CHAPTER 5 DISCUSSION AND CONCLUSION

5.1 Research Summary

The aims of this research have been to explore the knowledge creation process in UBI projects, identify the critical knowledge required in new product development (in the creative industries) and establish the critical knowledge management procedures within the UBI process. More importantly, the primary objective was to analyze and develop a knowledge management model for the UBI process. Following a review of essential literature and documents, primarily qualitative methods were used to gather both fundamental and in-depth data and information from case studies.

Knowledge creation is recognized as a key strategy for many companies and as such, managers frequently disclose the importance of focusing on new knowledge creation. With regard to the creative economy policy, the Thai government aims to achieve national competitive advantage through the creative industries, especially via SMEs. OSMEP and alliance universities have been one of many mechanisms to support SMEs through the country. To succeed in achieving government policy in line with the creative economy concept, a business incubation project with the main objective of developing new products and services was initiated with support from the OSMEP.

A UBI project for the northern region of Thailand was carried out by CAMT, Chiang Mai University in 2010 and 2011 and constituted the main sample in this research. During the initial stages of this research, a previous business incubation project related to e-tourism and e-handicraft (2E) was employed to identify the problems and relevant issues. Literature suggests the creative economy or the creative industries are fundamentally knowledge-based, where knowledge and creativity become a critical resource for development. Consequently, creating new knowledge within a UBI project is important for new product development in the creative sector. During the incubation process, industry experts are required to assist entrepreneurs in creating new products. This research focused on the critical processes that affect new product development in the creative sector for SMEs in Northern Thailand. In particular, the research aimed to understand how experts' incentives enhance their contribution and best efforts in a UBI project. Observations, document analysis and interviews were conducted with 17 SMEs, selected from 119 applicants.

The research identified critical processes affecting the project outcome, developed UBI from a knowledge management approach, and created an effective strategy for UBI project management. Following these steps, a knowledge management model for UBI was developed. Taking the perspective of knowledge management, the sections below provide conclusions to the findings, suggestions and discussions relating to important areas of managing UBI projects.

5.2 Discussion and Conclusions

The discussion and conclusions are separated into five sections according to the original research questions (see Chapter 1). These sections are as follows: 1) the incubation processes in a university business incubation project, 2) the knowledge creation processes in a university business incubation project, 3) the critical knowledge management processes that affect the project, 4) an appropriate knowledge management model and framework for Thai UBIs, and 5) a practical management strategy for Thai UBI.

5.2.1 Incubation Processes in the University Business Incubation Project

The objectives of the Creative Building for North SMEs' project 2010 were to develop a new source of national income from the concept of the creative economy, to develop new products and services, to strengthen entrepreneurs' capabilities through the creative economy concept, and to enhance the new product development and prototype process for SMEs. Entrepreneurship and technology are major constraints in many developing countries (UNCTAD, 2008) and as such, the incubation process followed three main phases intended to facilitate business development with support from government organizations (e.g. OSMEP and universities). These phases are described in Figure 5.1 and the key activities in each phase can be outlined as follows:

Selection phase

- Advertisement activities
- Application reviews (based on application form, business portfolio and business plan)
- Selection of applicants (from entrepreneurial capability, business and organization readiness, creativity focused and market potential)

Training and development phase

- Training and workshops
- Product planning
- Product concept development
- Prototype development

• Commercialization phase

- Buyers' comments and suggestions
- Trade fair participation and business matching

K.I.Asia (2009) indicates that the creative economy depends less on natural resources, and more on skilled, creative and innovative labor. In the selection phase it was shown that entrepreneurial creativity was considered during the selection criteria in order to support development towards creative economy products and services.

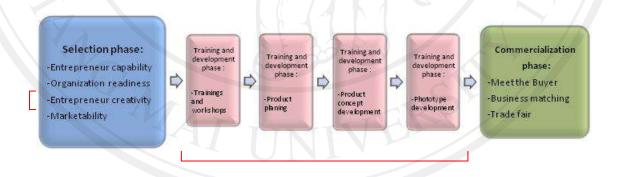


Figure 5.1 The business incubation process as it relates to the creative economy in the Northern Region of Thailand

Although creativity levels varied among entrepreneurs, the training and development phase provided opportunities for knowledge sharing and development of creativity between entrepreneurs and experts. To realize the effectiveness of the incubation process, and increase the chance of success for the participating businesses

(thus achieving project objectives), the operator of the UBI project must pay attention to the selection and training phase (Figure 5.1).

Northern SMEs – Handicraft Environment:

Entrepreneurs' creativity, along with their ability to generate new ideas and combine existing ideas to create new products or services, requires special attention and an appropriate process. Experts as external sources of knowledge are important and valuable for entrepreneurs' learning, especially in terms of market knowledge (e.g. information about trends, consumer behavior, fashion information, resources). Other useful knowledge from experts includes information regarding consumer demand, such as trends and market conditions which acted as key stimuli in the project to drive participants to generate new product ideas for specific target markets. For example, in the OSMEP 2011 project, a local silk clothing producer was able to select and integrate local flowers (from expert assistance) with modern consumer preferences and new textile technology to create a set of new outdoor accessories targeted at boutique hotels in southern Thailand.

5.2.2 Knowledge Creation Processes in a UBI Project

The knowledge creation process in a UBI project exists in both the training and development, and the commercialization phases. The SECI model (Nonaka, 1994) was employed to provide a suitable reference to identify activities and output in each development phase. The application of the SECI model to the UBI project is described as follows and illustrated in Figure 5.2. The socialization process is analogous to the training and workshop process, the externalization process is analogous to the new product planning process, the combination process is analogous to the new product concept development process, and the internationalization process is analogous to the prototyping and commercialization testing process.

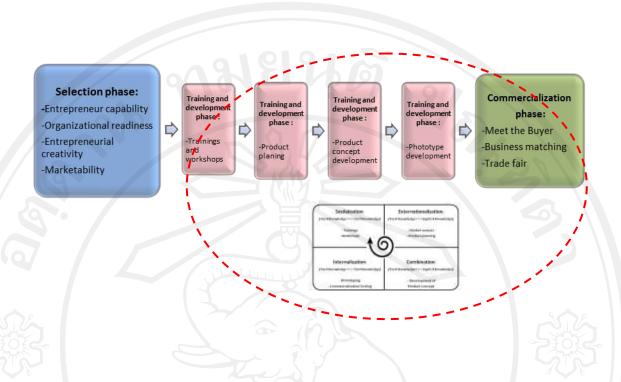


Figure 5.2 Knowledge Creation Process in a UBI Project

Investment in proper or formal training is limited among Thai SMEs with informal and on-the-job (OTJ) training often being preferred (Thassanabanjong et al., 2009). The OSMEP projects (2010 & 2011), focused on workshops and learning by doing (similar to on-the-job training) to improve local SMEs' problems. Experts' knowledge in related industries assisted SMEs in new product development with the aim of increasing commercial opportunities. The SECI model (Nonaka, 1994) was applied to develop the UBI process and satisfy SMEs' requirements for development. While the OSMEP projects experienced success, problems and suggestions were also identified from the case studies. Management of UBIs must pay attention to these problems and suggestions, which are summarized below.

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Summary of Problems from Operation of the OSMEP Projects 2010 and 2011

- Limited trust of expert (consequence incubatees unwillingly disclose their business secret)
- Experts have limited time (result late product plan and concept delivery which then limits time available for prototype work, thus causing frustration among incubatees)
- Expert usage of vocabulary (effect incubatees misunderstand marketing vocabularies when discussing with experts)

Summary of Suggestions from Operation of the OSMEP Projects 2010 and 2011:

- Other than focusing on new product development, the project should pay attention to building an effective business network.
- The university and supporters (OSMEP) should allow more time to operate the project.
- Experts should pay more attention and provide time for discussion and comment with incubatees to inform them of limitations and problems which can then be solved properly and punctually.

5.2.3 Critical Processes that Affect Project Outcomes

By employing Nonaka and Takeuchi's (2004) knowledge creation framework, this research identifies two critical knowledge creation processes for university business incubation projects.

Figure 5.3 shows that in UBI projects, externalization (product planning) and internalization (prototype development) are the two most critical processes that affect the likelihood of commercialization.

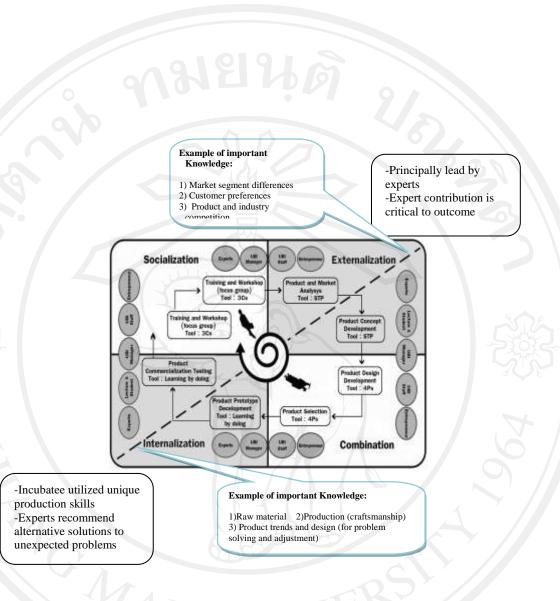


Figure 5.3 Effect of Critical process on project outcome Creation (adopted from Nonaka and Takeuchi, 1995)

The externalization process (product planning) involves the conversion of tacit to explicit knowledge, mainly through the development of a new product plan. It was principally experts who led this process and therefore the previous experience, motivation and concentration of experts affected the degree of their contribution in developing a new product plan. The most important knowledge in this process is market-segmentation, customer preference and product competition (see Figure 5.2). Among the top commercializable products, many incubatees reviewed experts'

interest and/or marketing ideas during the socialization process, which implies opportunity for further business networking opportunities.

The internalization process (prototype development process) converts explicit knowledge to tacit knowledge. The interview data indicates that incubatees utilized unique production skills and knowledge of raw materials that were suitable for new product development. In the meantime, results indicate that experts suggest and recommend alternative solutions to address unexpected problems in prototype development. Important knowledge in this process relates to raw materials, production (craftsmanship – for problem solving) and product trend and design (for problem solving and adjustment), as shown in Figure 5.3. In addition, results from document analysis and expert interviews, show that when a constructed prototype is comparable to the product concept, experts' internalization is limited. In contrast, when the constructed prototype requires major adjustment, experts' experience a higher degree of internalization. Project managers suggested that experts with business or marketing ideas for new product development are likely to create superior product plans when compared to those experts without business or marketing ideas.

The new product development processes in a UBI project comprises several parallel processes. Sharing tacit knowledge, i.e., market and product experience is a vital process for project effectiveness. In addition, the effectiveness of the tacit knowledge sharing process affects other subsequent development processes. For example, the externalization process involves development of mutual understanding and agreement on the new product planning process, occurring in parallel with training and workshops (socialization process). During this socialization process, individuals' (incubatees, experts and facilitator) tacit knowledge is shared. Together, these processes allow final agreement on new product planning, which is followed by a scoping and shaping of the new product concept with a careful evaluation and selection of markets, skills and resources. Exchange of new and existing knowledge between incubatees, experts and facilitators (project manager and staff) is mainly communicated through face-to-face meetings, telephone conversations and email. The internalization process experienced during prototype development provided a hands-on production experience and real production limitations that became vital

when creating new knowledge, and providing justification of commercialization potential.

5.2.4 Knowledge Management Model and Framework of Thai UBI

Business incubators are important instruments in creating employment and establishing sustainable new start-ups to support knowledge based enterprise development. Like other countries, the objectives of UBI programs in Thailand are to utilize university human resources, intellectual capital and expand available research work with the aim of commercialization. The UBI project development process requires cooperation between university staff, experts and entrepreneurs as the main participants.

Most SMEs in Thailand, especially micro and small enterprises, are limited in their training opportunities. When compared to larger enterprises where resources such as capital, staff, infrastructure and business networks are more sufficient SMEs are often less concerned about knowledge management and focus primarily on labor issues (since most are labor intensive businesses). In view of these constraints, when considering knowledge management as related to SMEs, the management model and framework must be simple and uncomplicated.

The knowledge management model and framework (Figure 5.4 and Table 5.1) presented below employs the SECI knowledge creation model. From a knowledge management perspective, this model and framework is concerned with participants' (entrepreneurs, experts and university staff) needs and provides incentives in order to encourage contribution and sharing at each stage of the business incubation process. In addition, key success attributes, i.e., objectives, processes and outcomes are illustrated in order to ensure achievement of the desired result.

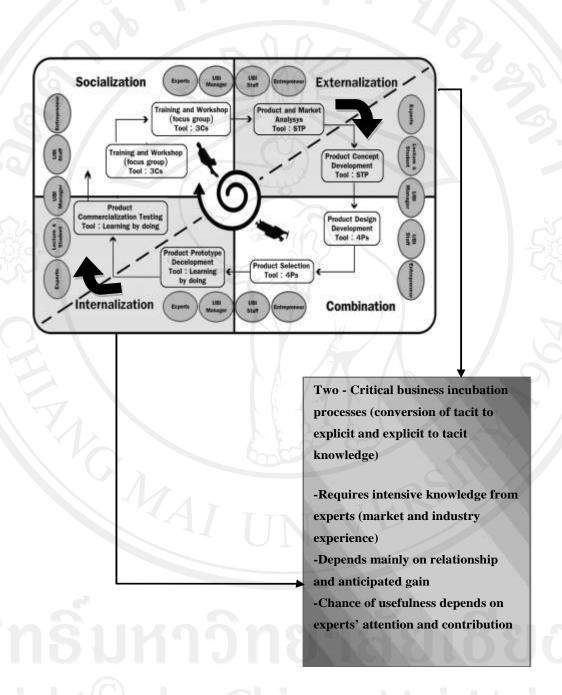


Figure 5.4 Knowledge Management Model for Thai UBIs Creation (adopted from Nonaka and Takeuchi, 1995)

Table 5.1 Knowledge Management Framework for Thai UBI Project

Knowledge Creation Process (Adapted from SECI Model)	Business incubation process	Key Participants	Purpose / Output	Key success attributes	
Training and Workshop (Socialization)	Step 1: Training and workshop (Large group)	 Experts Entrepreneur UBI manager and –staff Lecturers and students 	Purpose: Probe on potential product and business opportunities Develop business network Output: -Direction of new product idea -Better understanding of market	Objectives: Break the ice Personal introduction (profile, experience, inspiration) Processes: Face to face	
	Step 2: Training and workshop (Focus group)	ExpertsEntrepreneurUBI manager and –staff	Purpose: Brainstorm on new products and sharing new knowledge Output: - Recognize and identify core business competencies -List of possible new product ideas	discussion (group and individual) Site visit Outcome: -Trust and positive relationship -New knowledge	

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Knowledge Creation Process (Adapted from SECI Model) Business incubation process	Key Participants	Purpose / Output	Key success attributes
duct Development (Externalization) Step 3: Product and Market Analysis	ExpertsEntrepreneurUBI staff	Purpose: Indicate business opportunities and align with SME business objectives Determine new target market and consumer segment Output: -Industries and market analysis (SWOT analysis) -Competitor or key player analysis -Product positioning -Potential market growth -List of target markets and new product ideas	Objectives: Product plan developmen t and approval Additional tacit knowledge sharing Processes: Site Visit Individual meeting Telephone and email consultation
Market and Produc Step 4: Product Concept Development	 Entrepreneur UBI staff Lecturers and Students 	Purpose: Create new concept for new target market and selected consumer segment Students receive hands-on experience Output: New product concept (product theme, color, function, material) Marketing concept for new product	Report (product plan and market analysis) Outcome: Mutual trust and agreement on new product plan

Knowledge Creation Process (Adapted from SECI Model)	Business incubation process	Key Participants	Purpose / Output	Key success attributes
Product and Design Selection (Combination)	Step 5: Product Design Development	EntrepreneurUBI staffLecturers and Students	Purpose: Create collection of new design for new target market and selected consumer segment Students receive hands-on experience Output: New product design (design, material, skills required for production)	Objectives: Product concept developmen t and approval Agreement on concept for prototype developmen t Processes: Site visit
Product and Design S	Step 6: Product Selection	ExpertsEntrepreneurUBI manager and –staff	Purpose: Discussion and selection of design for prototyping. Mitigating risk and cost of new product development Output: New product selection (Reasoning, risk identification, expert suggestion)	Individual meeting Telephone and email consultation Report Outcome: Mutual agreement on new product concept selected

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	Knowledge Creation Process (Adapted from SECI Model)	Business incubation process	Key Participants	Purpose / Output	Key success attributes
	ction and Commercialization (Internalization)	Step 7: Product Prototype development	ExpertsEntrepreneurUBI manager and –staff	Purpose: Developing and adjusting prototype Expert - Gain new knowledge from incubatee by means of hands-on experience Output: New product prototype (Quality inspection, final adjustment and recommendation)	Objectives: New Product Prototype Hand on experience - New tacit knowledge Processes: Site visit Individual meeting Telephone consultation
ลิขสิเ	Production and Comme	Step 8: Product Commercialization	 Experts Entrepreneur UBI manager and –staff Lecturers and students 	Purpose: Obtain buyer and customer suggestions for further development Output: -Response and feedback from customers and buyers -Requirements for further development	Outcome: Prototype developmen t and adjustment Future business network Source of external knowledge and assistance

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5.2.5 The Strategy for UBI

To strengthen Thailand's economy in the creative industries, business incubation and entrepreneurial development can foster continuous progress towards creative goods and services. UBI can provide support to the Thai government development strategy, which in terms of the creative economy, focuses on the creation of new products and services from local wisdom and culture. The strategy is designed to encourage SMEs to pay attention to value creation from existing intellectual assets.

With regard to UBI strategy (Figure 5.5), this research focuses on developing the competitive advantage of SMEs with support from an effective UBI process. The concept not only focuses on creating individually competitive businesses, but on developing sustainable business opportunities for SMEs and the country as a whole. The strategy for Thai UBI encourages development of high value added products and difficult to imitate goods and services which are created from the available intellectual assets and in accordance with government policies. Instead of exploring imported materials, experts and entrepreneurs look for opportunities by utilizing local materials, local identity, traditional knowledge and technology to create new marketable products and services.

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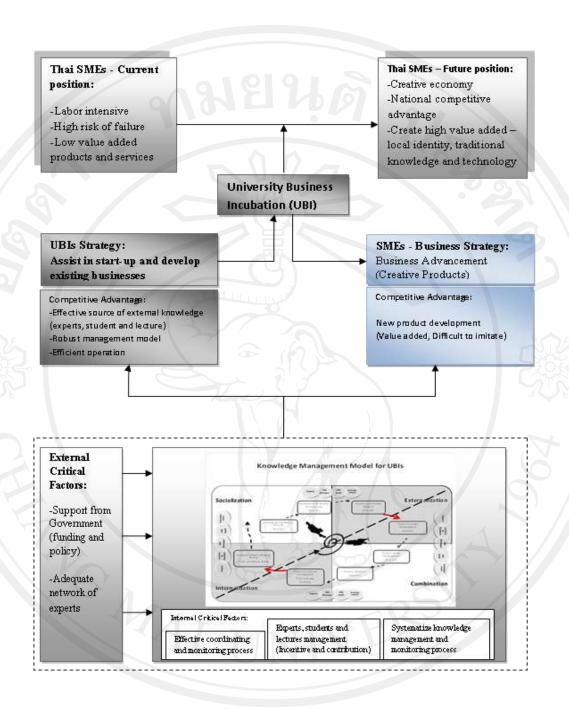


Figure 5.5 Thai UBI Strategy Toward the Creative Economy

According to the proposed management strategy, Thai UBIs must develop a robust management model and effective operation to successfully manage external sources of knowledge that support SME business strategies. Despite the nature of Thai SMEs' focus on labor-intensive businesses and their training limitations, Thai UBI employs knowledge from industry experts and the available knowledge from lecturers

and students to assist businesses in identifying new opportunities and creating new products and services.

The proposed knowledge management model and implementation framework for Thai UBI follows an eight-step process, providing guidelines that can improve the success of business incubation operation. These guidelines include information related to participants, objectives, processes, expected output, and expected outcome. The quality of knowledge in terms of actionable knowledge (Yoo et al., 2011) and tacit knowledge depends on the expert (Oguz and Sengun, 2011), which is the most critical factor to incubation success. From the implementation framework for Thai UBI purposed, through an eight-step process students and lectures benefit from knowledge transfer and knowledge creation activities. It is very important to sustainable development of Thai UBI. From proposed knowledge management model, systematic business incubation process students gain hand-on experience (from industry expert) in new product development with actual market issues and lectures gain practical experience for further research and academic advancement. Predominantly, students and lectures development through UBI will provide revitalization for local economy and promote national competitiveness.

5.3 Discussion on Northern Thailand's Handicraft SMEs and the Creative Economy

Thai SMEs must focus on increasing value added processes, market differentiation, knowledge-based products and processes and new marketing channels. In the handicraft industry, the recommended focus should be on combining local identity and traditional knowledge with modern technology to create new products and services that enable increased competitiveness. In comparison, SMEs in the handicraft industry require a greater extent of knowledge support than those industries relying on technology. In addition, when compared with large enterprise, SMEs have fewer resources (capital, research, structure and knowledge.) New products and services should respond to the changing needs of their target customers or be tailored to specific niche markets in order to offer the highest value to their customers. External

knowledge, like knowledge from industry experts, is critical to handicraft SMEs' success. In addition, since SMEs are an important component of Thailand's economy, the government should continue to support both tangible (new product development) and intangible (new knowledge) forms. Furthermore, the concept of industry clustering has a higher chance of success as SMEs realize the value of knowledge sharing and knowledge creation.

5.4 Discussion on the Processes of Critical Knowledge Creation and UBI

The two critical processes for business incubation are product and market analysis, and product prototype development. The product and market analysis process is primarily directed by experts, where their previous experience, motivation and concentration considerably affects the usefulness of the analysis, and which in turn affects the business incubation development process. University incubators must pay attention to the quality of product and market analysis, and support the prototype development resulting from expert contributions. During the prototype development process, incubatee input was craftsmanship (production skills) and knowledge of local raw materials. Experts' input consisted of recommendations of alternative solutions to address unexpected problems and new uses for local materials, a final refinement prior to the commercialization process. Site visits by experts (face to face) provided consistency with product concepts and design development. During the 2010 and 2011 projects, the availability of experts was limited due to geographical constraints. The project is more effective if experts' business incentive is identified prior to joining the project and if available experts are limited, another team of experts should be utilized to support market and commercialization objectives in the best interests of incubatees.

5.5 Discussion on Enabling Expert Contribution and Effort

In the handicraft industry, knowledge is an important input factor in the development toward a creative industry. Knowledge from industry experts is considered as external knowledge that is critical to the success of handicraft SMEs.

Issues of industry expert contribution are important and positively affect the marketability of a new product. In a UBI project, expert contribution is related to their involvement in each development process. As described earlier, two critical processes to UBI success are product and market analysis and prototype development, which require industry expert contribution to ensure a successful project outcome.

To understand industry experts' contribution and effort, a simple analysis using the technique of applied behavior analysis (ABA) can be employed. In short, according to Pavlov et al. (n.d.), ABA highlights the three factors that drive human behavior including antecedents, competencies and consequences, as shown in Table 5.2.

Table 5.2 Applied Behavior Analysis of Experts (Pavlov et al., n.d.)

Three Factors	Definition	Experts related action in a UBI			
Antecedents	Things that prompt expert to take action.	-Signed agreement on creating product development -Terms of reference attached to the agreement.			
Competencies	Knowledge, skills and abilities that enable expert to perform assigned tasks.	-Work experience - Product and market analysis and development capabilities			

Table 5.2 Applied Behavior Analysis of Experts (Pavlov et al., n.d.) (continued)

Three Factors	Definition	Experts related action in a UBI
Consequences	Things that happen to that expert when certain actions or behaviors are carried out.	-Consultation fee -Future consultation opportunities -Future business opportunities
3 2	7	-Future business network -Useful new tacit knowledge

As indicated in Table 5.2, the antecedents factor can be driven by a signed agreement and terms of reference attached to the agreement. The competencies factor is driven mainly by experts themselves. On the other hand, the consequences factor was clearly driven only by the consultation fee, while other elements are unclear. However, the UBI projects described earlier in this chapter indicate the important effects of experts' business incentives in relation to their contribution and effort. Therefore, it is vital that a proper management process is initiated to fulfill consequential factors that positively drive experts' contribution and effort.

5.6 Knowledge Management for UBI

This research found that to ensure the long-term success of the university NPD project and UBI center, a recurring spiral of knowledge creation is required to reach higher levels of knowledge. Universities and entrepreneurs benefit and realize long-term success by leveraging the spiral of knowledge to continually upgrade and expand the knowledge base of individuals, teams, and the organization. The spiral of

knowledge is fundamentally important when focusing on the creative economy, which is reliant on knowledge-based activities, the creative classes and creative entrepreneurs (Florida, 2002). The implications of this research are useful in developing long-term strategies for university projects and UBIs, which critically depend on expert contribution.

To ensure long-term success of the university NPD projects and UBIs, a 'spiral' of knowledge (Figure 5.4) must be considered. In organizational knowledge creation, a repeating 'spiral' of knowledge is required to reach higher levels of knowledge. Organizational knowledge creation, after hands-on experience of prototype development and commercialization testing (internationalization), allows both entrepreneurs and experts to enrich their own tacit knowledge base. The spiral of knowledge can be indicated through continuous contribution from experts and/or expansion of the expert network's contribution to future projects. In competitive situations, for knowledge sharing to exist, proper knowledge sharing methods must occur to ensure continuous and sustainable business development.

5.7 Research Limitations

Like most research, this study has several limitations. First, the study was geographically constrained as it was conducted in the northern region of Thailand, which may limit the ability to generalize results to other regions. Second, the knowledge creation model applied in the study does not provide specific guidelines or exact definitions, and as a consequence, the definitions applied during analysis were referring to information gathered from literature reviews. Third, there may be some variability in the comprehensiveness of discussion and interview data due to time constraints and the volatility involved in managing dynamic business projects. Regardless of the limitations, this study provides critical and important findings which will prove useful in the future management of UBI in Thailand.

5.8 Future Work

There are several areas based on the data collected from this study that require further investigation. These are:

- 1. Future work should focus on sharing and managing knowledge from an organizational perspective.
- 2. Attempts should be made to expand this study to other industries.
- 3. There should be a future focus on the different environments that shape the shared knowledge environment.

5.9 Conclusion

In summary, UBIs in Thailand are essential for development toward creative industries. After investigating issues of Northern Thais' SMEs development in creative industries from knowledge management perspective, two critical processes affecting UBI process were product planning and prototype development process. According to knowledge creation process, product planning is related to externalization and prototype development process is related to internalization. These two critical processes require assistance from experts that provides higher chance for commercialization of new developed product.

Effective UBI process can strengthen Thailand's economy in creative industries. To accomplish this task UBIs need to enhance knowledge sharing and knowledge creation among students, lecturers, entrepreneurs and experts. The proposed UBI knowledge management model for Thai SMEs acknowledge the importance of expert incentive to share their knowledge by identifying two critical processes and critical knowledge required for business incubation mentioned. The knowledge management implementation framework developed from proposed UBI knowledge management model for Thai SMEs provides proper business incubation processes to enhance entrepreneurs' and experts' contribution by indicating proper knowledge management objectives and key knowledge required as a guideline for each process.