

CHAPTER 3

Research Methodology



In conducting the study entitled “A Model of Community Data System Management Process by Digital Community Center and Citizen Involvement”, the researcher designed the methodologies to meet three objectives: 1) to study the community data usage requirement, 2) to develop a prototype of community data management system, and 3) to create a model of community data system management process by digital community center and citizen involvement, as follows:

Research Framework

Based on involvement with the community in the problems of the Tao river basin area affecting other aspects of the community, both direct and indirect outcomes and observations showed that the community reflected the long-going problem by telling us the root cause of the problem, situations of how to deal with the arising problems and reflecting the need to solve the problems. In the past, many organizations took part in research on cause of the problem and also the possible way out of the problems. However, at present, people have not been informed about the current status of how the problem is being solved. This caused inertia in the community to participate in any activities around the problem leading to the problem

being ignored and unresolved. However, community leaders still try to find the way out of this problem and they gather to study, search for data, learn from what happened and try to transfer the data in the past and present to the younger generation so that they can learn from this event as a lesson. Having said that, data that other organizations or staff had collected were over the place, some were lost and some were incomplete. In addition, there was a lack of knowledge in systematic data management process. Thus, a group of community leaders had an idea of systematic data collection, but they did not know how to do it, how to search, gather, archive and distribute them. The community leaders cannot accomplish all of these alone due to insufficient number of staff, processes, financial budget and tools. Thus, there is a search for organizations that can assist the processes in terms of providing service to the community. The researchers have an idea of having community digital center or community ICT learning center with the role as the hub for community information technology to drive the community to set up planned data system, design, function and being used in community. This resulted in a very good response to the outlined objectives in setting up these centers in the first place (Ministry of Information and Communication Technology, 2016). At present, there is no center that has designed citizen involvement in data management process yet.

The researchers have planned the scope of research in that citizen involvement is included in learning with administrators of community digital centers and better understanding in data management process leading to the design of the process. From Figure 2.4, the scope of research is involved in Research and Development which is part of Action Research to obtain the results of process and tools developed to become computer software used to respond to the need of the

community. The researcher has placed the scope that community digital center will build new services to the people aside to other basic services as mentioned in the review of concept on community digital centers in Thailand. The new service is the community data service as viewed accordingly by ITIL information technology service framework. The data management system obtained from carrying out the process previously designed will be a tool in service and to achieve the data management system with involvement from community digital center and citizen. The researcher has applied the principles of citizen involvement in creating the atmosphere of learning, planning, functioning, following up, evaluating and also decision making together to create the whole process together. These processes to be developed are those regarding information system development which will bring about tools in managing the data. In each process, there are process application, process description, role designation, participation under ITIL framework. ITIL framework will focus more on service to the users than development of system.

The aims of this research in terms of community data system management processes with involvement from community digital center and citizen are 1) To study the demands of the community in using data and data management in the community 2) To build the model of community data management system and 3) To build community data system management processes with involvement from community digital center and citizen

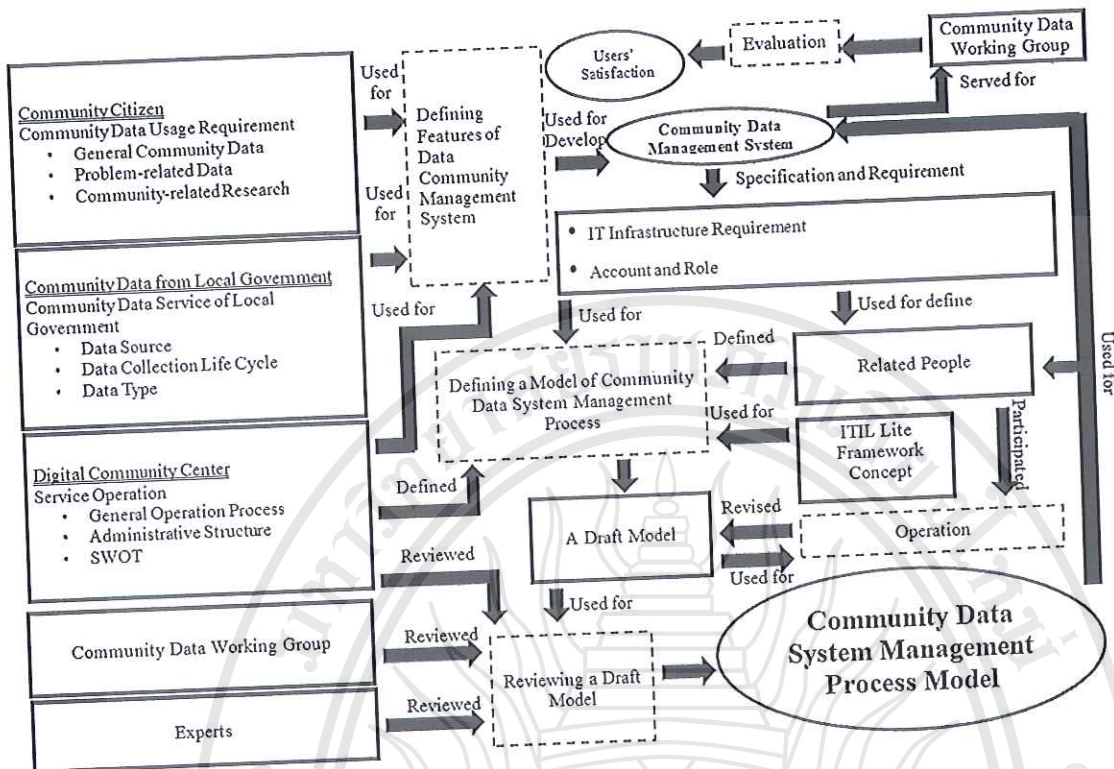


Figure 3.1 Research framework

Study of community data usage requirement

In order to study the community data usage requirement of the people in Mae Ku and Phra That Pha Daeng subdistrict, the instructions of data collection and analysis were designed as shown in Figure 3.1

1. Population and sample group

Population used for this study consisted of citizens, community leaders, 7,163 people in Phra That Pha Daeng subdistrict, and 4,905 people in Mae Ku subdistricts. The total population from both subdistricts was 12,068 people. (Local Administrative Division [LAD], Ministry of Interior, 2015)

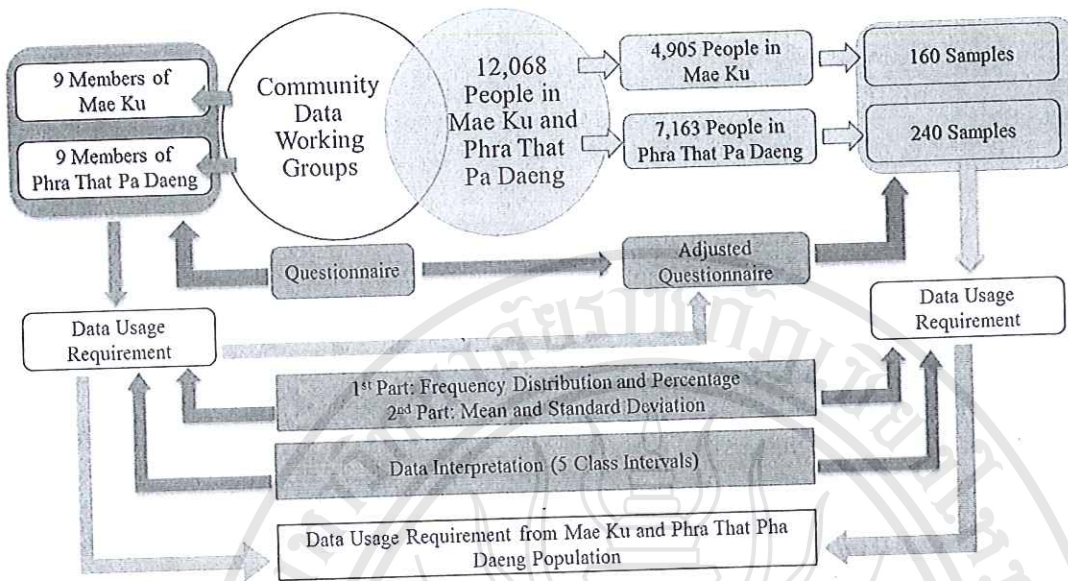


Figure 3.2 Procedure for exploring data usage requirement

According to Figure 3.1, community data usage requirement was collected from 2 parts, community data working groups as the key-informants and people in Mae Ku and Phra That Pha Daeng subdistrict as system user. Then, the sample population was separated into 2 parts too.

1.1 Community Data Working Groups

The sample populations in this part consisted of 18 people, 9 members of community data working group of Mae Ku subdistrict and 9 members of community data working group of Phra That Daeng subdistrict. They were defined by purposive sampling method.

1.2 The General Users

According to Figure 3.1, the total of population residing in Mae Ku and Phra That Pha Daeng subdistrict was 12,068 people. In order to obtain the correct

number of general user sample, Taro Yamane formula was applied as shown in Equation 3.1.

$$n = \frac{N}{(1 + Nd^2)} \quad (3.1)$$

Where

n = number of sample

N = number of population

d = deviation value which was determined as constant value equal to

0.05

The number of population was calculated according to Equation 3.1. The approximately result was 388 samples (387.18 samples as exactly result). However, this study used 400 samples as total sample size and quota sampling method was conducted. The samples for each subdistrict was illustrated in Table 3.1

Table 3.1 The sample size of general user in each subdistrict

Subdistrict	Number of population	Approximately Sample
Mae Ku	4,905	160
Phra That Pha Daeng	7,163	240
Total	12,078	400

2. Data and data source

To accomplish the community data usage requirement studying, primary data and secondary data were used. The details were described as follows:

2.1 Secondary data

Secondary data collected by researching documentaries was about the characteristic and general information of Mae Tao basin area covering Mae Ku subdistrict and Phra That Pha Daeng subdistrict. The information was collected from annual report of Mae Ku subdistrict municipal and Phra That Pha Daeng subdistrict administrative organization.

TCNAP questionnaire, data lists from web sites of smart information village, and related research document (Tetiawat & Isichaikul, 2010) were conducted for creating community data usage requirement questionnaire which was used in this study.

2.2 Primary data

Primary data was collected by using questionnaire to obtain the community data usage requirement from community data working groups which consisted of 18 samples. The collected data included; 1) general information of the respondent, 2) level of community data usage requirement, and 3) optional community data usage requirement.

To study the community data usage requirement from 400 samples who were community citizens, questionnaire was also conducted to obtain following information; 1) general information of the respondent, 2) community data acknowledgement channel and digital community center usage experience, 3) level of community data usage requirement, and 4) optional community data usage requirement.

3. Research instrument and procedure

3.1 Creating questionnaire: The researcher created the questionnaire to obtain community data usage requirement of community data working groups by merging data lists from research-related papers, TCNAP questionnaire data lists, and data lists from smart information village's web sites. The collection of data lists is shown in Appendix A. The result of created questionnaire as shown in Appendix B, consisted of 3 parts as follows:

3.1.1 Part 1: General information of the respondents - This part was designed as checklist type and fill in the blank,

3.1.2 Part 2: Level of community data usage requirement – This part was designed as 5 levels Likert scale and consisted of 16 data sets.

3.1.3 Part 3: Optional community data usage requirement – This part was designed as opened-end question.

3.2 Collecting the requirement of community data working groups: The searcher surveyed 18 samples from community data working groups of Mae Ku subdistrict and Phra That Pha Daeng subdistrict by using questionnaire as shown in Appendix B.

3.3 Analyzing and reporting the requirement: The researcher analyzed community data usage requirement of community data working groups and then reported the results to the community data working groups.

3.4 Questionnaire improvement: The researcher improved the questionnaire, used in previous step, by re-grouping the data lists using the results from previous step and suggestion of community data working groups to an improved questionnaire (Appendix C). It consisted of 4 parts as follows:

3.4.1 Part 1: General information of the respondents - This part was designed as checklist type and fill in the blank.

3.4.2 Part 2: Community data acknowledgement channel and digital community center usage experience – This part was designed as checklist type and fill in the blank.

3.4.3 Part 3: Level of community data usage requirement - This part was designed as 5 levels Likert scale and consisted of 19 data sets.

3.4.4 Part 4: Optional community data usage requirement – This part was designed as opened-end question.

3.5 Gathering the requirement of general users: The researcher surveyed 400 samples who was community citizen residing in Mae Ku subdistrict and Phra That Pha Daeng subdistrict by using improved questionnaire (Appendix C).

3.6 Analyzing and reporting the requirement: The researcher analyzed community data usage requirement of the community citizens by conducting the comparison with the requirement of community data working group. Finally, the conclusion of the community data usage requirements was reported to the community data working groups.

4. Data analysis

In order to study the community data usage requirement of the community data working groups, the analysis was conducted using statistical methods. Percentage, average, and standard deviation value were used to analyze the data from the questionnaires. According to questionnaire as shown in Appendix B and C, the general information of respondents section and community data acknowledgement channel and digital community center usage experience section were analyzed as a

percentage. Level of community data usage requirement section in both questionnaires was analyzed using average and standard deviation. In order to evaluate the findings obtained from data analysis, the absolute criteria as shown in Table 3.2 were used.

Table 3.2 The absolute criteria used for evaluate the level of the community data usage requirement

Average Range	Level of Requirement
4.21-5.00	Very High
3.41-4.20	High
2.61-3.40	Medium
1.81-2.60	Low
1.00-1.80	Lowest

Development of community data management system prototype

In order to develop a prototype of community data management system based on community data usage requirement from previous result, the instructions of data collection and analysis were designed as shown in Figure 3.2

1. Population and sample group

Population and sample group in this step consisted of 18 people of community data working groups, 1 officer of Mae Ku municipality, 1 officer of Phra That Pha Daeng subdistrict administrative organization, 2 administrators/operators of digital community center from each subdistricts, and 2 administrators from the digital community centers on the border of Tak province, Kamphaeng Phet Rajabhat University Mae Sot. The purposive sampling method was employed to select samples.

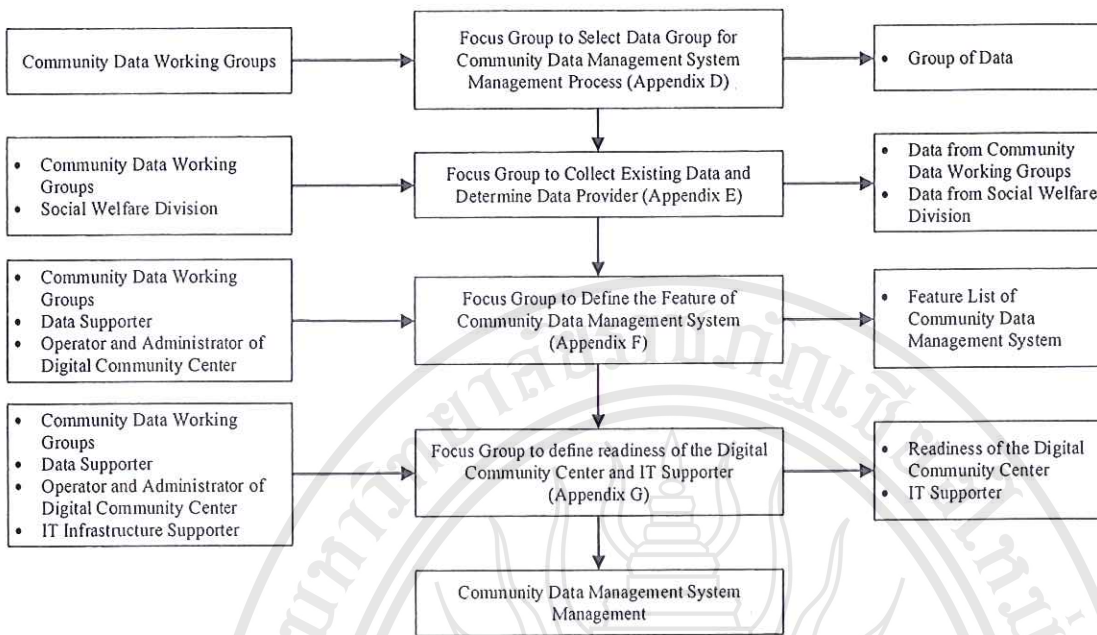


Figure 3.3 Procedure for developing a prototype of community data management system

2. Data and data source

The data was collected by using focus group process to obtain important information that was used to develop a prototype of community data management system. To select the data sets from the results of community data usage requirement, focus group was conducted on 18 people of community data working groups. The topics of focus group is shown in Appendix D.

In order to collect existing data and determine the data supporter, focus group was conducted on 18 members of community data working groups and 2 officers of local administrative organization. The topics of focus group is shown in Appendix E.

In order to define the feature of community data management system based on collected data, focus group was conducted on 18 members of community data working groups, 2 data supporters, 2 operators/administrator of digital community center of Mae Ku subdistrict, 2 operators/administrators of digital community center of Phra That Pha Daeng subdistrict. The topic of focus group is shown in Appendix F.

In order to define readiness of the digital community center and IT supporter, data collected from SWOT analysis discussed by the all representatives as shown in Figure 3.2. The topic in this data collection is shown in Appendix G.

3. Research instrument and procedure

3.1 Data group selection: The researcher set a focus group of 18 members of community data working groups from Mae Ku subdistrict and Phra That Pha Daeng subdistrict. The selected data groups, which based on the results of community data usage requirement, were evaluated by using focus group form as shown in Appendix D.

3.2 Existing data collection and data provider defining: The researcher set a focus group that consisted of 18 members of community data working groups from Mae Ku subdistrict and Phra That Pha Daeng subdistrict, and 2 officer of local administrative organizations from Mae Ku subdistrict Municipality and Phra That Pha Daeng subdistrict administrative organization. The collected data, which based on selected data group from previous step, was gathered by using focus group form as shown in Appendix E.

3.3 Feature of community data management system defining: The researcher set a focus group that consisted of 18 members of community data working

groups from Mae Ku subdistrict and Phra That Pha Daeng subdistrict, 2 data supporters from the result of previous step, and 4 administrators/directors of the digital community centers from each sub-district. The feature lists of community data manage system which were the results from this research step were evaluated by using focus group form as shown in Appendix F.

3.4 Defining IT supporter: The researcher set a focus group that consisted of 18 members of community data working groups from Mae Ku subdistrict and Phra That Pha Daeng subdistrict, 2 data supporters from step two, 4 operators/administrator of the digital community centers from each sub-district, and 1 administrator of the digital community center on the border of Tak province from Kamphaeng Phet Rajabhat University Mae Sot. The readiness of each community data center which used to analyze IT infrastructure requirement lists was used SWOT analysis process. The IT supporter and its supported list were evaluated by using focus group form as shown in Appendix G.

3.5 Community data management system development: This process was a web application development. It was developed and designed using Rapid Application Development-Based (RAD) methodology. Joomla! Framework and Yii2 Framework were employed for web development. Model-View-Controller (MVC) was used as coding architecture pattern. A relational database program based on open source network operating system was used as database management system. The use of community database system was demonstrated to users. Finally, system user's satisfaction was evaluated using five rating scale questionnaires, in four aspects such as; content, design, usage and system advantage, as shown in Appendix H. The results

were analyzed using statistical average and standard deviation. In order to evaluate the findings obtained from data analysis, absolute criteria were used.

4. Data analysis

Content analysis method was employed to analyze all data that was collected by using focus group process. The readiness of digital community centers, used for defining IT infrastructure requirement lists, was used SWOT analysis method

Level of system user's satisfaction analysis was conducted using statistical methods. Average and standard deviation were used to analyze the data from 5 levels Likert scale questionnaire (Appendix H). The findings were evaluated using the absolute criteria as shown in Table 3.3.

Table 3.3 The absolute criteria used for evaluate the user's satisfaction

Average Range	Level of Satisfaction
4.21-5.00	Very High
3.41-4.20	High
2.61-3.40	Moderate
1.81-2.60	Low
1.00-1.80	Lowest

A model of community data system management process by digital community center and citizen involvement

In order to create a model of community data system management process by digital community center and citizen involvement, the instructions of data collection and analysis were designed as shown in Figure 3.3

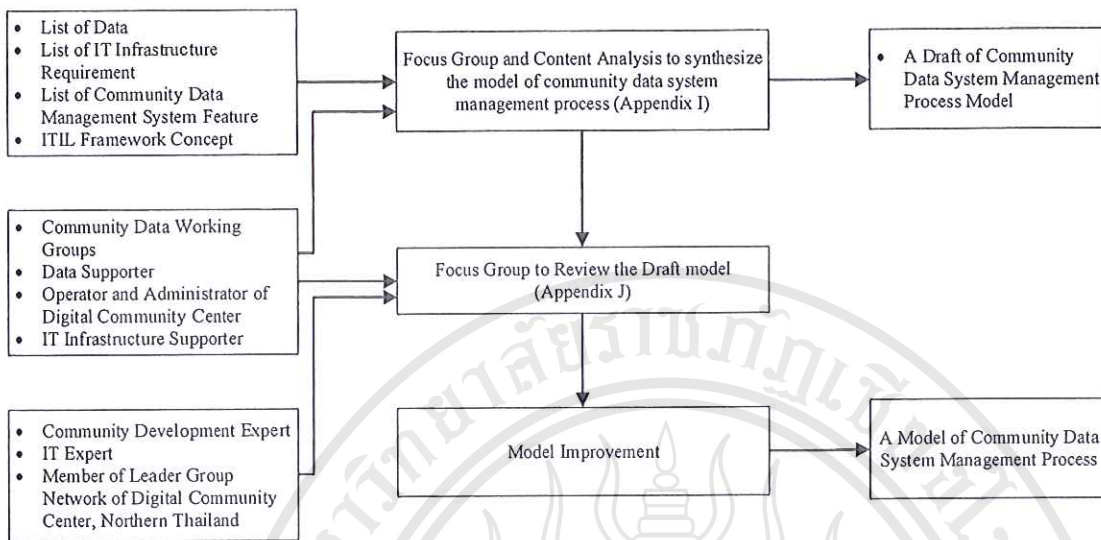


Figure 3.4 Procedure for create a model of community data system management process by digital community center and citizen involvement

1. Population and sample group

Population and sample group in this step consisted of 18 people of community data working groups, 1 officer of Mae Ku municipality, 1 officer of Phra That Pha Daeng subdistrict administrative organization, 2 administrators/operators of digital community center from each subdistricts, and 1 administrators from the digital community centers on the border of Tak province, Kamphaeng Phet Rajabhat University Mae Sot. In addition, the external representatives for critical analysis of the model consisted of 1 information technology expert, 1 community development expert, 2 members of leader group network of digital community center in northern of Thailand. The purposive sampling method was employed to select samples.

2. Data and data source

The data was collected by using focus group process to design the model as well as using the data that was the results from previous research step including: the list of data, the list of IT infrastructure requirement, and the list of community data management system features. ITIL framework concept was also applied for data management process design. Focus group process was conducted on 18 people of community data working groups, 1 officer of Mae Ku municipality, 1 officer of Phra That Pha Daeng subdistrict administrative organization, 2 administrators/operators of digital community center from each subdistricts, and 1 administrators from the digital community centers on the border of Tak province, Kamphaeng Phet Rajabhat University Mae Sot. The findings were a draft of the community data system management process model as shown in Figure 3.3.

In order to review and critical analyze the draft model, the focus group process was conducted on the samples using focus group form as shown in Appendix J. The expert who joined the model review process consisted of 1 IT expert, 1 community development expert, and 2 members of leader group network of digital community center in northern of Thailand. The findings were used to improve the model.

3. Research instrument and procedure

3.1 Synthesis of a draft model: The researcher set a focus group of 25 participants consisting of 18 member of the community data working groups, 4 administrators/directors of the digital community centers, 1 staffs from the division of social welfare, and 2 supporters for infrastructures of information technology from Kamphaeng Phet Rajabhat University as reported in a focus group form (Appendix I).

The results of focus group, the requirement lists and ITIL framework concept were used to synthesis the community data system management process model. The output from this step was the model in draft version.

3.2 Draft model reviewing: The researcher set a focus group of 29 participants from previous step and included experts to join the reviewing. The experts consisted of 1 information technology expert, 1 community development expert, 2 members of leader group network of digital community center in northern of Thailand. The focus group issues were shown in Appendix J. The finds were used to improve the draft model.

3.3 Model improvement: The researcher used the results of focus group process from previous step to improve the draft model. The findings from this step was the model of community data system management process.

4. Data analysis

Content analysis method was employed to analyze all data that was collected by using focus group process.