PERCEPTION AND AWARENESS OF THAILAND SMART CITY

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ABSTRACT

The purposes of this research were to examine the perception and level of awareness about Thailand smart city of the people in Nonthaburi Province, Thailand and to understand their differences of their perception and level of awareness by their demography information. This was a survey of quantitative research method using mainly the information collected via questionnaire. The findings revealed that the level of awareness and understanding of Thailand smart city collected from the sample of people in Nonthaburi Province of Thailand, the majority of respondents were rated their awareness at the medium level with the mean of 3.37 with a standard deviation of 0.44. When evaluated by the difference of awareness by different demographic information, it is found that only gender and age had the statistical significance.

Keywords: Smart City, Environment, Green, Adaptive

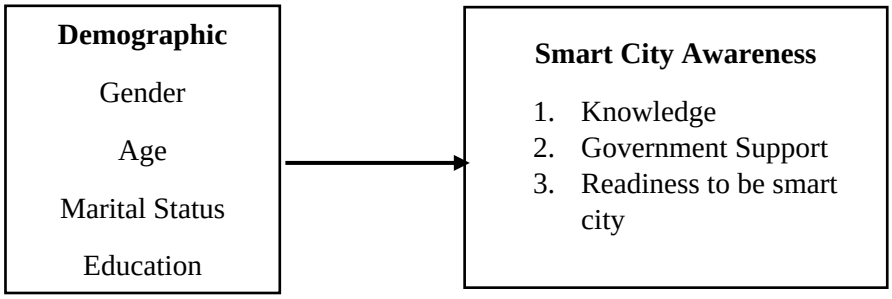
INTRODUCTION

Smart city is a new concept and it is an innovative city that can reduce many problems of pollution, enhance the system of environment friendly, increase the usage of clean energy, and manage the use of resources effectively and efficiently [1] [2]. It is a city with an integrated system and manage with the advanced information technology. The idea of smart city has been promoted by the government [3]. The idea of smart city development is a key point in the government plan to adapt towards a digital economy. It is designed to be a project developed between public and private collaboration model. The goal is to accelerate the country's progress and economic development in building smart city. The provinces that are considered in the plan to be a choice of smart city such as Kon Kaen, Chiang Mai, and Phuket [4] [5]. Then, the plan is to develop more smart cities across Thailand by focusing on the adaptive and develop according to economic and social needs. From the importance of smart city which may be crated in Thailand in the near future, the researcher is interested in investigating the awareness of the Thai people about Thailand smart city [6] [7].

RESEARCH METHODOLOGY

The objectives of this research were to investigate the perception and level of awareness about Thailand smart city of the people in Nonthaburi Province, Thailand and to compare their perception and level of awareness by their demography information. The information was collected during December 2016 to February 2017. The survey area of this research was Nonthaburi Province, Thailand and the population of this study was all adult people who live in Nonthaburi Province, Thailand during December 2016 to February 2017. Independent variables include gender, age, marital status, and level of education whereas dependent variables include knowledge of smart city, support from local government, and readiness to be smart city [8] [9]. Statistical analysis included mean, standard deviation, t-test, and One Way ANOVA.

Fig. 1 Conceptual Framework



FINDINGS

The findings revealed that the majority of respondents were female or about 54 percent. In terms of age, the majority of respondents had the age over 40 years old or about 42 percent and then the age between 31-35 years old or about 34 percent. The majority of respondents showed that 54 percent were married and had an undergraduate degree. From table 1, the findings revealed that the total awareness about Thailand smart city was rated at medium level with a mean of 3.25 and standard deviation of 0.54. While the majority of the respondent rated that they were aware of government policy of smart city the most and have little knowledge about budget for the smart city. This is understandable because the government has promoted the concept of smart city to general public but the information about budget of smart city is a detail information. Therefore, many people do not have information about budget of the smart city. However, the level of awareness was expected to be higher than this findings. Therefore, it is imperative for the government to promote the concept and increase the marketing and public relation to make sure that general people will be aware and understand the concept of smart city and willing to cooperate in the future [10].

Table 1
Level of Awareness

Thailand Smart City	Mean	S.D.	Level
Knowledge of smart city	3.30	0.71	Medium
Project of smart city	3.36	0.71	Medium
Budget of smart city	2.25	0.81	Medium
Infrastructure of smart city	2.97	0.88	Medium
Government policy of smart city	3.40	0.82	Medium
Total	3.25	0.54	Medium

Table 2
Level of Awareness (Gender)

Thailand Smart City	X	S.D.	t	Sig
Knowledge (Male)	3.38	0.47	10.510	0.002*
Knowledge (Female)	3.05	0.56		
Government Support (Male)	3.36	0.480	4.006	0.480
Government Support (Female)	3.16	0.574		
Readiness (Male)	3.33	0.503	0.203	0.653
Readiness (Female)	3.28	0.596		

From the table 2, the findings revealed that in terms of knowledge of the smart city, the difference in gender had different knowledge of smart city with statistical significance.

Table 3
Level of Awareness (AGE)

Thailand Smart City	*Age*	*X*	*S.D.*	*F*	*Sig*	*Difference*
1 Understanding (<25years old)		2.87	0.433	10.510	0.002*	(5)>(3)
(25-30 years old)		2.87	0.426			
(31-35 years old)		3.24	0.437			
(36-40 years old)		3.15	0.544			
(More than 40 years old)		3.30	0.628			
2. Government Support (<25years old)		3.60	0.692	4.006	0.048*	(1)>(5)
(25-30 years old)		3.00	0.424			
(31-35 years old)		3.23	0.471			
(36-40 years old)		3.04	0.598			
(More than 40 years old)		3.36	0.581			
3. Readiness (<25years old)		2.70	0.519	0.203	0.653	
(25-30 years old)		3.20	0.460			
(31-35 years old)		3.27	0.460			
(36-40 years old)		3.22	0.411			
(More than 40 years old)		3.42	0.628			

From the table 3, the findings revealed that in terms of understanding the concept of the smart city, the difference in age had different knowledge of smart city with statistical significance. In general, there are three major benefits of smart city. First is the economic benefit. This is the benefit from energy saving and reduce the cost of resources by developing high technology and the use of information technology as well as the focus of clean energy and efficiently use of scare resources. Second is the benefit to social and culture. This is the benefit about communication and information in the new effective system which allow people to learn and share information faster and large geographic area. Third is the benefit to the environment such as air, water, and trees. The city will have better system to manage air pollution, waste water and the garbage by using the high and green technology. In other words, it is the system that design to reduce the negative impacts to the environment.

CONCLUSION

The level of awareness and understanding of Thailand smart city of people in Nonthaburi Province of Thailand was rated at the medium level with the mean of 3.37 and standard deviation of 0.44. When evaluated by demographic information, it is found that only gender and age had the statistical significance. In other words, the level of awareness of Thailand smart city is not very high. This is due to the lack of public relation from both public sector and private sector. In other words, the success of the project Thailand smart city depend on the high level of participation from local community which resulted from the high level of awareness and understanding of the benefits of the Thailand smart city.

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VOTING RIGHTS FOR FRICAN AMERICANS IN THE USA

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ABSTRACT

After the U.S. Civil War, the 15th Amendment, was passed in 1870. This act aimed to protect newly freed male African Americans' voting rights. But Southern States implemented Jim Crow laws in order to segregate African Americans from whites. Moreover, Jim Crow laws were used to prevent African Americans from voting by imposing property ownership requirements, literacy tests, document interpretation tests, poll taxes, moral characters test and ancestral barriers. Voting rights activists criticized this policy in 1950s and 1960s. A group of African Americans to protest this practice marched into Selma, Alabama. Although it was a peaceful protest against voter supression, they were attacked by state troopers. Because they declined to turn back. The protesters either were beaten severely or pushed to run to save their lives. Americans watched the incident which is known as "Bloody Sunday", on national television. The brutal incident caused discontent among the people especially in Northern States. Johnson was one of them and gave an adress in a joint session of Congress on March 15,1965. He called for comprehensive voting right legislation. Johnson signed the Voting Rights Act into law on August 6, 1965. The objective of the act was overcoming the legal barriers for African Americans to exercise their right to vote under the 15th Amendment at the state and local levels. In this paper the motives of Southern States to prevent African Americans from the voting rights, the struggle of Africans Americans for their voting rights and the changes after Voting Rights Act of 1965 will be analyzed.

Being, Becoming and Belonging – A narrative inquiry into the professional identities of an Associate Department Head of a higher education institution in Hong Kong

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ABSTRACT

This study explores the professional identities of an Associate Department Head who used to be Department Head of a higher education institution in Hong Kong situated in the landscape of institutional change and seeks to understand how he negotiates his professional identities in an era of reform.

Being informed by the postmodern notion of multiple truths and realities, the author strongly believes that professional identities are ambiguous, fragmented and contingent. Thanks to this belief, it is not the author's intention to measure professional identities by means of figures or to draw on prominent theories to describe them. Holding a worldview that people live a storied life, the author set out on the research journey with her own autobiography and collected stories from in-depth unstructured narrative interviews with the participant, seeking to understand his rich and complex experiences. Sharing a similar role and career path in the "same" workplace, intense resonance with the participant was generated while attending to the stories told by him. The author added her version of the stories and co-constructed different layers in which she constantly reflected upon her own role contextualised in the same landscape, contesting her professional identities. Through the research process the author discovered that her professional identities and those of her participant have been transformed from being rather ambiguous to being demystified to a certain extent.

Readers are invited to join the research journey. It is hoped that they can gain resonance from the stories and as the stories unfold, they are able to form multilayered narratives with new meanings and knowledge. It is also the author's hope that readers can reflect upon their own selves and professional identities from the layered narratives, and that the uncovered narratives may have implications for those others working in the higher education institutions aiming at university status.

EXAMINATION OF THE LEVELS OF ETHİCAL DECISION-MAKING IN DISASTER TRIAGE OF EMERGENCY HEALTHCARE PROFESSIONALS WORKING IN IZMIR

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ABSTRACT

Disaster is an incident that creates a chaotic situation which results in the scarcity of and therefore creates imbalance between demand and supply of vital resources**.** What is more/Worst, it causes the death and injury of many people making a rush to response as quickly as possible**.** This imbalance and turmoil makes triage a vital process at every phase of disaster response**.** In this chaotic environment, healthcare professionals performing disaster triage have to make ethical desicions through the right assessment of casualties regarding which ones need immediate treatment and how to respond them by using scarce resources in order to save more lives**.** For this reason, it is significant for healthcare professionals to approach disaster triage with the aim of **"**doing the greatest good for the greatest number of casualties**".**

This study aims to analyze whether healthcare professionals in Izmir are qualified to do disaster triage and whether they make ethical decisions in this process**.** In order to answer this research question, the author conducts a questionaire prepared by Vignette method on healthcare professionals in 112 Emergency Stations, UMKE and AKS-110 Team**.** Through this method, their ability to carry disaster triage and make ethical desicions in conflictual situations is measured in relation to different variables**.** The data shows that the respondents**'** knowledge level about erthical disaster triage is insufficient and they don**'**t know as much as the difference between daily triage and disaster triage**.** Also they don**'**t succeed at overtriage and undertriage which cause ethical problem**.** All in all, it has been observed that the respondents are in tendency to ethical desicions in disaster scenario and as their disaster triage knowledge level increases, ethical decision making tendencies also increase**.**

Keywords: Disaster Triage, Ethical Decision Making, Ethical Principles of Disaster Triage

The Impact Of "Pipeline Diplomacy" On Conflict Resolution In The Caucasus-Caspian Region – The Case Of Azerbaijan And Afghanistan

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ABSTRACT

The purpose of the research is to rethink new concepts in pipeline diplomacy, conflict resolutions in Caucasus-Caspian region. On the one hand, research essentially tends to significance of energy security for demonstrating and explaining impact of the energy diplomacy in the conflict resolution process. Besides, this study provides such a crucial instrument (energy diplomacy) and opportunities to figure out clashes for both cases, Afghanistan and Azerbaijan. Moreover, paid attention to those cases at regional and global political perspective for identification new region, Caucasus-Caspian region.

On the other hand, in terms of the regional geopolitics, research also aims to contribute region, as mentioned above, in the international relations field. The purpose of contribution Caucasus-Caspian region as sub-area of the "Eurasian Balkans" is that to illustrate and clarify conflict resolution cases in narrow range analytical perspective for preventing future escalation of the geostrategic conflicts.

Furthermore, research also will contribute such a modality for conflict resolution in other regions of Turkey (PKK problem) and Georgia (Abkhazia) etc.

Keywords—Pipelines, Pipeline Diplomacy, Conflict Resolution.

I. INTRODUCTION

Role of the supplying and demanding has taken significant place in daily life. In this regard, energy resources provide economic well-being (social prosperity). Thus, natural resources (gas and oil) contributes to the basis for increasing standard of living. Moreover, it is clear that, natural reserves which are limited are not distributed equally. Additionally, Caspian –Caucasus which have huge energy reserves are quietly sensitive and fragile regions in terms of emerging confrontation, such ethnic issue. Development of the technology paves away for much more consumption of the energy, particularly after the post-Cold War.

A. Objective

The objectives of this research specifically is to demonstrate interaction between energy security and conflict in the framework of the pipeline diplomacy. In this context, Afghanistan and Azerbaijan cases have taken place in study for identification of new region (Caucasus-Caspian) and to illustrate how energy security works in order to promote peace and stability in those areas.

B. Problem Statement

Using pipelines diplomacy as instrument, in the different cases on the one region may provide different outcomes in case of energy security. Thus, problem is how energy diplomacy work for both Afghanistan and Azerbaijan in the Caucasus-Caspian region.

C. Significance

Many scholarly articles have been written about energy security and pipeline diplomacy. On hand, research significance is to illustrate impact of the energy security in the emerging conflicts. On the other hand, study is important for observing the characteristic of the energy security and its impact relation with conflict in framework of the pipeline diplomacy. Furthermore, research will be focused on significance of the energy security and pipeline diplomacy in the Afghanistan and Azerbaijan conflicts. Thus, this study plans demonstrates negative and positive impact of the pipeline diplomacy on the international relations.

D. Literature Review

Petersen and Barysch indicated that energy has come to symbolize the geopolitics of the 21st century, reflecting the state`s diminishing reliance on military and political power. Today, energy is an instrument of geopolitical competition, like nuclear weapons or large armies were during the Cold War (Petersen & Barysch, 2011).

There is a mainly close link between energy and security. In order to explain the energy security concept, Yergin mentioned the ability of the appropriate supplies at affordable price (Yergin, 2013) .

Furthermore, energy plays crucial role for foreign policy, as Senturk & Saraf highlighted states have taken energy as a profitable valuable stuff which provides economic income for developing economy and social infrastructures (Senturk & Saraf, 2015).Increasing demand of energy influences international politics and the scarcity of the resources on the world pave way for the energy conflict among states.

Middle East and Central Asia are main regions for the supplying energy resources in the world. Instability of the Middle East paves way for the importance of Caucasus- Caspian region for supplying energy. As Pamir highlighted, in the coming decades those regions will play significant role for increasing the diversification of the energy supply (Pamir, 2007).

As Pascual indicated that close relation exists between energy and geopolitics. Moreover, he also mentioned accessing or exploiting natural reserves become quietly significant issue that causes new confrontations in the 20th century (Pascual, 2015).

Pipelines diplomacy is policy towards the countries involved in transportation of oil or gas and energy-reach. Energy security is mainly related to pipelines diplomacy because foreign policy of states and pipeline diplomacy link each other. For example, Russia`s energy pipelines is significant factor for regional and global actors because its pipelines diplomacy purpose is to increase the its domination over the region by pipelines. In addition, Russian pipeline diplomacy impacts Central Asian countries, which prevents reconstruction pipelines for diversification of the energy supply in the Central Asian region. As Qurbanov mentioned transit actors are most significant issue for energy security in Caucasus (Azerbaijan) and Central Asia (Afghanistan). In this context, TAPI project may not be activated because of the Afghanistan problem (Qurbanov, 2012).

In this study, we mainly concerns Caspian-Caucasus region with energy security and pipeline diplomacy.

As for new concept Caspian-Caucasus region, The Caucasus-Caspian Commission which was promoted by European Union, according to them, ``extending from the shores of the Black Sea to the heart of Central Asia (Afghanistan), is the home of many nations, a corridor that connects Asia with Europe, a region with huge economic potential and a meeting point between cultures and civilizations`` (Commission, 2007).

Furthermore, commission stated this region has been focused as significant location between Asia and Europe by regional and global actors for their interests. In this regard, it is located as transition region between Europe, Russia, the Middle East, China and India.

In this regard, perspective of the commission is significant evident to explain and illustrate Caucasus-Caspian region. Besides, the Commission is in no doubt that this is a defining moment for the Caucasus-Caspian region (2007).

On the other hand, the Caucasus-Caspian region connects Europe to Central Asia and Russia with the Middle East (Caucasus-Caspian Commission to hold first meeting, 2007).

As Abuseitov argued at the end of the 20th century, the Caspian-Caucasus region has assumed significant importance for increasing the diversification of the energy supply. In this regard, this region includes many political and economic interests (Abuseitov, 2000).

Existing potential gas and oil makes this region more significant. In this regard, according to Mirzayev, energy conflicts have brought the dissatisfactions between energy producer and supplier. Besides, consequences of the energy wars destroy not only regional and but also international economic market (Mirzayev, 2015). Nevertheless, as the Ozdemir stated that clashing the energy interest at the same place has increased the potential problems (Ozdemir, 2007).

As the same scholars, Naji and Jawan indicated that after the Cold War Period energy caused competition and conflict among countries. However, they also stated that there is close relation between conflict and natural resources, because of scarcity of energy. In this approach, it is better to say deeply with such an example, the Iraqi war in the Middle East. Having different interests among states caused energy crisis (Naji & Jawan, 2012).

Vlad, Hurduzeu and Josanalso pointed out that, energy paves away advantage and disadvantage outcomes. As for advantage of energy, regional connection between Caucasus -Balkans and European Union is possible with energy factor. As for disadvantage, increasing demand in oil expending area in order to exploit energy reserves cause the conflict and emerging instability (Vlad, Hurduzeu, & Josan, 2009).

For Azerbaijan, Brzezinski mentioned that it`s vulnerability has wider regional implications because the county`s location makes a geopolitical pivot. It can be described as vitally important `cork` controlling access to bottle that contains riches of Caspian Sea and Central Asia (Brzezinski, 1997).

As Zarrilli indicated Nagorno -Karabakh occupies significant geopolitical and geographical position for Caspian natural resources that caused energy conflicts between Russian and Western countries. On the other hand, Russia has good relation with Armenia to increase its domination in the Caspian region (Zarrilli, 2001).

In terms of the energy sustainability and regional peace Caucasus region successful story, as Nichol stated a ceasefire agreement was signed in July 1994 by Armenia, Azerbaijan, and NK Armenians and the sides pledged to work toward a peace settlement (Nichol, 2014).

On the other hand, Zolyan mentioned that one of the main reasons in that decreasing the oil prices because this country is quietly connect to energy revenue. In this context, for years, at least since the late 1990s, Azerbaijan's strategy has been based on the assumption that oil profits and growing economy could be used to achieve a resolution of the Nagorno-Karabakh conflict issue in favor of Baku. Oil prices are unlikely to return to their previous levels any time soon and the perspective of defeating Armenia and "re-taking" Nagorno Karabakh by offering purely economic means seem highly unlikely (Zolyan, 2016).

As Zahur Shiriyev indicated Azerbaijan`s active participation in the fight against terrorism in Afghanistan could motivate the US to adopt an active strategy towards the Caucasus region. After the collapse of the Soviet Union, a few regions have emerged in the heart of the Eurasia. They are Caspian Basin, Central Eurasia (Central Asia) and Caucasus. Besides, Caspian energy resources has become the central element of the long-term commitment to gaining economic and political independence for regional countries. Besides, Azerbaijan as well as Georgia as a transit country sought to develop regional energy resources and to transport these energy resources to Europe by passing the Russia.US engagement with Caspian Sea region and Azerbaijan intended to prevent Russia from establishing regional hegemony at the heart of the Eurasia (Shiriyev, 2013).

BTC and BTE pipelines play significant role in terms of Caucasus region stability and peace for the Nagorno-Karabakh conflict. Since activation of those project in the region there is regional prosperity. For those projects, in planned in order to increase sustainability and continuity to supply energy. Furthermore, as Nanay and H.Kalicki stated that TANAP (Trans Anatolian Pipeline project) is planned to source from second phase of Azerbaijan`s Shah Denish field. It would connect on the border between Turkey and Georgia expand the upgraded (existing) Baku-Tbilisi-Erzurum gas pipeline. On the Turkey western side, TANAP will connect into new pipeline network for Europe through TAP. (Trans-Antic-Pipeline) (Nanay & H.Kalicki, 2013).

Energy security in Afghanistan is quietly complicate issue which caused regional instability. As Oskarsson indicated energy security is one of the fundamental conditions for economic development. Energy security means access to reliable, affordable, and sustainable energy supplies but the majority of the Afghan population still does not have access to modern forms and supplies of energy (Oskarsson, 2010). According to Chossudovsky, Afghanistan is a land bridge. The 2001 U.S. led invasion and occupation of Afghanistan has been analyzed by critics of US foreign policy as a means to securing control over the strategic trans-Afghan transport corridor which links the Caspian Sea basin to the Arabian Sea (Chossudovsky, 2015) .

According to Rashid, only an end to Afghan civil war would give the CARs (Central Asian Republics) and oil companies the confidence to go ahead with pipeline projects to South Asia which does not appear likely any time soon. Connection energy route with Turkmenistan to Pakistan and India provide peace in Afghanistan and between India and Pakistan as well. Besides, he stated that a pipeline through Afghanistan could became a peace-making business - difficult but possible (Rashid, 2000) .

In addition that, interests of the Iran and Russia stick to sustainability and prosperity of the region with supporting anti-Taliban alliance, because of this fact that US pipeline projects could never succeed (2000).

Energy has become most significant commodity at Central Asian region just like others. Moreover, it is clear that energy factor plays critical role in terms of the internal and external interests. As the Yesdauletova mentioned that most significant struggle of Central Asian countries is energy security which mainly caused by Afghanistan. Furthermore, those main purpose is reconstruction of new energy project, Turkmenistan-Afghanistan-Pakistan-India (TAPI) natural gas pipeline, in order to improve regional peace and stability. Even though they have located common region, almost one of them has different energy security policy that brings regional dissatisfaction and instability.

Existing of the Afghan issue has led to this territory in order to presence of the unsustainable of energy security in Afghanistan led to USA and NATO involve this issue to provide regional peace and prosperity. What is more, according to Central Asian countries, solution of the energy security problem (Afghanistan issue) is activating new oil and gas projects as stated above one of them (TAPI) that provides regional peace and solidarity (Yesdauletova, 2013).

Moreover, Yesdauletova stated that aftermath of the of 11 September of 2001 , Central Asia region become very important buffer zone between Europe and Afghanistan in terms of the preventing drug trafficking and radical Islamist movements. In this context, Central Asian support for the Northern Distribution Networks (NDN) for ISAF mission of NATO is very important, as it uses the territories of the post-Soviet counties including Latvia,

Russia, Azerbaijan, Georgia, Kazakhstan, Uzbekistan, and Tajikistan. In this context, the Afghanistan problem is closely related to energy security issue in the Central Asia. TAPI`s route may serve as peace corridor, linking neighbors together in economic growth and prosperity (2013).

In addition, Brzezinski indicated that main problem is energy factor in the Caspian Sea basin and Central Asia for regional stability and prosperity. Russian interest mainly is based on energy pipelines which pass through its territory. Furthermore, any other energy pipeline project may bring challenges in Russia's domination in energy factor over the region. There are two main pipeline routes which have located so critical role in case decreasing Russian monopoly in the region: one of them is BTC (Baku -Tiflis -Ceyhan) project, from Azerbaijan to Mediterranean Sea, other one is that from Turkmenistan to Arabian Sea through Afghanistan, those energy pipelines projects will not allow any country to control energy pipelines under one authority (1997).

In this context, it is significant to indicate that as the Yergin highlight that USA and EU purpose based on supporting new pipelines or presence projects in order to provide social prosperity, economic development and regional peace. Taking this fact account, those main player support to activate pipelines, one of the them is to supply gas from Azerbaijan and Turkmenistan to European consumers in order to break Russia and Iran influence in the region, other one is that North- South energy and trade corridor which plans to supply gas other supplies from Central Asia to Afghanistan, Pakistan, India (Yergin, 2013). In is clear that USA supports this project for developing regional stability. It seems that the same actors (USA and EU), as supporter countries, initiated to construct alternative pipelines in order to overcome ethnic/civil problem (in Azerbaijan) and international ethnic problem (in Azerbaijan, Nagorno-Karabakh issue). However, research conduct to illustrate how energy diplomacy works for both cases.

E. Novelty of the Research

At the research at first time, has introduced new political jargon "pipeline diplomacy"- as an essential part of energy security, clarifies that pipeline politics transformed from local level analyze into global one contribute and further promote geopolitical stability of any type of conflicts in those areas where the conflicts develop (definition of the "pipeline diplomacy").

Besides, research will be presented the results of how the instrument to be relevant for properly scrutinizing and predicting evolvement of conflicts and their resolution opportunities perspectives at global and regional political levels.

From regional geopolitics, at the research is made possible to identify new dimension: Caucasus-Caspian region encompasses littoral states of Caspian Sea, adjacent geographical zones of Central Asia, Caucasus and Afghanistan. The region is identified in aegis of so-called "Eurasian Balkan" conception and considered as one of the key geopolitical configuration from trans-scientific review (encompasses several academician branches: geopolitics, energy security, international security, geostrategic studies, conflict resolution, etc.) as well as from practical political ones.

F. Theoretical Value

After the post- Cold War, international system is chanced. This changing has impacted international relations theories too. Consumption of the natural resources with globalization, emerging the new conflict (such ethnic) caused to international theories to be more complicated.

In this context, Caucasus-Caspian region includes potential oil and gas resources which caused the regional, global and local outcomes. In this regard, research is based on the analysis of the situations (Azerbaijan, Nagorno-Karabakh and Afghanistan ethnic conflicts) and in the post-Cold War era and theoretical framework composes of the Realist, Neoliberal and Constructive approach related to conflict.

Firstly, research approaches realist theory, according to realists, significant factor is states' action on the confrontation. Scarcity and inequality distribution of the energy resources causes remerging energy conflict among states. According to them, natural resources seems as their national interests so that they argue powerful state who has not enough energy resources intervene to other states who maintain potential energy reserves. This is main theory for the research to explain how energy conflicts emerge.

On the other hand, Realists have paid more attention to global and regional and inter-state conflicts for the independent variables.

Secondly, according to neo-liberals, they are taking international institutions which provide to regional peace and cooperative relations between states, as a parallel, prevent to engage in conflict. As they believe that only this way to economic growth can be achieved through competition for the most efficient use of natural resources. According their approach, Caspian region which emerged as a new energy security after the Soviet Union collapsed is such way in order to promote relations between five littoral states for increasing revenue. It is clear that prosperity and stability of the Caspian region countries impact other regional and global states as well so that, it depends such an international institution which encourage stability and solves problems.

As for Constructive theory, this based on the ideas in the construction of the social life and with illustrating the socially constructed nature of mediators or subjects.

After the disintegration of the Soviet Union a multicultural environment was revealed, which includes many different historical influences that in certain cases have direct impact in the present interstate relations of the region and their intrastate situation. Therefore, according to constructivism, the impact of different cultural and social structures can have on the formation of the interests and the decisions of the political actors can provide an interesting aspect of analysis of the bilateral relations of the countries of the region. On the other hand, constructive theory tends to relations between energy importer and exporter states. After the collapse of the Soviet Union, income of gas and oil become such a character for declaring the national sovereignty in the different way.

G. Practical Value

The importance of the study is to deal with the characteristic of the energy security which is unstable. Contribution of the research in the academic life is to clarify consequences and repercussions of the energy security with compering Afghanistan and Azerbaijan. This researchgives a comprehensives approach of energy security and pipeline diplomacy thanks to outcomes the case studies. On the other hand, research provides regional studies for the International relations scope in the framework of energy security with case study method.

Furthermore, research will be more significant resource for scientists who are interested in international political and economic relations, at the same time researcher students who have different type of targeting the civil society. Furthermore, representatives of the governmental agencies which are responsible for international energy and security, different scientist will be able to utilize different material for the preparation article and also research paper. Practically, this study provides to illustrate impact of the pipeline diplomacy as instrument for analyzing evolvement of conflicts and its impact for resolution prospects perceptions at global and regional political levels. On the other hand, research is significant for identification of the new region, Caucasus-Caspian.

II. METHODOLOGY

This researchis based on the qualitative research. It involves the use of different written sources, such as books, scholarly and newspapers articles, working papers, documents issued by different institutions, governmental archives and internet resources. Besides, we will review literature and analyze governmental documents/foreign policy discourses in order gather vital information related to energy resources and observe its influence on the energy security and pipeline diplomacy.

This research is based on two theories. First, the interdisciplinary method that focus on two or more disciplines for obtain well-developed aspects. This method includes history, political science, and sociology etc. so it is more flexible method for study. Second, the “macro” perspectives of comparative policy analyses, such as social stability and change because this method has tends to social problems, social processes.

In this regard, this research takes pipeline diplomacy into consideration, in order to understand how pipeline diplomacy works for both states (Azerbaijan and Afghanistan) with feature of the differences and similarities in the energy security of those countries. Analysis of the problems related to the energy security formulation, conceptualization and implementation on case of the regional and global level of analyses requires a comprehensive approach and therefore this research will include historic overview of the processes, which is interrelated with the main reasons and data of the formulation and further implementation of foreign policy decisions and how the decisions are implementing. Moreover, during implementation of the research some others methods are to be used relevantly linked with and geopolitical and foreign policy-making analyses, such as case-study method that observes the Afghanistan and Azerbaijan in terms of energy security and content analyses, will be used for official documents related energy reserves on the local and global side.

As for methods, mainly method studies will be composed of the two parts:

First one is that utilizing case study method. This method utilizes particularly real situations. Although researcher tends to whether hypothesis evidence or not, case study may provide different or unpredicted outcomes. On the other hand, case study depends on notion which does not advocate whether it is exactly right or not in case study. During the research, we have followed the some questions in order to pay more attentions and study the situations. In this regard, case studies (Azerbaijan and Afghanistan cases) will based on the specifically Caucasus-Caspian region. Besides, utilizing these methods provides research to illustrate how those cases association with this region.

Second one is that the utilizing the comparative case study. The reason why we used this method is understanding each of cases in the analytical framework which flows cross-case comprehension. In this context, research tends to cross-case analyses, which demonstrate similarities and differences in order to explain progress in the situation.

Reason to prefer this method is understanding each of case in the analytical framework for the explaining and clarifying cases.
Reason of the tending this method is that with utilizing both Afghanistan and Azerbaijan case, explaining the impact of the energy security and pipeline diplomacy in conflicts from perspective two different states, so that both of the cases will be taken one by one will be examined. In addition, those cases will be compared according to dependent and independent variables.
As for hypothesis part, it composes of two parts, dependent and independent variables.

A. First Part: Dependent Variable:

Researchmainly considers to conflict so that, literature review paid more attention to specifically conflict. In this context, in the case studies, in the framework of the energy security and pipeline diplomacy is quietly link to ethnic conflict in the Azerbaijan and Afghanistan so that conflict will be analyzed as more effective argument for Caucasus-Caspian region.

B. HYPOTHESES

1) H1

Due to the international relations processes taken places at global, regional and local levels, regional geopolitics becomes most important and focused oriented factor for relevantly scrutinize and properly predicted events at any level of political analyzes. According to many experts, the globalization process including field of geopolitics has its positive and negative consequences and it's important to present the comparative analysis based on both factors and to prove above prevailing the positive factors, which promote the peace and stability in the World. However, there are some other regions importance to which determined from negative factors development. From the classical geopolitical thoughts, this space is to be identified Eurasia with its relevance to world political process from confrontation lines consideration between the global and regional powers. Hence it should be mentioned that the southern flank of the Eurasia area also has great potential (it deals with Harford Mackinder's heart of his Heartland – the Caspian Sea-which is a space that had the potential to become a major source of great-power contention in 20-21st centuries). From other point, former US National Security Advisor to President Jimmy Carter, Mr. Zbigniew Brzezinski called the southern part of the Eurasia as "Eurasian Balkans". Speaking in geopolitical terms, the Eurasian Balkans, encompassing the whole of Central Asia and Caucasus (South and North Caucasus ones) — which borders quite uncomfortably on the Middle East and quite promisingly on the Balkans and Eastern Europe. As for how far the "Eurasian Balkans" is indeed instable in its essence from geopolitical levels of analyses is indicated on concrete cases. In that regard, moving away from the expansive Eurasian Balkans and reverting to the roots of "Afghan anarchy" is the nature of the Reverse Brzezinski, and it poses the ultimate dilemma-like trap for the Global Powers. As it is indicated above, the "Eurasian Balkans" is in its scope very great space encompasses several important sub-regional dimensions with high-intensity conflicts and instability rims surrounded the areas. Here with, it is important to more in detail narrow range of analytical approaches in aegis of more concrete geopolitical dimension for thorough identifications and paternities dovetail in conflict resolution cases and preventing further escalation of the geostrategic confrontations. In this regard, it could be relevant to identify one of the sub-area of the "Eurasian Balkans" zone on case of Caucasus-Caspian region. The region is significant for other reasons, staying beyond geopolitics and pinched to the geostrategic (military-political balance implication at the regional level) and geo-economics (Caspian energy reserves) perspectives and reality. This reality is a much more interesting case to review, notable from the perspective of international society. In this respect, one of the key security challenges facing the Caucasus-Caspian region and the whole Central Asian states is the Afghan problem. The regional countries, including Azerbaijan, could contribute to enhancing security in Afghanistan through realizing the following energy projects: Turkmenistan-Afghanistan-Pakistan-India (TAPI) natural gas pipeline and the Central Asia – South Asia electricity scheme (CASA). Hence, the "Caucasian" branch countries experience to run similar already international important energy projects: Baku-Tbilisi-Erzurum (BTE) natural gas and Baku-Tbilisi-Ceyhan (BTC) oil pipelines in providing security provisions (for instance, including conflict-resolution ones) at regional level are proper modalities for further consideration. Hence, so-called "pipeline diplomacy" as some kind political background of energy security could be relevant analytical tool and instrument for reaching this academic mission and goal.

2) H2

According to dynamics of contemporary international politics and modern realms of geopolitical processes, energy security factor becomes dominant factor in fostering and influencing the processes of the international relations. In most interdependent and globalized world all types of interactions are intervened and the interactions are very relevantly dependent on each other's. Hence, energy security as a part of economic security provisions is not only influenced on geo-economics development taken places at all levels of politics but also takes part in

resolution of the conflict resolution cases. The influence has mostly both effects – positive and negative ones amid having strong and direct effect on regional and global developments, mainly economic characteristics. However, energy security makes serious input in fostering and forwarding processes of political and military characteristics. Therefore, the provision are becoming very important in scrutinizing of geopolitical and geostrategic events in stalemate Caucasus-Caspian region.

3) Second Part: Independent Variables

Scarcity of energy resources, besides, can be analyzed by observing increase in the world population with energy usage in the world opposing to world's overall energy capacity. In this regard, in the research scarcity of energy resources will be taken place as independent variable.

Identification of the new geopolitical dimension and its geostrategic importance of the Caucasus-Caspian region: as the Caucasus-Caspian commission indicated that this region is wealth in terms the energy resources that provide advantages for regional and global actors. This region is located as key position for international energy companies. Besides, it has paid more attention as strategic market by energy importers (China, India, the EU and Turkey, Afghanistan) and exporters (Russia and Iran, Azerbaijan, Turkmenistan).

Presence of the powerful actors (US, Russia, China, India): The presence of a major powers is another independent variable, possibility of the remerging conflict that related to escalating and triggering ethnic dissatisfactions is quietly link to existing of global actors because each of them has different interest that cause risk of energy security and pipeline diplomacy in the region.

Increasing or decreasing the oil prices: it is also quietly significance independent variable because, on the different period time, changing oil/gas prices (suddenly increased or decreased) has escalated and accelerated to pave way the for new energy conflicts.

International Institutions:

The role of the energy institutions, such as the Energy Charter Treaty, the International Energy Agency, and the International Energy Forum are also significant for impact of the energy diplomacy in the Caucasus-Caspian region. In case of the regional peace and prosperity, their decisions or perspective in the energy conflicts also pays attention.

Finally, on the research we considered to the cases which belong to post-Cold War period. Reason is that observe reflections or consequences of the energy security and pipelines diplomacy in terms of the positive and negative side over the breaking out conflicts which has become more significant issue particularly after this period because consideration of the energy reserves increased.

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A DEVELOPMENT OF 3-D WEB APPLICATION TO PROMOTE HERITAGE TOURISM OF SURAT THANI PROVINCE

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ABSTRACT

This Online heritage information system is very important for culture tourism that guides the knowledge and wisdom of the collective heritage. This paper aims to present a web-based online system to serve the heritage tourism information for Surat Thani province Thailand by using 3-D web application technology. The system is collective information of interesting around the area heritage place. The application is developed in PHP, JavaScript, MySQL and Panorama software. The performance of application system is evaluated by user satisfaction and expert evaluation. The obtained mean and standard division by after users and experts explain on 3.30, 3.33 and 0.687, 0.68 respectively. Furthermore, the quality of 3-D web application can be used a main information tool for heritage tourism.

Keywords–Surat Thani, Culture tourism, Heritage tourism, 3-D Web application

INFORMATION

Cultural tourism is a famous travel that stress in knowledge and wisdom of human culture. It is relative tradition and legend collection that depend on condition of place and social context. In Thailand, although there are many attractions as historic but culture tourism is not very interesting. Because of some tourism is the lack of information in this area.

Web application development has become to a long way, the use of the internet among online travelers increasing. It is the availability of easy to accessible and more comfortable. There are many techniques and programing languages that can be used to create the web application such as JavaScript, Flash XML and Web CL. Today, HTML and CSS are the famous web environment that use to present data or information to users. In addition, many players in this area tries to come up with difference and new technology to improve the user experience and help developers build faster and more powerful web application [1]-[2]. However, the key success of factors of tourist satisfaction should have 4 main factors in tourism service provider that consist trust, service quality, personal relationship and facility quality [3].

Surat Thani Province is one of the largest provinces of the South located 685 kilometers from Bangkok. It is the province with a name that literally means "City of the Good People". A former capital of the Srivijaya Empire, the province covers an area of approximately 12,891 square kilometers. Surat Thani Province borders the Gulf of Thailand to the north and east, Chumphon Province to the north, Nakhon Si Thammarat and Krabi Provinces to the south, Phang-Nga and Ranong Provinces to the west and Nakhon Si Thammarat Province to the east. It also is a city with a long history. Archeologists believe that it was once a community of prehistoric tribes of indigenous people, including the Saemang and original Malays who built their communities on the Tapee River Basin and Ao Ban Don. Later on, the Indians migrated into the area and gradually spread out their culture, as evidenced in the discovery of ruins of ancient communities in Tha Chana and Chaiya Sub-districts. Actually popular place for tourist is islands, beaches and dam. For example, Ko Samui, Ko Tao and Ko Pha-ngan a celebrated island that hosts the biggest beach full moon party [4].

Although Surat Thani province is a popular place for tourist but some of them remain lack of knowledge in cultural tourism both history and culture in the area. They are knowledge-based and the collective wisdom

of continuing under the terms of the context of society and culture. Many historic sites are forgotten, lack of promotion and development a long time [4].

With the problem mentioned above, others had an interest in doing research to develop the 3-D web application and mad the opportunities and channels for increase marketing trade of culture tourism in above province. The web application is available through internet that user can edit and store information in the database. It also makes a convenience for the tourist to get through and visit the culture or historic site in this place. The result was to benefit their lives, their community economically and the nation. Furthermore, this web application also supports the province, national tourism and the government in time for the union of the ASEAN Community.

RELATED INFORMATION

1. World Tourism Organization (WTO)

Compressive The World Tourism Organization to discuss the definition of a sustainable tourism development (sustainable Tourism) that sustainability is not just tourism, small or niche (Niche tourism segments). But sustainable tourism must cover the overall market or we know that "Mass tourism". In general, sustainable tourism means tourism that gives priority to equality between economic environments, including social and culture of the people in the present generation in the future. The principles and concepts of the WTO are consisted of 1) Travel must be aware and use of natural resources, biodiversity value and benefits. 2) Respect the culture and traditions of indigenous peoples, to recognize, adapt and understand the different cultures and traditions of each community. 3) Creating prosperity, economic stability and sustainability, sustainable tourism should pose a fair distribution of income and anvil threatening stakeholders in tourism. Furthermore, tourist should also be contributing to employment and income to local communities as well as the importance of reducing poverty in the local [5].

2. The Culture Tourism

Cultural tourism is the study area or an area with significant historical and cultural features. It described the story of the social and human development through history as a result that concerns the culture, knowledge and the values of the society. It also shows the value of architecture, or natural environment that plays the beautiful and benefit from natural. Culture tourism can reflect the conditions of life and being of the people in each period as well such as economic social and tradition. This is one of factory that uses the culture to selling point to attract the attention of foreign tourists. Especially, American and Europe tourism are very interesting in learning the culture, historical heritage, visit architecture and experience the lifestyle of the people living in that country [6].

Timothy and Boyd [7] described the technique to identification and classification on the heritage tourism that can be classified as tangible immovable resources such as building, rivers and natural location; tangible movable resources such as objects in museums or documents in archives; intangibles such as values, customs, ceremonies, lifestyles; and the last group is including experiences such as festivals, arts and cultural events.

Ballet Jittangwatana [8] proposed the scope of cultural tourism that consist of history, traces history, museum, vintage architecture, art, handicraft, drawing, religion, Religious ceremony, archeology, movie, language, literature, lifestyle, cloth, food, tradition, local culture, festivals and local knowledge. Beside, each country in Asia ware focuses on cultural tourism to make an income of their country. Thus, culture tourism is one of strategic of the country. For example, in South Korea, the government was created the organization for support private company that export culture product in the concept of "touch culture and technology". In Malaysia, the culture tourism stress on Muslim life that offer for the tourist as interesting in lifestyle of Islam culture.

In resent year, many researchers are described in culture tourism that is very important to increase economic of each country. For example, Malaysia is promoters in experiencing cultural hybridization that is the

combination of multiple cultures together and tourism activities [9]. On the other hand, some tourism enticements were concentrated on dramatic tourism objectives such as resorts or theme parks, but today tourism enticements have developed and find to try in new experiences. They are interested in the experience culture in the region that are visiting on which tourism causes genuine, meaningful interactions between cultures [10].

3. Web Application

Thanya Nualaong [11] proposed the method to promote art and culture tourism in Pathum Thani province that studied on problem, limited of location, marketing and the method to develop in that location. The result showed the best factor to improving is the temple and riverside community. The archaeological sites, the culture of Mall Samkok group and Mearng Pathum Thani district are the subordinate organization consequently. In the case of availability of tourist location, they found the Pathum Thani district is the best of infrastructure availability. However, the researcher found the big problem in water transport that are not enough and low quality service. The properly culture tourism marketing in Pathum Thani province consists of art and culture, demand of tourist and vision of tourism location access.

In addition, Sornchai Trichompoo and et al. performed the model development to support the sustainable of Thai and Mall couture tourism at Prapradang, Samutprakan province. He focuses on the potentiality resource such as art tradition and historical. There are very interesting and properly for bicycle rally activity because there are available in local culture, point service and accommodation along the way. The government organizations always support and development forever [12].

RESEARCH OBJECTIVE

In this study, the authors focused to find answers based on the following objectives:

1. To identify the appropriate model for promoting heritage tourism in Surat Thani province
2. To build a 3-D website for promoting heritage tourism in Surat Thani province
3. To promote culture tourism in Surat Thani province

ANALYSIS AND DESIGN

In order to perform this work, we investigated and collected data from tourist and the tourism official of Surat Thani province. A lot of information was used to analysis and design state that perform to management the web application and database. It also was helpful the researcher to make the system fast and works easily. This web application must be compatible to use all international web browsers. In this work, the technique to use for analysis and design that can be divided into 4 steps as follow: system overview, use-case diagram of the system, database design of the web application and sequence diagram of the system as shown in Figure 1-4 consequently.

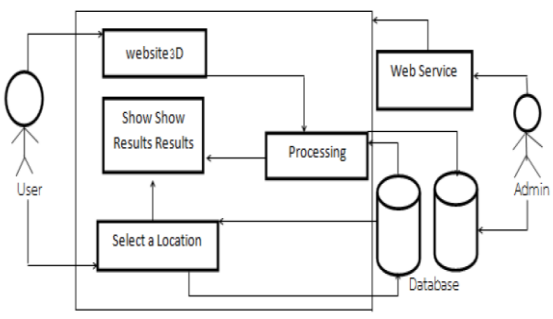

Fig. 1 System overview

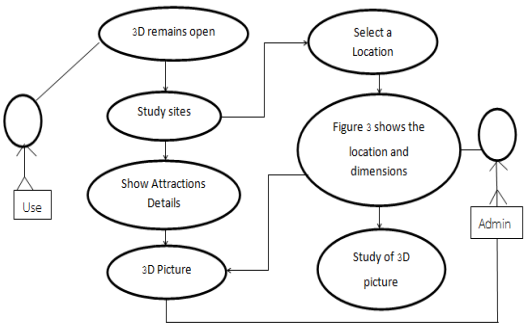

Fig. 2 Use-case diagram of the system

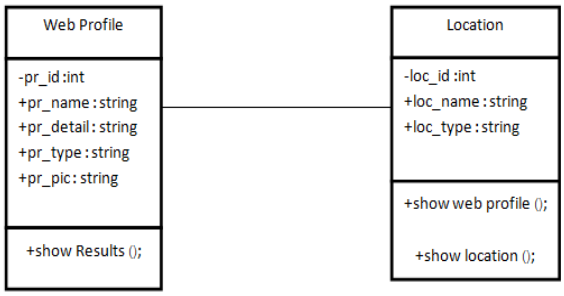

Fig. 3 Database design of the web application

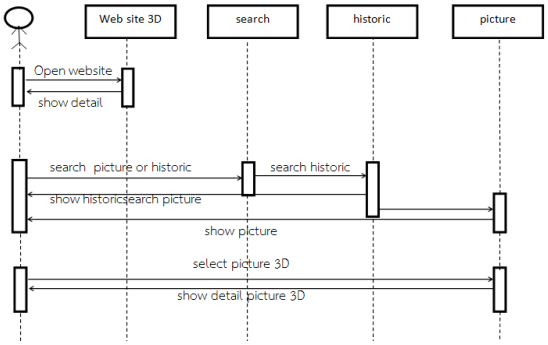

Fig. 4 Sequence Diagram of the system

RESULTS AND DISCUSSION

In the work, the result was divided in 2 parts: development of 3-D heritage tourism web application and evaluating the performance and satisfaction of the 3-D heritage tourism web application.

1. Developing of 3-D heritage tourism web application

The state of development the 3-D heritage tourism web application, Panorama Application software, Adobe Dreamweaver, PHP, HTML, CS6, AJAX and Java Script was used to implement and coding with MySQL database. The system consists of the detail heritage information's place, search system, categorization system and map. The home page is displayed the menu keys such as location name search, arrow selection show, main menu, rotation menu and location map. In each web page can be shown in panorama or 360 degrees that depend on the user selection or automatically show. Besides, the user can click on the map or some area, picture to see more information of heritage in Surat Thani province. For a backend, the system administrator used to manage the policy such as log-in name and password. This system also offers the administrator to edit or updating more information any time that corresponded to the related information in the database as shown in Figure 6-8 [13]-[14].

2. Evaluating the performance and satisfaction of the 3-D heritage tourism web application

In the step of evaluating the performance and satisfaction of the 3-D heritage tourism web application, we tested and evaluated the performance of the system by using the Black Box Testing and Questionnaires. There are 7 experts and 30 users that were used to test this web application. Black Box testing was estimated in the error of the project as follows: functional requirement test, Function test, Usability test, Performance test and Security test. The functional Requirement test was evaluated the ability of the system to support the requirements of the users and Functional test was used to evaluate the accuracy of the system the proposed by Amman and Offutt [15]. The suitability of the system was tested by the Usability test. Performance test was estimated the processing speed of the system. Lastly, Security test was applied to evaluate the security of the system that proposed in Laurie Williams [16] as shown in Table 1.

Table1
The Results of the System Evaluating

	Experts		Users	
	$\bar{x}$	SD	$\bar{x}$	SD
The ability of the system				
1. the ability of the system to provide information	3.83	0.75	4.00	0.89
2. the ability of the system to link menu	4.33	0.82	4.67	0.52
3. the ability of the system to search	4.33	0.52	4.33	0.52
4. the ability of the system's response time	4.33	0.52	4.50	0.55
5. the ability of the system to work automatically	4.67	0.52	4.67	0.52
6. the ability of the system to manage the database	4.17	0.75	4.33	0.82
The accuracy of the system				
1.the accuracy of the system to display information	4.33	0.82	4.67	0.52
2. the accuracy of the system to information retrieval	4.17	0.75	4.00	0.89
3. the accuracy of the system to update	4.67	0.52	4.50	0.55
4. the accuracy of the system in storage	4.17	0.75	4.33	0.52
5. the accuracy of the system to report	4.50	0.84	4.67	0.82
6. the accuracy of the system in the overall system functions	4.50	0.55	4.33	0.82
The suitability of the system				
1.the suitability of the functions with ease of system usage	3.83	0.75	3.67	0.52
2. the suitability of text display clarity	4.33	0.52	4.00	0.63
3. the suitability of using color	4.50	0.55	4.33	0.52
4. the suitability of data presentation	4.67	0.82	4.50	0.84
5. the suitability of user interface	4.50	0.55	4.33	0.82
The speed of the system				
1. the speed of program as a whole	4.33	0.52	4.50	0.55
2. the speed of search data	3.83	0.98	4.17	0.98
3. the speed of data presentation	4.50	0.55	4.33	0.52
4. the speed of showing the link	4.67	0.52	4.50	0.55
5. the speed of edit data	3.83	0.41	4.00	0.63
The security and verify data of the system				
1.the security and verify data of set the permissions of using	4.50	0.55	4.50	0.55
2.the security and verify data of determining a user account	4.00	0.89	4.17	0.98
3.the security and verify data of verify the accuracy of input data	4.17	0.98	4.33	0.82

The table1 shows that assessment of the ability of the system to meet the needs of the experts and users respectively in average of 4.55 and 4.52 and standard deviation of 0.54 and 0.59 so that satisfaction in quality toward the system is well.

Table 2
The results of the Black Box testing of the system

	Experts		Users	
	□	SD	□	SD
1.Function Requirement Test	4.37	0.64	4.17	0.66
2. Functional Test	4.39	0.70	4.42	0.68
3. Usability Test	4.37	0.64	4.17	0.66
4. Performance Test	4.23	0.59	4.30	0.65
5. Security Test	4.22	0.81	4.33	0.78
Summary	4.30	0.68	4.33	0.68

The results of the Black Box testing of the system as show in Table 2 that a quality assessment of the system is well in all aspects and Mean were 4.30 and 4.33 and standard deviations were 0.68 and 0.68. It can be concluded that this 3-D web application is good to promote the heritage tourism of Surat Thani province.

CONCLUSIONS

The development of 3-D web application to promote heritage tourism of Surat Thani province, Thailand. In this work, the system was implemented by using any software that consists of panorama maker, Adobe Dreamweaver, PHP, HTML, CS6, AJAX, Java Script and MySQL database. Black Box Testing and Questionnaires were used to evaluating the system that estimated both 7 experts and 30 users. The result showed a statistically significant difference of quality assessment of the system is well in all research objectives. It can be concluded that 3-D web application is good and appropriate to promote the heritage tourism of Surat Thani province.

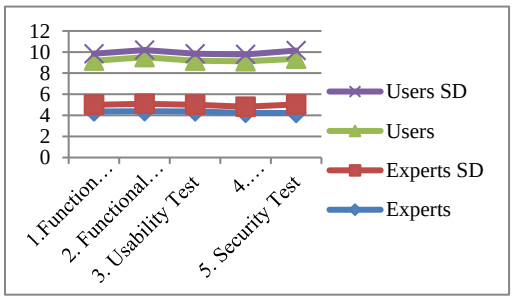

Fig. 5 the results of Black Box testing

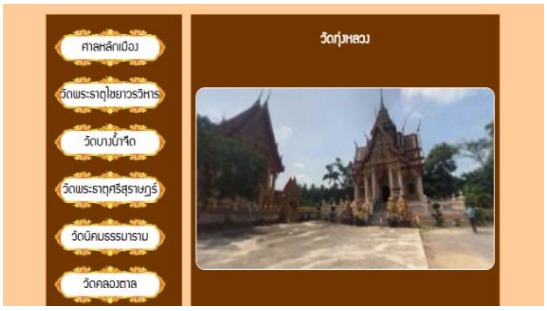

Fig. 6 Homepage of 3-D web application

Fig. 7 Example category of web application

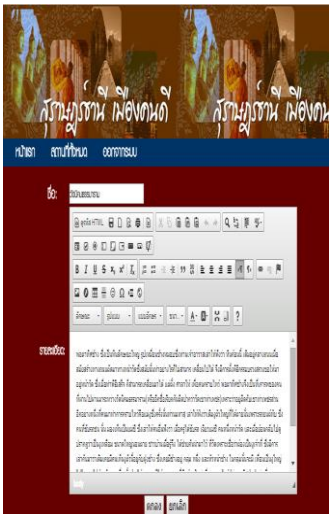

Fig. 8 Webpage for editing and updating

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AWARENESS OF LEARNING ENGLISH CORRELATED WITH LEARNING BEHAVIOR

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ABSTRACT

The objective of this study was to assess about the awareness of learning English related to the learning behavior of students at College of Allied Health Sciences, Suan Sunandha Rajabhat University. Data was collected by a survey questionnaire, which there was 80 sampling specimen. The results presented that 90 percent of all respondents were women during the ages of 18-20 years old, who mostly experienced for Science – Mathematics Program at the high school level. This analysis proved the factors of awareness of what vary with learning behavior. Findings of this study were that 61.8 percent of all students usually paid attention in the English class, 55 percent of all students sometimes commented and expressed their opinion in the English class, 50 percent of all sometimes communicated with teacher and friends in English and 55 percent of all realized the awareness of learning English because of teacher's stimulants, as well as 41.3 percent actively found new vocabulary. These frequencies informed the high level of awareness of learning English. Majority students realized the awareness of learning English in class. Behaviors that represented the awareness of learning English were the attending to class ($\overline{X}$ = 3.80, S.D = .800), the flexible seat or sitting near the close friends ($\overline{X}$ =3.78, S.D = .802), taking note in class ($\overline{X}$ = 3.68, S.D = .803), doing homework enthusiastically ($\overline{X}$ = 3.60, S.D. = .805), further practicing via online lesson ($\overline{X}$ = 2.55, S.D = 1.501), communicating with native speakers ($\overline{X}$ = 2.55, S.D = 1.501). The tested significant correlation coefficient was accepted as revealed at .273 (>0.05). Thus, it was implied that awareness of learning English was related to the learning behavior.

Keywords: Awareness of learning English, Correlation of Learning English, Learning behavior

INTRODUCTION

The effective learning English is the personal social value which is concerned with individual behavior and society, as part of the lifestyle, educational level, and educational structure. Currently, there are points of instructional grammar and focus on vocabularies memorization of English language in order to do more exams. These mean that only theirs focus and caused students forget. In addition, students do not use English as a communicative tool in interaction with family members or other ways outside the classroom, thus causing a delay in learning English. As we asking, what are some ways to make English teachers for high level at all of the educational step? As we know, most of which are not familiar with the deep structure of English, and can't use the English language to communicate with students fluently. Normally, most of the English teachers are Thai and can do for teaching or speaking in Thai style. Otherwise, they are "teach English by speaking Thai" and focus on teaching to pass the exams. Furthermore, it is another important challenge of Thai educational management to move to the ASEAN community in 2015, which is the year that the ASEAN community begins and stays with 10 members and all of these countries are focusing on communicative English language. Moreover, they are developing students' foreign languages.

In the field of current English media learning, like internet, video, media learning. These gave more efficiency communicated. There were easier and faster. So, creating interactive learning materials, integrated online tutorials which connected to smartphones and tablets, is essential to inspire those who learned. [1] The

quality of English must be more than just communication, but need to use English correctly in of the main original language too. The main point is to concentrate for accent in natural native language. Furthermore, English is the language of the whole world [2], the benefits of using English is the opportunity to search more knowledge from English textbooks. In addition to reading the Internet for entertainment and learning, and learning more by researching yourself. Thus, English language will also provide students with access to world-class English literature and, then, it is a new world wide open and limitless. And step into a universal world.

As above mentions, the skills of learning English are successful in our Thai style. [3] On the other hand, the concerned problem for the teachers, they lack the teaching techniques, especially, and media tools to stimulate students' interest. In addition, there are more problems with the English proficiency assessment system of graduate students. Each institution sets its own quality criteria and does not accept each other. As a result, there are the lack of credibility in the quality of graduation. [4]

OBJECTIVE

To assess the awareness of learning English related to the learning behavior of students at College of Allied Health Sciences, Suan Sunandha Rajabhat University.

SCOPE OF RESEARCH

1. *Location*
   College of Allied Health Sciences, Suan Sunandha Rajabhat University, Samut Songkhram, Thailand.

2. *Population*
   The number of sampling was 80 students in English classroom.

METHODOLOGY

This research was conducted to use questionnaire which includes a basic information of students, the awareness of learning English frequency and the key point of behavior. Then, to determine the statistic use, to start with percentage, Mean and Standard Deviation. [5] Then, test the chi-square with the significant confidence at 0.05. [6]

RESULTS

Table 1
Characteristics of 80 students in English classroom

Characteristics	Variables	Value
Sex	Male	8
	Female	72
Age	18-20 years old	77
	20 years above	3
Educational (Program in high school)	Sciences - Mathematics	72
	Arts	8
Education (Year)	First year	5
	Second year	52
	Third year	23
Major / Field	Applied Thai Traditional Medicine	21
	Public Health	26
	Health Sciences (Child and Elderly)	24
	Aesthetic Health Science	29

Note: N = 80

Results of the research, as shown in Table 1, was the characteristics of all respondents who completed the survey questionnaire. Of the 80 students studied English at College of Allied Health Sciences, 72 of all were female and the least were male. Calculated percentages were 90% and 10% respectively. Most of the students, 77 of all were 18-20 years old (96.25%), and 3 of all were above (3.75%). According to their educational experience, 72 students of all were from Science – Mathematics Program, only 8 students were from Arts. 52 students were studying in the second year (65%), followed by 23 third year students (28.75%) and 5 freshmen (6.25%). 29 of all respondents were students in the field of Aesthetic Health Science (36.25%), 26 of all were students in the field of Public Health (32.5%), 24 of all were students in the field of Health Sciences (Child and Elderly) (30%), and 21 from the Applied Thai Traditional Medicine (26.25%), respectively.

Table 2
Analysis of awareness of learning English

Variables	Frequency (%)				
	Always	**Usually**	**Sometimes**	**Seldom**	**Never**
1. Pay attention in English class	21	61.8	15	2	0
2. Express opinion in English class	12.5	25	55	5	2.5
3. Communicate in English class	0	7.5	50	37.5	5
4. Teacher's stimulant	55	21.3	16.3	2.5	0
5. Find vocabulary	35	41.3	12.5	11.3	0
Total	**123.5**	**156.1**	**148.8**	**58.3**	**7.5**

As shown in Table 2, the Practice English in the frequency, 61.8% of respondents "Usually" paid more attention in English class. There were only 21% of all "Always" paid attention in English class, 15% of all "Sometimes" concentrated to the class, however, there were no respondents who "Never" paid attention in English class – that are very interesting. Furthermore, expressing the opinion or participating in English class was another variable factor. 55% of all respondents "Sometimes" did it in English class, averagely. Next, the variable of communicating in English class, no students "Always" communicated in English class by using English. Most of the scores were "Sometimes" concentrated; 50%, followed by 37.50% of "Seldom", 7% of "Usually" and 5% of "Never". For the variable of teacher's stimulants or forces, 55% of all "Always" realized the awareness of learning English because of teachers, 21.3% of all "Usually", respectively. In addition, most of the students, 41.3 "Usually" enthusiastically wanted to understand the meaning of new vocabulary.

Table 3
Interpretation and Score Level

Score Level	Meaning
30 – 53.99	No awareness of learning English
54 – 89.99	Less awareness of learning English
90 – 125.99	Moderate awareness of learning English
126 – 161.99	Much awareness of learning English
162 – 180	Most awareness of learning English

Score level in Table 3, showed the interpretation on awareness of learning English. Most of the students realized the awareness of learning English according to high level in the ranges of 126 – 161.99.

Table 4
Analysis of learning behavior

Variables / Behavior of learning English	$\overline{X}$	S.D	Interpretation
Attendance in English class	3.80	.800	Less
A requirement of sitting next to close friends	3.78	.802	Less
Concentrating and taking note in class	3.68	.803	Less
Keen on homework	3.60	.805	Less
Surfing internet / online media for information	2.55	1.501	More
Communicating with foreigner by talking in English	2.55	1.501	More

Table 4 was the analysis of learning behavior. This showed that behaviors of learning English were depended on a variety of criteria that scores of the attendees in English class ($\overline{X}$) were around 3.80, at its standard deviation at .800, followed by the flexible seat in class; sitting next to the close friends ($\overline{X}$ = 3.78, and S.D =.802), and concentrating and note taking in class were around 3.68 and S.D = .803, a keen on homework, $\overline{X}$ was 3.60 which its S.D was .805. Finally, surfing internet for more information $\overline{X}$ = 3.6 and S.D = .805. Further research and learning oneself through online media, and communicating with foreigner were indicated the same scores at $\overline{X}$ = 2.55, S.D, = 1.501, respectively.

Table 5
Interpretation Criteria

S.D Level	Behavior meaning
>1.75	Most different behavior
1.25 – 1.75	More different behavior
<1.25	Less different behavior / same

Empirical data in Table 3 and interpretation criteria presented that behaviors of learning English were less different.

Table 6
Correlations between awareness of learning English and learning behavior

			Awareness	Behavior
Spearman's rho	Awareness	Correlations Coefficient	1.000	.124
		Sig (2-tailed)	.	.273
		N	80	80
	Behavior	Correlations Coefficient	.124	1.000
		Sig (2-tailed)	.273	.
		N	80	80

Data in Table 6 presented the correlations between awareness of learning English and learning behavior which its significance was .273 (>0.05). This implied that the assumption of this research can be accepted at the significance level 0.05. Correlation Coefficient was .124.

DISCUSSION AND CONCLUSION

In conclusion, teachers should aware the students' behaviors that they act in the English class such as their concentration, participation and action, as well as should follow up how often students practice themselves in order to improve their skill. [7] Teachers should also prepare both inside and outside English classes such as activity class that will boost them to learn more in the reality, and should design the class by concerning the child-center and learned-center education. [8]In addition, the cooperative learning and learning

by doing will enhance the capability and efficiency of the students. [9] Teaching with the new techniques and creating a good atmosphere class will stimulate the students' perception and awareness of learning English in class. [10]

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COGNITIVE STUDY AND TREATMENT PROCESSES OF PARESIS AND PARALYSIS BY THAI TRADITIONAL DOCTORS

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ABSTRACT

This research was aims to study cognitive background about diagnosis, treatment processes, promotion, and rehabilitation of paresis, and paralysis by Thai Traditional Doctors. By means of in-depth interviewed with specialized 5 Thai Traditional Doctors about paresis, and paralysis treatment. All of them had well experienced in these symptoms treatment not less than 10 years, and lived in 5 provinces in Thailand. The result found that all of them had well experienced, and used the various methods to treat paresis, and paralysis such as massage, hot iron tread, herbal compress, herbal steam, and herbal medicines eating. Treatment process was consist of 3 steps as follows: Step 1; Diagnosis was consist of observation the body shape, color skin, standing, walking, sitting, and hands touching of the patients. Besides, the blood pressure monitor, and stethoscope were also used. Step 2; Treatment was consist of body massage, and herbal compress, then local massage/ hot iron tread, and herbal compress, herbal medicines eating, symptom evaluation, herbal medicines eating again, and herbal steam.

Step 3; Promotion, and rehabilitation were consist of arm, and leg exercise, massage, and herbal compress, continuously herbal medicines eating, patient prohibition, and mental care. The treatment results were evaluated from 25 patients. In case of the patients, the results found that most of them were hemiplegia, paralysis, and facial paralysis. This study indicated that 35 recipes were used by Thai Traditional Doctors, and 80 species of herbal medicines were overall found in these recipes. The treatment of paresis, and paralysis had to take the long period, continuously. The take care of caregivers, and the act on the doctor's advice were also important. All of five food categories eating was useful to the patients, and had to avoid the food that was no good to the disease, such as liquor, sticky rice, bamboo shoots, dessert, fat, and salty foods. These treatment processes help to better symptoms, and mentality of the patients.

Keyword--Paresis, Paralysis, Herbal Medicines, Thai Traditional Doctors

INTRODUCTION

Paresis, and paralysis were the life threatening problems of worldwide population. In Thailand, it was found that 690 per 100,000 people were sick with these diseases. There was the mortality rate about 20-25 % of all patients. It was the fourth cause of death in the country [1]. Stroke (cerebrovascular disease), for Thai people, this word was familiar with paresis, and paralysis. In modern medicine, it was treated these diseases with taking medicine, injection, and surgery. After surgery, patients must receive rehabilitation through physical therapy, to increase movement efficiency, and body system balance. Besides, they had to speech, and having meal practice, and also must be received psychological counseling [2]. Modern medicine treatment was a high risk, patients, and some relative may be anxiety the adverse effects of drug that must be administered continuously, and for a long time.

Thai traditional medicine (TTM) is defined by law as "the medical processes dealing with the examination, diagnosis, therapy, treatment, or prevention of diseases, or promotion and rehabilitation of the health of humans or animals, midwifery, Thai massage, as well as the preparation, production of Thai traditional medicines and the making of devices and instruments for medical purposes. According to TTM

which is based on Buddhism, the human body is composed of four elements ('taht' in the Thai language), i.e., earth, water, wind, and fire. When the four elements of the body are in equilibrium, it will be healthy. In contrast, if an imbalance in these elements occurs, i.e., if there is a deficit, an excess, or disability in any of the four elements, a person will become ill [3].

At present, Thai Traditional medicine was the one choice for Thai patients. It began to play a huge role in the treatment of paresis, and paralysis persons, especially in the rehabilitation phase. Many symptoms can be treated by Thai Traditional medicine, such as massage for strength uterus [4], and self-foot massage to relieve the pain for type 2 diabetic patients [5]. It was the holistic care, both physical and mental care. It was included taking the herbal medicine, massage, herbal compress, Thai style body exercises, pray, and practicing mindfulness. Treatment by Thai Traditional medicine would be promoted the patient self-reliance, reduce the cost of healthcare, and reduce the burden on caregivers. The Ministry of Public Health has a policy to develop Thai Traditional medicine for support of national intelligence as part of maintaining public health. By incorporating into the service of the state to reduce the cost of maintaining health, and as an alternative to treat the symptoms instead of the modern medicine [6].

From abovementioned problems, and to know the effectiveness in treatment, the researcher was aimed to in-depth study about history of diagnosis, treatments, promotion, and rehabilitation of the patients by Thai Traditional Doctors. The researcher expect to found empirical data in this study, and was able to apply these data with modern medicine for help the Thai people at the present, and in the future. It can act as an alternative to solve the chronic problems in the health system of the country [7].

OBJECTIVE

1. To investigate the knowledge, treatment processes, and results of curing paresis, and paralysis patients by Thai Traditional Doctors.

2. To conserve the recipes, and treatment processes of curing paresis, and paralysis patients of Thai Traditional Doctors.

SCOPE OF RESEARCH

1. Location

Location of this research was follow as selection criteria. The selection criteria of Thai Traditional Doctors was determined by specialization in the treatment of paresis, and paralysis. They must be experience in the use of herbal medicines to cure paresis, and paralysis not less than 10 years, and they must be a professional licensed. Their patients were treated continuously for not less than 3 persons per month. From this criteria, it was found 2 area as follows: 4 provinces in central region (Lop Buri, Phranakorn Sri Ayutthaya, Ang Thong, Suphan Buri,), and 1 province in eastern region (Srakaew).

2. Population

The population of Thai Traditional Doctors were come from selection criteria as above. It was consisted of 5 Doctors from 5 provinces. The population of patients were come from paresis, and paralysis persons who was willing to give information, and consisted of 25 patients.

METHODOLOGY

The tools were questionnaire, and in-depth interview form for Thai Traditional Doctors, the first was the personal information of Thai Traditional Doctors, and the second was the treatment processes of paresis, and paralysis. Another tools were questionnaire, and in-depth interview form for the patients. In-depth interviews and observation, by using open-ended questions, and note taking. Note taking were transcribed,

and summary. Verify the accuracy and integrity of information. Extra interview for content and completeness. Data were analyzed as separate issues, according to the objective of the study.

RESULT

From selection criteria, the result found that 1 female, and 5 males of Thai Traditional doctors had been selected, as follows: 1) Mrs. Sudjai Payakruang, 2) Mr. Soonthorn Nimnom, 3) Mr. Winai Saiplian, 4) Mr. Chanwut Phansaai, and 5) Mr. Manus Rachatathaworn, and the range of age was between 50-74 years old. They lived in 5 provinces in Thailand as follows: Lop Buri, Phranakorn Sri Ayutthaya, Ang Thong, Suphan Buri, and Srakaew. Their Thai Traditional medicine knowledge were inherit from their ancestors, and carry on from the others. Thai Traditional Doctor' regulation was as follows: no request money from the patients, behave themselves in moral, and religious, and do not help daily routine of the patients.

Paresis, and paralysis patient' s treatment processes were consisted of as follows: The first step was observation the body shape, color skin, standing, walking, sitting, and hands touching of the patients. Besides, the blood pressure monitor, and stethoscope were also used. The second step was consist of body massage, and herbal compress, then local massage/hot iron tread, and herbal compress, herbal medicines eating, symptom evaluation, herbal medicines eating again, and herbal steam. The third step was promotion, and rehabilitation which were consist of arm, and leg exercise, massage, and herbal compress, continuously herbal medicines eating, patient prohibition, and mental care.

In case of herbal medicines. This study indicated that 35 recipes were used by Thai Traditional Doctors, and 80 species of herbal medicines were overall found in these recipes. The concept of treatment of paresis, and paralysis of 5 Thai Traditional doctors came from inherit knowledge from Thai Traditional medicine scripture. Besides, the treatment combines a holistic healing together, include massage, hot iron tread, and herbal steam, as shown in Table 1.

Table1
The concept to explain the use of herbal medicines to cure paresis, and paralysis

Thai Traditional Doctors	Major Treatment
1. Mrs.Sudjai Payakruang	Herbal medicines, Traditional Thai massage
2. Mr.Soonthorn Nimnom	Herbal medicines, Traditional Thai massage
3. Mr.Winai Saiplian	Herbal medicines, Herbal steam
4. Mr.Chanwut Pansaisri	Herbal medicines, Hot iron tread
5. Mr.Manus Rachatathaworn	Herbal medicines, Royal court type massage

From the data in Table 1, it was found that the major remedies were consist of herbal medicines taking, and massage. Massage help to increase of blood, and lymph circulation, as a result was nutrients, and oxygen were better transport into tissues than normal condition. Excretion was also better than normal condition. It also help to relax of muscle, and also promote of elasticity of tendon. Hot iron tread help to relax of muscle, relieve of pains and aches, reduce of spraining, arm and shoulder get stuck, and inflexible of back. It was also help to increase of blood circulation. Herbal compress help to stretch out of connective tissue, reduce inflexibility of joints, tense muscle, pain and swelling that caused by inflammation of muscle, and tendon. It was also help to increase of blood circulation. Herbal steam help to increase of blood circulation, solve the beriberi symptoms, and increase of excretion of waste.

Herbal medicines eating help to rehabilitation, all of 80 species were divided into 6 groups as follows: 1) carminative group; it was hot and spicy taste, used for wind element balancing, and for better digestive

system working, 2) tendon nourishment group; it was fat taste, used for stimulation the works of tendons, 3) body system (elements) nourishment group; it was hot taste, used for body system balance, 4) fever treatment group; it was bitter taste, used for reduce body heat, 5) appetite medication group; it was bitter taste, used for help to more foods taking, and 6) laxative group; it was sour taste, used for defecate wastes out of body. Formulation for paresis, and paralysis as the principle of Thai Traditional Medicine, it was required the 3 major parts as follows: herbal medicines that acting as carminative, tendon nourishment, and body system nourishment. Besides, it was required the 3 supporting parts as follows, herbal medicines that acting as fever treatment, appetite medication, and laxative.

In case of the 25 patients, there were male more than woman, and the range of age was between 50-77 years old. Cause of symptoms were come from car accident, falling, and stroke. Most of them were right hemiplegia, left hemiplegia, and facial paralysis. Treatment process at their home was consist of arm, and leg exercise at least 30 times/day, this action help to protect weak muscle, muscular atrophy, and inflexibility of joints. Massage, and herbal compress 1 time/day or 1 time/2 days. Strictly herbal medicines eating. All of five food categories eating was useful to the patients, and had to avoid the food that was no good to the disease, such as liquor, sticky rice, bamboo shoots, dessert, fat, and salty foods. Fitness equipment, such as pulley for arm, and leg exercise, seesaw board for leg exercise were easy equipment at their home.

CONCLUSIONS

From the research results, it was found that treatment of paresis, and paralysis by Thai Traditional Doctors gave precedence to finding the etiology of the disease, which was consistent with Thai Traditional medicine theory. All of 5 specialized Thai Traditional Doctors had well cognitive, experience, diagnosis, treatment, promotion, and rehabilitation of paresis, and paralysis. They were the various methods to treat paresis, and paralysis such as massage, hot iron tread, herbal compress, herbal steam, and herbal medicines eating. These treatment methods help to better symptoms, and mentality of the patients. Treatment process was consist of 3 steps as follows:

Step 1; Diagnosis was consist of observation the body shape, color skin, standing, walking, sitting, and hands touching of the patients. Besides, the blood pressure monitor, and stethoscope were also used.

Step 2; Treatment was consist of body massage, and herbal compress, then local massage/hot iron tread, and herbal compress, herbal medicines eating, symptom evaluation, herbal medicines eating again, and herbal steam.

Step 3; Promotion, and rehabilitation were consist of arm, and leg exercise, massage, and herbal compress, continuously herbal medicines eating, patient prohibition, and mental care.

These treatment methods help to better symptoms, and mentality of the patients such as massage help to increase of blood, and lymph circulation, as a result was nutrients, and oxygen were better transport into tissues than normal condition. Excretion was also better than normal condition. It also help to relax of muscle, and also promote of elasticity of tendon. Hot iron tread help to relax of muscle, relieve of pains and aches, reduce of spraining, arm and shoulder get stuck, and inflexible of back. It was also help to increase of blood circulation. Herbal compress help to stretch out of connective tissue, reduce inflexibility of joints, tense muscle, pain and swelling that caused by inflammation of muscle, and tendon. It was also help to increase of blood circulation. Herbal steam help to increase of blood circulation, solve the beriberi symptoms, and increase of excretion of waste.

Herbal medicines eating help to rehabilitation, all of 80 species were divided into 6 groups. Most of patients were right hemiplegia, left hemiplegia, and facial paralysis. Treatment process at their home was consist of arm, and leg exercise at least 30 times/day, this action help to protect weak muscle, muscular

atrophy, and inflexibility of joints. Besides, fitness equipment, such as pulley for arm, and leg exercise, seesaw board for leg exercise were convenient equipment at their home.

ACKNOWLEDGMENT

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PROPERTIES AND METABOLITES FROM SUAN SUNANDHA PALACE HERBAL MASK UP RECIPE

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ABSTRACT

Beauty has always been associated with the women from the past to present. In Suan Sunandha Palace, there was one of the herbal mask up recipe named "Suan Sunandha Palace herbal mask up", which was help to soft, and moisture face, bright facial skin, reduce black spots, and fit closely skin pores. From investigation the skin care properties, and classification the kind of active ingredients from this recipe, it was found that this herbal mask up recipe was consists of 8 species of medicinal plants, and 1 mineral material as follows: turmeric, wild turmeric, lakoocha, centella, thanaka, coffee, coconut, aloe vera, and whiting calcined. All of these materials possessed the skin care properties, such as skin rashes, and papules treatment, reduce inflammatory, and infection, increasing collagen production, and epidermal cells, stimulate regeneration of damaged tissues, anti-oxidants properties, inhibit melanogenesis, reduce skin wrinkle, no skin dryness, reveals beautiful and bright skin, and help to flawless skin. The active ingredients from nine herbal medicines were consist of organic and inorganic substances, calcium oxide was only inorganic. The organic group was divided into primary metabolites, and secondary metabolites. The first was consist of lipid, carbohydrate, and also found protein. The second was consist of ketone, sesquiterpenes, aromatic hydroxy ketone, phenol volatile oil, stilbenoids, glycoside, alkaloid, anthraquinone, benzopyrones, methylated phenol, and polyphenols.

Keyword: Herbal Mask Up, Metabolite, Chemistry, Suan Sunandha

INTRODUCTION

From the past to present, the beauty of the women have always been associated with the herbal medicines. In the past, no cream, oil for the face or skin care, and no cosmetics for oily skin or dry skin. Herbal medicines were used for a long time, such as using turmeric for skin care, and white clay filler for facial mask [1]. In ancient Egypt era, Queen Cleopatra used to bathe in milk to enhance her youth and beauty. Sandalwood was one of the oldest remedies for skin problems that has been used since ancient times, and it holds and important place in Ayurvedic treatment. Turmeric was a widely used kitchen spice in India and it holds a very important place in auspicious Hindu ceremonies such as marriages where turmeric or "Haldi" paste in applied on the bride and bridegroom's face and body. Milk cream or "Malai" is perhaps the oldest known home remedy for improving skin health. [2].

In the reign of King Rama V of Thailand, there were used herbal mask up by the royal concubines. Suan Sunandha Palace herbal mask up was one of the skin care products in the past. Investigation the skin care properties, and classification the kind of active ingredients from this recipe, and conservative the cognitive of the recipe by publish to the public for inherit knowledge were interesting.

OBJECTIVE

This article was aimed to investigate the kind of natural products from the Suan Sunandha palace herbal mask up recipe by focus on the skin care properties of active ingredients, and conserve the cognitive of the recipe.

METHODOLOGY

A review of the literature on Suan Sunandha palace herbal mask up recipe [3,4], and related documents [5,6,7,8,9,10,11,12,13,14,15]. The kind of natural products by focus on the skin care properties of active ingredients were classified, and publish to the public for inherit knowledge.

RESULTS

Suan Sunandha palace herbal mask up recipe was consists of nine herbal medicines as follows: turmeric powder, wild turmeric powder, lakoocha powder, centella powder, thanaka powder, fresh coffee beans powder, coconut oil, white clay filler (whiting) calcined, and gel of aloe vera leaves, respectively. The skin care properties of the first was skin rashes treatment, reduce inflammatory, and help to flawless skin. The second was able to inhibit melanogenesis. The third was also able to inhibit melanogenesis, and help to white skin. The fourth was able to increase collagen production, and epidermal cells. The fifth was able to skin healing, reduce infection, stimulate the regeneration of damaged tissues, and help to flawless skin. The sixth was perfumery for skin care for Thai women in the past, it was also used for blemish, and acne treatment, skin whitening, besides it was able to UV protection. The seventh was help to moisture face, bright skin face, reduce wrinkle, no skin face dryness, and there was anti-oxidant properties. The eight was used for scrubbing detoxification, reveals beautiful and bright skin. The last was able to papule, rash treatment, and help to beautiful skin as shown in Table 1.

Table 1
Skin care properties of Suan Sunandha palace herbal mask up recipe

Herbal Medicines	Skin care properties
1. Turmeric rhizome	skin rashes treatment, reduce inflammatory, help to flawless skin
2. Wild turmeric rhizome	inhibit melanogenesis
3. Lakoocha heartwood	inhibit melanogenesis, help to white skin
4. Centella leaves	increase collagen production, epidermal cells production
5. Aloe vera leaves	skin healing, reduce infection, stimulate the regeneration of damaged tissues, and help to flawless skin
6. Thanaka (*Hesperethusa crenulata*)	perfumery for skin care, blemish, and acne treatment, skin whitening, UV protection.
7. Coconut oil	help to moisture face, bright skin face, reduce wrinkle, no skin face dryness, anti-oxidant properties
8. Fresh coffee beans powder	scrubbing detoxification, reveals beautiful and bright skin
9. Whiting calcined	papule, rash treatment, and help to beautiful skin

From Table 1, it was found various properties of herbal medicines from this recipe. Wild turmeric rhizome, and lakoocha heartwood were able to inhibit melanogenesis. Turmeric rhizome, and whiting calcined were able to skin rashes treatment. Turmeric rhizome, and aloe vera leaves help to flawless skin. Lakoocha heartwood, and thanaka help to white skin. Fresh coffee beans powder, coconut oil, and whiting calcined help to beautiful and bright skin. Centella leaves, and aloe vera leaves help to increase cells production. Thanaka, and whiting calcined were able to treat papule, blemish, and acne. Coconut oil help to moisture face, reduce wrinkle, and there was anti-oxidant properties. Fresh coffee beans powder was used for scrubbing detoxification.

The active ingredients from nine herbal medicines were consist of turmerone, zingiberene, curcumin, demethoxycurcumin, bisdemethoxycurcumin, eugenol, oxyresveratrol, asiaticoside, linoleic acid, thiobarbituric acid, aloin, anthraquinone, marmesin, arbutin, coumarin, lauric acid, capric acid, vitamin E, caffeine, trigonelline, tannin, glucose, dextrin, protein, and calcium oxide, as shown in Table 2.

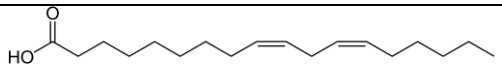
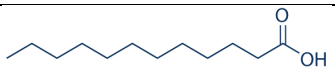
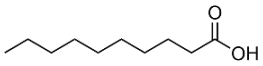
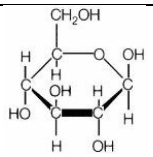
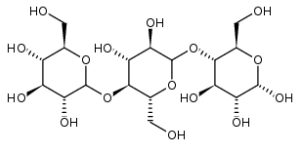
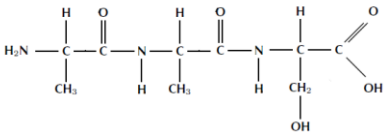
Table 2
Active ingredients from Suan Sunandha palace herbal mask up recipe

Herbal Medicines	Active ingredients
1. Turmeric rhizome	turmerone
	zingiberene
	curcumin
	demethoxycurcumin
	bisdemethoxycurcumin
2. Wild turmeric rhizome	eugenol
	curcumin
3. Lakoocha heartwood	oxyresveratrol
4. Centella leaves	asiaticoside
	linoleic acid
	thiobarbituric acid
5. Aloe vera leaves	aloin
	anthraquinone
6. Thanaka *(Hesperethusa crenulata)*	marmesin
	arbutin
	coumarin
7. Coconut oil	lauric acid
	capric acid
	vitamin E
8. Fresh coffee beans powder	caffeine
	trigonelline
	tannin
	glucose
	dextrin
	protein
9. Whiting calcined	calcium oxide

From Table 2, it was found the various type of active ingredients, both organic and inorganic substances were found in this recipe, calcium oxide was only inorganic, and the others were organic substances. The organic group was divided into primary metabolites, and secondary metabolites. The first was consist of lipid, carbohydrate, and also found protein as shown in Table 3. The second was consist of ketone, sesquiterpenes, aromatic hydroxy ketone, phenol volatile oil, stilbenoids, glycoside, alkaloid, anthraquinone glycosyl, anthraquinone, benzopyrones derivative, benzopyrones, methylated phenol, and polyphenols as shown in Table 4.

Table 3

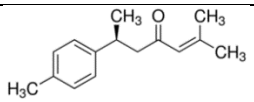
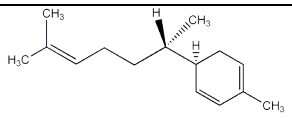
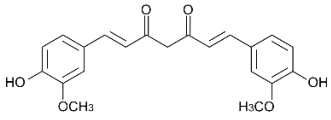
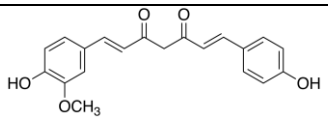
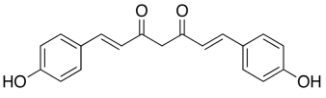
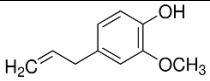
Primary metabolites from Suan Sunandha palace herbal mask up recipe

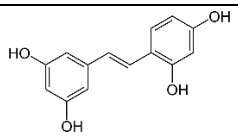
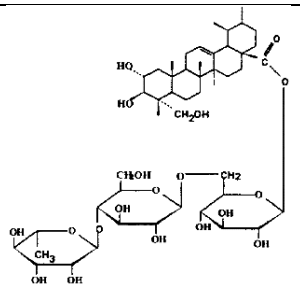
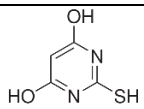
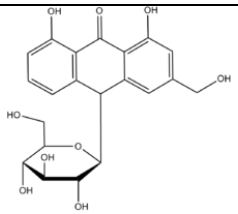
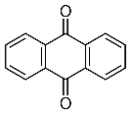
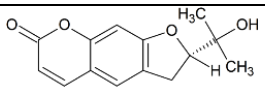
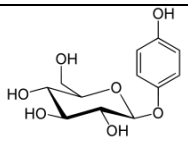
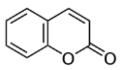
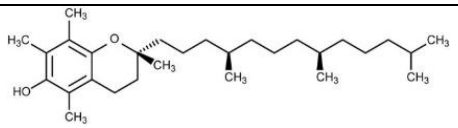
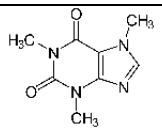
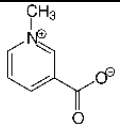
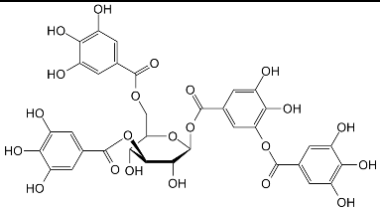
Primary metabolites	Chemical formula
Linoleic acid	
Lauric acid	
Capric acid	
Glucose	
Dextrin	
Protein	

From Table 3, it was found the three types of fatty; i.e. linoleic acid**,** lauric acid**,** and capric acid, two types of carbohydrate; i.e. glucose, and dextrin, and protein.

Table 4

Secondary metabolites from Suan Sunandha palace herbal mask up recipe

Secondary metabolites	Chemical formula
Turmerone (essential oil)	
Zingiberene	
Curcumin	
Demethoxycurcumin	
Bisdemethoxycurcumin	
Eugenol	

Oxyresveratrol	
Asiaticoside	
Thiobarbituric acid	
Aloin (barbaloin)	
Anthraquinone	
Marmesin	
Arbutin	
Coumarin	
Vitamin E	
Caffeine	
Trigonelline	
Tannin	

From Table 4, it was found one type of aromatic ketone; i.e. turmerone, one type of sesquiterpenes; i.e. zingiberene, three types of aromatic hydroxy ketone; i. e. curcumin, demethoxycurcumin, and bisdemethoxycurcumin, one type of phenol volatile oil; i. e. eugenol, one type of stilbenoids; i. e. oxyresveratrol, three types of glycosides; i.e. asiaticoside, aloin, and arbutin, three types of alkaloid; i.e. thiobarbituric acid, caffeine, and trigonelline, one type of anthraquinone**;** i.e. anthraquinone molecule, one type of benzopyrone derivative; i.e. marmesin**,** one type of benzopyrone; i.e. coumarin, and one type of polyphenols; i.e. tannin, respectively.

CONCLUSIONS

The objectives of this study were to investigate the kind of natural products from the Suan Sunandha palace herbal mask up recipe by focus on the skin care properties of active ingredients, and conserve the cognitive of the recipe. The results of the study were summarized as follows: 1) this herbal mask up recipe was consists of 8 species of medicinal plants, and 1 mineral material as follows: turmeric, wild turmeric, lakoocha, centella, tanaka, coffee, coconut, aloe vera, and whiting calcined. There were 7 materials were used as the powder as follows: turmeric powder, wild turmeric powder, lakoocha powder, centella powder, thanaka powder, fresh coffee beans powder, and whiting calcined powder. The coconut was used as coconut oil, and the aloe vera was used as gel from its leaves. All of these materials possessed the skin care properties, such as skin rashes, and papules treatment, reduce inflammatory, and infection, increasing collagen production, and epidermal cells, stimulate regeneration of damaged tissues, anti-oxidants properties, inhibit melanogenesis, reduce skin wrinkle, no skin dryness, reveals beautiful and bright skin, and help to flawless skin.

The active ingredients from nine herbal medicines were consist of organic and inorganic substances, calcium oxide was only inorganic. The organic group was divided into primary metabolites, and secondary metabolites. The first was consist of lipid, carbohydrate, and also found protein. The second was consist of ketone, sesquiterpenes, aromatic hydroxy ketone, phenol volatile oil, stilbenoids, glycoside, alkaloid, anthraquinone, benzopyrones, methylated phenol, and polyphenols.

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DELAYED GRATIFICATION AND ITS RELATIONSHIP WITH BUSINESS STUDENTSS'ETHIAL PERCEPTIONS OF CHEATING ACTIONS

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ABSTRACT

Cheating in College is a major problem that seems to be increasing with advances in technology and the proliferation of online classes. Cheating among business students is even more concerning especially that research shows that business students who cheat in college are more likely to cheat in the workplace after graduation. The current study examines the ethical perceptions of various cheating actions to determine if business students view cheating actions differently depending on the method of cheating. The study also examines the relationship between delayed gratification as a personality variable and the ethical perception of cheating. Based on a large sample of business students in a university in the USA, those who exhibited a higher level of delayed gratification were more likely to perceive cheating actions as unethical compared to those who prefer immediate gratification. In addition, students viewed certain cheating actions as more unethical than others. Demographic differences in ethical perception of cheating also appeared based on gender and age. The results have implications for college instructors as they attempt to minimize cheating in their classes.

TOWARDS A MORE COMPREHENSIVE BUSINESS COMMUNICATION COURSE THROUGH PRAGMATICS

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ABSTRACT

Effective business communication helps in making new contacts, networking, winning new markets, getting more customers; in short - it helps in making money. However, too often Business communication courses at postgraduate level, particularly in India , fail to succeed in classrooms . They are tailored around 'bookish' lessons dealing cursorily with units on grammar and vocabulary . The situations are far-fetched and students do not connect to them. Also, many courses do not offer glimpses into the nuances of actual business transactions. It is being argued here that business communication courses must be re-designed to make them more comprehensive and effective. " Communication is an essential function of enterprise. Whether written or oral, it is the conduit through which an enterprise speaks to its customers" . I propose four main components of a more effective course – business skills, pragmatic communication, business culture, and ethics. Of these, pragmatics contribute immensely to the success of business professionals, as they should know not only about oral and non-verbal communication, but also about appropriate communication in oral and written contexts. Pragmatic communication means using a set of sociolinguistic rules related to language within a communicative context; it is the way the language is used to communicate rather than the way language is structured. It involves chiefly using language for different purposes, and changing language according to listener's needs and the situation and following etiquettes of general conversation. A business communication course focusing on these aspects would be more effective.

Keywords: Business communication, Pragmatic communication, business ethics and culture

FACTORS AFFECTING TO LOW BIRTH WEIGHT NEWBORN

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ABSTRACT

This descriptive study aimed to analyze the factors affecting low birth weight in the newborns. The sample of the study were 85 mothers who gave a low birth weight newborn at Thepparat hospital, Pakthongchai hospital, Chokchai hospital, and Dankhuntod hospital from October 1st, 2016 to January 15th, 2017. Research instrument was the open ended questions and the prenatal records which were tested for its validity and reliability. Data were analyzed by using descriptive statistics, Chi- square test, Pearson product moment correlation, and multiple regression.

The findings of the study were as follows.
The factors related to the low birth weight were age and the body weight before pregnancy of the mothers. Mothers' age less than 18 years old and the body mass index less than 18 kg/m^2 were the predictive factors of the low birth weight newborns.

Keyword: Low Birth Weight Newborn, factors

THE DEVELOPMENT NETWORK OF INFECTIOUS CONTROL: ACTION RESEARCH

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ABSTRACT

The objective of this action research were to situation analysis, develop infection network and guideline practice to reduce infection rates in hospitals Nakonchai Burin, The North East. The total of 157 participants hospital was composed of Tertiary and secondary hospital, 30 hospital on develop network in Nakonchai Burin. The study was devided into three periods from December 2013 to September 2015. The 1st period was for situational analysis about nosocomial infection. The 2nd period was for developing network and guideline practice to reduce infection rates . The 3rd period was for evaluation. Qualitative and quantitative methods were used to collect data. Qualitative data were analyzed using content analysis and quantitative data were analyzed by using mean, standard deviation.

The results showed that the rate of infections overall an average 0.44 per thousand bed days(SD =0.59), Tertiary hospitals had high rate of infections with an average of 2.19 per 1000 bed days (SD = 0.70) than general hospitals and community hospitals. For the development of the infection network included surveillance nosocomial infection network, Multidrug-resistance network, and the development of prevention and infection control in Health Promoting Hospital District. It was found that all the networks have developed practices to reduce infection rates to be consistent with the context. After developing the network found that participants were satisfied with the overall level of scores 4.33 and the knowledge can be utilized to high mean score 4.35.

The results of this study suggest that the presentations should include outcome developing a network of prevention and infection control in hospitals to health care committee to achieve sustainability policy further.

Keyword: Infections control, Infections network, nosocomial infection

ROUTE OPTIMIZATION FOR TRAVELLING BY HIRING A CAR

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ABSTRACT

More and more people like to rent a car when traveling abroad. Gasoline is cheap in recent years and traveling by car is a hassle-free way to get to the preferred destinations. However, planning an itinerary of traveling by car usually requires a lot of cumbersome work, especially for traveling in foreign countries. Given a set of candidate destinations, the planner needs to decide an optimal route that can most satisfy the preferences of all the tourists to the destinations and should not exceed the limited mileage corresponding to the total rental days and even some other constraints. In addition, if the pickup and the return locations of a hired car are different, the final destination should have the return service point.

In this paper, we present a route optimization approach which aims to most satisfy the preferences of tourists and the constraint of mileage. The tourists are first invited to indicate their preferences to the scenic destinations in a region. Then a mathematical formulation is presented to model the corresponding optimization problem based on the preferences of tourists and some constraints, including the mileage limit. Finally, an evolutionary algorithm is employed to solve the optimization problem. To investigate the effectiveness and the efficiency of the proposed approach, a number of experiments are performed with different number of candidate scenic points, different preference coefficients, and different travel days. Concluding remarks will be made and some suggestions for traveling by car will be given in this paper.

Keywords: Travel by car, optimization, route, travel planning, Tourism

CREATING THE FLIPPED CLASSROOM: EFL ONLINE READING COURSE DESIGN FOR ACTIVE LEARNING

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ABSTRACT

Flip teaching, an innovative pedagogical approach to blended learning, reconstructs the classroom by engaging students with pre-class lectures of instructional content so that teachers can better utilize limited face-to-face class time to guide students toward successful and active learning. The flipped classroom has been implemented via various learning management systems such as MOODLE, or more recently, MOOC platforms, enabling teachers to blend both online and offline course elements to create an optimal learning environment and flip lessons for active learning. This study aims to construct an online reading course for a flipped classroom, implement flip teaching in EFL classes, and examine its effects on learner autonomy.

To facilitate flip teaching, the researcher constructed an in-house course platform for students to download teaching videos. Each video followed the format of before-, during-, and after-reading stages. In the before-reading process, the researcher listed important keywords derived from written texts and briefly explained them in a lecture-format video. An overview of a text was provided to give students an understanding of the content of the written passages. In the during-reading phase, video lecturing with explanations of major sentence structures was provided, followed by instant quizzes to keep track of students' progress. In the after-reading phase, the researcher designed treasure-hunt activities to develop students' critical thinking and problem-solving skills.

Flip teaching was conducted in a freshman English course in a national university in northern Taiwan. Thirty-eight students participated, completing four flip reading lessons during the semester-long project. They filled out pre- and post- autonomy questionnaires to measure changes in learner autonomy. Results showed that students assumed greater responsibilities for learning after experiencing the flipped classroom. They increased learner autonomy in the area of assuming more responsibility in classroom activities. They also improved decision-making and engaged in more frequent out-of-class English learning activities. This project provides a comprehensive online reading course for teachers interested in the flipped classroom and engages EFL learners in active learning through a new teaching approach.

Keywords: *The flipped classroom; online learning; ELT curriculum design; EFL*

A TAILORED LANGUAGE LEARNING GAME FOR DEVELOPING EARLY ENGLISH READING SKILLS

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Abstract

In recent years, games have demonstrated usefulness for a variety of instructive or educational ends. That said, educational games face a significant difficulty in developing a sufficiently quantity of content or scenarios to meet a range of instructive objectives. Procedural Content Generation (PCG) promises a solution to this difficulty, as it generates game content that is applicable to various objectives and also individually customizable. In this paper, we put forward a PCG approach that intends to produce educational game content from the viewpoint of both designer and user. This approach generates content by means of genetic algorithm, and thereby offers designers the ability to control the process of content generation for various learning goals according to their preferences. It furthermore takes into consideration how the content can adapt according to the skill of the users. We demonstrate effectiveness of the framework by way of an empirical study of human players in an educational language learning game aiming at developing early English reading skills of young children. The results of our study confirm that users' performance measurably improves when game contents are customized to their individual ability, in contrast to their improvement in uncustomized games.

Keywords: procedural contents generation, early English reading skills, educational game, genetic algorithm

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ABSTRACT

In recent years, games have demonstrated usefulness for a variety of instructive or educational ends. That said, educational games face a significant difficulty in developing a sufficiently quantity of content or scenarios to meet a range of instructive objectives. Procedural Content Generation (PCG) promises a solution to this difficulty, as it generates game content that is applicable to various objectives and also individually customizable. In this paper, we put forward a PCG approach that intends to produce educational game content from the viewpoint of both designer and user. This approach generates content by means of genetic algorithm, and thereby offers designers the ability to control the process of content generation for various learning goals according to their preferences. It furthermore takes into consideration how the content can adapt according to the skill of the users. We demonstrate effectiveness of the framework by way of an empirical study of human players in an educational language learning game aiming at developing early English reading skills of young children. The results of our study confirm that users' performance measurably improves when game contents are customized to their individual ability, in contrast to their improvement in uncustomized games.

Keywords: procedural contents generation, early English reading skills, educational game, genetic algorithm

CONSUMER-BASED BRAND EQUITY MODEL:IS IT THE SAME FOR DIFFERENT DESTINATIONS OR DIFFERENT MARKETS?

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ABSTRACT

Different studies on consumer/customer-based brand equity (CBBE), have revealed varying pictures of components and divergent relationships. The current study analyzed a large data with path analysis to test: 1) the validity of a general CBBE model (familiarity, image, quality, brand value, consumer value, and loyalty); 2) the validity of a customer model (+ satisfaction) using data for a single destination brand; 3) the cross-brand validity of the general model for five U.S. destination brands; and 4) the cross-market validity of both models for different segments based on nationality, gender, and past visitation. The data was gathered using Amazon's Mechanical Turk using a structured survey with single item measures for each of the CBBE components. The study was conducted in the destination brand context, using five of the most popular tourist destination cities in the United States – New York (NY) City, Miami, Orlando, Las Vegas, and Tampa – along with each respondent's favorite city. The results revealed that familiarity and image were the two most prominent components explaining loyalty in both models, although both consumer value and brand value also had some mediating effects on loyalty. The model was variant for different destinations, variant for different nationalities, partially variant for different genders, and invariant for visitors and non-visitors of one destination brand. Theoretical, methodological and managerial implications will be presented at the conference.

FACTORS PREDICTING K-12 TEACHERS' APPROACH TO DEEP LEARNING IN ICT ENVIRONMENTS

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ABSTRACT

This study examined the effects on K-12 teachers' deep learning strategies. Data collection involved completion of a self-report survey by 790 school teachers in Thailand. Items measured the effect of self-efficacy beliefs and classroom goal orientation on teachers' deep learning strategies. Analysis relied on structural equation modeling to test the combined influence of all constructs. The result indicated that self-efficacy beliefs (general teaching self-efficacy and ICT teaching self-efficacy) and ICT use for student-centered learning were positively associated with mastery and performance classroom goal structure. We found that mastery classroom goal structure was the best predictor of the use of deep learning strategies. Positive association was found between ICT use for student-centered learning and deep learning strategies. Results are discussed with respect to their implications for classroom goal theory and teacher development.

Keywords: ICTs, deep learning strategies, goal orientation, self-efficacy beliefs, school teachers

INTRODUCTION

Educational reform –global issue. Need to more towards new forms of learning that are more effective e.g. for a knowledge economy in which learners have to think for themselves and solve highly complex problems [17]. Challenge to reform, globally, is the persistence of traditional practices in K-12 in particular i.e., teachers tend to teach as they were taught and may be resistant to change. Previous research provided supporting evidence that students consider extensively teacher-centered activities rather than student-centered activities [35]. Teacher-centered/content-centered approach is a traditional instruction which focus on transmitting information by lecture notes or handouts [5, 11, 16]. Students learn by receiving materials or contents and do not need to be active in the teaching process [16]. In addition, teacher emphasis on extrinsic motivation such as examination marks, qualification and use assessment method by frequent tests and quizzes [11]. While, student centered/learner-centered approach is the alternative instruction which focus on encouraging students to discover and construct knowledge by their own [11, 21]. The alternate or flexible assessment has been utilized for the improvement of student learning [16]. Student's perception of the quality of the teaching was related to the quality of their approach to learning [16] as cited in Ramsden, 1997). Good teaching can drive students intrinsically motivated, feel self-confident and adopt deep approach to learning [29]. The teacher's role is then to organize the teaching/learning context so that all students are more likely to use the higher levels of conceptual learning, rather than memorization or adopt surface approach to learning [5].

Learning strategies seem to be associated with motives strategies and both are important with academic achievement for students' learning [33]. Research on motivation goals theory has been addressed how motivational process which teachers emphasize in classroom influence students' learning and performance [1, 13, 23]. A mastery goal implies intrinsically motivated applying to students by focusing on the development of competence and leading them to prefer challenging task [1, 3, 27]. In contrast, performance-approach goal is

considered to extrinsic motivated, characterizing by demonstrating one' competence relative to others [1, 27]. Many research on achievement goal theory proposed that students who are highly mastery-approach goal oriented will engage in deep approach to learning for improving their comprehension [25] with intrinsic interest. Inversely, students who adopt performance goal will associated with greater use of shallow cognitive engagement such as rote memorization from one's class notes and it will not involve creating integrated knowledge from prior experience. Deep and surface approaches to learning have been identified in a study of student learning strategies [16]. In the corresponding of these constructs, the current research raises the issue of teachers' perceptions of the teaching engages deep or surface approaches in teaching/learning environment. In addition, deep strategy was predicted by self-efficacy [15]. The previous evidence showed that pre-service teachers with high self-efficacy beliefs are likely to decide more efficient teaching practices, which lead to better learning outcomes, than teachers with low competence perceptions [19]. Many studies have demonstrated that mastery-approach goal orientation and self-efficacy are precursor to adopt deep processing strategies (e.g., [24, 32]).

In general ICTs (Information and Communication Technologies) have an important role to play in learning. UNESCO (2011) emphasized the outcomes and persistence to learning with ICTs in education and argued that ICTs can change the nature of teaching and learning. ICT integration can foster development of 21st-century skills of students [12, 28, 36]. ICTs can "facilitate meaningful learning which enables students to construct deep and connected knowledge, which can be applied to real situations" ([30], p. 257). However, the relatively recent advent of use of ICTs in teaching has led to increased and somewhat more successful attempts to reform teaching. UNESCO (2002) state that

> "ICTs provide an array of powerful tools that may help in transforming the present isolated, teacher-centered and text-bound classrooms into rich, student-focused, interactive knowledge environments. To meet these challenges, schools must embrace the new technologies and appropriate the new ICT tools for learning. They must also move toward the goal of transforming the traditional paradigm of learning" (p.16).

Educational reform in the Asia pacific region including Thailand is particularly challenging because of a traditional emphasis in these countries on rote learning. Educational reform ideally will move teaching and learning towards more student-centered, constructivist and deep forms of learning. The latter approach, deep learning is needed to develop by using ICTs. In addition, the activities for students using ICTs in classrooms consider to challenge and tend to involve high-level or skills development to include more collaborative, cross-disciplinary, problem-based or project work. However, there was still limited use ICTs to support deep learning [18].

The review of the literature conducted for this paper found no studies in an Asia –pacific context of factors that predict the use of deep learning strategies for teachers. Such knowledge is needed for example, for the in-service and pre-service education of teachers.

PURPOSE

The study reported on in this paper aimed to fill this important gap in the literature through a study of K-12 teachers in Thailand. The research question for the study was:

What is the relationship between measures of self-efficacy beliefs, ICT use for student centered learning, goal orientation, and the use of deep learning strategies?

METHODS

1.1 Participants

The survey was carried out at the end of the second semester, school year 2014–2015. The participants for this study were 790 (45%) of 253 (32%) primary and 537 (68%) secondary teachers in sciences 317 (40.1%),

mathematics 254 (32.2%) and Technological 219 (27.7%) subjects from the schools in Thailand. The majority of participants were female (515 females (65.2%) and 275 males (34.8%)). The mean age of the sample was 40.2 years (SD = 10.03) with average teaching experience of 15.3 years (SD = 10.97). These teachers had prior experience in number of time for ICT training in past three years raging from never to five or more than, with a mean of 2.4 times (SD =1.67). They were selected via the stratified random sampling method in order to select the schools and send the questionnaire by mail.

1.2 Measures

Our survey questionnaire was written in Thai and divided into two sections. The first part of the survey asked for general information which included gender, teaching experience, and subject area of teaching. The second part of the survey assessed personal teaching efficacy, self -efficacy belief in ICT integration, ICT use for student-centered learning, classroom goal structure, and deep learning strategy. The section on personal teaching efficacy assessed the value placed on a teachers' beliefs in their teaching abilities to bring about the positive students' behavioural change [8] (e.g., "If a student gets a better grade, I think it is because I have the better teaching method"). The section on Self-efficacy belief in ICT integration assessed the teacher's confidence in teaching with ICT (e.g., I know well how to teach effectively with ICT). The questions here were translated and adapted from [9]. The classroom goal orientation section assessed mastery orientation (e.g., "I give a wide range of assignments, matched to students' need and skill level") and performance approach orientation (e.g., "I help students understand how their performance compares to others"). In the personal teaching efficacy, self-efficacy in ICT integration and classroom goal structure sections of the survey, teachers were asked to respond to each item using the 5-point Likert-Scale: 1 = strongly disagree, 2 = disagree, 3 = unsure, 4 = agree, and 5 = strongly agree. The section on self-report on ICT use for student-centered learning was adapted from [34]. ICT use for student-centered were measured in terms of the frequency of teacher's perception of ICT use for support students' learning. (e.g., "I let students use the computer to synthesize their knowledge"). The section on self-report deep learning strategy was adapted from [6]. Deep learning strategy referred to teaching approach that teachers emphasize through instructional practices (e.g., "I let students to work practice problems to check their understanding of new concepts"). In ICT use for student-centered learning and deep learning strategy section, teachers were asked to respond to each item using the 5-point Likert-Scale: 1 never = 2, = rarely, 3 = sometimes, 4 = often, and 5 = always.

Our survey questions were developed for the Thai context using standard research technique of translation/back-translation (see [10]). Questions were initially developed in English by the principal researcher. Two bilingual Thai researchers then translated each item into Thai. Two bilingual researchers and the principal researcher reviewed each item written in Thai and translated it back into English. Finally, the English and Thai translations were compared, and, by consensus, found to be conceptually equivalent. Table 1 presents the original source of each construct, numbers of items in each construct, and Cronbach's alpha values.

ANALYSIS

Before conducting factor analysis, statistical analysis investigated multi-collinearity in order to determine whether data was appropriate to undertake an exploratory factor analysis. The determinant, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Barlett's Test of Sphericity all suggested that the sample size was sufficient relative to the number of items in the scale and the correlations among the individual items were strong enough to suggest that the correlation matrix was factorable [31]. To determine interrelationship among the items in each section of the survey, exploratory principal component factor analysis with varimax rotation was performed. This inductive approach of exploratory factor analysis discovers the interpretation of the factor based on the measured variables that most strongly associate with it. Factors were extracted based on eigenvalues greater than 1 and factor loadings greater than .40 [31]. Factor loadings ranged from .56 to .86 and scale reliability alpha values ranged from .743 to .945 (Tables 1 and 2).

Table 1
Measurement scales, sample items, and reliability estimates.

Scale	Items	Sample item	Alpha
Personal teaching efficacy	4	If a student gets a better grade, I think it is because I have the better teaching method	.841
Self-efficacy belief in ICT integration	7	I know well how to teach effectively with ICT	.899
Mastery goal orientation	4	I give a wide range of assignments, matched to students' need and skill level	.743
Performance goal orientation	3	I help students understand how their performance compares to others	.758
Self-report ICT use for student-centered learning	8	I let students use the computer to synthesize their knowledge	.945
Self-report deep learning strategy	3	I let students to work practice problems to check their understanding of new concepts	.783

Table 2
Inter-correlations between the major variables.

		1	2	3	4	5	6
1.	Personal teaching efficacy		.544**	.437**	.280**	.233**	.261**
2.	Self-efficacy belief in ICT integration			.493**	.306**	.484**	.301**
3.	Mastery goal orientation				.465**	.380**	.392**
4.	Performance goal orientation					.329**	.226**
5.	Self-report ICT use for student-centered learning						.378**
6.	Self-report deep learning strategy						

** $p < .01$

In order to answer the research question, we used path analysis procedures with SPSS and AMOS to test the combined influence of personal teaching efficacy, self-efficacy belief in ICT integration, ICT use for student-centered learning, and classroom goal orientation on deep learning strategy use in classroom of K-12 teachers [26,4]. Path analysis is considered a good technique to test direct and indirect relations between variables when there is theoretical and empirical justification for the relationship [7]. We used maximum likelihood method to compute covariance matrices from the raw data. This estimation procedure has been recommended for use with multivariate normally distributed data [2]. We chose three indexes to evaluate whether our path analysis model was a good fit: comparative-fit-index (CFI), norm-fit-index (NFI), and root-mean-square-error-approximation (RMSEA). Models with CFI and NFI values close to .95 and RMSEA value less than .5 are normally considered an acceptable fit [26].

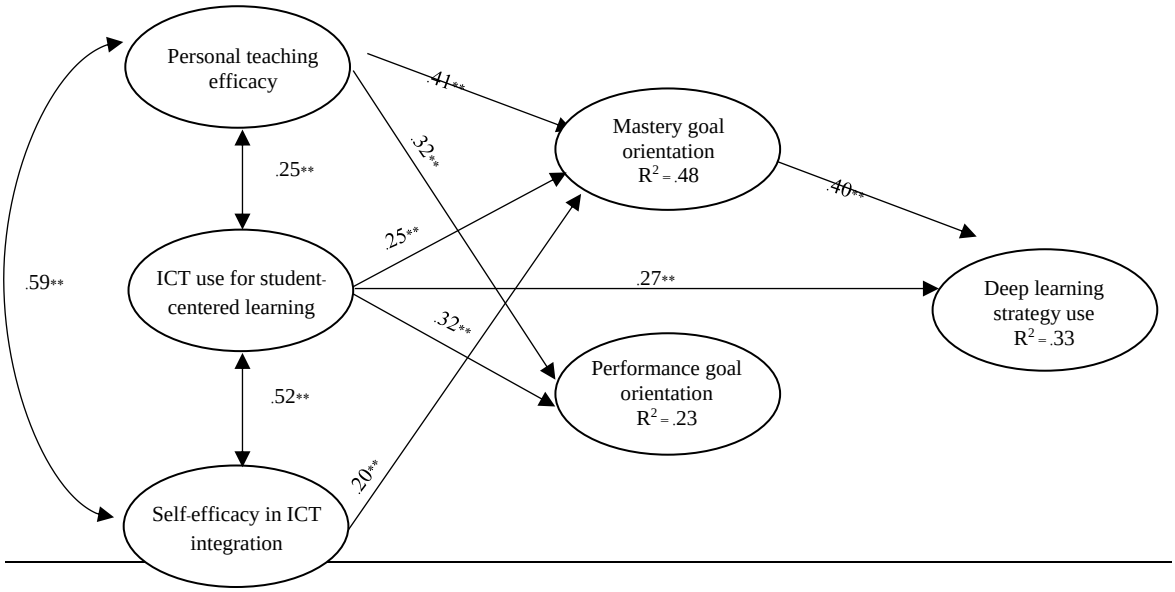
RESULTS

The path analysis model is presented in Fig. 1. The statistics associated with the path model indicate the fit to data was good and the model accurately accounted for the relationship obtained among measured variables. NFI was .938 and CFI was .963, and RMSEA was .041, all indicating a good-fitting model.

Path analysis shows that the exogenous variables of self-efficacy (personal teaching efficacy and self-efficacy in ICT integration) and ICT use for student-centered learning are positively associated with each other. Self-efficacy and ICT use for student-centered learning had indirect association (with the intervening variable of "mastery goal") with deep learning strategy use in classrooms. ICT use for student-centered learning had only direct association with deep learning strategy use in classrooms. Personal teaching efficacy, self-efficacy in ICT integration and ICT use for student-centered learning accounted for 48% of variance in mastery goal. Parameter estimates revealed that personal teaching efficacy, ICT use for student-centered learning and self-efficacy in ICT integration were positively associated with mastery goal (beta = .415, .250 and .203, respectively)

and mastery goal, ICT use for student-centered learning were positively associated with deep learning strategy use (beta =.404 and .267, respectively). The strongest total effect on mastery goal was personal teaching efficacy followed by ICT use for student-centered learning. The strongest total effect on deep learning strategy use was mastery goals followed by ICT use for student-centered learning (Table 3).

Figure 1
Standardized coefficients for model of deep learning strategy use mediating the relations between self-efficacy and ICT use for student-centered learning, and classroom goal orientation (N = 790).



Note. $^{*}p < .05$; $^{**}p < .01$.

Table 3
Direct, indirect and total associations.

Effect	Direct	Indirect	Total
On mastery goal orientation			
Personal teaching efficacy	.415		.415
ICT use for student-centered learning	.250		.250
Self-efficacy in ICT integration	.203		.203
On performance goal orientation			
Personal teaching efficacy	.291		.291
ICT use for student-centered learning	.316		.316
On deep learning strategy use			
Personal teaching efficacy		.167	.167
ICT use for student-centered learning	.267	.101	.368
Self-efficacy in ICT integration		.082	.082
Mastery goal orientation	.404		.404

DISCUSSION

This study has highlighted the importance of self-efficacy beliefs, ICT use for student centered learning, goal orientation, and the use of deep learning strategies. The present study provides additional support for the notion that self-efficacy belief both personal teaching efficacy and self-efficacy in ICT integration predict their

adoption of mastery and performance goals orientations [14, 22, 23]. Teachers who have strong sense of efficacy for teaching were confident in their ability to manage and engage students in the classroom [3]. They can implement the variety of instructional practices to emphasize a mastery oriented approach as well as those associated with a performance oriented approach [22]. It has been suggested that these teachers use two goals structure to promote students' motivation through their instructional practices. Consistent to goals theory and Wolters's work, mastery and performance goal structures were related. The moderate effect between the two goal structures demonstrated by positive bivariate correlation can be supported this circumstance [22].

The current study also adds to the literature on changes in teachers' goal orientation through ICT use for student-centered learning. These effects also demonstrated main effects on both mastery and performance-approach classroom goal structures. Teachers who teaching with student-centered approach in ICT context, they tend to emphasize on establishing mastery-oriented, as well as performance-oriented classroom environment. It may be that when teachers perceived that ICT can help student learning, they tend to integrate ICT into the curriculum and using the multiple goal oriented approach. The environment compose of those two goals were used by teachers through the various instructional strategies. For example, when teachers assign students to do the projects which create by ICT tools, teachers can use grading comparison to motivate students' performance, involving of develop skill, mastery, and improvement by mastery orientation to increase intrinsic interest of students [20].

The next important finding indicated that mastery classroom goals and student-centered learning with ICTs were predictive of the use of the deep learning strategies. This is in line with previous findings (e.g., [33, 13]. Teachers who are more likely to addresses the mastery goal orientation, they can take many teaching methods induce students do and learn with activities to support deeper level understanding. Results as the same in ICT context, student-centered learning is a positive effect on teacher's strategies use with deep learning. It can be inferred that teachers tend to motivate students to learn and more likely to use ICTs as cognitive tools to foster deep and constructive learning. Thus, deep learning and student-centered learning strategies are closely related and meaningfully enabled and constructed.

In conclusion, the current study supports previous research that emphasizes the importance of classroom goals structures in explaining the tendency of teacher motivation to promote deep learning strategies through their instructional practices. Recent research has revealed important links between different aspects of teachers' perceived classroom goal structure [22] and How ICT can be appropriately integrated in the classroom. Future research is needed to explore the possible influence of whether two goals effect on deep and surface learning in students' aspect. It would be valuable for the development of teaching strategies enhancing students' learning ability and their long-term persistence of academic's achievement.

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ANALYSIS ABOUT SEQUENTIAL PATTERN OF DISEASE BY USING KOREAN'S HEALTH INSURANCE CLAINS DATA

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ABSTRACT

As the focus of the healthcare industry shifts from treatment to prevention, it is becoming more important to predict the possibility of disease and provide adequate medical care for each person based on healthcare big data. Individual can be provided with personalized healthcare services if the correlation of diseases is found and the additional information such as individual's disease history, genetic information, dietary habits, health management method are analyzed. In this study, we analyze the sequential patterns of all diseases using the sample cohort data of 10 years produced by the National Health Insurance Corporation in South Korea. This institution manages the health insurance records of Korean people as the first step of deriving these services. As a result of the analysis, a sequential pattern in which Acute bronchitis(J20) occurs after Acute upper respiratory infections of multiple and unspecified sites(J06) or Acute pharyngitis(J02) or Acute sinusitis(J01) and a sequential pattern in which Other intervertebral disc disorders(M51) occurs after Dorsalgia(M54) have been found. In addition, we use a big data platform from the data preprocessing to the analysis and generate personalized medical records as time series data because the amount of sample cohort is big data. We also compare and analyze the processing speed according to the amount of data to be processed. Instead of the single machine environment, Spark based on a cloud system shows overwhelming performance compared to R on a single machine.

Keywords—Healthcare big data, Sequential patterns mining, Performance comparison, Apache Spark

INTRODUCTION

The size of healthcare data has been rapidly increasing due to health examination details, disease data, electronic medical records(EMR), and genome data. As the focus of the medical industry shifts from treatment to prevention and healthcare, the importance of predicting the likelihood of disease outbreak or providing appropriate medical services to individuals is increasing. In line with this trend, the use of healthcare big data is actively being made (Lee, IJ., 2014).

Among these, healthcare big data studies using sequential pattern mining are also being conducted. However, only a single disease related to chronic diseases is mainly covered, but there were few studies on all diseases. The reason is that it was difficult to mine large amounts of data before big data appeared (Jeong, JS., 2017).

The purpose of this study is to find a sequential pattern and correlation of diseases occurrence in individual. We also show how to use Spark, an in-memory distributed big data computing platform, to create a list of individual diseases from about 900,000 patient care records over five years and to find sequential patterns from the disease list.

THEORY

2.1. Sequential Pattern Mining

2.1.1. Sequential Pattern Mining Overview

The Sequential Pattern is a technique for searching the correlation of patterns according to time-series by adding the concept of time to Association Rule. This is called a sequence, and the sequential pattern searching extracts a large sequence, which is a sequence satisfying the minimum support set by the user, and finds the maximal sequence among them (Han, J. & Kamber, M.,2001). Support is the percentage of customers that include sequences.

2.1.2. PrefixSpan Algorithm

The PrefixSpan algorithm is one of sequential pattern mining algorithms based on Pattern-Growth. The PrefixSpan algorithm projects data according to the prefix notation of frequently occurring patterns, greatly reducing the rate at which candidate sequences occur while mining the entire pattern. Also, prefix-projection reduces the size of the projected database and proceeds efficiently (Han, J. et al, 2001b). Therefore, the amount of computation is relatively small compared to other algorithms, and thus the computation speed is high.

Table 1

PrefixSpan Algorithm Example Data

SequenceID	Sequence
10	< a (a b c) (a c) d (c f) >
20	< (a d) c (b c) (a e) >
30	< (e f) (a b) (d f) c b >
40	< e g (a f) c b c >

Table 2

Prefix-Projection Database

Prefix	Projected (postfix) database
<a>	< (a b c) (a c) d (c f) >, < (_d) c (b c) (a e) >, < (_b)) (d f) c b >, <(_f) c b c >
<b>	< (_ c) (a c) d (c f) >, < (_c) (a e) >, < (d f) c b >, < c
<c>	< (a c) d (c f) >, < (b c) (a e) >, < b >, < b c >
<d>	< (c f) >, < c (b c) (a e) >, < (_f) c b >
<e>	< (_f) (a b) (d f) c b >, < g (a f) c b c >
<f>	< (a b) (d f) c b >, < c b c >

2.2. SPARK

In 2014, the Apache Foundation formally unveiled a processing-based Spark 1.0 that allows big data processing to run at high speeds in distributed clusters. Because Spark is based on in-memory processing, it is expected to be a framework for next-generation big data processing with faster and less delayed analysis (Hadoop Release, 2015).

Spark consists of four representative libraries. The libraries are as follows. SparkSQL to enable SQL queries on in-memory RDD datasets, GraphX engine to perform graph theory and algorithms, MLlib to provide a machine learning specialized library, and Spark Streaming to process real-time data (Holden Karau et al, 2015).

RELATED WORK

A sequential pattern analysis study based on patient medical records are described as follows. Kim, HY. (2004) used a sequential pattern to calculate the degree of influence on all combinations of risk factors for hypertension over time and found a pattern of health risk habits. Lee, HM. (2007) extracted pattern of disease treatment by sequential pattern mining of discharge summary data of lung cancer patients using PrefixSpan algorithm. Cho, YK. et al. (2008) analyzed the relationship between cardiovascular disease that can cause fibrillation of heart and diseases caused by fibrillation of heart. Jin, JS. et al. (2007) analyzed the association between diabetes and other diseases and proposed a method of managing patient relationship through it. Shin, AM. et al. (2009) analyzed the diagnosis of patients with cerebral infarction and identified the preceding diseases and complications of cerebral infarction.

Above-mentioned studies analyzed the factors affecting disease or search for the relation of diseases to single diseases. But big data analysis was not applied yet because the number of patients is as low as several hundreds and the observation period is not long.

METHODS

This study is based on sample cohort data sampled from National Health Insurance Corporation(NHIC)'s 10-year insurance claim data, NHIC is the organization responsible for the national health insurance records of the Republic of Korea. Since the insurance claim data reflects the actual society, researchers can observe the current status and trends reflecting the actual environment rather than the limited and experimental environment (Kim, TB., 2016). The consultation period is set to five years from 2009 to 2013, and a total of 914,541 people's data are utilized. In addition, we try to find correlation among diseases using medical data (except dentistry, oriental medicine, and pharmacy data). Also, diseases diagnosed less than 10 times in 5 years are excluded because they would not affect sequential pattern results. When evaluating performance, we randomly increase the number of patients to 90 million, or 45 million.

First, diagnostic data is extracted from insurance claim data and converted into List format as shown in Table 3. Neighboring duplicate diseases in a list are removed but non-neighboring duplicates are not removed. Because when an individual is diagnosed with A disease, he or she is more likely to be diagnosed with A disease later even if he or she might diagnose another disease in the middle. In this paper, we try to analyze this case as well. In order to analyze the refined data by Spark, it is converted into Array [Array (String)] form as shown in Figure 1, and the sequence is given.

Table 3
Data converted to List format

PersonID	Disease List
99924627	**Z48**/S61/S99/M19/**E05**/L25
99905947	**M75**/ M54/ M65/**M75**

⇨

```
Array(Array(N400),Array(J350),Array(D34),Array(I1(
Array(Array(R51),Array(S0220),Array(N398),Array(H
Array(Array(K760),Array(K769),Array(J209)
```

Figure 1
Data converted to a sequence format

Mining the sequential pattern through Spark MLlib's PrefixSpan using this data set, we set the minimum support and maximum pattern length and get the disease sequence pattern that is sorted in the order of highest support among the patterns which satisfy the minimum support. Similar tasks have done in R for performance comparison.

RESULTS

5.1. Whole disease sequential pattern mining

5.1.1. Basic Analysis

Table 4 shows the percentage and frequency of the most frequent diseases among 5years diagnosed diseases. Essential(primary) hypertension(I10) has the highest frequency (1,645,628), accounting for about 5% of all diseases. This means that the number of patients diagnosed with hypertension is the highest among all patients. The next most common diseases are Dorsalgia(M54), Gonarthrosis [arthrosis of knee](M17), Acute bronchitis(J20), Other intervertebral disc disorders(M51), Acute tonsillitis(J03).

Table 4

Percentage and frequency of the top 10 diseases

disease	ratio	frequency
Essential(primary) hypertension(I10)	0.051314	1645628
Dorsalgia(M54)	0.046962	1506042
Gonarthrosis[arthrosis of knee](M17)	0.034503	1106478
Acute bronchitis(J20)	0.030416	975432
Other intervertebral disc disorders(M51)	0.023068	739777
Acute tonsillitis(J03)	0.019976	640636
Type 2 diabetes mellitus(E11)	0.018609	596787
Shoulder lesions(M75)	0.018404	590209
Gastritis and duodenitis(K29)	0.015337	491864
Acute obstructive laryngitis [croup] and epiglottitis(J06)	0.014499	464982

5.1.2. Disease Sequence Pattern Result

Table 5 shows 21 significant patterns of 59 disease sequential patterns satisfying the minimum support of 0.045. First, diseases such as essential(primary) hypertension(I10), acute bronchitis(J20), acute tonsillitis(J03), and dorsalgia(M54) have sequential pattern consisting of the same diseases such as 'dorsalgia(M54) → dorsalgia(M54) → dorsalgia(M54)'. Despite the process of eliminating neighbor redundancy, it has appeared in three or more consecutive sequential patterns. The reason is that, unlike some diseases that are cured in a short period of time through treatment, chronic or serious diseases often recur. Another reason is that some patients are diagnosed with additional diseases before a disease is cured.

Second, Acute upper respiratory infections of multiple and unspecified sites(J06), Acute pharyngitis(J02) and Acute sinusitis (J01) have a sequential pattern with acute bronchitis(J20). This is because J06, J02, and J01 are symptoms of a cold, often accompanied by acute bronchitis(J20) (Um, SJ., 2016).

Third, 'Dorsalgia (M54) → Other intervertebral disc disorders (M51)' indicates that these two diseases are highly related to each other. According to several studies in Korea, dorsalgia(M54) results in spinal diseases with high probability, and when the back is repeatedly impacted by excessive force and pressure, it causes disease symptoms such as deformity or intervertebral disc disorder (Kim, DJ., 1999). It shown that 40,000 people, 4.5% of the total of about 910,000 people have the same pattern. Therefore, patients diagnosed with dorsalgia(M54) need care and attention to prevent other intervertebral disc disorders (M51).

Table 5

Analysis result of the whole disease sequence pattern

Sequential Pattern	frequency	Support
Acute bronchitis(J20) → Acute bronchitis(J20)	140834	0.164805
Essential(primary) hypertension(I10) → Essential(primary) hypertension(I10)	98951	0.115793
Acute tonsillitis(J03) → Acute tonsillitis(J03)	94275	0.110321

Dorsalgia(M54) → Dorsalgia(M54)	89793	0.105077
Acute tonsillitis(J03) → Acute bronchitis(J20)	88032	0.103016
Essential(primary) hypertension(I10) → Essential(primary) hypertension(I10) → Essential(primary) hypertension(I10)	84588	0.098986
Essential(primary) hypertension(I10) → Essential(primary) hypertension(I10) → Essential(primary) hypertension(I10) → Essential(primary) hypertension(I10)	73735	0.086285
Acute upper respiratory infections of multiple and unspecified sites(J06) → Acute upper respiratory infections of multiple and unspecified sites(J06)	69420	0.081236
Gastritis and duodenitis(K29) → Gastritis and duodenitis(K29)	69184	0.08096
Acute upper respiratory infections of multiple and unspecified sites(J06) → Acute bronchitis(J20)	68593	0.080268
Acute bronchitis(J20) → Acute bronchitis(J20) → Acute bronchitis(J20)	67791	0.07933
Essential(primary) hypertension(I10) → Essential(primary) hypertension(I10) → Essential(primary) hypertension(I10) → Essential(primary) hypertension(I10) → Essential(primary) hypertension(I10)	64325	0.075274
Gonarthrosis[arthrosis of knee](M17) → Gonarthrosis[arthrosis of knee](M17)	56198	0.065763
Vasomotor and allergic rhinitis(J30) → Vasomotor and allergic rhinitis(J30)	56045	0.065584
Vasomotor and allergic rhinitis(J30) → Acute bronchitis(J20)	55920	0.065438
Acute nasopharyngitis[common cold](J00) → Acute nasopharyngitis[common cold](J00)	53999	0.06319
Dorsalgia(M54) → Dorsalgia(M54) → Dorsalgia(M54)	53324	0.0624
Acute pharyngitis(J02) → Acute bronchitis(J20)	52042	0.609
Acute pharyngitis(J02) → Acute pharyngitis(J02)	47178	0.055208
Dorsalgia(M54) → Other intervertebral disc disorders(M51)	39706	0.046464
Acute sinusitis(J01) → Acute bronchitis(J20)	38765	0.045363

5.2. Performance Comparison

5.2.1. Performance in a Single Machine Environment

Sequence pattern mining performed by Spark is also analyzed using R, and the performance of the two is compared. R is open source software that provides a variety of statistical and graphical techniques such as linear and nonlinear modeling, classical statistical testing, time series analysis, and classification. R consists of a single machine. For this reason, Spark originally consists of multiple clusters and performed better, but for comparison with R, we first evaluate performance in a single machine environment. The hardware specifications for the test server are CentOS 7, Intel(R) Core(TM) i7-6700 CPU 3.4GHz, 16G RAM, and 1TB HDD. Spark used version 1.6.0, R used version 3.3.1, and Sequential pattern analysis is performed by setting the minimum support to 0.03.

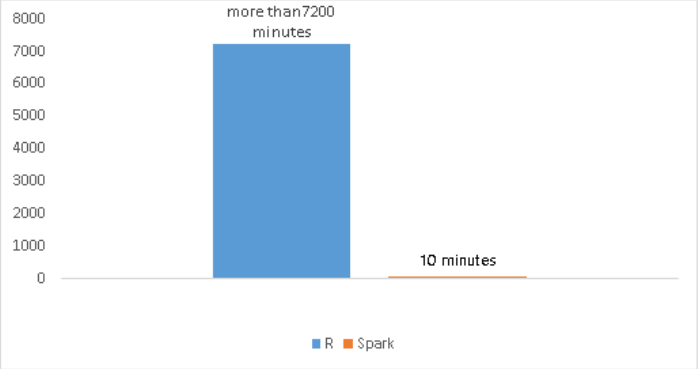

Figure 2. Single machine performance test

As a result of the test, as shown in Figure 2, the performance of Spark is much faster. In R, the results are not generated after more than 5 days, but Spark produces the results in 10 minutes. The reason is that Spark is an in-memory based solution, but R is a disk based solution. In addition, it seems that the different types of data required as input values affect the performance. It would be more efficient to use Spark to perform sequential pattern analysis on a single machine.

5.2.2. Performance in a cloud environment

Spark can be distributed data processing to multiple machines. We conduct a performance evaluation using the cloud system with Spark. Spark is installed on a 15 nodes cloud system and measured performance while increasing the size of the data. Table 6 shows the experimental environment. We configured the cloud system with 14 nodes and 1 master node, 540 gigabytes of memory, and 1 Gb of network speed between nodes.

Table 6
Cloud test environment

Master Node	1
Slave Node	14
Core	144(5 Intel Xeon E5, 9 Intel i7)
Memory	540GBytes
Network	1GB
Data	900,000 rows / 9,000,000 rows / 45,000,000 rows

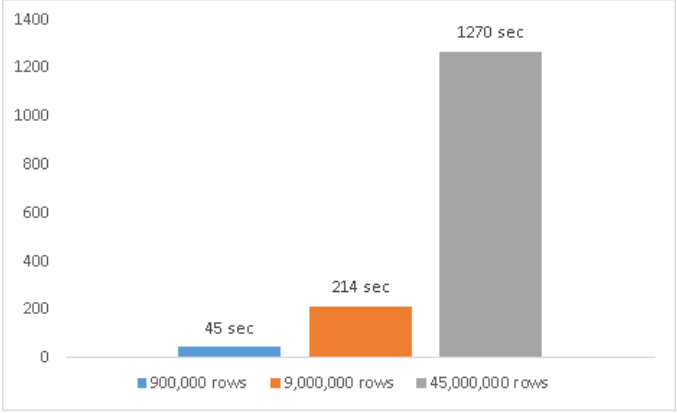

Figure 3. Performance test results in a cloud environment

Due to the nature of distributed processing computing, the processing performance increases with the number of nodes. As a result of configuring the cloud system with multiple nodes, the processing speed is superior to that of a single machine test (Figure 3). As a result of performance measurement, it takes 45 seconds

for 900,000 rows, 214 seconds for 9 million rows and 1270 seconds for 45 million rows. In the case of analyzing using R on a single machine, it is impossible to analyze the sequential pattern of 900,000 data. However, when the environment is changed to Spark, it is possible to process 45 million data in about 20 minutes with only 14 nodes. As the amount of data increases, the number of nodes can be increased(scale-out), so that scalability can be guaranteed.

CONCLUSION AND FUTURE WORK

In this study, the disease sequential pattern mining is performed by collecting and refining data on health insurance claim data. The results of the analysis are summarized as follows.

The result of sequential pattern analysis about whole disease, we find sequential patterns that acute bronchitis (J20) occurs after Acute upper respiratory infections of multiple and unspecified sites(J06), Acute pharyngitis(J02) and Acute sinusitis (J01), and that other intervertebral disc disorders(M51) occurs after Dorsalgia(M54).

In addition, result of performance evaluation in various experimental environments, Spark shows that data processing speed is fast enough to get results in 10 minutes even if single machine was used, unlike R which does not get results after more than 5 days. In a cloud-based big data platform consisting of 15 nodes, 45 million rows of data are processed in 20 minutes.

The result of this study can be used as a guideline for patient's disease prevention by confirming the relationship between a disease and the next disease over time and predicting the next disease based on analysis of the patient's medical records. Also, by comparing the throughput of Spark and other open source technology for the same analysis, it can be used as a guideline to select an appropriated technology.

In the future, we aim to conduct data analysis of other factors that affect patients' illnesses such as sex, age, and income quintiles. In addition, neighboring duplicate diseases are cleaned but individual's non-neighboring duplicate diseases are not cleaned. In this case, it would affect the support and reflected in the sequential pattern result. we expect that more effective sequential pattern analysis results will be obtained if weight is given to duplicate diseases.

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EVALUATION OF NURSING CURRICULUM

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ABSTRACT

This research is a document research with aims to study the research on nursing curriculum evaluation the following field: 1) research methodology that uses nursing curriculum research, 2) evaluation form that uses nursing program evaluation, and 3) results from the nursing curriculum evaluation research and publication published online. The research tools used in this study include frequency and percentage analysis. Collecting data by 3 steps : 1) carry out research in nursing curriculum evaluation, 2) read and analyze each research topic carefully, and 3) record the findings of the research according to the researcher's record created for each research topic. Qualitative analysis were used to analyze content and its classification. The result showed that there were eleven researches that were related to nursing curriculum and all were survey research. The instrument that was used in the study was CIPP questionnaire model and the sample group include university executives, lecturers, students, graduates, and high school students. A total of 2,639 people were used as the sample group. It was found that majority of the curriculum were very suitable and conform with the concept of the National Higher Education Quality Standards Framework 2009 and the standard of bachelor's degree in nursing.

Keywords--Evaluation, Nursing Curriculum, Curriculum Evaluation

INTRODUCTION

Curriculum is an important tool in educational management. That is, it brings the philosophy of education into practice. Good curriculum will lead to good teaching and learning quality, as well as achieving the goal of the curriculum. Curriculum is considered to be the most important element in educational management as it is the master plan for education institutions. It is used as guidelines for teaching and learning and helps shaped the desired quality of students. Good curriculum has to be updated to the needs of the society. So, to know if the curriculum used in the teaching and learning is appropriate or not, there needs to be an evaluation for the curriculum. Subsequently, course evaluation is very important in the educational process. It is a tool used to improve the quality of the curriculum. With this reason, the researcher has been interested in the study of evaluation of nursing curriculum in difference institutions. So, in order to gain more knowledge on the evaluation of nursing curriculum, it is important to gather knowledge and basic information, which will help produce efficient nursing graduates in accordance with the demand of the society.

PURPOSE

The following are the purposes of the study related to nursing curriculum evaluation:

1. Research methodology used in evaluating nursing curriculum.
2. Evaluation model used in the evaluation of nursing curriculum.
3. Results from the research related to evaluation of nursing curriculum.

LITERATURE & THEORY

This research reviews the theoretical concepts related to curriculum evaluation. The assessment are as follows:

1. Definition and the importance of curriculum evaluation.

Course evaluation is a systematic learning process. The purpose of the evaluation is divided into two parts: first to improve the learning process and to evaluate the curriculum that will help the improvement and modification of the curriculum. In addition, the results of the course evaluation will also help determine the value of the curriculum. (1) Course evaluation helps to determine what changes are needed and whether it is conflicted with the objectives. The evaluation covers the content of the course, as well as the process including the objectives, scope content, users of the curriculum, quality of the students, and learning and teaching materials. (2) Evaluation seeks to find suitable information that helps to determine decision making in the course evaluation. (3,4)

2. Type of course evaluation

There are several types of course evaluation depending on the classification. (5). In this paper, the curriculum evaluation is classified by the purpose of the assessment and by the curriculum being evaluated.

2.1 Evaluation of the curriculum that is based on the objectives consists of: 1) formative evaluation is the evaluation that is being conducted while the curriculum is being used. It seeks to examine the curriculum administration and instructors. It aims to improve the management process of the teaching and learning process so that it complies with the curriculum standards; 2) summative evaluation or evaluation of course achievement. This evaluation is used after the course has been implemented, in order to obtain information about the course's success. The results of the assessment help to decide whether to improve and make any changes to the course.

2.2 Course evaluation according to what have been assessed or CIPP Model. (3). It is divided into four categories: 1) context evaluation is an assessment of policy, goals, conditions, social needs, and resources and restrictions that occurred during the course implementation. Information obtained from the assessment is used to make decisions about curriculum development, as well as goal setting so that it is consistent with the education policy or social conditions; 2) input evaluation is an assessment of course's readiness and adequate of resources. Information obtained from the this type of evaluation is used in decision making regarding curriculum and instructional management, including resource allocation; 3) process evaluation is used to evaluate curriculum management process and promote the used of the curriculum. Information obtained from the assessment is used in the decision making to improve the curriculum management process, teaching and learning process, and promote the use of curriculum more effective; and 4) product evaluation is used after the course has been implemented. Output evaluation is also used as part of this evaluation, which is based on the quantity and quality of the output compared to the course objectives. The information obtained from this assessment is used to determine the value of the curriculum's output in terms of quantity and quality.

3. This research collected and analyzed data from 11 researches about nursing program evaluation. (6-16)

METHODOLOGY

1. Documentary research is an analysis of research on nursing curriculum evaluation which was published online and researched during 15 to 20 February 2017.

2. Population and sample is a research paper that the researcher conducted online search on eleven topics on "Nursing Science Research Assessment." A total of 2,639 samples including school's administrators, students, graduates, high school students were used in this research.

3. Tool was used as a research instrument which includes 1) research methodology used in evaluating nursing curriculum; 2) the evaluation form used in the evaluation of the nursing curriculum and 3) the results from the research evaluation of the nursing curriculum.

4. Methods used to create research tools

4.1 Study preliminary information from related research papers on nursing curriculum evaluation.

4.2 Define the structure of the journal according to the objectives

4.3 Create topics that needs to be studied in a journal style

4.4 Validating the information according to the objectives

4.5 Improve the recording so that it is precise and meets the recommendations of qualified experts.

5. Data collection.

5.1 Carry out research in nursing curriculum evaluation.

5.2 Read and analyze each research topic carefully.

5.3. Record the findings of the research according to the researcher's record created for each research topic

6. Data processing and analysis

6.1. Compile all data obtained from the log file for each topic according to research objectives

6.2. Analyze and synthesize the findings in each topic from the recording using qualitative research methods from content analysis and typology. For quantitative research, simple statistics, frequency and percentage are used

RESULTS

1. Research methodology used in the research of evaluation of nursing science program

1.1. Research methodology found that 100.00 percent of survey research was used

1.2 The sample group found that this research collected ten topics from graduates (90.91%), 8 topics from curriculum administrators (72.73%), 6 topics from supervisors (54.55%),3 topics from current students (27.27%), 2 topics from co-workers of graduates (18.18%) and one topics from high school students (9.09%), totaling to 2,639 respondents

1.3 Scale rating scale (CIPP Model) based on 11 CIPP Model concepts, representing 100.00% was used research tools

1.4 Data analysis revealed that all research data were analyzed by means of percentage, arithmetic mean, and standard deviation. There was one t-test and one qualitative data analysis.

2. Course Evaluation Model

It was found that 100.00 percent used Stufflebeam's CIPP Model assessment model, which evaluated four aspects: context evaluation, input evaluation, process evaluation, and product evaluation

3. Results from the research on nursing curriculum evaluation

3.1 Context Evaluation is an assessment of the suitability of the course in terms of course's philosophy, structure and content. Majority of the research found that (9 subjects, 81.82%) assessed the content is highly appropriate, while there were 2 researches (18.18%) assessed the content is moderate level. As for the assessment in the conform of the concept of the National Higher Education Quality Standards Framework 2009 and the standard of bachelor's degree in nursing, it is found that 9 topics or 81.82% were relevant and 2 topics or 18.18% were most relevant. While, 1 research topics found that majority of high school students have no interest in nursing study.

3.2 Input Evaluation assesses the readiness of the students, availability of school buildings, factors contributing to the learning and teaching process, materials, textbooks, and audio-visual equipment. Results of the input evaluation indicate that majority were at appropriate level (9 topics, 81.81%) and reasonable level (1 topic, 9.09%) and highest level (1 topic, 9.09%). Nevertheless, the least appropriate topic was on teaching materials and computers.

3.3 Process Evaluation is an assessment on the curriculum management, teaching and learning, course evaluation, and activities to promote the curriculum. Factors promoting the teaching and learning were at high level (10 topics, 90.91%), and at low lever (1 topic, 9.09%).

3.4 Product Evaluation is an evaluation on the performance of graduates (4 topics, 36.36%), assessment on the quality of nurses (3 topics, 27.27%), assessment on the characteristics of nurses (3 topics, 27.27%), assessment of the achievement of current students (2 topics, 18.18%), assessment of proficiency examination for registered licensed for professional nurses (2 topics, 18.18%) and assessment on the attitude towards the profession (1 topic, 9.09%), the results showed that the all of the topics were at good rating level.

CONCLUSION AND FUTURE WORK

1. The results showed all nursing curriculum research were survey research that that were questionnaire-based using CIPP Model. It evaluates the context, input, process and output. As for the output, there were only 27.77 percent on the performance of graduate nurses. It is also noted that the performance of nurses plays the key role for nursing profession. So, in the evaluation of nursing curriculum, performance of nurses should also be given importance in the evaluation process. (17)

2. Course Evaluation found that teaching materials and computers were found to have low level of appropriateness. It is important to note that teaching and learning materials, especially computer, play an important role in the 21 century. Students need to have high skills in information technology (18), which will help students to become self-directed) and contribute to the development of lifelong learning process

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CUSTOMER RELATIONSHIP MANAGEMENT IN NAKHONPATHOM PROVINCAIL WATERWOKS AUTHORITY

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ABSTRACT

The goal of this paper is to examines and provides a detailed investigation of customer relationship management in provincial waterworks authority. CRM help to establish, develop, maintain and optimize long term mutual valuable relationship between customer and organization. With that respect it have been investigated relationship between provincial waterworks authority water and consumers in Phutthamonthon region by conducting survey. In order to have a better understanding of customer satisfaction the survey questioner were developed based on the literature review. In addition to individual survey, detail study has conducted to gain more information about company relationship with customers. After detail analysed of data that collected from survey and were able to confirm that the customer relationship between provincial waterworks authority water and residents are not satisfactory level. Customer relationships with utilities services are usually seen as a lack of concern. In order to improve relationship between provincial waterworks authority and customer highly recommend implementing better CRM system to provincial waterworks authority. With the recent escalated of water and wastewater charges company hasn't been able to provide better service to their customers. The Survey found there is none imbalance between increase of water price and proper services and facilities. Implementation of successful CRM system to provincial waterworks authority water bring many benefits, which helps to better understand, improve communication, delivery and develop existing customer relationship in addition to creating new customer.

Keywords--Customer Relationship Management (CRM), Water bills, Provincial Waterworks Authority

INTRODUCTION

The investigation of customer satisfaction in Phutthamonthon area in regarding to the increasing of water bills. In order to analysis customer satisfaction, have delivered some questioners to residents in Phuttamonton Subdistrict. However, in this survey it only focus on the two suburbs due to some constrains, our area of interest was Salaya and Klongyong. The Nakhonpathom Provincial Waterworks Authority owns and maintains the significant underground network of water and wastewater mains that deliver water throughout the city and collects and treats wastewater (sewage) from homes and businesses. This paper also discusses about several problems regarding to the quality of water and system reliability of the equipment in Nakhonpathom Provincial Waterworks Authority. Furthermore, also offer some specific solution considering these issues due to have imbalance between increase the price of water and service quality by Nakhonpathom Provincial Waterworks Authority.

OBJECTIVE

The objective of this report is to investigate customer satisfaction in relevant to recent escalated of rates, improve customer satisfaction and demonstrate how CRM has significant role to customer satisfaction. To achieve the objectives, the customer's perspective will be obtained from the survey in Phuttamonton Subdistrict areas by using questionnaires. Then, the result from the customer feedback will be analysed.

LITERATURE AND THEORY

Customer Relationship Management (CRM) is managing customer knowledge for better understanding and serving them (Aofah and Ijaz, 2005). It is an application that allows companies to make the move towards being a customer centered organization by putting the customer at the centre of all the information that relates to them and allowing authorized people within the organization to access the information.

The primary objective of CRM is to increase profitability, revenue and customer satisfaction. In order to achieve CRM, a company extensive set of tools, technologies and procedures promote the relationship with customer. As a consequence, CRM is fundamentally a strategic business and process issue rather than technical issue. CRM consists of three components that are customer, relationship and management as shown in below figure.

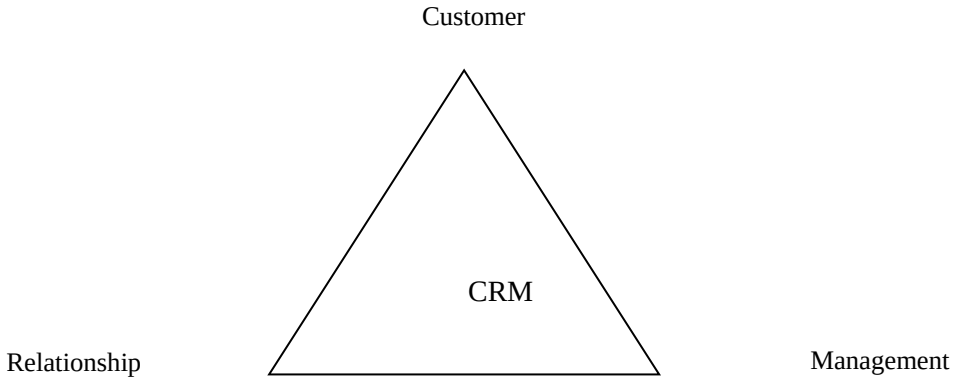

Figure 1. Component of CRM

According to Buttle (2004), there are five key steps in the development and implementation of CRM strategy.

1. Customer portfolio analysis: this step relates an analysis potential customer base in order to identify which customers' requirement to serve in the future. The most priority will strategically important customers including those that will generate profit in the future
2. Customer intimacy: company will get customer identity, profile, requirements and expectations
3. Network development: company will identify and manage relationship with company's network members. These are the organization and people that contribute to the creation and delivery of the propositions for the chosen customers.
4. Value proposition development: this relates to identify sources of value for customers and create a proposition and experience that meet their requirements.
5. Manage the customer life cycle: process of how will the company go about the significance processes of customer acquisition, retention and development and structure: how will the company organize itself to manage customer relationship.

There are many researches provide benefits of using CRM to implement in the business. According to Chen and Popovich (as cited in Sharma, 2012), CRM applications are able to deliver repositories of customer data at a much lower cost than exiting network technologies. Throughout an organization, CRM systems can collect, store, maintain, and distribute customer knowledge. Moreover, effective management of information

has a significant role to play in CRM because it can be used to for product tailoring, service innovation; consolidate views of customers, and for calculating customer lifetime value.

In the other words, CRM systems assists companies evaluate customer loyalty and profitability relied on repeat purchases, the amount spent. Bull (as cited in Sharma, 2012) supported that CRM makes it practicable for companies to find unprofitable customers that other companies have abandoned. This position is supported by Galbreth and Rogers (as cited in Sharma, 2012) that CRM helps a business organization to fully understand which customers are worthwhile to acquire, which to keep, which have untapped potential, which are strategic, which are important, profitable and which should be abandoned. Greenberg focus on CRM can mitigate the true economic worth of business by developing the total lifetime value of the customer, adding that successful CRM strategies encourage customers to buy more products, stay loyal for longer periods and communicate effectively with a company. CRM can also ensure customer satisfaction through allocation, scheduling and dispatching the right people, with the right parts, at the right time (Chou et al., 2002). Curry and Kkolou (as cited in Sharma, 2012) refer to the major benefits and reasons for adoption of CRM which include: customers from the competition will come prefer the organization; a simplified, customer – emphasized internal organization will simplify the infrastructure, shrinking the work flow and eliminating non- productive information flow; and profits will increase from satisfied customers which will lead to more compact and focused company. Due to the fact that the State Government charges Allconnex to buy water from them, the price is then passed directly to Allconnex customers. Therefore, CRM will be implemented in this project in order to increase customer satisfaction and improve relationship between company and their customers.

METHODOLOGY

Survey design

1. Selection of the towns

Nakhonpathom Provincial Waterworks Authority is responsible for the delivery of water, wastewater and recycled water service to households and businesses across the three local government areas. These are including Salaya, and Klongyong sub-district.

2. Structure of questioner

The questioner was divided into two different sections. The question itself consists of 10 different questions. The content of questioner is include:

- Section A, refer to detail information of customer profile
- Section B, is deal with the following topic such as water supply, problems related to water service, quality of water, water bills issues, nature of problems to contact customer service, long of period to solve the problems, rate of customer service, experiencing with increasing water bills compared to the service, suggestion for improve water service

Implementation

Collection data was carried out from the Phuttamonta Subdistrict residents. Most of residents are living in different suburbs such as Salaya, Klongyong, and Mahasawat. The questioner was delivered into 50 questioners but we only got 34 questioners from this survey.

DISCUSSION

Data Analysis

1. Customer Detail

The overwhelming majority of correspondent who contribute in this survey is (41%) respondent from Salaya and from different suburb near Klongyong (69%). In questioners for section A, several questions regarding to customer details. Generally, they are giving a same respond. For example, types of accommodation, most of correspondents are choose house (42%). However, there are some people were responding living in the apartment (18%) and unit (21%). In addition, lots of residents give comment that especially they are who living in the house. They said that increasing of water demand has a negative impact on the increasing of water bills.

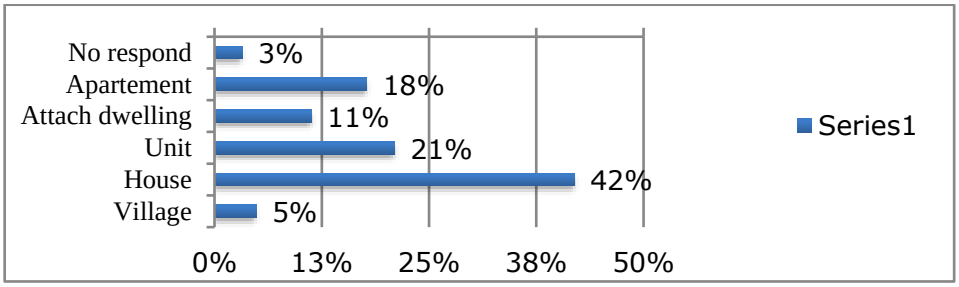

Figure 2. Type of accommodation

2. Water issues

Issues that are related to increase of water consumptions are not had significant impact on residents in Klongyong and Salaya. As figure 3, explain that most of correspondents are responds NO regarding water supply problems. On the one side, there are few residents that are responds YES and impact on their water bills.

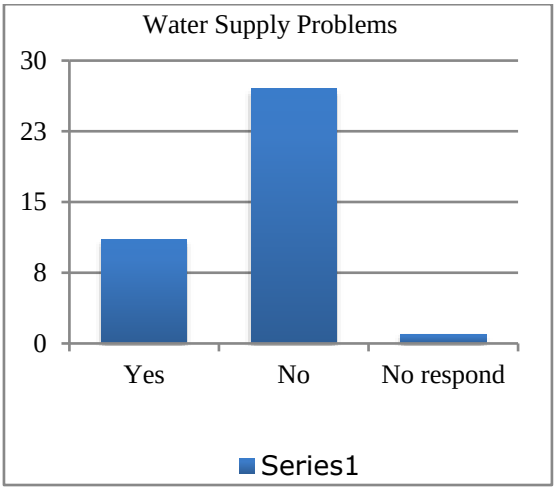

Figure 3. Water supply problems

3. Type of problems

The different issues that faced by residents in Phuttamonton areas. These are including system reliability, quality of water, inspection and maintenance. It is also covered residents that are not having issues regarding with water usages and no respond for this survey. In addition, as Figure 4 illustrate that most of correspondents

were not have impact on water bills. As a result, almost 50% of correspondents were not responded in this survey. On the other hand, qualities of water and system reliability are still main issues related to water service.

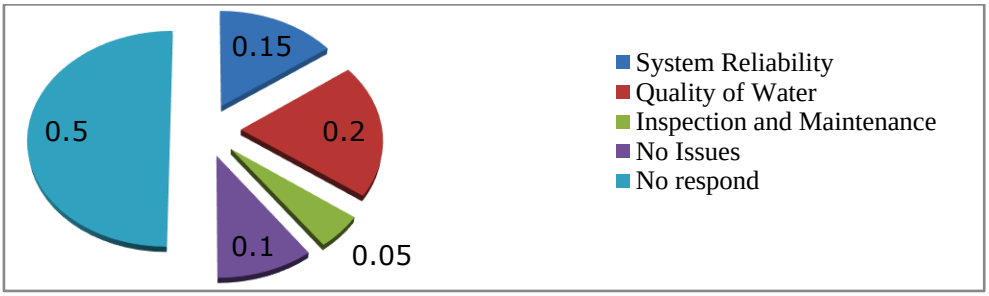

Figure 4. List types of problems

4. Quality of problems

In the survey, it has measured the quality of water such as taste, flavour and clarity. One third of the correspondents were responding that the qualities of water are average. Overall, quality of water is at acceptable state.

Table 1
Rating quality of water

Excellent	7	18%
Good	14	35%
Average	15	38%
Poor	3	8%
No Respond	1	3%

5. Water bills

Survey indicates that increase of water bills is not affected resident in Phuttamonton. Almost 75% respondents are not getting an impact on increase of water demand in their house.

Table 2
Water bills issues

Water Bill Issues	Correspondents	Percentage
Yes	8	20%
No	30	75%
No Respond	2	5%

CONCLUSION

In this survey, it found that increasing of water bills by Nakhonpathom Provincial Waterworks Authority is not had huge impact into customers in Salaya. This includes customers who staying in units, apartments, and owner housing. On the other hand, there are a few customers who staying in house have a significant impact on the increasing of water rates. In questioner, several questions to investigate customer satisfaction for resident in Salaya. Most of them still complain about increasing of water bills is not balance with the service that given . Appropriate maintenance and water treatment process are highly recommended to implement These are due to manage the customer life cycle and increase network development between customer and the company.

RECCOMENDATION

Nakhonpathom Provincial Waterworks Authority should develop CRM system in order to provide a better service to customer, which enable to create, assign and manage requests made by customers. It is strongly recommended detect service problem, monitoring service performance, monitor customer service centre before implementation of CRM system as they are the main concerned. Quick respond to the customer problems is one of key to successful to implementing customer relationship management. Because company not only solve their problems but also to increase customer satisfaction.

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MULTI-DIMENSIONAL ANALYSIS AND VISUALIZATION OF MOUNTAIN ACCIDENT

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ABSTRACT

Abstract— Even if National Emergency Management Agency strengthens the safety measures to prevent mountain accident, but many cases still occur. This study is proposed a method of effective visualizing various multi-dimensional analysis result on a map. For the analysis of mountain accident, we provided the information of date, sex, age, cause of an accident, required time for rescue, rescue time and rescue location respectively. Also, based on the analysis result, we visualized them on a map to effectively figure out the status of the accident after database modeling for the multi-dimensional analysis.

Keywords— Mountain accidents, Multi-dimensional Analysis, DW, Data Warehouse, Geo Visualization.

INTRODUCTION

As the number of people whose hobby is mountain climbing get increased day by day, the numbers of mountain climber get increased gradually. Accordingly, a rescue team fully prepares the safety measures during mountain climbing by strengthening the safety measures to reduce the mountain accidents. Even though installing a plan card to the place of frequent accidents, but mountain accidents won't decrease still.

The causes of mountain accidents include natural disasters and meteorological factors. But most of them occur from the inattention, carelessness, and lack of preparation by climbers. The types of the accident include tripping and falling (40.7%), the attack of private diseases (12.0%), distress accident (15.6%) and others (31.7%). [1]

This study conducts multi-dimensional analysis modeling then analyzes and visualizes to present the status of mountain accident in Chungbuk.

The configuration of this study is as follows. Chapter 2 describes overall process of this study and Chapter 3 expresses the multi-dimensional data modeling into ERD while Chapter 4 conducts multi-dimensional analysis by year, season, time-slot, accident type and the kinds of a mountain. At the same time, it suggests a better visualization method through a map chart.

RELATED WORKS

Many existing researches have been conducted such as natural disasters and so on. But there is no direct research for the analysis of mountain accident has been conducted.

Statistical analysis has been used a lot for the analysis of accident causes. There is the statistical research to analyze ocean accident through ANOVA (analysis of variance). It tried to find out the various causes to affect ocean accident, and it shown the most powerful causes in accordance with situation. [3]

But it was not easy to figure out the result as all the results were expressed in table. Therefore, this study visualizes data to easily understand the result as well as analysis.

ANALYSIS DESIGN

A. Process

Data used in this study were provided by Chungbuk fire station, it includes the data of mountain accidents from 2011 to 2014. It covers date of accident (year, month, date), date of rescue, rescue, required time for rescue (minutes), place of accident (address), information of survivor and cause of the accident.

First, data was received as excel file to go through the refining process. Inaccurate and omitted information was deleted and the address information went through the process of coordinate transformation. Also, the causes of the accident were classified into big groups and small groups.

Second, we saved data to SQL Server, established Data Warehouse in accordance with the purpose of analysis. So Data Warehouse schema can be expressed in ERD. Total 1,325 cases were used and dimension was composed with total 6 groups which include mountain, date, season, sex, age and cause of accident.

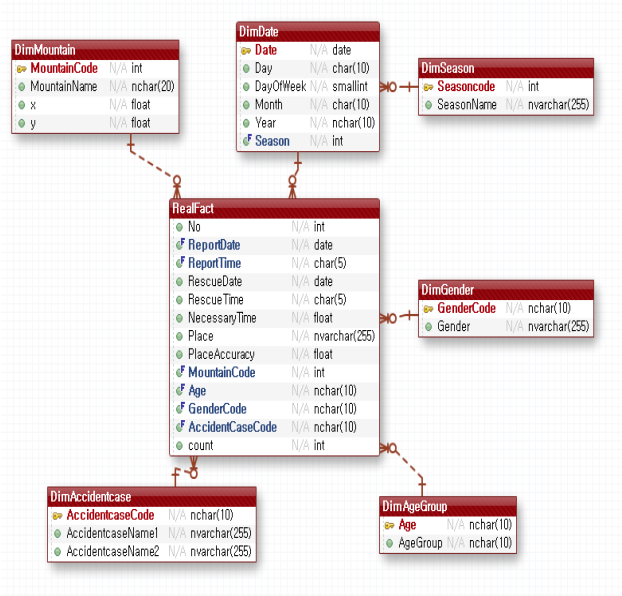
Finally, we conducted the multi-dimensional analysis using OLAP Tool. One step further, we suggested the effective visualization by expressing its meaningful annual result on a map after multi-dimensional analysis.

B. Data Warehouse Design

We establish Data Warehouse in accordance with its purpose for the multi-dimensional analysis. Data Warehouse refers to the collection of data in which we selectively compose data collected from various sources in accordance with the analytical purpose and the questions of users.

Figure 1 expresses Data Warehouse which was established for the analysis of mountain accidents into ERD. Mountain accident analysis is to prevent from having accidents, to figure out accidents for the rapid action and to intensively handle the place of frequent accident. So this study established Data Warehouse with data of yearly, time-slot, the place of frequent accident, age, sex of survivors, accident type data.

Figure 1
ERD for mountain accident analysis



C. Analysis Results

Multi-dimensional analysis refers to the method to variously analyze in accordance with its purpose. This study is to analyze the types of mountain accidents such as the year, season, time-slot, mountains multi-dimensionally. Also, this study suggests more effective visualization by integrating such result to express on a map.

Figure 2
Mountain accidents by years

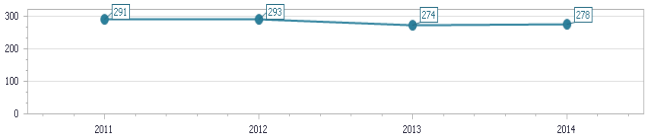


Figure 3
Mountain accidents by season

Figure 4
Mountain accidents by time-slot

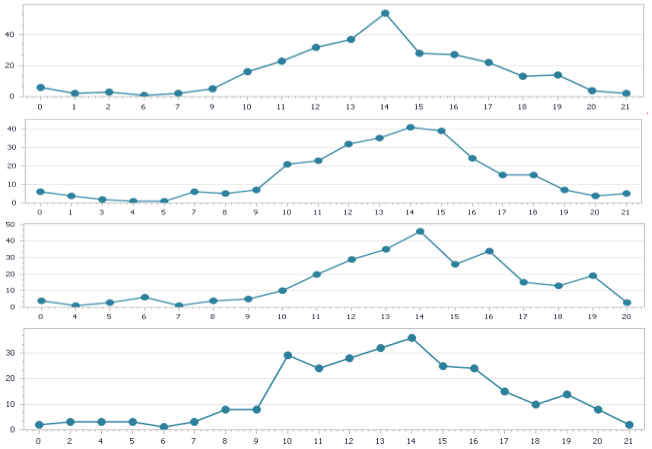


Figure 2, Figure 3 and Figure 4 shows the multi-dimensional analysis of mountain accidents by year, season, time-slot. Total numbers of mountain accident have no significant change from 2011 to 2014. It shows the highest accidents numbers of 366 for autumn, from 10 AM to 2 PM for the time-slot.

Figure 5
Accident type of mountain

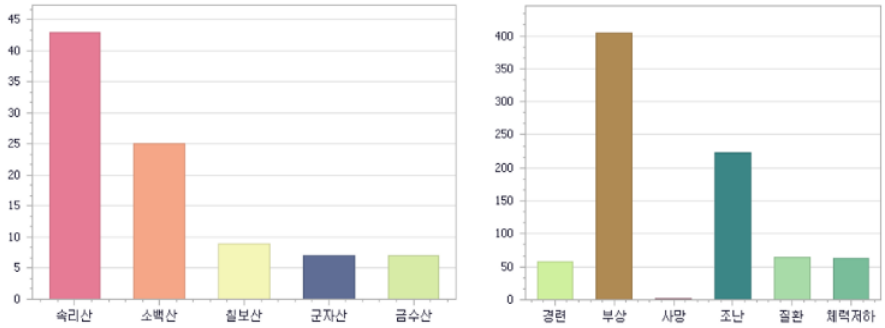


Figure 5 shows the analysis of the mountain where accidents occurred most and its accident type.

A Sokrisan mountain shows the highest accidents of 141 cases among Chungbuk area. A Sokrisan mountain shows the highest accidents every year, all around seasons. The majorities of accident type were the injury caused from the inattention of survivor. Falling and leg injury take up the majority cause.

While time factor has no significant difference, the result differed in accordance with other factors. During the hour where accidents occur most frequently, the occurrence place, type and season of accidents differed. Following results show the analysis of accidents number during the same time range (10 AM ~ 2 PM) when accidents occur by year.

In 2011, 31 accidents among total 108 occurred in winter. Accidents occurred 9 at a Chilbosan mountain, 7 at Chuntaesan mountain. Also 43 falling takes up the majority of accidents among accident type.

In 2012, 37 accidents among total 111 occurred in autumn. Accidents occurred 12 at a Sokrisan mountain, 9 at a Sobaeksan mountain. Also 35 falling takes up the majority of accidents.

In 2013, 37 accidents among total 94 occurred in autumn while 12 Accidents occurred in Sokrisan mountain most following by 28 falling occurred.

In 2014, 41 accidents among total 113 occurred in autumn, 15 Accidents remarkably occurred at a Sokrisan mountain and 22 falling occurred.

Figure 6
Visualization of accident black area map

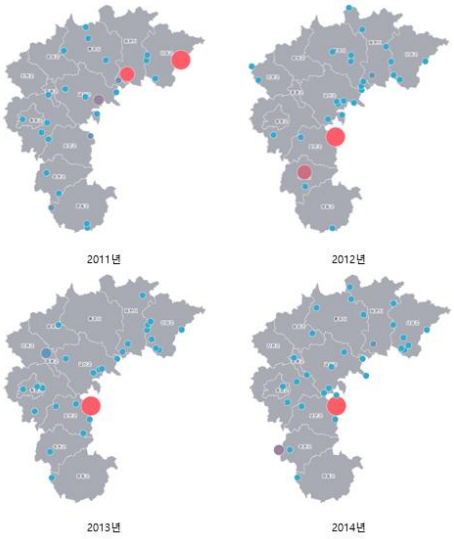


Figure 6 visualizes the accident number of season when many accidents occur at the same time range by year on the map. We can understand directly by visualize its data on the map. Because it is the integrated outcome of multi-dimensional analysis, it can suggest that such region requires more intensive management of mountain accidents.

CONCLUSION

This study suggested more effective visualization method by data modeling, multi-dimensional analysis and visualizing on the map by using Chungbuk mountain accident data. It is very important to decide the direction of analysis. It is also important to visualize data so that users can understand directly. we expected that this study can be an effective method for decision making to prevent mountain accident.

Small amount of data might have the limitation. if mountain accident data can be collected continuously, a kept up to date result can be provided as well. Also, if we analyzed data such as weather more variously, it would be able to figure out the cause of accident and suggest the countermeasure method.

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