Chapter 5
2nd Method:
A New Paradigm of the Cognitive Knowledge Model

5.1 Consolidate Critical Cognitive Criteria for Modeling

From the 1st Method to acquire the elements necessary to create dynamic knowledge modeling, in this 2nd method the study is using the heuristic approach to reconfigure the critical contributing factors. With in the cognitive knowledge framework, this study will initially create a number of arbitrations of the combination cross over between the hidden and predefined contribution factoring as the first essential configuration of this method.

The following is the list of the recapturing of the selected cluster elements aggregated from the 1st method.

    1. Diamond Model
        1.1 Factor conditions (input)
        1.2 Context for firm strategy and rivalry
        1.3 Related and supporting industries
        1.4 Demand conditions
    2. MESO Model
        2.1 Business Layers to complete micro macro and meta
            layers:
            2.1.1 Firms
            2.1.2 Industries/Micro
            2.1.3 Cluster/Meso
            2.1.4 Nation/Macro
            2.1.5 Supranational/Meta
        2.2 Contribution factors essential for the development on
            each layers
            2.2.1 Firms
                2.2.1.1 Positioning (Comparative Scope)
                2.2.1.2 Activities (Corporate Strategies)
                2.2.1.3 Resource (Organization)
                2.2.1.4 Knowledge (Leadership)
        2.3 Industries/Micro
            2.3.1 Industry Characteristics
                2.3.1.1 Competition
                2.3.1.2 Cooperation
                2.3.1.3 Strategic Groupings
                2.3.1.4 Role of Lead Firm

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6. Factors in GEM Model
   - 6.1 Engagement of key people and leaders
   - 6.2 Availability of finance
   - 6.3 Workforce, labor and technical knowledge
   - 6.4 Vision for the cluster
   - 6.5 Government and institutions
   - 6.6 Linkages
   - 6.7 Physical Infrastructure
   - 6.8 Supplier Competitiveness
   - 6.9 Related industries
   - 6.10 Local company rivalry
   - 6.11 Company ownership structures
   - 6.12 Number of firms
   - 6.13 Local markets Value Chain
   - 6.14 Freight access to customers and suppliers
7. Sufficiency Economy
   - 7.1 Moderation
   - 7.2 Reasonableness
   - 7.3 Self-Immunity
   - 7.4 Knowledge and Ethics
   - 7.5 local knowledge and indigenous
8. Madragon's Management Model
   - 8.1 Customer Satisfaction
   - 8.2 Profitability
   - 8.3 Internationalization
   - 8.4 Development and Innovation
   - 8.5 Social Involvement
9. Empirical Evident
   - 9.1 Bottom-up approach
   - 9.2 Top-down approach
   - 9.3 Requirement and respond technique
   - 9.4 Driven by Economically Potential
   - 9.5 Driven by Economically Contribution
   - 9.6 Natural process for mobilization
   - 9.7 Clusters were heuristically selected
   - 9.8 Natural process for mobilization
   - 9.9 Handicraft Focus on either Product or Raw Materials
   - 9.10 SME , Agriculture Focus
   - 9.11 SME supply chain for Fruit Exporting
   - 9.12 Tourism and Micro Enterprises
   - 9.13 Innovation
   - 9.14 Job creation
   - 9.15 Business Survival
   - 9.16 Social benefit for Local Community

By applied Common KAD Framework using assessment template (Figures 5.1) for the 2nd method of this study, it arbitrated both knowledge from the theoretical

frameworks and the empirical knowledge from the participants in the field studies to establish the project scope delimiters.

Figures 5.1 Assessment Template
Source: Chukpitak, 2005

  1. Diamond Model has been widely misused and mislead from the concept model into many other unproved referencing action items including implementation frameworks and etc.

  2. Diamond model along with Porter's 5 Force Model must be used hand in hand to develop the strategies for cluster development.

  3. The 3 steps cluster development phases, mobilization-strategic development-implementation, and cluster mapping are the after the fact trails reflecting the natural cluster development. It is the document of proof that clustering could be achieved. It is merely for the learning proposes not the cluster induction strategies.

  4. Most of cluster modeling is only one-legged economic development system for global competition. It never tries to address the social phenomena for national sustainable competitiveness.

  5. The cluster development in most of the cases is implemented with research in action approaches. It is a learning-by-doing consulting approach with no clear scope of work or predetermine hypothesis to be proved on. Since, there are too many affecting factors to impact cluster development both in social and commercial contribution.

  6. Cluster initiatives and development are more academic initiative rather than social and economic driven activities.

  7. Cluster is generally believed to be one of the significant concepts for global competition in the new economy after the industrial revolution. However, it is also believed by many cluster development resource persons and researchers that cluster development is the natural process with strong social characteristic within the area and it is very difficult to be induced otherwise.

  8. Most of the hidden impacting factors (for SME in various industrial) are the complex social contributing factors rather than commercial contributing factors. Even though the final outcome is the economic impact for the clusters.

  9. The difference between the global competition and the local survivorship are the outside-in and the inside-out points of view approach.

  10. The critical success factors for cluster mobilization are lying between the government top-down and the voluntary bottom-up approaches and the mixture of both depending on the situation and environment.

11. Impacted information, particularly, market information is one of the contributing for market failure. It is regard as one of the most essential elements of fact for global market competition and it become one of the sustainable key elements sort after for cluster mobilization for SME.

12. Clustering should consist of the mixture elements of commercial and social contribution, particularly the local area implication. It should not be otherwise.

13. Acquiring knowledge and impacted information are the keys essential for clustering, particularly for the all SMEs clustering.

14. Even though R&D and technologies are the signification factors for cluster development. However they are disregarded as the key measurements of innovation.

15. Civic entrepreneurs are the key success of cluster development rather than public sector as a whole.

16. Knowledge and the management process of the knowledge can be used as the integration tools for the value chain creation in stead of the products and services focus.

17. Analogy learning method can help reduce the cluster concept confusion and also improve bye-in significantly.

18. Innovation must be unlearn and relearn in order to build new strategies.

The mentioned details above will be used as the element of empirical assumption. And this will be used as a part of model construction later on in this method.

5.2 Construct Cognitive Parameters Using Cynefin Framework

According to the research assumption on the impact of externality over the controllable economic elements, within this method the result from theoretical element analysis will be combined with the hidden factors implication to create the essential boundary of framework constructing using cognitive framework.

It is another way of addressing the misunderstanding of confusion circle (Figures 5.2) implied from the research question of the benefit of cluster and competitiveness proposed by CDA community. It described the cluster initiatives as the skeptical development processes with unpredictable results. Information, knowledge and decision making to resolve the skeptical, in our case, might be as important as the known contributing factors. By applying the knowledge modeling technique into the cluster development process, the dynamic model which shall be proposed later on can help CDA to improve the situation.
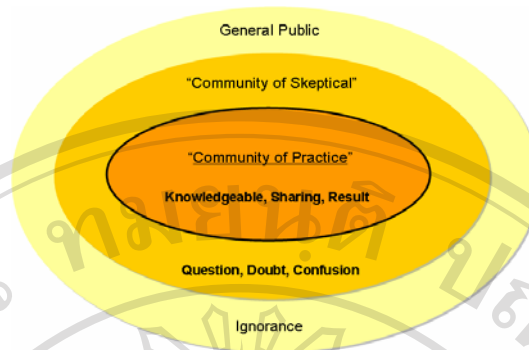
Figures 5.2 Confusion Circle
Source: Tamprasirt, 2006

5.2.1 Process 1: Create Cognitive Knowledge Classification using Cynefin Framework

With information acquired from the 1st method, the collected cluster contributing factors can be classified by using Cynefin framework (Figures 5.4) in order to categorize contributing factors into a set of broken down workable tasks from very complex scenarios in cluster development subcategories.

Cynefin Framework
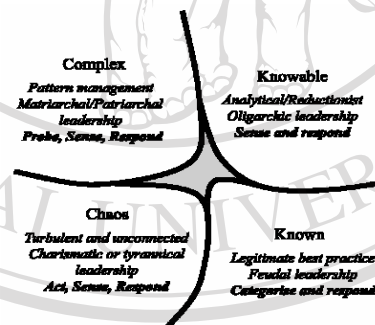
Figures 5.3 Cynefin Framework Method
Source: Snowden, 2003

Cynefin is the cognitive screening criteria for capturing and classifying knowledge into actionable framework as followed:
1. Complex:
Breakdown the complex stories into pattern with the pattern management.
2. Knowable:
One the complex system has been defined the story will be broken down into knowable subsystems with analytical or reduction methods
3. Chaos:
Chaos is sometime difficult to differentiate with very complex situations. Very complex situations can be broken down into solvable pattern.

However, chaotic situation can not be. It must be deal the turbulent with the unconnected pointed of views.

          4. Known:

From complex situation can be broken down into knowable pattern, it can also further separated into the known practices or knowledge which best practice can be built from.

        By mapping the contributing factors into 4 subsets in order to derived the very complex cluster situation into known and digestible task. The following is the subsets of classification and classification profile (5.1).

Classification:
1. Complex System
2. Knowable Transformation
3. Known (Theoretical Model)
4. Implied Factors (Interaction)

Table 5.1 Classification Profile

Complex System	Cluster can be viewed as very complex system which can be taken parts in order to simplify the complexity level into manageable levels.
Knowable (Transformation)	Pattern of the simplified activities can be learned and set up as a set or subset of manageable activities.
Known (Theoretical Model)	The well defined model or best practices resulted from the analysis and deduction of the knowable.
Implied Factors (Interaction)	Unpredictable and unable to manage activities, it required spontaneous and reaction tools, intervention, issue based management to deal with almost infinite factors.

        Form the classification set derived from the classification profile, the study will further classify related knowledge and contributing factors into their own class using the Common KAD framework in conjunction with the classification template (Figures 5.5), the result is the following.
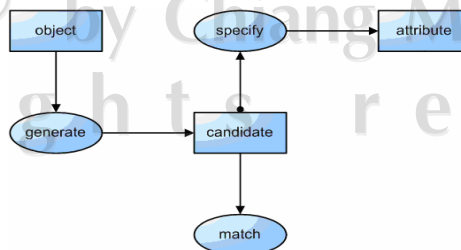
Figures 5.4 Classification Template
Source: Chakpitak, 2005

Table 5.2 Contribution Factor

		Complex	Knowable	Known	Implied Factors
1. Diamond Model					
	Factor conditions (input)			X	
	Context for firm strategy and rivalry	X			
	Related and supporting industries			X	
	Demand conditions	X			
2. MESO Model					
	Business Layers to complete micro macro and meta layers:				
	o Firms	X			
	o Industries/Micro	X			
	o Cluster/Meso	X			
	o Nation/Macro	X			
	o Supranational/Meta	X			
	Contribution factors essential for the development on each layers				
	Firms				
	Positioning (Comparative Scope)			X	
	Activities (Corporate Strategies)				X
	Resource (Organization)			X	
	Knowledge (Leadership)				X
	Industries/Micro				
	Industry Characteristics				X
	Competition	X			

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Table 5.2 Contribution Factor (Continue)

		Complex	Knowable	Known	Implied Factors
	Cooperation	X			
	Strategic Groupings				X
	Role of Lead Firms				X
	Micro Policies	X			
	Micro Institutions			X	
	Cluster/Meso				
	Input and Suppliers			X	
	Demand and Customers			X	
	Shared Resources	X			
	Shared Activities	X			
	Complementarities			X	
	Substitutes		X		
	Meso Polices			X	
	Meso Institutions			X	
	Nation/Macro				
	Macroeconomics		X		
	Macro Government Policies	X			
	Macro Institution		X		
	Civil Society	X			
	Supranational/Meta				
	Multilateral Organizations				X

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Table 5.2 Contribution Factor (Continue)

		Complex	Knowable	Known	Implied Factors
	Supranational Polices			**X**	
	International Financial Flows	**X**			
	Foreign Multinationals	**X**			
	Regional Groupings	**X**			
	Interaction within and between layers			**X**	
3. CIPM model					
	The social, political and economic setting within the nation				
	Business Environment	**X**			
	Policy		**X**		
	Cluster Strength	**X**			
	The objectives of the cluster initiative (CI)				
	Research and Networking			**X**	
	Policy Action	**X**			
	Commercial co-operation	**X**			
	Education and Training				**X**
	Innovation and Technology			**X**	
	Cluster Expansion				**X**
	The process by which the cluster develops				
	Initiation and Planning			**X**	
	Governance and Financing	**X**			
	Scope of Membership				**X**

Table 5.2 Contribution Factor (Continue)

		Complex	Knowable	Known	Implied Factors
	Resources and Facilitations				**X**
	Framework and Consensus			**X**	
	Momentum				**X**
The performance of the CI					
	Competitiveness			**X**	
	Growth			**X**	
	Goal Fulfillment			**X**	
objective to drive the interaction between the critical factors					
	Foster networks among people				**X**
	Promote expansion of existing firms			**X**	
	Foster networks among firms				**X**
	Facilitate higher innovativeness				**X**
	Promote Innovation, new Technologies			**X**	
	Attractive new firms and talent to region			**X**	
	Create brand for region			**X**	
	Promote exports from cluster				**X**
	Provide business assistance				**X**
	Assemble market intelligence			**X**	
	Analyze technical trends			**X**	
	Improve firms' cluster awareness				**X**
	Promote management training				**X**

Table 5.2 Contribution Factor (Continue)

		Complex	Knowable	Known	Implied Factors
	Diffuse technology within the cluster			X	
	Enhance production processes			X	
	Lobby government for infrastructure				X
	Improve FDI incentives				X
	Improve regulatory policy				X
	Provide Incubator services			X	
	Lobby for subsidies				X
	Study and Analyze the Cluster		X		
	Co-ordinate purchasing		X		
	Conduct private Infrastructure projects		X		
	Establish technical standards		X		
	Produce reports about the cluster		X		
	Reduce competition in the cluster			X	
4.9 Steps Model					
	Potential of Cluster (Screening Process)				X
	Business Strategic Segmentation		X		
	Business Positioning			X	
	Demand Analysis			X	
	Innovation Driven				X
	Value Chain Realization				X
	Benchmarking for Competition		X		

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Table 5.2 Contribution Factor (Continue)

		Complex	Knowable	Known	Implied Factors
	Strategic Options to Kick of the Implementation		**X**		
	Clustering and Expand the Networking			**X**	
5. Scottish Enterprise Implementation					
	Mobilization		**X**		
	Diagnose		**X**		
	Collaboration		**X**		
	Implementation		**X**		
	Hypothesis of cluster initiation for cross-cutting implementation action			**X**	
6. Factors in GEM Model					
	Engagement of key people and leaders				**X**
	Availability of finance				**X**
	Workforce, labor and technical knowledge				**X**
	Vision for the cluster				**X**
	Government and institutions	**X**			
	Linkages				**X**
	Physical Infrastructure	**X**			
	Supplier Competitiveness			**X**	
	Related industries			**X**	
	Local company rivalry	**X**			
	Company ownership structures			**X**	

Table 5.2 Contribution Factor (Continue)

		Complex	Knowable	Known	Implied Factors
	Number of firms				**X**
	Local markets Value Chain				**X**
	Freight access to customers and suppliers				**X**
7. Sufficiency Economy					
	Moderation	**X**			
	Reasonableness	**X**			
	Self-Immunity			**X**	
	Knowledge and Ethics	**X**			
	Local knowledge and indigenous	**X**			
7. Madragon's Management Model					
	Customer Satisfaction				**X**
	Profitability			**X**	
	Internationalization			**X**	
	Development and Innovation				**X**
	Social Involvement				**X**
9. Empirical Evident					
	Bottom-up approach		**X**		
	Top-down approach		**X**		
	Requirement and respond technique				**X**
	Driven by Economically Potential				**X**
	Driven by Economically Contribution				**X**

Table 5.2 Contribution Factor (Continue)

		Complex	Knowable	Known	Implied Factors
	Natural process for mobilization			X	
	Clusters were heuristically selected			X	
	Handicraft Focus on either Product or Raw Materials				X
	SME , Agriculture Focus			X	
	SME supply chain for Fruit Exporting			X	
	Tourism and Micro Enterprises			X	
	Innovation				X
	Job creation				X
	Business Survival				X
	Social benefit for Local Community				X

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5.3 Construct Cognitive Knowledge Model Using System Thinking

This research was intended to create a new paradigm in competitiveness to improve the learning mechanism for community involved (CDA and Cluster participants) and also reduce the confusion cycle mentioned earlier. This model proposed here was created from the cross over between the top down and bottom up approaches and the interaction between the theoretical concepts and practical model. This model is not trying to define more contributing factors. It is, however, trying to build a new way of dealing with the known and unknown elements involved with in order to cope with the complex situations. It is the way to prove the existing of the externality superimpose on elements of the cluster development.

5.3.1 Process 1: Creating Cognitive Knowledge Ontology

Ontology is one of systematical method that suitable to illustrate the explicit specifications into mapping model. In this research, the abstract knowledge objects are connected into sets of the network of knowledge objects. Dynamism can be displayed the associate path, common properties, distinction and etc.

Cognitive Knowledge Ontology is derived of the Ontology created by Tom Gruber, Stanford University, in 1993[49] referring to a numbers of Ontology at www.w3.org/2004/OWL. By definition, *Ontology* is one of systematical method that suitable to illustrate the explicit specifications into mapping model. In this research, the abstract knowledge objects are connected into sets of the network of knowledge objects. Dynamism can be displayed by the relationship of system thinking on the network to derive the associate path, common properties, distinction and etc.

Cognitive Knowledge Ontology System (CogKnOS) consists of the dynamic system and Ontology map. This method focuses on facilitating the on-going learning for cluster implementation particularly for community involved. The CogKnOS system will be constructed using cross definitions and properties from various theories, concepts, knowledge and etc. More importantly, the constructing mechanism is based on Nonaka's analogy knowledge creation method [40]. More importantly, the constructing mechanism is based on *Nonaka's analogy learning method* derived from Nonaka's SECI knowledge management model (Figures 5.6)

Nonaka's SECI
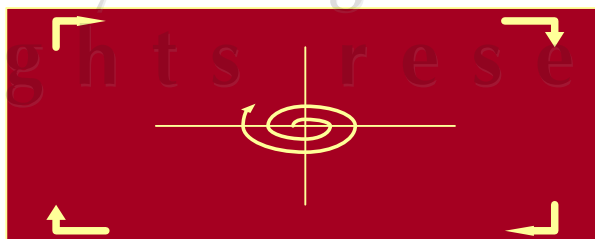
Figures 5.5 Nonaka's SECI Model
Source: Nonaka, 1995

Nonaka's SECI model:
1. Tacit and Explicit Knowledge
2. Socialization: From tacit knowledge to tacit knowledge
3. Combination: From explicit to explicit
4. Externalization: From tacit to explicit
5. Internalization: From explicit to tacit

Nonaka's Analogy Learning Method can be used to imply the knowledge decision making with the opposite extreme characteristic of the objects. In addition to the decision making, it also can be used as the key learning method to clarify the confusion at the same time. The following are some examples of Nonaka's Analogy within the cluster development domains.

1. Industry Leads VS. Civil Entrepreneurs
The different between the industry leads and Civil Entrepreneurs are the profit orientation. The specific industrial leaders are concerned with the benefits and profits for their niche industries in which the Civil Entrepreneurs are concerned more on the benefits as a whole including the profits making as well as the job creation and other social issues.

2. Innovation VS. Research and Development
As mentioned by Dr. Enright in his speech in Thailand in 2005, he has emphasized that innovation i.e. new business models, breaking new market entries and etc. are more significantly appropriate for developing countries than break through R&D. Since R&D is usually more expensive and long-term investment. R&D model is usually effective for the developed countries.

From the knowledge classification, this method is using cynefin framework, the CogKnOS system proposed was also further construct into the network ontology using Nonaka's analogy learning method as the following. The CogKnOS system construction was based on the bipolar 2 extremes concepts illustrated in the following Figures (Figures 5.7)
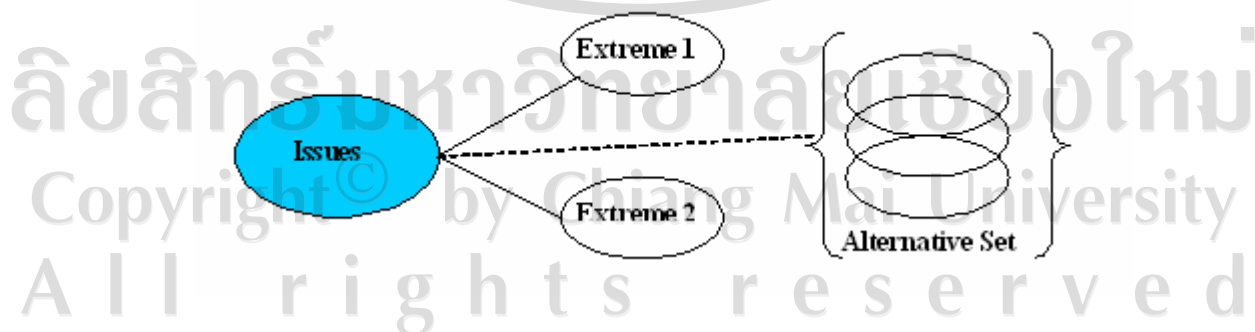
Figures 5.6 Bipolar Analogy Ontology
Source: Tamprasirt, 2007

When applied the bipolar analogy learning to cluster framework, the parameters used in this process consists of the following:

1. National Agendas VS. Firm Survivorship
2. Economic VS. Social Direction
3. Standalone VS. Group Development
4. National Sustainability VS. Firm Prosperity

The above bipolar extremes indicated the delimiters or scope of the general cluster environment in order for CDA to synthesize the innovative ideas.

5.3.2 Process 2: Dynamic System

The system dynamic construction concepts (Figures 5.6)
1. System includes such human systems as families, organizations, cities, and nations.
2. Balance Process with Delay Subsystems Process.
3. Limit to Growth Subsystems Process.
4. Shifting the Burden Subsystems Process.
5. Escalation Subsystems Process.
6. Every subsystem and their components in the system dynamic are always interconnected.
7. They are never disconnected from the interconnectedness.

System Dynamic
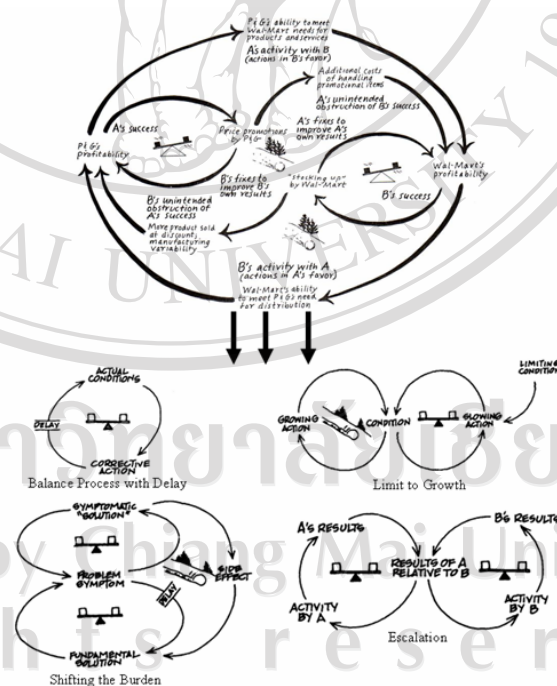
Figures 5.7 System Dynamic
Source: Senge, 1990

5.3.3 Process 3: Constructing Cognitive Knowledge Ontology System (CogKnOS)

Since each cluster development is unique and nearly unrepeatable due to the dynamism of the expected outcome from the very complex externalities in each state of any cluster implementation. This model (Figures 5.7) offers the strategic thinking framework to systematically align cluster development with their externality consideration. Cynefin and Nonaka's bipolar learning frameworks are used as the ontology illustration for the knowledge network of the relationship of policy and business externality circles projected on two dimensional cluster internal network: first, Integration between the cluster contribution factors and their objectives and the cross integration between factors themselves. And the second dimension is the impact of the motivation of the cluster. The novelty of this method is based on a new paradigm concepts of the dynamic adjustment relating to the externality governing parameters projected from the system thinking of maintaining the intersection between the government policies and firm strategies circles over the lifecycle of cluster implementation.
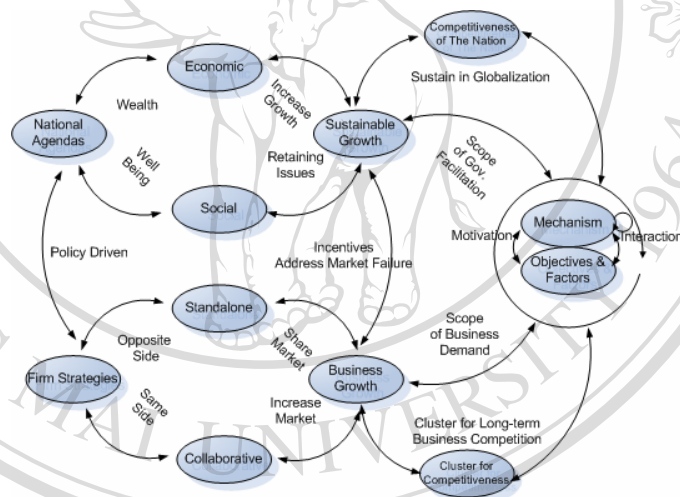

Figures 5.8 Dynamic System Knowledge Map
Source: Tamprasirt,2007

This Dynamic System can be further expanded into the bipolar subsystems depending on each other by which project their implication onto the cluster internal mechanism. The government dynamic subsystem focuses on the sustainable growth of the nation. The firm-level dynamic subsystem imposes on the business and industry growth of the country as the whole. Again this bipolar concept can be expanded into layers on ontology network map explained in the later section of this method.

1. Government Dynamic Subsystems (Figures 5.8) focus on the main collected issues of national agendas by which social and well being of the nation human resource can be ignore as suggested by the theoretical framework.
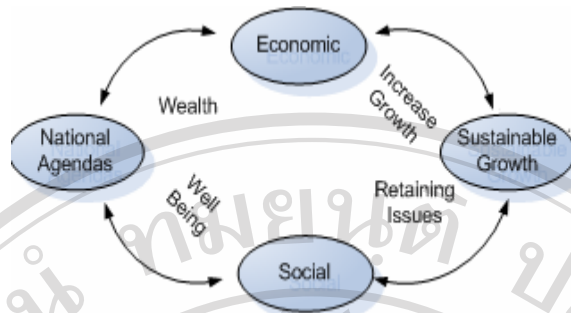
Figures 5.9 Government Dynamic Subsystem
Source: Tamprasirt, 2007

2. Firm-Level Dynamic Subsystems (Figures 5.9) indicates the standalone and collaboration in order to sustain business capability for the global competition. The important issue here is the withstanding globalization.
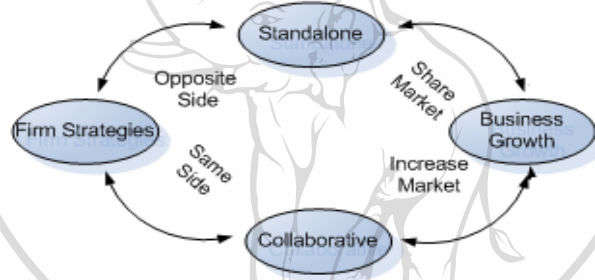
Figures 5.10 Firm-Level Dynamic Subsystem
Source: Tamprasirt, 2007

Both of the above subsystems are superimpose on the competitiveness and clustering subsystems (Figures 5.10) where by the answer of the entire country productivity and sustainability by which every theoretical framework was trying to modeling them. However, the above subsystems are externality disregarded from the model by which needed to be considered for the result of the cluster implementations.
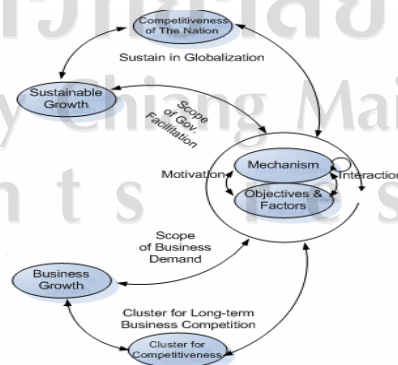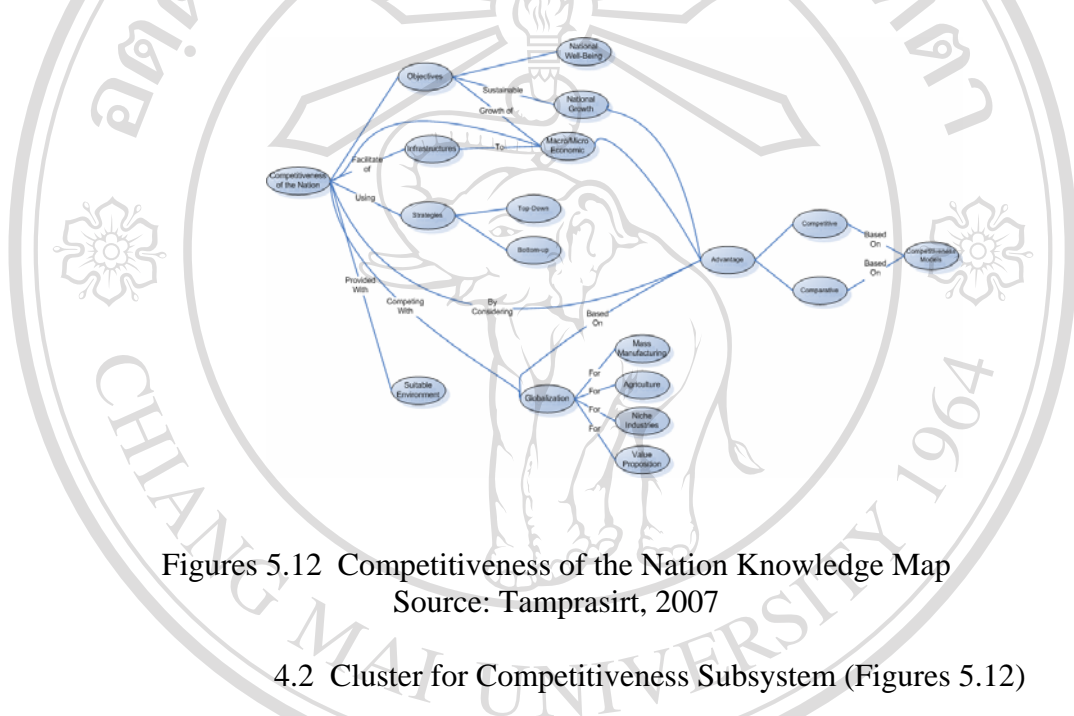

Figures 5.11 Competitiveness and Cluster Subsystems
Source: Tamprasirt, 2007

3. Governing Cluster for Competitiveness

There are two major governing subsystems, the competitiveness of the nation subsystem and the cluster for competitiveness subsystem direct connected with the cluster development system. These subsystems maintain balance of the interaction between the public interest and the economic driven from the business benefit improvement.
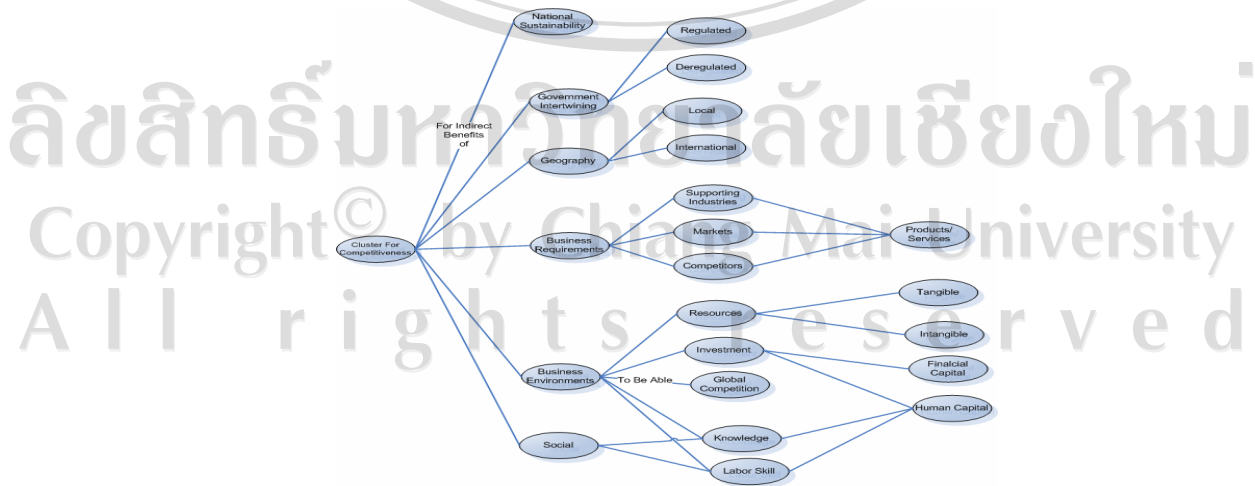
4. Factors defined by two subsystems as the following:

4.1 Competitiveness of The Nation Subsystem (Figures 5.11)

Figures 5.12 Competitiveness of the Nation Knowledge Map
Source: Tamprasirt, 2007

4.2 Cluster for Competitiveness Subsystem (Figures 5.12)

Figures 5.13 Cluster for Competitiveness Knowledge Map
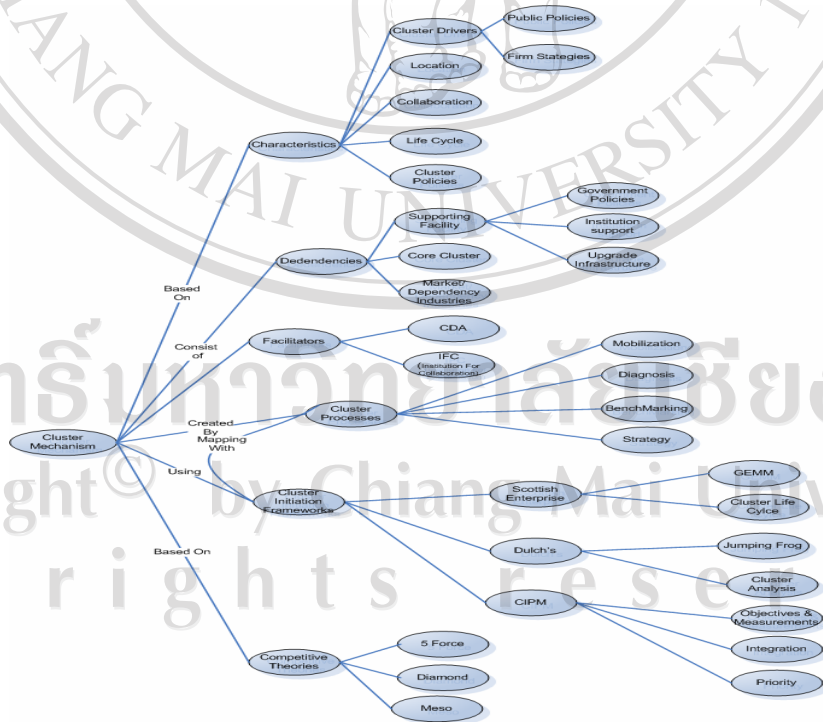Source: Tamprasirt, 2007

Systematically, cluster base engine is driven by the cluster mechanism with defined objectives and factors governing by motivation and interaction between them (Figures 5.13).
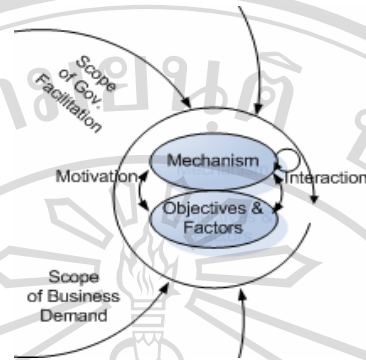
Figures 5.14 Cluster Base Engine
Source: Tamprasirt, 2007

5. Cluster Mechanism

Cluster Mechanism is the ontology display the relationship of knowledge necessary for CDA to be acquired and managed for the entire life time of cluster (Figures 5.14)

Figures 5.15 Cluster Mechanism
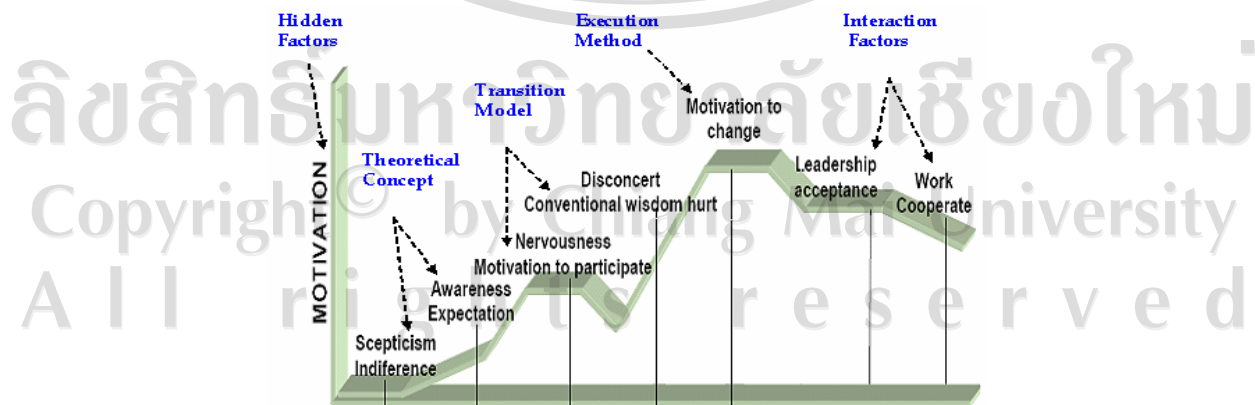Source: Tamprasirt, 2007

6. Cluster Objectives and Factors

The essential objectives and contributing attributes can be summarized into groups. It also can be displayed as the following ontology (Figures 5.15).
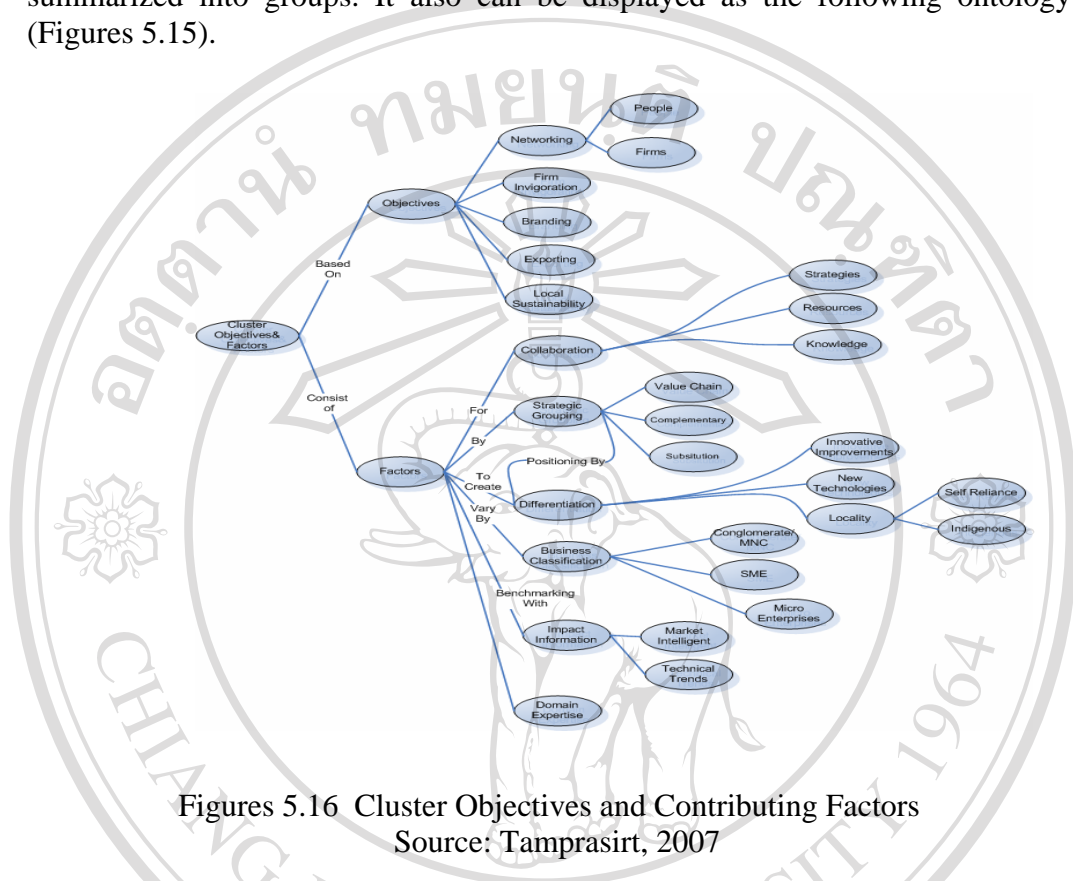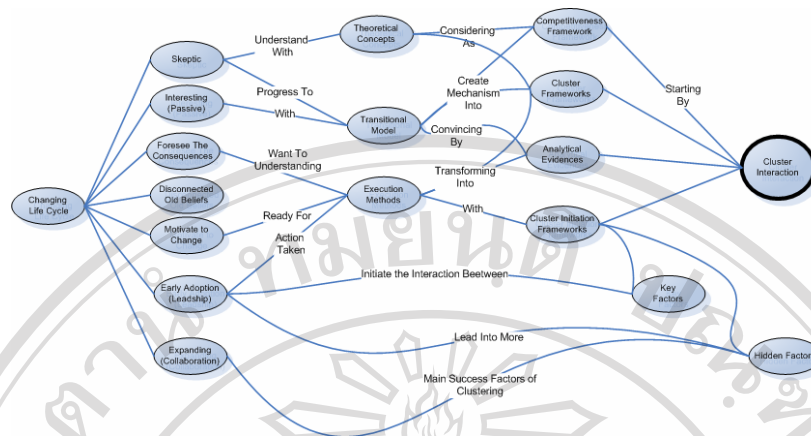

Figures 5.16 Cluster Objectives and Contributing Factors
Source: Tamprasirt, 2007

By mapping cluster interaction to motivation profile (as suggested by Dulch in his 9-step model- Figures 5.16) of cluster implementation, the proposed CogKnOS system can be mapped into the base engine

Figures 5.17 Cluster Motivation Profile
Souce: Duch, 2005

Figures 5.18 Ontology of Base Engine
Source: Tamprasirt, 2007

The base engine is construction of the life cycle of motivation and the cluster process in action. This is a multidimensional view of clustering started from the concept to implementation effected by the change motivation profile over time (Figures 5.17). Noted breaking from the social norm beliefs to the early adoption leadership remains one of the major challenges process along with the limitation of the time dimension. This also proved that the learning strategies equally important to the other economic definition factors.

5.4 Robustness Validation

The validation here illustrates the integrity of proposed CogKnOS model in which KMS shall be built upon later for the benefit primary for process improvement. The robustness assurance was conducted to verify the effective of knowledge map in use by using the other two case studies conducted in Thailand namely Chiang Mai Northern Handicraft Clusters and Maeklong Basin Clusters as the referring cases.

5.4.1 Analysis of Robustness Validation

Using two referring cases from four clusters situated in 4 different locations in 3 different regions in Thailand mentioned above. Four cluster projects involved at least 15 consultants who act as Cluster Development Agents (CDA). There were also involved with at least 5,000 people within different 20 communities and 10 different clusters combined.

The analysis of robustness was conducted by verifying the knowledge map and ontology created to prove the learning capability of community's users involved in the process. This is an test of framework completeness before introducing it into software production later on.

Validating Framework

Cluster System (Figures 5.18) illustrated the consolidation of knowledge network to improve the understanding of competitiveness concept and spirally reduce the confusing circle. The validation of the hypothesis can be conducted by validating appropriateness of use the contributing factors offered by the dynamic model illustrated as followed.
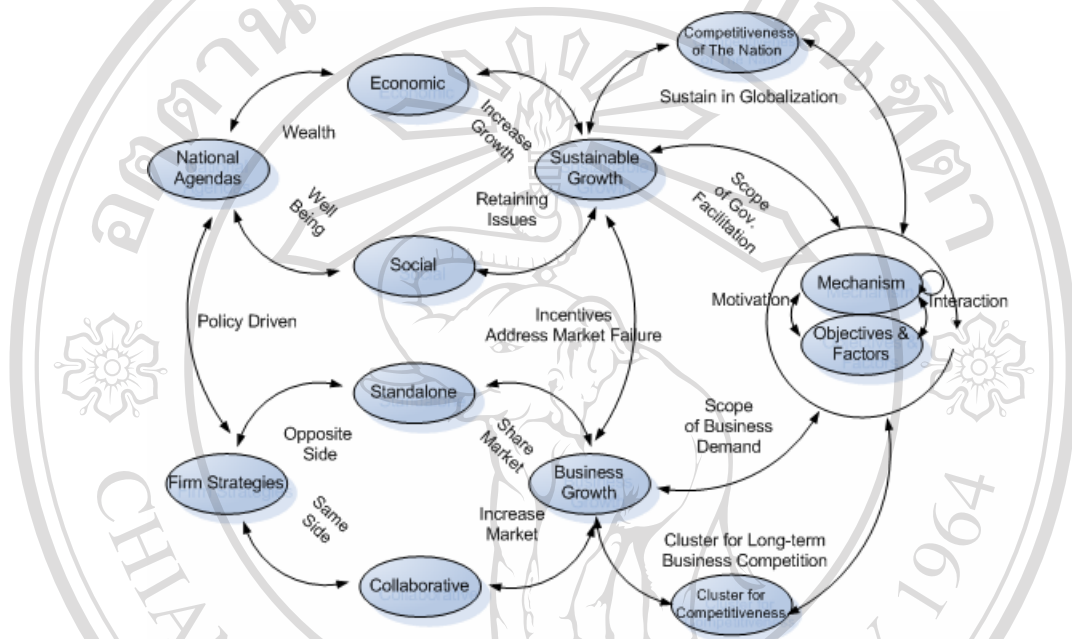

Figures 5.19 Dynamic System Knowledge Map
Source: Tamprasirt, 2007

1. CogKnOS Model Improved the Cluster Decision in Northern Region Handicraft Clusters.

This test case is based on the Northern handicraft clusters in Chiang Mai and vicinity provinces in the Northern Region of Thailand. Handicraft is one of the handmade exporting industries in Thailand. The products offered include tableware, kitchenware, home decorative items, gift, wooden craft decorative items, ceramic and etc. These clusters are experiencing the fierce global competition, even more appearance when China was opened the country in the recent decades. They need to find the way to sustain their income in the local community and at the same time withhold the global competition with their unique skill and abundance resource both human capital and raw material in the area.

Northern handicraft industry is diversified and complex since it consists of various products offered i.e. tableware, kitchenware, home decorative items, gift, wooden craft decorative items, ceramic and etc (Figures 5.19). In this test case, the main fundamental issues for cluster development can be separated into the following scenarios.
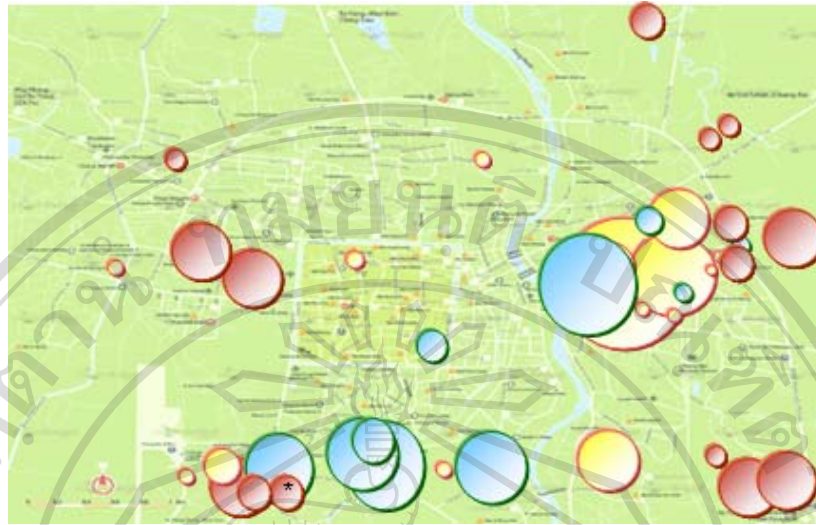
Figures 5.20 The Overview of Chiang Mai Cluster Map
Source: Chakpitak, 2005

1. Chiang Mai cluster directive was decided toward the business improvement oriented rather than strong social contribution due to the cognitive decision making upon the improvement of SMEs and Micro Enterprises after the comparison between these two extremes consideration. It was decision base on the firm base collaboration driven for private competitiveness with minor government involvement and supports.

2. The other cognitive decision base upon the decision made of Cynefin complex reduction from multi-complex scenarios into two distinct business upgrading objectives to improve the business as the industry.

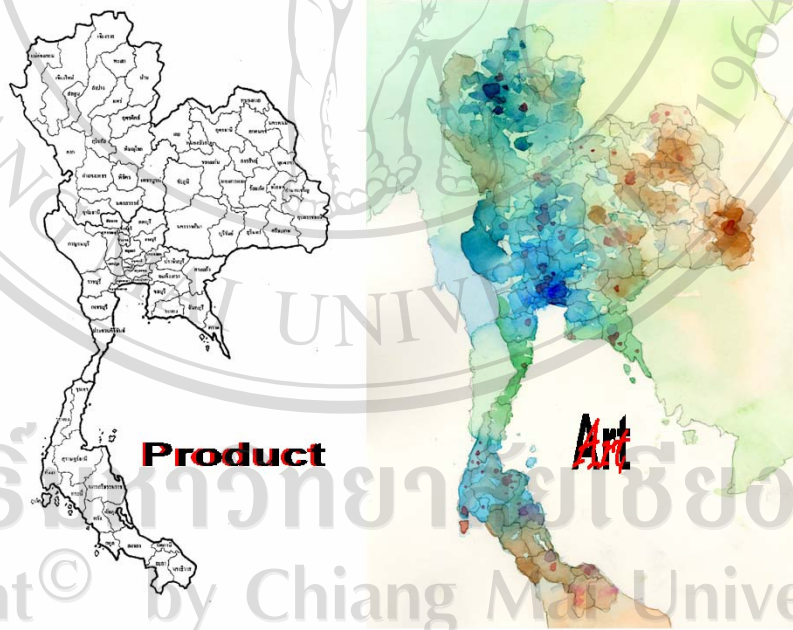2.1 The 1st extreme was base on the product base.
2.2 And the 2nd one was base on raw materials.

With the same objective, it was very difficult to justify the path taken without constantly review the entire system since both of which objectives were focus on the benefit of the income driven for labor force survival and SME limitation.

From the decision making base on system dynamic comparison of the system offered between different boundaries i.e. government versus private agendas, decision of collaborative versus stand-alone directions (Figures 5.20), the cluster was decided to focus on the development of artistic articulate (Figures 5.21) rather than conventional consumer gift and household goods (Figures 5.22) in retail business direction as result illustrated in the following
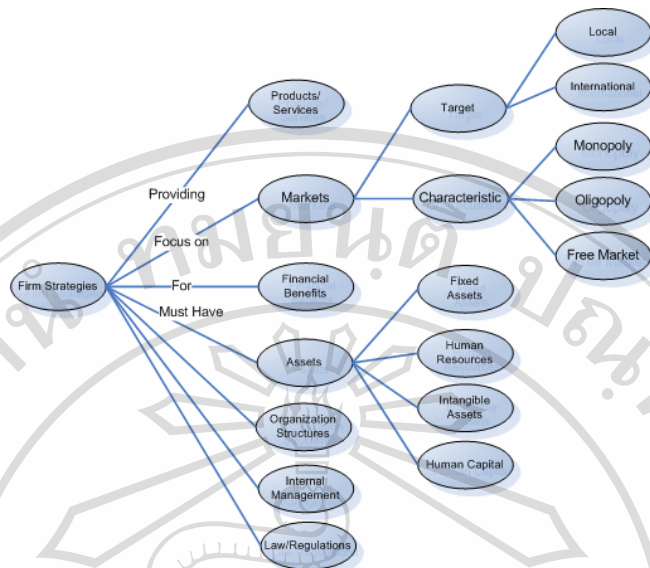
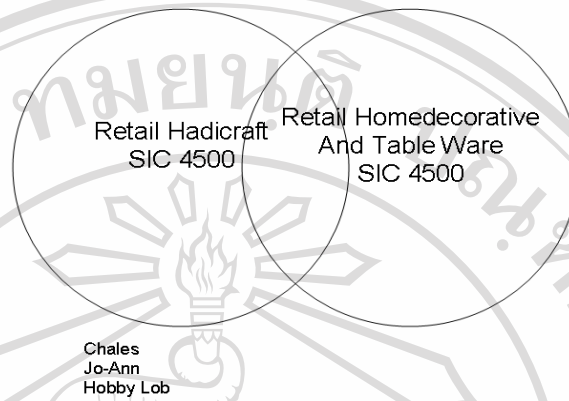Figures 5.21 Firm Strategy Ontology
Source: Tamprasirt, 2007

Figures 5.22 "Inside-Out" Art Value Creation
Source: Atipothi, 2005

Product Positioning

USA

Retail Hadicraft
SIC 4500

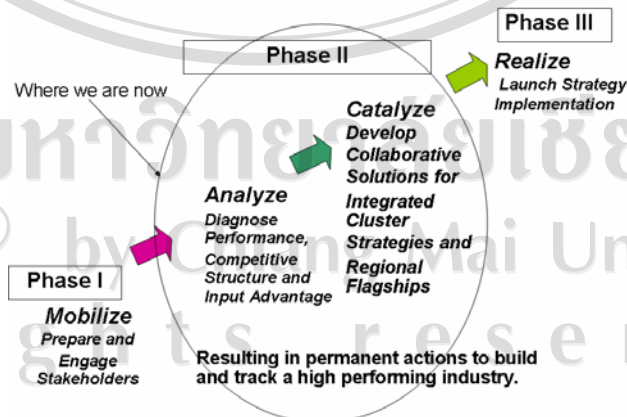Retail Homedecorative
And Table Ware
SIC 4500

Chales
Jo-Ann
Hobby Lob

Figures 5.23 "Outside-in" Market Demand Products
Source: Chakpitak, 2005

1. The other proven of the required strategic learning of the CogKnOS model was validated by the decision of the "outside-in" and "inside-out" requirements. Both of which represented the excellent value proposition with extremely different pros and cons. The cognitive model help ease the decision making of selecting the niche and value creation of the Chiang Mai cluster were select between the products or artisan. In one hand, for the product consideration, this focus on the "outside-in" market demand outlook approach. But in the other hand, for the artisan consideration, this focus on the "inside-out" capability value creation approach.

A Three-Phase Process
Strategy For a Cluster Strategy

Phase III
Realize
Launch Strategy
Implementation

Phase II

Where we are now

Catalyze
Develop
Collaborative
Solutions for
Integrated
Cluster
Strategies and
Regional
Flagships

Analyze
Diagnose
Performance,
Competitive
Structure and
Input Advantage

Phase I
Mobilize
Prepare and
Engage
Stakeholders

Resulting in permanent actions to build
and track a high performing industry.

Figures 5.24 The current status of Chang Mai Clusters
Source: Amaranan, 2005

1.1 CogKnOS model also demonstrated the beneficial enhancement for thechronic situation, particularly for Chiang Mai's clusters since it has been the longest running competitiveness development (Figures 5.23) in all the four cluster projects (have been initiated 6 year ago by USAID) and these cluster concepts used include the entire competitive model i.e. Diamond model, 5 force model, Meso model and 9 steps model as the part of their trails. Without learning mechanism, CDA involved has been significantly deviated from the main objectives and extremely difficult to revert back to the appropriate position otherwise since al of these approaches required different set of parameters when comparing to the other. And, the outcome and measurement will all have some pros and cons accordingly. By cognitive decision judgment to gain the quick wins for business survival was enough to generate the social mobilization momentum to uplift the cluster initiative onto another stage. This was the good judgment call for the time being for critical chronic situation.

1.2 Due to this cluster dynamism, the real time strategy to response to the endless need for help and facilitation. CDA must capable to effectively manage these requirements with innovative "real time" strategy.

1.2.1 Social Benefit of CogKnOS model in Maeklong Basin Region Tourism Community Cluster.

Maeklong is the river basin nearby Bangkok Metropolitan. It is the symbolically portray Thai culture and way of life which residing by the river's banks for centuries. Tourism includes home stay, agro-tourism, canola cruising and etc. is one of the main business in the regions. Strong community concerning to preserve various Thai traditional and cultures are now under way. This could be one of an excellent example for clustering to build up the strong senses of participation for the sustainable community.

Figures 5.25 Social Mobilization Concepts
Source: Atipothi, 2005

With in Maeklong cluster project, CDA introduced the unique social mobilization concepts to create the buy-in mobilization concept (Figures 5.24)

to "wake up" the sleeping local wisdom and region conversation to create the long term sustainability tourism using the various best practices around the world as the along with the vivid colorful displays artifacts as their consulting technique. From this cluster implementation, CogKnOS was also used as the validation model to support the decision making taken part of the initiative process. The realignment between the social stimulation judgment and the business trade off was the issue started from the beginning.

Maeklong is also another interesting basin area (Figures 5.25) for cluster and competitiveness development. The benefit created within the region from surrounding preservation reemphasis the sufficiency economy and Thai's way of life that pass on from generations. Culture preservation with the long term economic sustainability, particularly the coexisting between tourism and local way of life has been very significantly important issues for the micro enterprises, local community business and other similar types of small businesses in the areas.

Figures 5.26: Maeklong Basin
Source: Atipothi, 2005

1. The decision made early on resulted from the cognitive Cynefin reduction from the multiple outcome derivative decision making to the social contributions intervention focus (Figures 5.26). This was also selected from choices of the international best practices adaptation. The example of clustering approach here was resulted from the bi-polar extreme decision making based when compare between the government intervention of local community concern over Chiang Mai's business clusters initiative which have been evolved over many years.
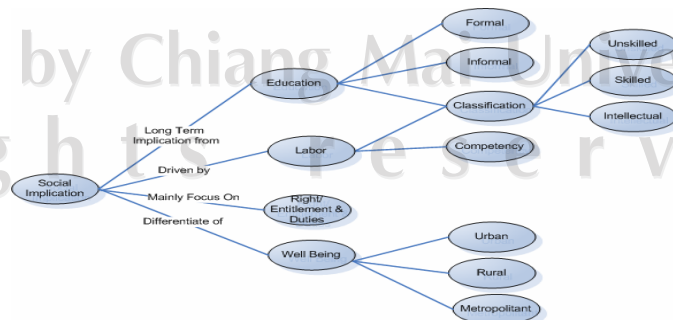
Figures 5.27 Social Implication Subsystem
Source: Tamprasirt, 2007

2. The Strength of the induction methods reemphasis the focus of this cluster on the participation and learning mechanism concerning with the social and community as the top priority. The vivid image of social stimulation represented by examples used by CDA to facilitate the learning mechanism for cluster participations (Figures 5.27).

Figures 5.28 Examples Illustrations
Source: Atipothi, 2005

3. The cluster selection and screening were the outcome of the people and community mobilization activities rather than the short-win business survival requirements. Simple business clustering by unsophisticated products development was selected from local community are agriculture, fishery and tourism as the result from the initial phase (Figures 5.28).

Figures 5.29 Result of Cluster Selection Process
Source: Atipothi, 2005

4. Cluster development was the by-product and the community learning to participate was the outcome of the cluster initiatives process rather than competitiveness model driven architecture.

4.1 Conclusion of the Robustness Validation.

The following table compared the highlighted of cluster for competitiveness development. (Table 5.1)

Using these two cluster empirical case studies to represent the validation of the model on the local context crossing audited with the competitiveness theoretical framework, this research verified the empirical contribution factors as followed.

Table 5.3 Validation Comparison Outcomes
Source: Tamprasirt, 2007

Chiang Mai Clusters	Maeklong Clusters
Cluster was driven from business improvement oriented extreme comparing to Maeklong's case study, particularly the improvement of SMEs and Micro Enterprises.	Cluster was approached from the social local community concerning and let the business improvement be the result evolved by the social development process.
Focus on "Outside-In" versus "Inside-Out" business decision making.	Participation Development coexisting with vivid stimulation learning methods.
Distributed job creation was one of the derivatives of SME development.	Direct grass root job creation was one of the focus outcomes to community mobilization activities.
Appling all the competitive models i.e. Diamond model, 5 force model, Meso model and 9 steps model as the underlying methodology of the trails.	Social Learning and best practice vivid illustrations were the main technique used.

From the evident of over 170 controllable contributing factors constructed above. Evidently, these factors are a mere justification explanation of the unpredictable of the critical chronic situation. As the result, these factors are the minimal criteria for the success of the cluster initiatives to be considered. And on the contrary, CogKnOS alternative model is cognitive knowledge model proposed the "outsider looking in" strategic learning methodology using bi-polar and cynefin as governing frameworks. This concluded that empirical test result signified the boarder terms of internal and externality integration generalization necessary over the infinite spill over of internal controllable contribution.

Chiang Mai Artisan and Maeklong Basin Clusters are at least two cases of empirical results of academic knowledge in the practical used. The proposed model helped the situational strategic decision making over the ongoing of clusters' life cycle i.e. Chiang Mai decided to switch from conventional commercial products to artisan and later on improve the ceramic weight with CAD/CAM innovation and etc (Figure 5.30).
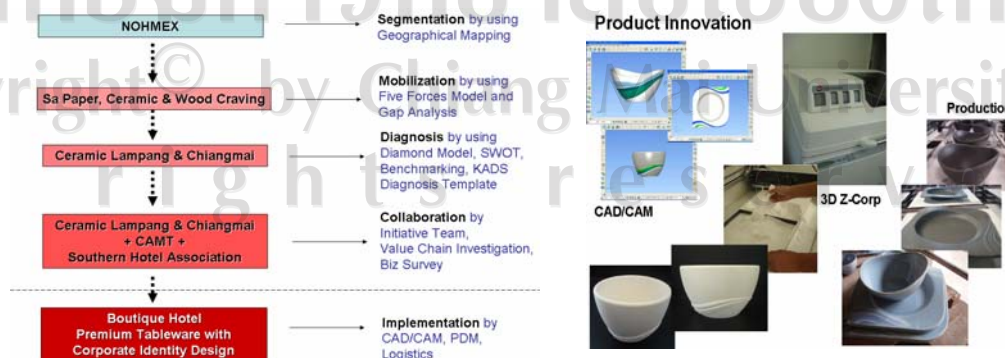

Figure 5.30 Chiang Mai Practical Results
Souce Chackpitak, 2007