by state of the art science and technology
- Emphasize in new products research and development for responding to changing customers need all the time
- Emphasize in effective human resources development by creating learning and raise better quality of working life to employees
- Treat and practice fairly to stakeholders
- Society responsibility by reduce pollution to environment, strengthen in develop and support community

Value:

- Creative
- Productive
- Relationship
- Attitude
- Morale

Culture:

- Embedding value to all levels of the employees continuously, by leadership
- Creating team work in the organization
- Customer focus
- Agility which reflect by daily management and working of all levels of the employees

Result from being a learning organization:

- Productivity Improvement
- Innovation

- Good return to stakeholders
- Increase Customer Satisfaction
- Community Satisfaction

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics: Exchange knowledge from stakeholders to public and Best Practices

Recommendation: Pull out tacit knowledge from people to explicit knowledge and exchange throughout the organization

Company 13

Type: Manufacturing

Product: Bakery

Established: 1989

No. of employees: 1,800

Vision: Leading Company in producing and distributing fresh bakery thru Thailand modern trade channel

Mission:

- Emphasize in production and service development frozen foods by state of the art science and technology
- Emphasize in new products research and development for responding to changing customers need all the time
- Emphasize in effective human resources development by creating learning and raise better quality of working life to employees
- Treat and practice fairly to stakeholders
- Society responsibility by reduce pollution to environment, strengthen in develop and support community

Value:

- Creative
- Productive
- Relationship

- Attitude
- Morale

Culture:

- Teamwork
- Agility management

Result from being a learning organization:

- Better in all aspects of the organization
- Better people and organization
- Better performance (cycle time) and competitive advantage
- Better employee satisfaction and come together to the organization

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics: Add Knowledge Management Assessment and

Internal and External Audit

Results from KM and Organizational Learning

- Reduced Cycle Time
- Innovation
- Sustainable major KPI

Recommendation: In block 2, sharing and transfer should spread to public or outside also, not only import from outside

Company 14

Type: Manufacturing

Product: Printing

Established: 1956

No. of employees: 600

Vision: Create Innovation together with quality and service development for impression to customers

Mission:

- Leading in printing business
- Fortify teamwork
- Build up Customer Satisfaction
- Continuously income creation
- Emphasize quality of life
- Create better environment and lend a hand to public

Value: Rightness-Satisfy-Right time-Right Principle

Culture: Concerning Objective

- Build up Customer Satisfaction
- Morality and social responsibility
- Human Resources Development and Education all the time

Concerning Thinking

- Everybody involves in quality creation
- Give priority to working process
- Next process is our customer

Concerning working method

- Management by fact at site
- Problem solving at cause and emphasize on repetition
- Statistical method
- Setting priority
- PDCA management cycle
- Standardize system by continuous improvement

Result from being a learning organization: Same as TQM result

Opinion on characteristics of a learning organization: Accept the conceptual model

Add some characteristics:

- Management by Fact
- Recognition

Recommendation: No

Company 15

Type: Manufacturing

Product: Ethylene and Propylene

Established: 1990

No. of employees: 493

Remark: Not reply questionnaire

Success Factors:

- Definite and continuous market for main products in the long run
- Definite source of raw materials in domestic
- Flexibility in raw materials selection, more than 80% of cost structure is raw materials and due to the factory was designed for flexible input of raw materials or feed optimization make competitive advantage in cost per unit
- High efficiency of factory, continuous operate, due to good preventive maintenance and management; no unplanned shutdown
- Fully emphasize on expansion of production and business to downstream

Company 16

Type: Service

Product: Retail

Established: 1988

No. of employees: 26,833

Success Factors:

- Nationwide network, largest for Thai convenience store, good location, good reputation, and brand awareness make competitive advantage from economy of scale to CPSE

- Bewitchingly and efficiency distributing system and logistics make right delivery to the right place and right time wherever CPSE branch in Thailand
- Just-In-Time merchandising management makes quick turnover and response to customers need
- State of the art Information Technology assist management efficiency

Result from being a learning organization:

- Efficiency improvement in all process
- Result effectiveness
- Process Innovation and Products Innovation

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics:

Add lifelong learning culture, Mental Model, and Team learning

Recommendation:

- Leaders at all levels must be role model to energize people to learn in the organization.
- Create networking for sharing and transfer knowledge and innovation into performance management.

Company 17

Type: Manufacturing

Product: Auto-parts

Established: 1992

No. of employees: 196

Remark: Not reply questionnaire

Success Factors:

- Customer Satisfaction
- Quality
- Financial/Business Growth

- Environment
- Continuous Improvement
- Technology

Company 18

Type: Manufacturing

Product: Concrete Products

Established: 1991

No. of employees: 1,345

Result from being a learning organization: New Products and Services

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics: No

Recommendation: Action learning is a powerful tool for a learning organization

Remark: MBNQA assigned Concrete Products to Service Type

Company 19

Type: Manufacturing

Product: Electronics

Established: 2003(former AMD Thailand more than 10 years)

No. of employees: 1,329

Claim: We are a learning organization

Key success factors:

- Leadership role model “Good and Smart”
- A clear operational philosophy
- Senior management with purpose and sincerity

- A corporate culture that encourages responsibility
- An atmosphere that promotes a sense of joint ownership
- Respect of humanity, people is the most important asset, thus people development is of greatest important to the success that drive quality, productivity, innovation, employee participation and customer satisfaction
- Innovation from human potential
- Bottom up system stimulate and promote potential of human at work
- Motivation by acclamation to the success of human regularly through number of channels
- Communication both formal and informal habitually

Results from a learning organization:

- Increase efficiency
- Increase Productivity
- Improved Quality
- Increase human capital's knowledge
- Increase happiness in the organization

Add more characteristics: Commitment and Engagement

Recommendation: No

Company 20

Type: Manufacturing

Product: Paper

Established: 1983

No. of employees: 630

Business Philosophy:

- Adherence to fairness
- Belief in the value of the individual
- Dedication to excellence
- Concern for social responsibility

Vision: To be a leading paper company in Asia in the area of profitability, business growth, create value added to stakeholders, and social responsibility

Mission: Concentrate to be a leading, printing and writing, paper company in Asia by quality, customer satisfaction, and long-term benefit to stakeholders

Success factors:

- Consistently produce good quality of products
- Keep good long term relation and sincere to customers
- Service that directly satisfied customer target group

KM is the importance factor of the organization to create value added to stakeholder, support and maintain the organizational competitiveness sustainable and Knowledge Sharing and Transfer leading to Excellence.

These happen due to the individual learning and organizational learning, organizational innovation and value creation to the employees.

Learning must embedded in the operation of the organization and the employees for example; daily management, problem solving and root cause, knowledge sharing and transfer among employees, research and development and external learning (from customers, suppliers, partners and benchmarking).

These learning could happen due to the leader of the organization giving value and creating good relationship among the employees for example, the leader's intention in supporting the achievement of the employees, supporting in knowledge sharing and transfer among employees to responding customers need, and creating new innovation from accumulation of organizational learning and employees which leading to "intellectual capital"

The structure of Thai Paper Company Limited KM is linking to the KM system of Siam Cement's Paper and Packaging business. Thai Paper Company Limited had sent the representative to "KM working team" which has the following duties:

- Collection and selection professional knowledge and techniques in the paper industry operations and process, in addition, there are "sub KM working team" to review and define the necessary knowledge including the standardized for training and examining.
- Sourcing the data base system for data management for user convenience and maintain the data up-to-date, safety through the network via web base.
- Define the criteria and competency of the operators and let them select and consider the new knowledge to the organization.

KM of the company is including the sourcing and collecting, exchanging or sharing and transferring, using the skills and experience of the employees' knowledge which working at any process in the organization, from best practices and research and development in Siam Cement from the past to present including the external knowledge. In the view of activities, the organization supports employees to transfer their knowledge and gain benefit from practical that knowledge. The real examples are the knowledge sharing and transfer of TPM (Total Productive Maintenance), QCC (Quality Control Circle) activities twice a year, daily morning meeting, activities board, OJT (On the job training), E-classroom training, weekly meeting, problem solving group presentation, web base practice of subsidiary company, seminar from outside or public training.

Result from being a learning organization:

- Work-life balanced
- High value added products
- Business Growth

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics: Add Retaining staff in organizational function

Recommendation: No

Innovation Management:

Intellectual Capital: Only Intangible Asset shown in annual report: Goodwill, software

Not clarified Human Capital, Process Capital, Innovation Capital, and Customer Capital in annual report

Company 21

Type: Manufacturing

Product: Chemicals

Established: 1978

No. of employees: 307

Remark: Not reply questionnaire

Aditya Birla Group vision:

To be a premium global conglomerate with a clear focus on a business

Birla Carbon vision:

To be the most respected, green, global, advanced fillers business with a clear focus on tyre and research products markets

Aditya Birla Group mission:

To deliver superior value to our customers, shareholders, employees and society at large

Aditya Birla Group values:

- Integrity: honesty in every action
- Commitment: deliver on the promise
- Passion: energized action
- Seamlessness: boundary less in letter and spirit
- Speed: one step ahead always

Success factors:

- Excellent quality and services
- Capability to produce customized grades
- Revenue through waste heat recovery
- Low cost production
- Ability to develop customized packaging
- On time product deliveries

Company 22

Type: Manufacturing

Product: Chemicals

Established: 1996

No. of employees: 211

Siam Mitsui PTA succeeds to gain the major shares by using three key factors:

- Quality (In term of consistence and conforming to customers' requirements)

- Cost (Competitive with competitors and high margin)
- Delivery (Reliable supply)

Result from being a learning organization:

- Eliminate repetitiously problems
- Continuous Improvement and Innovation
- Competitive Advantage
- Stakeholders Satisfaction

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics: No

Recommendation: No

Company 23

Type: Education

Product: Training & Consulting

Established:

No. of employees: 110

Result from being a learning organization:

- Productivity Improvement
- Innovation
- Acceptance between management team and employee

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics: No

Recommendation: No

Remark: From interviewed, present TQA/TQC criteria, activities are less than year awarded

Company 24

Type: Manufacturing

Product: Packaging

Established:

No. of employees: 192

Result from being a learning organization:

- Better quality of working life
- Loyalty
- Enduring to use competency and knowledge to improve products and service
- Better business result even high competition

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics:

- The eight characteristics are covering but the most importance is Implementation and Execution.
- Management team and employee must implement and execute knowledge management and a learning organization seriously and not only written policy.

Recommendation:

- To promote and build a learning organization,
- Require effective communication
- Cross-functional team to stimulate at the beginning and campaign continuously
- The organizational culture will embedded to individual and people will accept and practice with no resistance.

Company 25

Type: Manufacturing

Product: Cement

Established: 1971

No. of employees: 600

Vision: By the year 2015, SCG will be well recognized as an innovative workplace of choice, and a role model in corporate governance and sustainable development.

Mission: Sustainable Development" to promote business operation with contributions to economy, society, and environment and encourage employees to take part in community contributions

Result from being a learning organization:

- Increase knowledge to people (Improve mental model)
- Learning awaken
- Understanding present competitive situation (See big picture)
- Better problem solving
- Improve effectiveness

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics: No

Recommendation: No

Innovation Management: SCG power of innovation award: Innovative Manufacturing Process, Innovative Product, and Innovative Service and Non-Manufacturing process

Intellectual Capital: Disclose in annual report

Company 26

Type: Manufacturing

Product: Acrylic Fiber

Established: 1987

No. of employees: 464

Vision:

- Be a world leader in Acrylic Fiber
- Business and achieve Customer
- Delight through Excellence in all Spheres of Activities

Mission: To create value for all stakeholders

Value:

- Customer is the focus of everything we do
- Employee respects and regards to the right of individual; he must has an honor and elegant also
- We do business with honesty and we must strive for a good businessperson
- We must work safety with good hygiene, good environmental management and improving and correcting continuously in all matters of environment

Key indicators: QCDIPSM (Quality-Cost-Delivery-Innovation-Productivity-Safety-Morale)

Learning through activities:

- TQM (Total Quality Management)
- TPM (Total Productive Maintenance)
- Best Practices
- TAF(Thai Acrylic Fiber) 'Open House Communication Session'

Key of success:

- Define clearly Vision, Policy, and Strategy
- 'Share Vision Session' meeting for management level
- Leadership commitment and support

- ‘Systematic analytical’ skill training to employees
- Learning Organization
- Cross Functional Team

Success Factor:

- Priority to human resources
- Effective communication
- Team work

Results from being a learning organization:

- Creating better value for all stakeholders
- Stay ahead of competition

Opinion on characteristics of a learning organization: Accept the conceptual model

Add or Delete some characteristics: It is all right

Recommendation:

- Learning all the time
- Continuous Improvement

Innovation Management: Culture + People + Knowledge = Innovation

Intellectual Capital: Disclose in annual report

World-class Recognitions for Organization Performance Excellence:

- First & the only winner of “Japan Quality Medal” in S.E. Asia
- Winner of “Deming Application Prize”
- The first winner of “Thailand Quality Award”
- Winner of “International Asia Pacific Quality Award”
- Winner of “Special Award for TPM Achievement”
- Winner of “National Award for Safety”
- Certified company in ISO 9001:2000, ISO 14001, OHSAS 18001 and SA8000

Appendix G

Questions concern Innovation from the quality award criteria:

Appendix G

Questions concern Innovation from the quality award criteria:

Questions concern Innovation from the quality award criteria:

1. What role, if any, do these organizations (suppliers, partners, and collaborators) play in implementing **innovations** in the organization? (Organizational Relationships) P.1 b (3)
2. What are any key changes taking place that affect the competitive situation, including opportunities for **innovation** and collaboration, as appropriate? (Competitiveness environment changes in Organizational Situation) P.2 a. (2)
3. What are the key elements of your performance improvement system, including your evaluation, organizational learning and **innovation** processes? (Performance improvement system) P.2 c.
4. How do senior leaders create a sustainable organization? How do senior leaders achieve to create an environment for organizational performance improvement, the accomplishment of your mission and strategic objectives, **innovation**, performance leadership, and organizational agility? (Creating a sustainable organization by senior leadership) 1.1 a.(3)
5. How do your strategic objectives achieve by address your opportunities for **innovation** in products, operations, and your business model? (Strategic Objective Considerations in Strategy development) 2.1 b.(2)
6. How your organization listens to the voice of the customers, builds customer relationships, and uses customer information to improve and identify opportunities for **innovation** (Customer focus) 3
7. How do you use customer, market, and product offering information to improve marketing, build a more customer-focused culture, and identify opportunities for **innovation**? (Customer data use in customer engagement) 3.2 a. (4)
8. How do you select, collect, align, and integrate data and information for tracking daily operations and overall organizational performance, including

progress relative to strategic objectives and action plan? How do you use these data and information to support organizational decision-making and **innovation**? (Performance measurement in measurement, analysis and improvement of Organizational Performance) 4.1 a. (1)

9. How do you select and ensure the effective use of key comparative data and information to support operational and strategic decision-making and **innovation**? (Comparative Data in measurement, analysis and improvement of Organizational Performance) 4.1 a. (2)
10. How do you select and ensure the effective use of voice of the customer data and information (including complaints) to support operational and strategic decision-making and **innovation**? (Customer Data in measurement, analysis and improvement of Organizational Performance) 4.1 a. (4)
11. How do you use organizational performance review finding to develop priorities for continuous improvement and opportunities for **innovation**? (Continuous improvement and innovation in measurement, analysis and improvement of Organizational Performance) 4.1 c. (3)
12. How do you manage organizational knowledge to accomplish the assembly and transfer of relevant knowledge for use in your **innovation** and strategic planning processes? (Knowledge management in management of information, knowledge, and information technology) 4.2 a. (3)
13. How does your learning and development system address the organizational performance improvement and **innovation**? (Learning and development system in workforce and leader development under workforce engagement) 5.2 c. (1)
14. What are your current levels and trends in key measures of indicators of the operational performance of your key work systems and processes, including productivity, cycle time, and other appropriate measures of process effectiveness, efficiency, and **innovation**? (Operational Process Effectiveness Results under Product and Process Outcomes) 7.1 b. (1)

Appendix H

Sample of Innovation Process

Appendix H

Sample of Innovation Process

(Activator)

Step 1. Define Organization's Vision, Mission, and values…….Objectives…Initiation

Step 2. Assess Trends, Strengths and Weaknesses

Step 3. Find Improvement Opportunities-Incremental change (Browsers)

Step 4. Find Growth Opportunities-Breakthrough, Radical change…..Research…Information

Step 5. Select an Opportunity for further experimentation

Step 6. Gather and Analyze relevant information (Creator)

Step 7. Generate Creative Ideas or Solutions…….Idea……Ideation

Step 8. Experiment and Turn Creative Ideas into Innovations (Developer)

Step 9. Decide on what Innovation to Implement Development..Invention

Step 10. Design and Test Innovation (Executor)

Step 11. Plan and Implement Innovation……..Launch..Implementation

Step 12. Obtain feedback for Continuous Improvement

Step 13. Continuous Innovation

From Nth Degree Software, Inc. and Winning at Innovation (Philip Kotler, 2010)

Appendix I

Most Admired Knowledge Enterprises Survey

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Most Admired Knowledge Enterprises Survey

Most Admired Knowledge Enterprises

Nominate up to three organizations that you consider as leading knowledge enterprises. Rate on a scale of 1 (poor) to 10 (excellent) each organization's performance against the eight knowledge performance criteria listed below:

My nominations for leading knowledge driven Organizations are	**Org.A**	**Org.B**	**Org.C**
1.Ability to create and sustain an enterprise knowledge-driven culture	1-10	1-10	1-10
2.Ability to develop knowledge workers through senior management leadership	1-10	1-10	1-10
3.Ability to develop and deliver knowledge-based products/services/solutions (innovation capability)	1-10	1-10	1-10
4.Ability to manage and maximize the value of enterprise intellectual capital	1-10	1-10	1-10
5.Ability to create and sustain an enterprise-wide collaborative knowledge-sharing environment	1-10	1-10	1-10
6.Ability to create and sustain a learning organization	1-10	1-10	1-10
7.Ability to manage customer/stakeholder knowledge to create value and enterprise intellectual capital	1-10	1-10	1-10
8.Ability to transform enterprise knowledge into shareholder/stakeholder value (or societal value for non-profits and public sector)	1-10	1-10	1-10

Appendix J

ASTD BEST Awards Application Summary

Appendix J

ASTD BEST Awards Application Summary

The ASTD BEST Awards application must be completed online.

Contact Information

Enterprise Information

Part 1: Learning Metrics

- Organization Data
- Financial Data – Learning
- Non-Financial Data – Learning
- Content Distribution
- Delivery Methods-Learning

Part 2: In-Depth Information

Section A: Scope and Role of the Learning Function

Section B: Evidence that Learning Has Value in the Culture

Section C: Evidence of a Link between Learning and the Performance of the Enterprise

- Alignment
- Effectiveness
- Efficiency
- Measurement
- Integrated Talent Management

Section D: Learning and Performance Investment

Appendix K

Illustration of the survey

Appendix K illustration of the survey

Summary of replied questionnaire: Frequency in each question corresponded to Likert Scale (5-4-3-2-1)

Mission and Policy

Questions	**5**	**4**	**3**	**2**	**1**
Q1	7	10	3	-	-
Q2	10	9	1	-	-
Q3	11	9		-	-
Q4	10	9	1	-	-
Q5	9	9	2	-	-
Total	47	46	7	-	-

Leadership

Questions	**5**	**4**	**3**	**2**	**1**
Q5	13	7	-	-	-
Q7	16	3	1	-	-
Q8	12	8	-	-	-
Q9	14	6	-	-	-
Q10	15	3	2	-	-
Total	70	27	3	-	-

Knowledge Sharing and Transfer

Questions	**5**	**4**	**3**	**2**	**1**
Q11	5	12	3	-	-
Q12	8	9	2	1	-
Q13	7	11	2	-	-
Q14	9	8	3	-	-
Q15	7	10	3	-	-
Total	36	50	13	1	-

Internal External Support

Questions	**5**	**4**	**3**	**2**	**1**
Q16	2	12	6	-	-
Q17	6	12	2	-	-
Q18	6	9	5	-	-
Q19	5	12	3	-	-
Q20	7	12	1	-	-
Total	26	57	17	-	-

Cross-Functional Management

Questions	**5**	**4**	**3**	**2**	**1**
Q21	6	12	2	-	-
Q22	3	11	7	-	-
Q23	4	12	4	-	-
Q24	5	13	2	-	-
Q25	8	11	1	-	-
Total	26	59	15	-	-

Communication

Questions	**5**	**4**	**3**	**2**	**1**
Q26	8	10	2	-	-
Q27	10	9	1	-	-
Q28	3	15	2	-	-
Q29	13	6	1	-	-
Q30	7	11	1	1	-
Total	41	51	7	1	-

Continuous Improvement

Questions	**5**	**4**	**3**	**2**	**1**
Q31	7	11	2	-	-
Q32	14	6	-	-	-
Q33	7	11	2	-	-
Q34	7	9	4	-	-
Q35	13	5	2	-	-
Total	48	42	10	-	-

High Performance Expectation

Questions	**5**	**4**	**3**	**2**	**1**
Q36	4	12	4	-	-
Q37	9	8	3	-	-
Q38	5	14	1	-	-
Q39	10	9	1	-	-
Q40	7	10	3	-	-
Total	35	53	12	-	-
Grand Total	329	383	86	2	-
Percentage	41.12	47.88	10.75	0.25	

Appendix Table

Summary of replied questionnaires (Open-ended part)

Appendix Table Summary of replied questionnaires (open-ended part)

No.	Accept Model	Added Characteristics	Results from being a learning organization	Recommendation
1	Yes		-Improved overall working system -Reduced Cycle Time -Improved Quality of Working Life	
2	Yes	Benchmarking	-Working as a team -Striving for the same goal -Integrated to be one	
3	Not replied			
4	Yes		The organization is continuously enthusiastic in new searching and learning with embrace change, making the organization adapt to change in time and continuously leading in business	Culture setting for people alignment All kinds of analysis and evaluation by fact
5	Yes		-Trend of productivity is continuously increasing -People working as a team by using diverse knowledge	Cross-functional teamwork in the organization encourages people from different departments

Appendix Table (Continued)

No.	Accept Model	Added Characteristics	Results from being a learning organization	Recommendation
			-Improve and create innovation -Storage specific knowledge for applying	to work together and solve specific problems. This statement is depending on each Organization's culture
6	Yes	-Learning Culture -Mental development -Team Learning	Sustainability in self-development and business growth Critical Success Factors: 11 Core Values 6 Management Tools: GSP House, BSC, CRM, MIS, Cross Functional Team, and TPM	By declare a LO, top management has to show and practice his/her commitment in learning and development not only speech or wording. The organization has to set a concrete foundation of Learning management system including culture of the organization. Cause of failure is come from top management him/herself
7	Not replied			
8	Yes	-Monitoring	-The organization learning is more objective and	

Appendix Table (Continued)

No.	Accept Model	Added Characteristics	Results from being a learning organization	Recommendation
		-Evaluation	efficient -Develop competitive advantage of people both continuous learning and working capability -The organization achieve target with more Sustainability	
9	Not replied			
10	Yes	Personal Learning	-Process Improvement of new service innovation -New products and business model	The most importance of key success in TQM and TQA is top management and executive management team
11	Yes	Knowledge Identification	Enhance employee competencies	
12	Yes	Exchange Knowledge from stakeholders to public and best practice	-Productivity Improvement -New Innovation -Good return to stakeholders	Pull out tacit knowledge from people to explicit knowledge and exchange throughout the organization

Appendix Table (Continued)

No.	Accept Model	Added Characteristics	Results from being a learning organization	Recommendation
			-Increase customer and community satisfaction	
13	Yes	-Knowledge management Assessment -Internal/External Audit	-Better in all aspects of the organization -Better people and organization -Better performance (cycle time) and competitive advantage -Better employee satisfaction and collaboration to the organization	Sharing and transfer should spread out to public or outside also, not only import knowledge from outside-in
14	Yes	-Management by Fact -Recognition	Same as TQM result	
15	Not replied	-Lifelong learning culture -Mental Model -Team Learning	-Efficiency improvement in all process -Result effectiveness -Process and Product Innovation	

Appendix Table (Continued)

No.	Accept Model	Added Characteristics	Results from being a learning organization	Recommendation
16	Yes	-Lifelong learning -Mental Model -Team Learning	-Efficiency improvement in all processes -Result effectiveness -Process and product innovation	--Leaders at all levels must be role model to energize people to learn in the organization -Create networking for sharing and transfer knowledge and innovation into performance management
17	Not replied			
18	Yes		New product and service	Action learning is a powerful tool for a LO
19	Yes	-Commitment -Engagement	Increase efficiency, productivity, quality, Human capital's knowledge, and happiness	
20	Yes	Retaining Staff	-Work life balanced -High value added products -Business Growth	CSF: Strong KM, Innovation and IC Best Practice
21	Not replied			

Appendix Table (Continued)

No.	Accept Model	Added Characteristics	Results from being a learning organization	Recommendation
22	Yes		-Eliminate repetitiously problems -Continuous Improvement -Innovation -Competitive Advantage -Stakeholders Satisfaction	
23	Yes		-Productivity Improvement -Innovation -Credence between management team and employee	
24	Yes		-Better quality of working life -Loyalty -Enduring to use competency and knowledge to improve Product and service -Better business result even high competition	-Seriously implementation and execution of LO is the most importance not only written policy -To promote and build a LO require an effective communication and cross-functional team to Stimulate at the beginning and campaign

Appendix Table (Continued)

No.	Accept Model	Added Characteristics	Results from being a learning organization	Recommendation
				-Organizational culture will embedded to Individual and people will accept and practice without resistance
25	Yes		-Increase knowledge to people -Learning awakening -Understanding present competitive situation -Better problem solving	
26	Yes		-Creating better value for all stakeholders -Stay ahead of competition	-Learning all the time -Continuous Improvement CSF: Strong KM Team Market Innovation and IC Best Practice

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