DECISION SUPPROT SYSTEM FOR MULTI LEVEL MARKETING

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MASTER OF SCIENCE

IN

STRATEGIC MANAGEMENT INFORMATION SYSTEM

SCHOOL OF INFORMATION TECHNOLOGY

MAE FAH LUANG UNIVERSITY

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ACKNOWLEDGEMENTS

I would like to express sincere thanks to my advisor, Asst. Prof. Dr. Punnarumol Temdee for her valuable suggestions, continuous support, encouragement and guidance in making this thesis a successful one. Moreover, I would like to thank the rest of my thesis committee for their thoughtful comments and suggestions.

I also wish to extend my thanks to 10 experts and 50 members in MLM business for their valuable suggestions, knowledge to set the system, and the help for testing the system. I would like to thank all members in SMIS group for their friendship, enjoyment and encouragement.

Before closing my acknowledgement, I would like to express my deepest gratitude to my parents for their encouragements, morale and cordial supports throughout my life.

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Thesis Title Decision Support System for Multi Level Marketing

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Degree Master of Science (Strategic Management Information System)

Advisor Asst. Prof. Dr. Punnarumol Temdee

ABSTRACT

Teamwork is a key success factor of Multi Level Marketing (MLM) business. Generally, the teamwork of MLM business has a hierarchy structure with a set of team leaders called up-line members and a large number of team members called down-line members. There is normally the difficulty for coordinating all team members to work together to obtain the maximize profit of the team. Consequently, the real time monitoring from the team leader to down-line members is required to provide any support appropriately in time. Therefore, the decision support system for the team leader to provide the real time mentoring to the down-line members is proposed in this thesis. This proposed system provides the mentoring task by using the professional status of down-line members and decision tree. Then, this proposed system provides the suggestion according to the prior knowledge from 10 experts. The proposed system is tested with 50 down-line members of one MLM company in

Thailand. The results show that the proposed system is able to provide 86% accuracy for providing the same suggestions to those made by human experts. Additionally, the proposed system has the overall satisfaction scores both from the experts and the users averagely in “very good” levels for suitability, precision, flexibility and ease to use aspects.

Keywords: Decision Support System/Team Work Monitoring/Multi Level Marketing

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CHAPTER 1

INTRODUCTION

1.1 Principle and Motivation

Multi Level Marketing (MLM) can be called as Network Marketing or Direct Selling (Dong, Wang & Goa, 2009). It is a marketing strategy in which the profit is considered not only from the sales that the salesperson individually generates, but also from the sales that other members collectively generate. The incomes of MLM business can be separated into three parts. The first income is from selling the products to the customers. The second income is from creating the consumer base for distributing the products. The last income is from managing the team to develop consumer's base and increase the circulation of the team.

MLM business is popular in Thailand. Most people are interested in joining this business because MLM business uses less investment than those of the other business. However, the return or profits is generally more than those of many businesses. For the investment side, MLM business requires no money for production because the company is responsible for producing all products. The real cost investment comes from time and people. Time means the time spending for creating the consumer base, which is one type of income of MLM business. Lastly, people in MLM business is the most important part because the most income comes from selling the product and distributing the product, so the more people the more generated incomes.

The MLM business consists of the leaders called up-line members and the other team members called down-line members. Therefore, MLM business potentially

has a problem of managing the team members to work coordinately to maximize both individual and team profits. MLM business is the large organization that one up-line member can have more than 100 to 10,000 down-line members. The up-line members have to support and help their down-line members individually and appropriately. There is the difficulty for up-line members to support a large numbers of down-line members, yet the supporting is very important to the team. Therefore, this thesis applies information technology to develop the decision support system for monitoring the team members of MLM business so that the team members can work effectively.

1.2 Objective

The objective of this thesis is to propose the decision support system for monitoring team members of MLM business so that the team members can obtain the support appropriately.

1.3 Scope

The scope of this thesis is to study one MLM business in Thailand. This thesis uses decision support system (Silberschatz, Korth & Sudarshan, 2006) and decision tree (Dua & Du, 2011) to create knowledge base system. The rules and the relationship between attributes are set by collecting data from 50 people from one MLM business in Thailand. Additionally, the knowledge base is constructed based on the knowledge from 10 experts.

CHAPTER 2

LITERATURE REVIEW

This chapter reviews the previous studies of multi level marketing and decision support system.

2.1 Related Works

The most important prospect of MLM is team building and customer base expansion. The difficulty in MLM business is coordinating people in organization. This thesis involves decision support system (DSS) and decision tree. The related works are shown as following (2.1.1 and 2.1.2).

2.1.1 Decision Support System (DSS)

DSS (Silberschatz et al., 2006) is a computer based information system that supports organization to make the decision. DSS serves managements, operations and planning, which rapidly changes and includes knowledge base system and it is usually developed with software to help making decision from a combination of difference raw data.

DSS has been found in cyber business such as using fuzzy synthetic evaluation model to find the result of cyber marketing performance for enterprise (Won-Hai Gao, 2007). DSS is also widely used in social business (Hsieh, Stu, Liang, Yang & Chou, 2009) to represent advertising framework by using social network to show current status of the team in the social application. Lately, the deployment of DSS has been

found in the area of MLM business particularly for advertising services. For example, the work proposed by Dong (Dong et al., 2009) representing the relationship investigation among direct sellers, personality traits, sale behaviors and team's performance based on data from questionnaire survey. However, there is no tool for monitoring team work in MLM business yet. This thesis thus proposes the monitoring tool for MLM which employs working data called professional status of down-line members for decision-making task and uses DSS to create knowledge base system for monitoring team worker. More detail is shown in Chapter 3.

2.1.2 Decision Tree

Decision tree (Dua & Du, 2011) is a decision support tool that uses a tree like graph or model of decision and their possible results, including chance event outcomes, resource costs, utility, etc. Decision tree is one way to display an algorithm. Generally, decision trees are commonly used in operation research, specifically in decision analysis, to help identify a strategy most likely to reach a goal.

Consequently, the applications of decision tree can be found in wide areas such as data mining (Rutkowski, Pietruczuk, Duda & Jaworski, 2012; Ochoa Zezzatti et al., 2009), biomedicine (Zorman & Kokol, 1997; Statis, Loukis, Pavlopoulos & Koutsouris, 2003), logistics industry (Jin, Xiaoye, Zhang & Zhang, 2007), simulation system (Moussa, Ruwanpura & Jergeas, 2004), intrusion detection (Tabia & Benferhat, 2008), web searching (Gupta, Garg & Gupta, 2012), web caching (Bonchi, Giannotti, Mango & Renso, 2001), and online catalog (Sung, Yang, Yiu, Cheung, Ho & Lam, 2002).

This thesis also employs decision tree for creating the decision rules to provide the right intervention status to the down-line members regarding the knowledge and experience of up-line members.

The important process of decision tree is to choose and to prioritize the attributes so that the decision rules can be made appropriately. The general way to choose the right attributes is to compare the information gain of each attribute. The attribute having the highest gain is assigned as the root attribute node. Then, the calculation repeats again to have the next attribute node until the whole data is classified successfully.

The gain of each attribute is shown in equation (2.1), the information gain (Mitchell & Tom, 1997) of the system (not considering any particular attribute) is shown in equation (2.2), and the information gain of each attribute for all classes is shown in equation (2.3), the probability of having members in each class is shown in equation (2.4) respectively.

$$Gain(X) = I(M) - I_x(M) \tag{2.1}$$

$$I(M) = \sum_i^n -p(m_i) \log_2 p\,(m_i) \tag{2.2}$$

$$I_x(M) = \sum_{i=1}^n \frac{|t_i|}{|T|} I(t_i) \tag{2.3}$$

$$p(m_i) = \frac{s_i}{S} \tag{2.4}$$

Where;

$Gain(X)$ is the Gain of attribute *X*

$I(M)$ is the Information Gain of the system

$I_x(M)$ is the Information Gain for all class *M* of attribute *X*

$I(t_i)$ is the Information Gain of each class *i*

M is the class of each attribute

t_i is the number of members in class *i* of attribute *X*

T is the total number of attribute *X*

$p(m_i)$ is the probability of having members in class *i*

s_i is the number of members in class *i* in each attribute

S is the total number of each attribute

n is the total numbers of classes in each attribute

2.2 Proposed Method

This thesis uses decision tree to create the DSS for helping the up-line members to monitor the team members or down-line members and proving the intervention. The more details are shown in Chapter 3.

CHAPTER 3

RESEARCH METHODOLOGY

This thesis consists of four main phases including Criteria Selection, Design and Development, System Testing, and Discuss and Conclusion. The process of DSS of this thesis is shown in Figure 3.1.

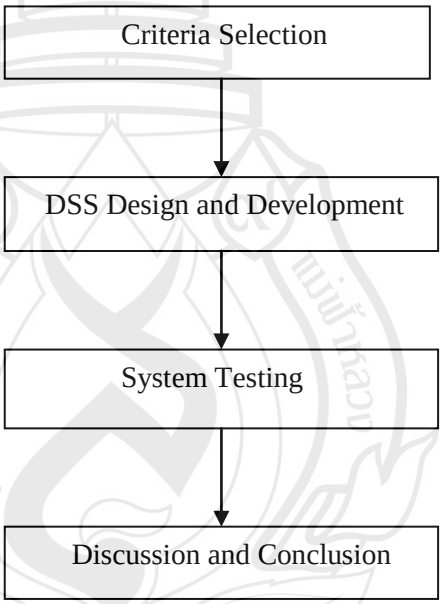

Figure 3.1 The Process of DSS for Multi Level Marketing

3.1 Criteria Selection

Firstly, the user records 11 attributes of professional status which are working behaviors data including business call, business meeting, present the products and business plan, have new members, have private sale point, have customers, learn the product and business plan, join the meeting in company, join the training in company, contact up-line members and contact down-line members.

Table 3.1 Meaning of All Attributes of Professional Status

Attributes	Meaning
1. Business call	Make a call for business.
2. Business meeting	Have face to face meeting.
3. Present product and business plan	Set needs for sale the product and set needs for invite prospect to join your team.
4. Have new members	Have the new down-line members joining the team.
5. Have private sale point	Reach the target sale which is required by the company.
6. Have customers	Have a new regular customer.
7. Learn the product and business plan	Listen to the CD and read a book to understand about the product and business plan of company.
8. Join the meeting in company	Setup new product and new business plan.
9. Join the training in company	Develop working performance.
10. Contact up-line members	Report working performance and ask the support.
11. Contact down-line members	Check working performance and motivate the down-line to get the best performance.

All activities in Table 3.1 are activities for guiding the down-line members to improve their performance or achieve better profit. Some activities can achieve the same goals such as business call, business meeting and present the products and business plan can help the down-line members to get the new members. Meeting and training in the company may help the down-line members to have more experience, so they can have more customers. Learn the products and business plan may help the down-line members improve themselves individually any time. Contact up-line members may help the down-line members are able to deal with some problems. Finally, some information also shows the progress of each individual such as having new members, having new customers and having private sale points.

Table 3.2 shows the example of professional status of one member which is recorded in the professional recording sheet. The frequency of performing those activities is different for person according to their performances. The frequencies of performing those activities are transformed into the points and are recorded in the professional recording sheet in each day respectively. The team members should record their own activities for being monitored by their team leaders or up-line members later on. The team leader will use this information and the generated profit to help managing the behavior of each member to gain better profit. Consequently, different members will be receiving different suggestions individually and appropriately. The questionnaire of working behavior to record in professional recording sheet is shown in appendix B.

Table 3.2 Example of Professional Recording Sheet

Criteria	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Business call	1	0	2	0	0	1	0
Business meeting	2	1	2	0	1	2	0
Present the products and business plan	2	1	2	0	1	2	0
Have new members	0	0	0	0	0	0	0
Have private sale point	1	1	1	1	1	1	1
Have new customers	0	0	0	0	0	1	0
Learn the products and business plan	1	1	1	1	1	1	1
Join the meeting in company	0	0	0	0	1	0	1
Join the training in company	0	0	0	0	0	0	0
Contact up-line member	1	0	0	0	0	0	0
Contact down-line members	0	0	0	0	0	0	0
Total Score	**8**	**4**	**8**	**2**	**5**	**8**	**3**

3.2 DSS Design and Development Phase

The second process is DSS Design and Development. This process is to construct the knowledge by using the rules of attribute relation to develop the knowledge for the system. Figure 3.2 shows the system design of this thesis.

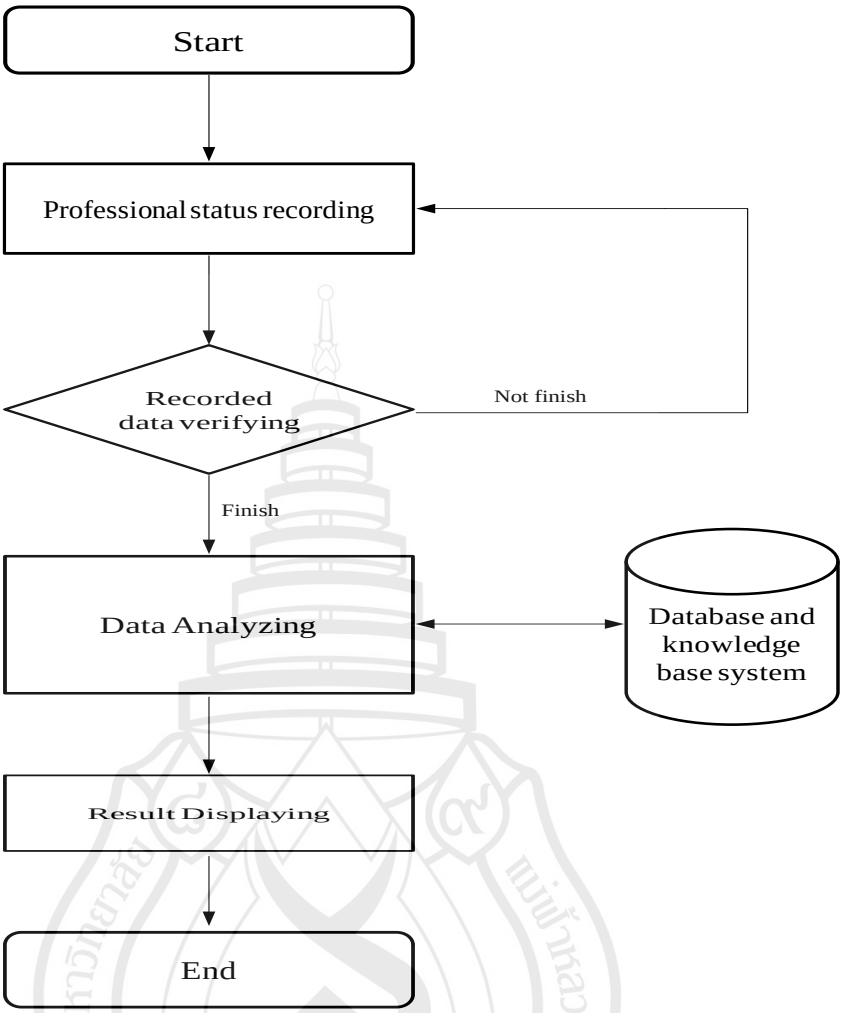

Figure 3.2 The Process of DSS for MLM

Figure 3.2 shows that after the down-line members finish recording their professional status, the system will analyze the data by using the constructed knowledge base system of the expert and the results will be shown later on.

3.2.1 Recording Professional Status

Recording professional status is the first process that the down-line members record working behavior data in the professional recording sheet. Then, the system will verify whether the down-line member has finished his/her sheet. If the down-line member finishes recording all attributes, the system will call the next process.

3.2.2 Data Analyzing

The difficult part of MLM business is to mentor team members because of the large size of team members. The problem of monitoring happens when the down-line members do not record working data and this data is not analyzed by up-line members or the team leaders frequently in time. Generally, the up-line members and the down-line members have a face to face meeting as the main communication way. However, the meeting is normally not arranged very often because of some limitations such as time and budget. Therefore, the management of some problems happening with down-line members might not be solved or arranged in time. This evidence probably causes the whole profit of the team. Therefore, this thesis proposes the system that assists the down-line members to record their activities more convenient and the up-line members can see all record activities real time so that the suggestion can be arranged to the down-line members in time.

Figure 3.3 shows the conceptual diagram of monitoring model used in this thesis. There are 2 types of data used in this process including personalization status and the working status record from the last process. The personalization status and working status are classified using the decision tree according to the decisions made by the experienced up-line members through knowledge base system. Finally, the decision is made whether or not the intervention is required by down-line member individually.

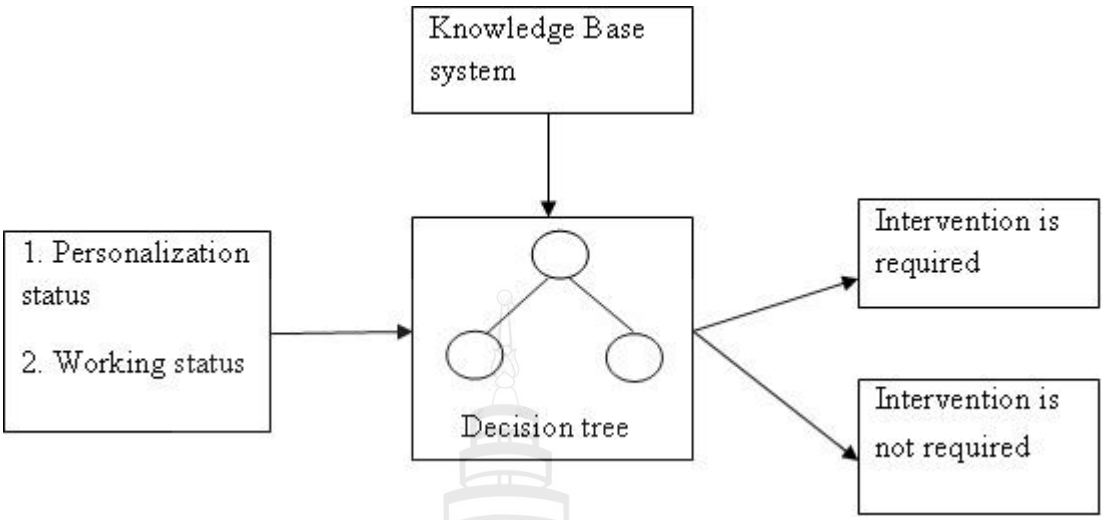

Figure 3.3 Conceptual Diagram of Monitoring Model

Table 3.2 shows personalization status and Table 3.3 shows working status with the classes in each attribute respectively.

Table 3.3 Personalization Status

Attributes	Class	Definition
1. Age	≤25, ≥25	Age of each member
2. Gender	Male, Female	Gender of each member

Table 3.4 Working Status with Classes

Attributes	Class	Definition
1. Business call	<3, 3-5, >5	How often do the members call to set the meeting with prospect? (day per week)
2. Business meeting	<3, 3-5, >5	How often do the members face to face discussion with prospect? (day per week)
3. Present the product and business plan	<3, 3-5, >5	How often do the members to set needs for sale the product and set needs for invite prospect to join your team? (day per week)
4. Have new members	<1, 1-3, >3	How many new down-line members join your team? (person per week)
5. Have private sale	<100, 100-200, >200	How much the member gain private sale? (point per week)
6. Have new customer	<2, 2-5, >5	How many customers do the members have per month? (person per month)
7. Learn the product and business plan	Yes, No	Do the members listen to the CD and read a book to understand about the product and business plan of your company?
8. Join the meeting	<1, 1-2, >2	How often do the members join the company meeting per week? (times per week)
9. Join the training	<1, 1-2, >2	How often do the members join the company training per month? (times per week)
10. Contact up-line members	<1, 1-3, >3	How often do the members contact the up-line per day? (times per day)
11. Contact down-line members	<1, 1-3, >3	How often do the members contact the down-line per day? (times per day)

Table 3.5 Output Status

Attributes	Class	Definition
1.Intervention Status	Require, Not require	Do the members require the intervention from the up-line members?

Table 3.5 shows that the output of the model which is the decision whether or not each down-line member requires the intervention from the up-line member.

3.2.3 Decision Knowledge Construction

This section shows how to construct the knowledge for decision making system. The decision making module of this thesis employs the personalization and working status of 17 down-line members include 8 female and 9 male members respectively. The sample members are asked to complete the questionnaires about their personal and working data as shown from the last section. Then the personalization and working status are recorded. There are 10 experienced up-line members investigating the obtained working status and making decision whether or not each down-line members should have the intervention. The maximum votes are considered to be the decision. For the case that the votes are equal, all experienced up-line members are asked to reconsider their votes again, so that the final decision will be made appropriately.

The decision knowledge of the thesis is constructed by using the decision tree. The decision knowledge starts with determining the root attribute. All gains for all attributes are compared so that the attribute have the highest gain is considered to be the root attribute. Table 3.6 shows the decision made by the experienced members for “Have New Member” attribute. There are 7 members and 10 members who are considered to require intervention (Intervention) and do not require intervention (Not Intervention) respectively.

Table 3.6 Decision Summary for "New Member" Attribute

Sample	New Members	Intervention decision
X1	>3	Not Intervention
X2	<1	Intervention
X3	<1	Intervention
X4	1-3	Not Intervention
X5	>3	Not Intervention
X6	1-3	Not Intervention
X7	<1	Intervention
X8	<1	Intervention
X9	>3	Not Intervention
X10	1-3	Not Intervention
X11	1-3	Not Intervention
X12	<1	Intervention
X13	1-3	Not Intervention
X14	1-3	Not Intervention
X15	1-3	Intervention
X16	<1	Intervention
X17	1-3	Not Intervention

To create the decision tree, the information gain of the system as shown in equation (2.1) is firstly determined. Since there are 2 classes of the system which are "Not Intervention" and "Intervention" class respectively, then $p(m_i)$ from equation (2.4) can be shown as in equation (3.1) and (3.2) respectively, where $s_1 = 10, s_2 = 7 \; and \; S = 17$.

$$p(m_1) = \frac{10}{17} \qquad (3.1)$$

$$p(m_2) = \frac{7}{17} \qquad (3.2)$$

Where, $p(m_1)$ is the probability of having members for “Not Intervention” class and $p(m_2)$ is the probability of having members for “Intervention” class respectively. Then, the information gain of the system from the equation (2.2) is showing as in equation (3.3).

$$I(M) = -\frac{10}{17}\log_2\frac{10}{17} - \frac{7}{17}\log_2\frac{7}{17} \qquad (3.3)$$

$$I(M) = 0.977$$

Therefore, the information gain of the system is 0.977. Next, the information gain of all attributes as shown in equation (2.3) is calculated. For example, “New Members” attribute has $n = 3$ including the class “<1”, “1-3”, “>3”, the members of each class are $t_1 = 6, t_2 = 8, t_3 = 3$ respectively and the total members is$T = 17$. For the case of the information gain of “<1” class, which is$I(t_1)$, there are 6 members are classified as “Not Intervention” and no members “Intervention” class respectively. For the case of the information gain of “1-3” class, which is$I(t_2)$, there is 1 member and 7 members are classified as “Not Intervention” and “Intervention” class respectively. Finally for the case the information gain of “>3” class, which is$I(t_3)$, there are no members and 3 members are classified as “Not Intervention” and “Intervention” class respectively. Therefore, the information gain of each class $(I(t_i))$ in “New Members” attribute can be show in equation (3.4)-(3.6) respectively.

$$I(t_1) = -\frac{6}{6}\log_2\frac{6}{6} - \frac{0}{6}\log_2\frac{0}{6} = 0 \qquad (3.4)$$

$$I(t_2) = -\frac{1}{8}\log_2\frac{1}{8} - \frac{7}{8}\log_2\frac{7}{8} = 0.543 \qquad (3.5)$$

$$I(t_3) = -\frac{0}{3}\log_2\frac{0}{3} - \frac{3}{3}\log_2\frac{3}{3} = 0 \qquad (3.6)$$

Therefore, the total information gain of “New Members” attribute from equation (2.3) can be shown as following.

$$I_{New\ Members}(M) = \left(\frac{6}{17} * 0\right) + \left(\frac{8}{17} * 0.543\right) + \left(\frac{3}{17} * 0\right) \quad (3.7)$$

$$I_{New\ Members}(M) = 0 + 0.256 + 0 = 0.256$$

Then, the gain of “New Members” attribute is now showing as following.

$$Gain(New\ Members) = 0.977 - 0.256 = 0.721 \quad (3.8)$$

The gain of all attributes is calculated so that the attribute having the maximum gain is selected as the root attribute for the decision tree. Table 3.6 shows the gain of all attributes. It can be concluded from Table 3.7 that the “New Members” attribute has the maximum gain so it is considered to be the root attribute of decision tree as shown in Figure 3.4.

Table 3.7 Gains of all Attributes for Root Attribute Selection

Attributes	Equation	Summary
Gain (Business call)	0.977 - 0.967 = 0.010	
Gain (Business meeting)	0.977 - 0.952 = 0.025	
Gain (Show The product and business Plan)	0.977 - 0.854 = 0.123	
Gain (Have private Sale point)	0.977 - 0.856 = 0.121	
Gain (Have new customer)	0.977 - 0.918 = 0.059	
Gain (Have new members)	0.977 - 0.256 = 0.721	Root Node
Gain (Learn the product and business plan)	0.977 - 0.711 = 0.266	
Gain (Join the meeting in company)	0.977 - 0.443 = 0.534	
Gain (Join the training in company)	0.977 - 0.873 = 0.105	
Gain (Contact the up-line members)	0.977 - 0.618 = 0.359	
Gain (Contact the down-line members)	0.977 - 0.977 = 0	

After having the root node, some information can be classified as shown in Figure 3.4. It can be shown that if the down-line member can have new members less than 1 member per week, this down-line members is required the intervention. If this down-line member can have new members more than 3 members a week, that down-line member does not require any intervention. However, if this down-line member can have new members between 1-3 persons per week, the decision cannot be made yet whether or not intervention is required to this member. The next attributes is required for further decision. Then, the gain calculation repeats again so that another attribute is selected for making the further decision based on the maximum gain. Figure 3.4 show the complete decision tree for the proposed monitoring model of this thesis.

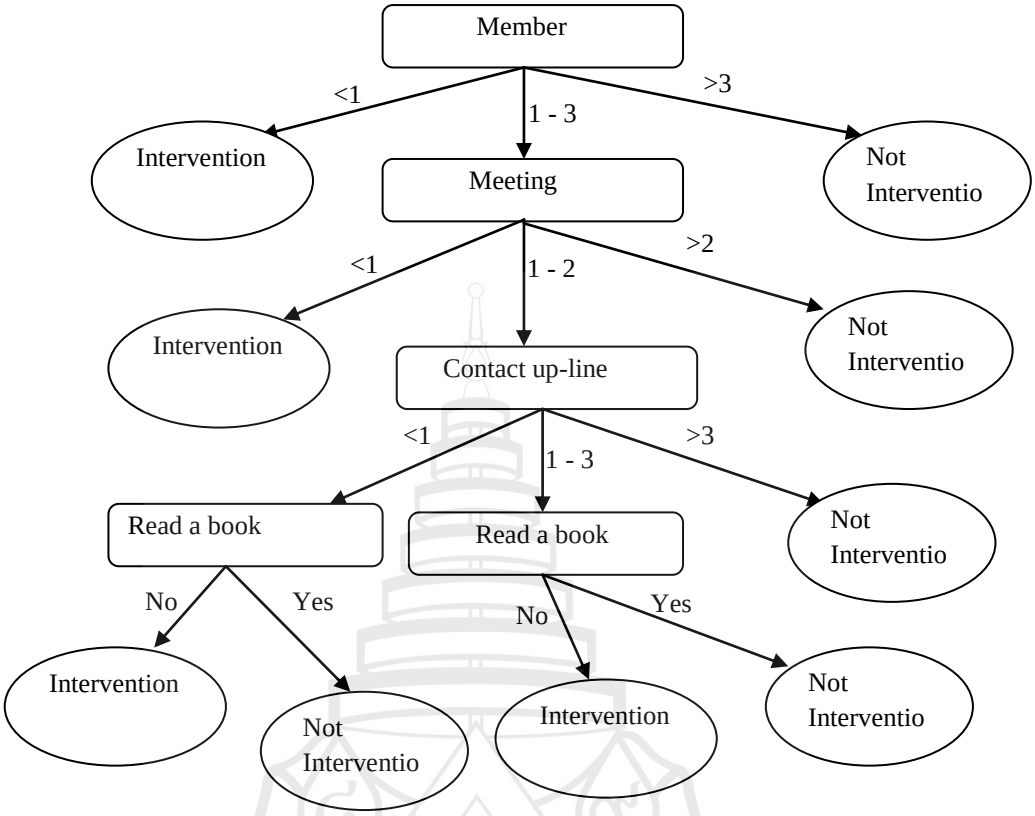

Figure 3.4 Decision Tree of Intervention Model

The decision rules are finally constructed from the decision tree for being used as the knowledge based system of the proposed model. Some rules derived from Figure 3.4 are showing as follow:

If New Members = “1-3” and Meeting = “1-2” and contact up-line = “<1” and read a book = “No”, then decision = “Intervention”.

If New Members = “1-3” and Meeting “1-2” and contact up-line = “>2”, then decision = “Not Intervention”.

It can be shown from Figure 3.4 that, the ability of having the new member is considered as the root attribute. As mentioned before that the profit of MLM business comes from the numbers of new members and customers. Next, join the meeting is also important because the down-line members can have new members and customers from the meeting. Next, contact up-line member is considered to be the next classified attribute. By contacting up-line members very often, the down-line members can have more knowledge and helps in time. Finally, read a book is the last classified attribute that all experience members though that it is important for down-line members to have more knowledge about their business and product.

After having the intervention model, the suggestion model is constructed so that the completed monitoring model is constructed for the system. Figure 3.5 shows the suggestion model of this thesis.

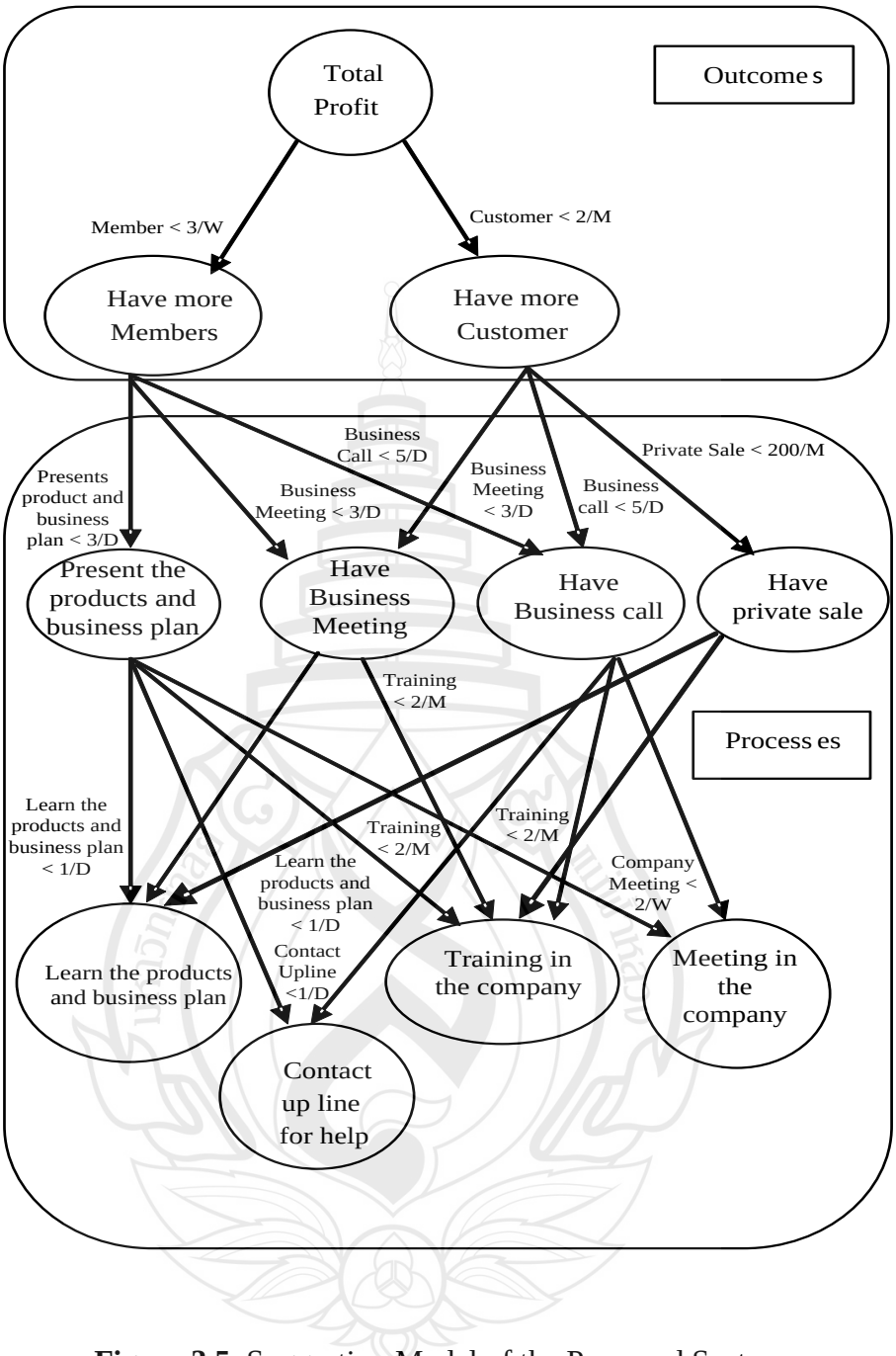

Figure 3.5 Suggestion Model of the Proposed System

From Figure 3.5, there is the relationship between outcomes (the profit) and the process (the activities) of doing MLM business. It can be shown that the total profit, which is the outcome of the team, comes from 2 factors including have more members and have more customers. In order to have more members, there are three activities can be performed including present the products and business plan, have business meeting (business meeting), and have business call (business call). Then, if the members are suggested to have more business call, the members will be suggested to perform among three different activities including asking help from the leaders (contact up-line members), participating more in the training (train in the company) and participating more in the meeting (meeting in the company). These sample decisions are derived by 10 experts of MLM business. After having knowledge for making decision, all knowledge will be transformed as knowledge base system, which is implemented with a set of decision making rules.

3.2.3.1 The examples of the decision making rules

IF have new member < 3/Week THEN Do more members

IF present the products and business plan < 3/Day THEN Do present the products and business plan

IF business meeting < 3/Day THEN Do business meeting

IF business call < 5/Day THEN Do business call

IF have new customer < 2/Month THEN Do More Customer

IF contact up-line < 1/Day THEN Do contact-upline

For the above examples, the members will be firstly classified whether or not they require one activity between more members or more customers or both. Then, if the members need to find more members, the activities will be suggested later such as the members should perform any among three activities include showing the plan, meeting, and making business call. If the members have present the products and business plan less than 3 times a day, then they will be suggested to do more showing the plan similarly, if the members have been contact up-line member less than 1 time per day, then they need to contact up-line member more and more.

3.2.4 ER Diagram and Database Design

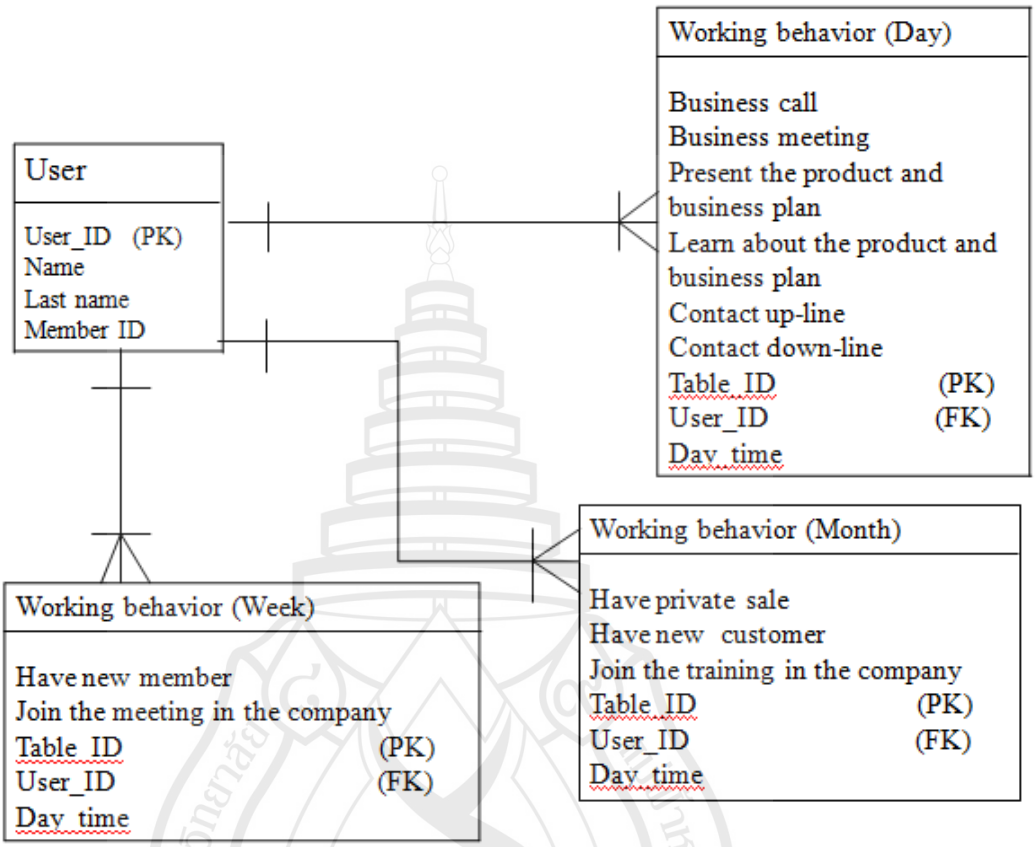

Figure 3.6 ER Diagram and Database Design

From Figure 3.6, there are four main tables used in this thesis. Firstly, User table has User_ID as a primary key. Secondly, Working behavior (Day) has Table_ID as a primary key and User_ID as a foreign key. Thirdly, Working behavior (Week) has Table_ID as a primary key and User_ID as a foreign key. Lastly, Working behavior (Month) has Table_ID as a primary key and User_ID as a foreign key. More detail in each table can see in Figure 3.6 and appendix A.

3.3 System Testing

The proposed system of this thesis is tested with 50 down-line members and 10 up-line experts that working MLM business for checking the accuracy between human expert and system. Additionally, the satisfaction of up-line members and down-line members is evaluated about the system by 4 aspects are including suitability, precision, flexibility and easy to use. More detail is shown in Chapter 4 and the questionnaire is shown in appendix C.

3.4 Discussion and Conclusion

This thesis proposes the decision supporting system for monitoring the team in MLM business and for giving the suggestion to the team appropriately in time. More detail of discussion and conclusion will be discussed in Chapter 5.

CHAPTER 4

EXPERIMENT AND RESULT

4.1 User Interface

This section describes the user interface of the proposed system. The page for logging in and creating new account are shown in Figure 4.1 and 4.2 respectively.

Figure 4.1 Login Page

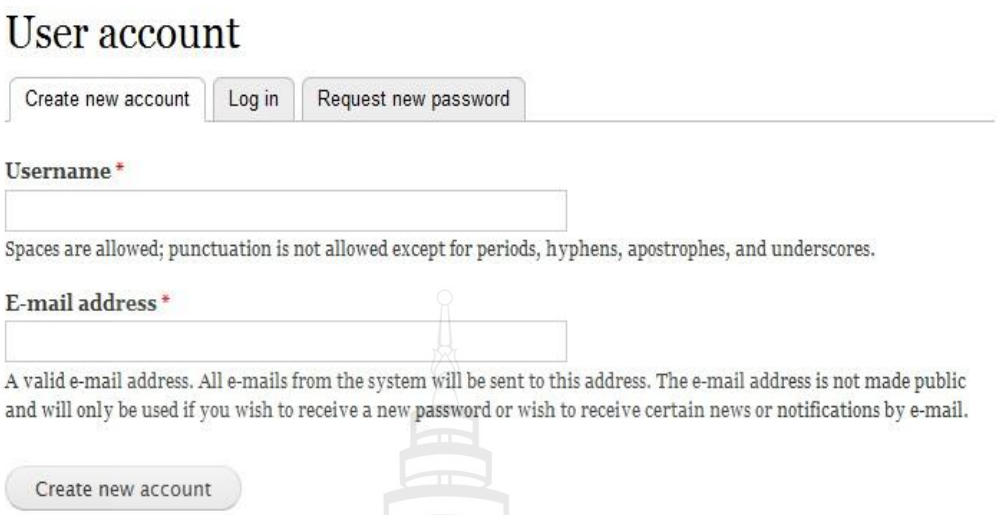

Figure 4.2 Create New Account Page

Figure 4.2 shows the page for creating new account. The user can create new account by setting username and email address. Additionally, the user can change the password in this page too.

The users or down-line members can record their working behaviors by using professional sheet with different periods including daily, weekly and monthly that the user interfaces can be shown in Figure 4.3, 4.4 and 4.5 respectively.

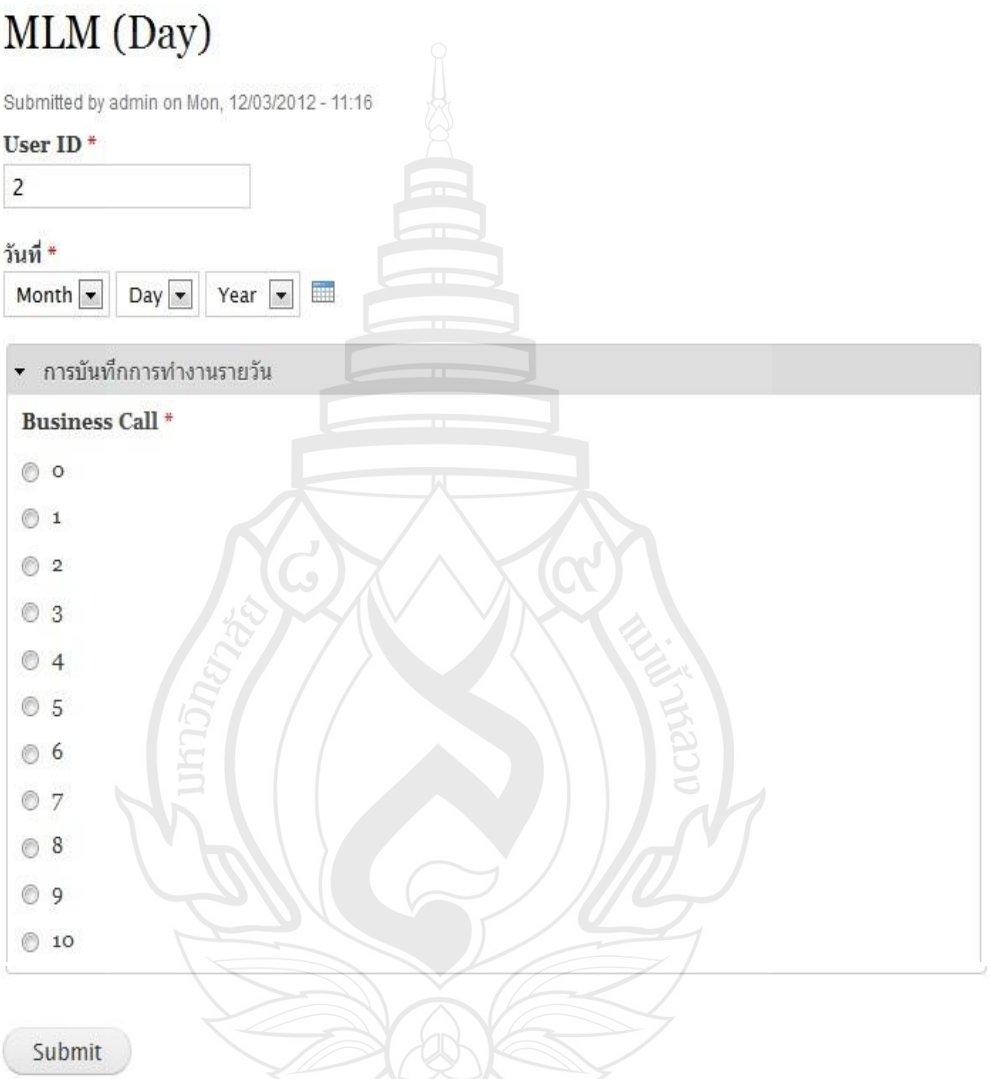

Figure 4.3 Daily Professional Recording Sheet

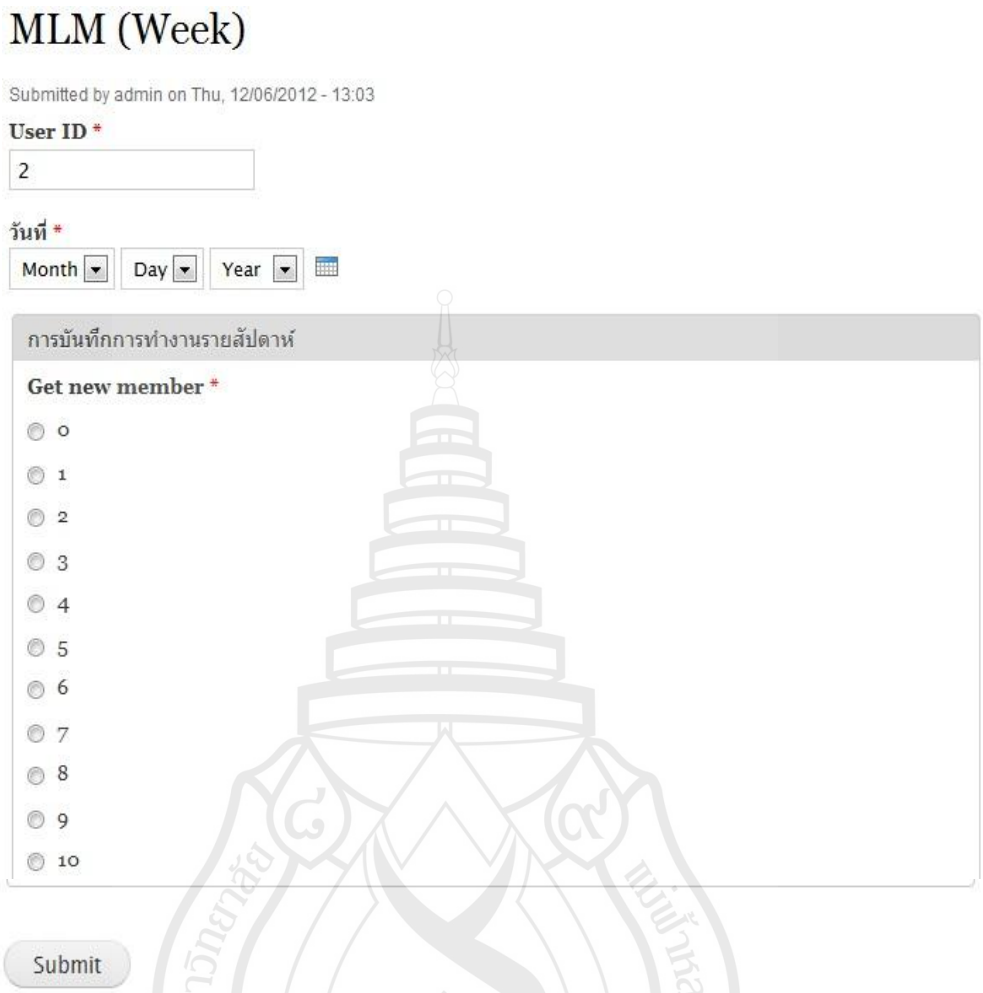

Figure 4.4 Weekly Professional Recording Sheet

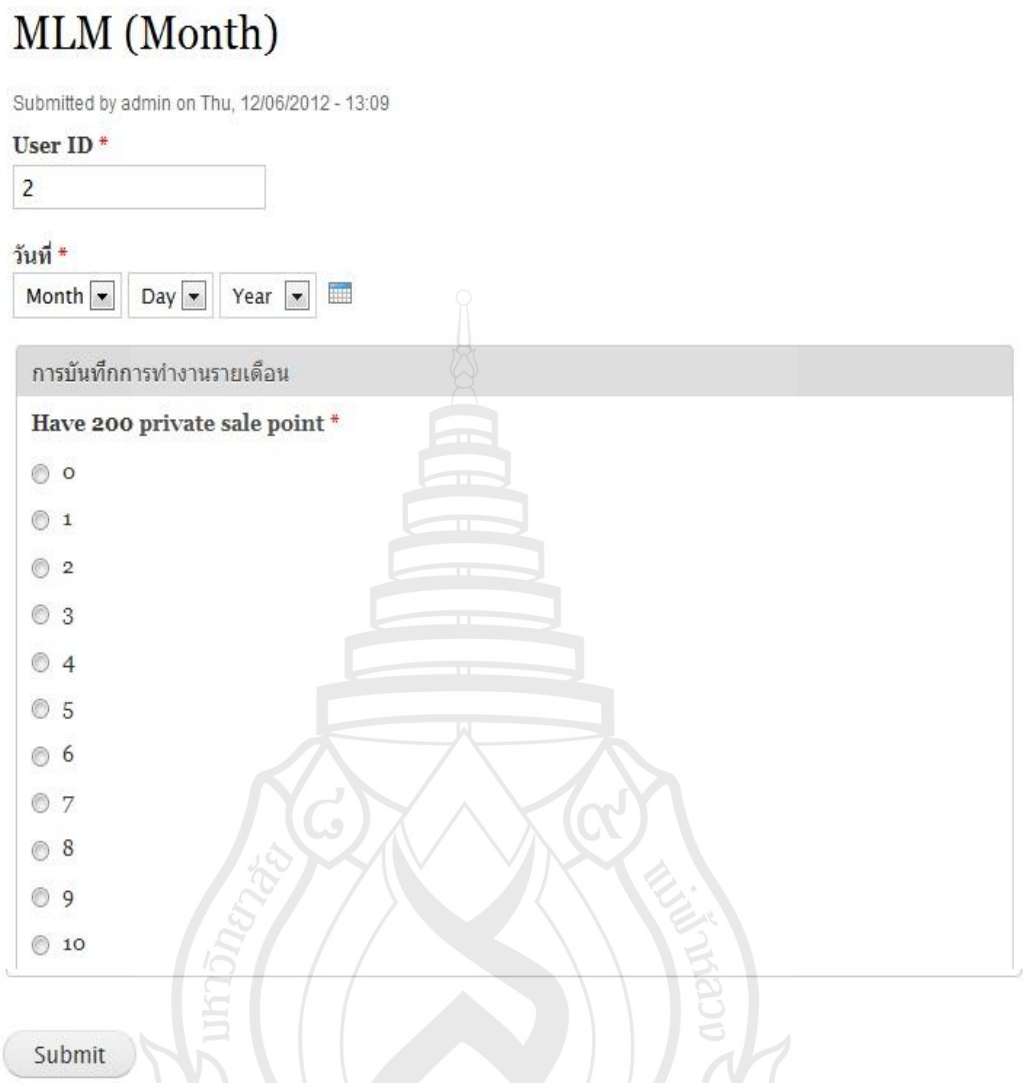

Figure 4.5 Monthly Professional Recording Sheet

4.1.1 Reporting

The report can be generated weekly and monthly. The interfaces for requesting the report can be shown in Figure 4.6 and 4.8. After requesting the report by choosing the time duration for weekly and monthly reports, the professional data will be evaluated and the intervention result will be displayed as the examples are shown in Figure 4.7 and 4.9 respectively. It can be shown from Figure 4.7 that the intervention is required for this down-line member and the suggestions are also given. At the same time, Figure 4.9 shows the case that the intervention is not necessary for this down-line member.

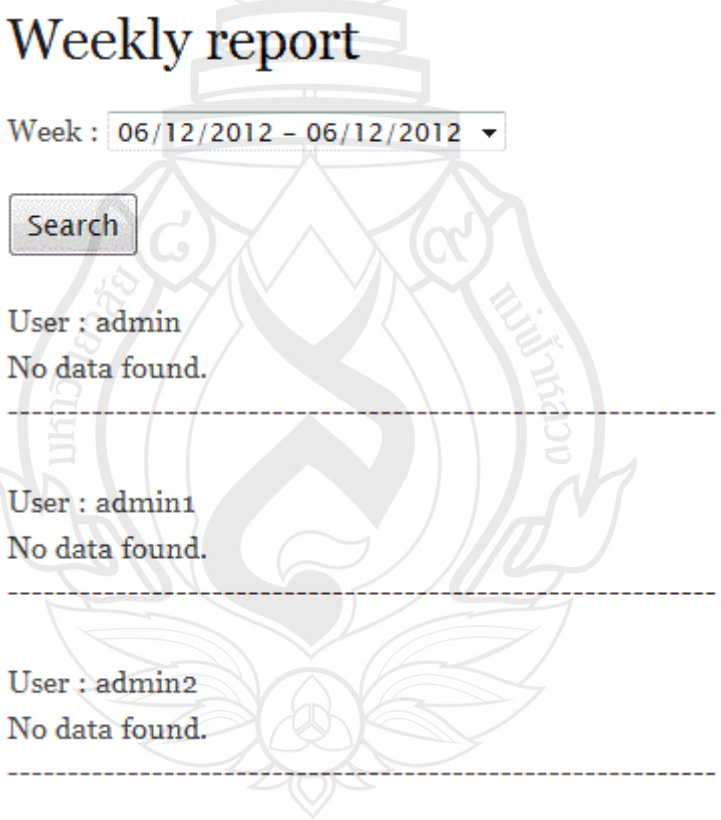

Figure 4.6 Weekly Report

User : admin2
Week 17/03/2013 - 23/03/2013

Criteria	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Business call	3	2	2	3	2	4	3
Business meeting	1	2	2	1	1	3	3
Present the products and business plan	1	1	1	1	1	3	3
Have new members	0	0	0	0	0	1	0
Have private sale point	1	1	1	1	1	1	1
Have new customers	1	0	0	0	1	1	1
Learn the products and business plan	1	1	1	1	1	1	1
Join the meeting in company	0	0	1	0	1	1	1
Join the training in company	0	0	0	0	0	0	0
Contact up-line member	1	1	1	1	1	1	1
Contact down-line members	0	1	1	1	0	0	1
Total Score	9	9	10	9	9	16	15

#####Intervention#####

Outcomes	Process
No member	Explan the product and business plan Have business meeting Have business call Training in the company.

Figure 4.7 Example of Intervention Report

Figure 4.8 Monthly Report

User : admin5
Week 17/03/2013 - 23/03/2013

Criteria	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Business call	4	2	6	1	8	10	6
Business meeting	1	0	7	2	4	10	6
Present the products and business plan	1	0	7	2	4	10	6
Have new members	0	0	5	0	0	0	0
Have private sale point	1	1	1	1	1	1	1
Have new customers	1	0	5	2	2	2	4
Learn the products and business plan	0	0	0	0	0	0	0
Join the meeting in company	0	0	0	0	0	0	0
Join the training in company	0	0	0	0	0	0	0
Contact up-line member	1	1	1	1	1	1	1
Contact down-line members	0	0	1	1	1	1	1
Total Score	9	4	33	10	21	35	25

#####Not intervention#####

Figure 4.9 Example of No Intervention Report

4.2 Decision Efficiency

The system is tested by 50 down-line members that working for one MLM company in Thailand. There are also 10 human experts in this kind of business evaluating the system. All 50 members are asked to record their professional recording sheets every day. The information separately analyzed by the system and the experts. Finally, the decisions given by both system and experts are compared to evaluate the accuracy. Table 4.1 shows the examples of professional recording sheets of one member recording for 1 week for evaluation process. Table 4.2 shows the result suggestion from expert and system for the professional data in Table 4.1.

Table 4.1 Example of Professional Recording Sheet (Week 1)

Criteria	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Business call	8	7	1	10	4	10	10
Business meeting	2	2	3	3	5	8	1
Present the products and business plan	2	2	3	3	5	8	1
Have new members	0	0	0	0	0	0	0
Have private sale point	1	1	1	1	1	1	1
Have new customers	0	0	0	0	0	0	0
Learn the products and business plan	1	1	1	1	1	1	1
Join the meeting in company	1	1	1	0	1	0	1
Join the training in company	0	0	0	0	0	0	0
Contact up-line member	1	1	1	1	1	1	1
Contact down-line members	0	0	0	0	0	0	0
Total Score	**16**	**15**	**11**	**19**	**18**	**29**	**16**

From Table 4.1, it can be shown that this member has been working hard with business call, business meeting and present the product and business plan.

Table 4.2 Example of Suggestions from Experts and the System (Week 1)

Advice from expert (Outcome)	(Process)	Advice from system (Outcome)	(Process)
No member	Present the products and business plan	**No member**	Present the products and business plan
	Business meeting		Business meeting
	Join the training in company		Business call
			Join training in company
No customer	Business meeting	**No customer**	Business meeting
	Join the training in company		Business call
			Join training in company

Table 4.2 shows the example of suggestions from experts and the system. The comparison from both decisions from the system and the expert shows that both suggestions are almost the same. The suggestions from expert and system are the same for more than 90% for this particularly case. The total accuracy of the system for providing the same suggestions to the experts is 86% accuracy.

4.3 Discussion of Decision Efficiency

As it is shown in Table 4.2 that, the different of suggestion is provided by the system and the expert. The system gives more suggestions than the experts because the experts ignore a several details but the system analyzes all details in the record.

4.4 System Satisfaction

The proposed system is also tested in term of satisfaction. Ten experts are invited to examine the system with 4 aspects including suitability, precision, flexibility and easy to use. The suitability means the potential suggestions provided for the members for solving or managing any problems. Precision means the accuracy to provide the same advice with the expert. Flexibility means the ability of the system that can adapt the knowledge. Finally, ease to use means how easy the user can interact with the system.

All 10 experts are asked to complete questionnaire regarding the mentioned aspects with five levels of rating scales include 1.0 means absolutely not agree, 2.0 means not agree, 3.0 means neutral, 4.0 means agree and 5.0 means absolutely agree. The total average score also has 5 ranges including 0.0-1.0 means very poor, 1.1-2.0 means poor, 2.1-3.0 means average, 3.1-4.0 means good and 4.1-5.0 means very good.

Table 4.3 shows the average scores in all criterions and overall average score. It is show in Table 4.3 that the suitability, precision and flexibility of the system are in the “very good” level. The ease to use is only one that assessed to be in the “good” level because there are some difficulties for interacting with the system. Additionally, the overall average score of this system is also considered in “very good” level.

Table 4.3 Average Score of System from Expert

Criteria	Average score from 0-5
Suitability	4.50
Precision	4.30
Flexibility	4.50
Easy to use	3.90
Average	**4.30**

The system is also evaluated with the users or the down-line members. Table 4.4 shows the average scores in all criteria and overall average score. This score is from 50 down-line members. Table 4.4 shows that the suitability, precision, flexibility and easy to use score is in a “very good” level but the “easy to use” is lowest scores because some interfaces are difficult to understand such as the result of intervention. However, the overall average score of this system is in the “very good” level.

Table 4.4 Average Score of System from Down-line Members

Criteria	Average score from 0-5
Suitability	4.50
Precision	4.50
Flexibility	4.30
Easy to use	4.10
Average	**4.35**

4.5 Discussion

The system achieves 86% accuracy for providing the same decisions as those made by the experts. More frequency of data collection and more criterions are probably required for improving the accuracy. Additionally, the scores of easy to use are lowest for both from the expert and the down-line members. The expert and down-line members give the same comment that the professional recording sheets are difficult to use because there are totally three forms including daily, weekly and monthly. Additionally the entering data page is also claimed that the user interface is not easy to use.

CHAPTER 5

CONCLUSION

5.1 Conclusion

This thesis proposes the decision supporting system for mentoring the team working in MLM business because the profit of the team is very important. To support the team appropriately in time, the leader or the up-line member requires the real time mentoring system. This thesis employs the professional status and the knowledge from 10 experts to create the knowledge base of the system. There are 50 down-line members and 10 experts of one MLM company in Thailand used for testing the system. The result shows that the system is able to provide 86% accuracy for providing the same decisions as the experts. More frequency for data collection and more criterions are possible required to improve the accuracy.

The system obtains the satisfaction from the expert in the “very good” level for suitability, precision and flexibility in the “good” level for easy to use. At the same time, the satisfaction score of system from down-line members is in the “very good” level for suitability, precision, flexibility and easy to use. However, the easy to use has the lowest scores for both from the experts and the down-line members because the user interface is difficult to use.

5.2 Future Work

The future work should be focused in improving the satisfaction for easy to use. Additionally, the system can be developed in mobile platform for promoting convenient use. Additionally, the improvement of decision accuracy is also the promising future work of this thesis.

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APPENDICES

APPENDIX A

DATABASE DETAIL

Table User

User ID	ID of user when register on web
Name	Name of user
Last name	Last name of user
Member ID	ID from MLM company of user

Working behavior (Day)

Business call	How often do the members call to set the meeting with prospect?
Business meeting	How often do the members face to face discussion with prospect?
Present the product and business plan	How often do the members to set needs for sale the product and set needs for invite prospect to join your team?
Learn the product and business plan	Do the members listen to the CD and read a book to understand about the product and business plan of your company?
Contact up-line	How often do the members contact the up-line per day?
Contact down-line	How often do the members contact the down-line per day?
Table ID	ID of each table
User ID	ID of user when register on web
Day time	Date and time of each record

Working behavior (Week)

Have new member	How many new down-line members join your team?
Join the meeting in the company	How often do the members join the company meeting per week?
Table ID	ID of each table
User ID	ID of user when register on web
Day time	Date and time of each record

Working behavior (Month)

Have private sale point	How much the member gain private sale?
Have new customer	How many customers do the members have per month?
Join the training in the company	How often do the members join the company training per month?
Table ID	ID of each table
User ID	ID of user when register on web
Day time	Date and time of each record

APPENDIX B

QUESTIONNAIRE OF WORKING BEHAVIOR IN MULTI LEVEL MARKETING BUSINESS

1. How often have you present product and business plan in a day?
   ☐ Less than three times ☐ Three to Five times ☐ More than five times
2. How many do you have private sale points per month?
   ☐ Less than 100 points ☐ 100 to 200 points ☐ More than 200 points
3. How many new customers do you have per month?
   ☐ Less than two customer ☐ Two to five customers ☐ More than five customers
4. How many new members do you have per week?
   ☐ Less than one member ☐ One to three member ☐ More than three members
5. Have you ever learned the product and business plan?
   ☐ Yes ☐ No
6. How many times do you have business call per day?
   ☐ Less than one times ☐ One to three times ☐ More than three times
7. How many times have you join the meeting in the company per week?
   ☐ Less than one times ☐ One to two times ☐ More than two times
8. How many times have you join the training in the company per month?
   ☐ Less than one times ☐ One to two times ☐ More than two times
9. How many times have you contact up-line members per day?
   ☐ Less than one times ☐ One to three times ☐ More than three times

10. How many times have you contact down-line members per day?

☐ Less than one times ☐ One to three times ☐ More than three times

11. How many times do you have business meeting per day?

☐ Less than one times ☐ One to three times ☐ More than three times

APPENDIX C

QUESTIONNAIRE OF SYSTEM SATISFACTION

Criteria	Score from 0-5
The advices for solving or managing any problem (**Suitability**)	
The accuracy to provide the same advice with the expert (**Precision**)	
The ability of the system that can adapt the knowledge (**Flexibility**)	
How easy the user can interact with the system (**Easy to use**)	
Average	

The rating scales including

1.0	Means absolutely not agree
2.0	Means not agree
3.0	Means neutral
4.0	Means agree
5.0	Means absolutely agree

The total average score also has five ranges including

0.0 to 1.0	Means very poor
1.1 to 2.0	Means poor
2.1 to 3.0	Means average
3.1 to 4.0	Means good
4.1 to 5.0	Means very good

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CURRICULUM VITAE

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