

Information System Development for Knowledge Management increasing Production Quality of Monthong Durian

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Abstract

This research has the objective to 1) collect knowledge about the increasing quality of Mon Thong durian product 2) design and develop information system for knowledge management of the increasing quality of Mon Thong durian products and 3) to evaluate the satisfaction of the user's information system. The knowledge requirement is from both questionnaires and In - depth interview with the Mon Thong durian growers for creating the knowledge body about the high quality of the Mon Thong production according to demand and distributing through an information system. For the development of the information system, theory of System Development Life Cycle is to use as methodology which develop the system in the web application platform by mean of Context Diagram to analyze and design the whole system. Besides, the E-R diagram is to indicate a relation of data in the system. Then, it is to evaluate the satisfaction of the user's information system through the evaluating form. The result of research found that the developing information system has a scope of work into 3 sections according to a scope of the user's system including system administrator, farmer and the general visitor. Moreover, the system is to enable the user's within the scope. For the result of the evaluation of the satisfaction of user's information system, it found that the average of the satisfaction is at good.

Keywords—Information System, Knowledge Management, Durian

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I. INTRODUCTION

According to the national economic and social development plan has been important in the agricultural sector, their strategy is to enhance a farmer through a level of effectiveness and the potential of production relating to the proper geography for agriculture further focus on the knowledge body as science and technology.

For Nakon Sri Thammarat, the main agriculture is the plantations as rubber, oil palm, rice, crops and fruits. Many farmers used to grow several fruits like mangosteen, durian, and rambutan in the large number leading to the higher competitive on the quality of the

production, the prices raise high following. The farmer should learn and study information about the production aim at production development to gain an advantage in the market. Moreover, Mon Thong durian product would be treated as a potential product for both domestic and export market where collectors and wholesalers purchase durian according to grades and demand then the farmer who can improve their quality of the product is to negotiate for the higher price.

From above, the research aims at the product development to solve a problem production through the utilization of technology apply to knowledge management theory. Knowledge management indicates

a systematic process of collecting, creating, sharing and managing of knowledge to provide the new knowledge to solve a problem from the unqualified product in the market. In the case of Mon Thong durian product, knowledge management is to transform both tacit and explicit knowledge from the qualifies farmer into the knowledge body to widely disseminate. The knowledge body of Mon Thong durian production is a systematic process and the researcher will develop and distribute in the platform of the information system for knowledge management of the increasing the quality of Mon Thong durian production through the digital media platform. Thus, this research has the objective to 1) collect knowledge about the increasing quality of Mon Thong durian product 2) design and develop information system for knowledge management of the increasing quality of Mon Thong durian products and 3) evaluate the satisfaction of the user's the information system.

II. LITERATURE REVIEW

AGRICULTURE

Agriculture is the activity of cultivating plant, livestock and other living to be food, fibers, biofuels, medicines and other commodities for the sustenance and competence of the human living. Agriculture has four divisions: 1) cultivation including rice planting, fruit planting, crop planting and the without soil planting 2) livestock including diary cattle farming, poultry farming, sheep farming 3) fishery including aquaculture, the capture fisheries. 4) forestry including the economic value of tree planting, the wood products recreation.

DURIAN

Durian is the native fruit to Bruni, Indonesia and Malaysia. It is well-known for the western country when 600 years before. The custard-like pulp of durian is edible at various stage either immature or mature. The durian odor has its unique which component of volatiles compounds esters, ketones and volatiles sulfur compounds. Some people recognize durian as a fragrance fruit, by contrast, some people character as an unpleasant odor to intense disgust then it has led to the fruit's banishment from certain hotel and public transportation in Southeast Asia. The durian is a fruit with high sugar and also rich in sulfur and fat so it is

not suitable for a diabetes patent. The most cultivated species of durian are of 4 as Mon Thong, Chanee, Kan Yao, and Kradum Thong.

KNOWLEDGE MANAGEMENT

Knowledge management is the process of collecting, creating, ordering, sharing and utilization to organization throughout the system developing data to information to knowledge and enlightenment finally. The knowledge management consist of a collection of organization procedure to identify, create, express and distribute the knowledge for the organization's utilization and learning throughout the information management with higher efficiency for the business doing well.

For the organization, the structure of knowledge management is according to the general objective and specific aspect as sharing knowledge, increasing the capacity of working to competitive advantage or raising the higher level of innovation. The category of knowledge divide into 2.

1) Tacit knowledge is a kind of knowledge which is difficult to articulate and gained from action and experience regarded in beliefs, skill, and subjective. It is practiced to be expert that embedded in personal and context-specific neither formal nor communicable.

2) Explicit knowledge is a kind of knowledge which is collectable, systematic and transmittable through the digital. It is regarded as objective, theoretical and transmittable through directly the formal means without any dependence.

However, both kinds of knowledge are unable to separate but also depending on each other. Among the knowledge management having various of a model, the key component of knowledge management respect on a level of human's capacity as differentiate expertise in human nature.

SYSTEM DEVELOPMENT LIFE CYCLE: SDLC

System development life cycle is multi-steps of working phrase to produce a high-quality system and reach completion with time's expectation through providing the activities within a given step from start to complete which defines the stage of the activities inner the development of system including 7 phrases

as planning, analysis, design, development, testing, implementation and maintenance.

Problem Definition: The information system enables the manager or the user to require the new information system replacing the old system for nowadays so led to the development in the information system inner many organization both business sector, industrial sector or productivity sector.

Feasibility Study: There be to define the problem and determine to develop the new information system or repair the existing system whether costs, time and expectations are to consider the feasibility.

Analysis: The system analyst evaluates the feasibility study on the technic and human resource for solving the problem. The system analysis should begin at the business performance study in case of improving the existing system before to design the new system as the mean of easy way doing.

Design: The system analyst is after the catalyst of the authorizing development for a new system. The system analysis decides to arrange the framework can be configured on the program. In the analysis step, the system analyst defines what to do, then to the design step, they need to know how to do for creating the new system to meet the user and the executive's need.

Construction: A programmer starts at work writing code and does the testing to ensure that the program properly construct the system and the selective data configure then having the manual usage and the training course prepare for the real user.

Integration: This phrase involves the actual installation of the newly-developed system under the controller of the system analyst to put the data via the direct cutover which gradually happen so the company start to conduct business in the new system environment.

Maintenance The maintenance is as the process of change and upgrading the program after the deployment. The main causes of maintenance are of 2 there are 1) the problem on a program call Bug 2) the performance change is in the organization or the business. The system analyst must pay much attention on the maintenance.

DATABASE SYSTEM

Database System is the structure of a set of related data that allows data to be manipulated for make a decision and easily accessed. A software which can perform the operations on database is Database Management System which act as a connecting bridge between the database and the user to make access and management of data such as storing in database, searching or deleting. The three types of database include: Hierarchical database, Network database and object-oriented database.

RELATIONAL DATABASE

Relational database is the type of database containing two-dimensional tables with row and columns to identify and access data in relation to another or more piece of data in the database by mean of an attribute. An attribute is the properties that define a relation to make them unique throughout normalization to avoid or reduce data redundancies for the database system management being more efficiency.

INFORMATION SYSTEM

Information system is the data processing which convert data into information with a high benefit to support the executive board's decision call the information processing which is by mean of an electronic tool then call Information Technology.

INFORMATION TECHNOLOGY

The information technology is the data management based on the technology to governs the acquisition, processing, storage, and dissemination of information or data and generated through the information technology equipment and supplies, and telecommunications. The information technology composes of 3 components:

1. The data processing system based on the electronics system through the computer and supplies is for higher accuracy and faster.
2. The information system based on the telecommunication is to enable dissemination the data between the computer system, the electronics equipment and the distant user to communicate with higher efficiency.

3. The art of formatting and using information technology is to data or information management.

DIGITAL CONTENT

Digital content is certain information that exists in the form of digital data available on various digital equipment such as a computer, mobile phone, television and theatre. According to the office of national economic and social development board propose the definition of digital content including animation, game and electronic media for learning (E-learning)

RELATED WORK

Research related to the development of information systems for knowledge management such as: [9] Philuek. S, study the subject The Development of Information System for the Management of Community Welfare Fund: A Case Study of Nakhonsawan Province. This research aims to develop an information system for the management of community welfare fund and evaluate the information system for community welfare fund management. Data collection for the development of community welfare fund in Nakhonsawan is for knowing about the present operations process and the new system requirements. The development of information systems is applied for the knowledge of information technology and Internet technology to develop systems by using PHP in system development and MySQL for database management. Such process data as a report format which can be used for the management of community welfare fund according to the objectives (that has set). Evaluation of information systems for the management of the Community Welfare Fund by using the assessment survey of participants showed that the ability of the system to users, system designs and efficiency are in high level of satisfaction when comparing with the established criteria. As same as [6] Labseeda. P, study the subject Development of a Management Information System for Information technology services Department: A Case Study of an Insurance Company in Bangkok. The purposes of this research are to design and develop a management information system for Information technology service department and to find the efficiency and satisfaction of the developed system. The system was developed in the

form of a web application and used SDLC (System Development Life Cycle) to design and develop the system. The results of this research found that the effective assessment result was good with an arithmetic mean of 4.11, Standard deviation of 0.44, and Alpha coefficient reliability .9210. The satisfaction officers of Information technology department using the system was good with the arithmetic mean of 4.29, Standard deviation of 0.43, and Alpha coefficient reliability .7493. [11] Sungsi. S, study the subject The Development an Information System for Knowledge Management of Intelligence of Locality. Case Study of Floating-Basket Fishery in the Sakaekrang River, Uthaithani Province. The development of information system promotes and supports for concept of knowledge management to benefit the society and community, where a lot of knowledge and intelligence were found but were not well-organized for searching. The information system brings concepts of knowledge management and information integration, which depends on ontology concept for designing semantic network and which is approving by specific experts. Data were analyzed by OWL (Web Ontology Language) which is a language structure and RAP system (Rdf API for PHP) were used to support of Process analysis according to knowledge management and to meet the users' needs. The result showed that the precision was 95.03%, Recall was 97.52%, F-measure was 94.57%, and satisfaction the information system for knowledge management of Intelligence of locality in the Case study was at a high level.

III. METHODOLOGY

This research approach divides into 3 parts following the objective of the research include 3 parts.

Part 1: a step is a data collection method and tools through the questionnaires and in -depth interview to collect knowledge body about the production of Mon Thong durians. This research collect data in accordance with the context of the plantation and the production of Mon Thong durians from the farmer samples while in-depth interviews are the personal knowledge and wisdom of each farmer samples such as name, surname, address, the area of plantation, a period of growth, a period of harvest, the number of

experiences, type of wisdom caring the durian garden and the high quality production

Part2: a step of the development of the information system is for knowledge management. Knowledge gathering from personal interview is to analyze to structure the data for the information system by mean of SDLC theory and the content analysis theory to design the system.

Part3: a step of the evaluation of the information system is for the knowledge management. The users try out information system for knowledge management and evaluate the satisfaction of the information system via a researcher's evaluate form in the number of 50 persons.

Population and samples

The population of the research is Mon Thong durian growers inhabit in the domicile of the area of Tum-Yai municipality, district of Thung -Sung, Na Kon Sri Thammarat province.

Samples

Samples of the research are Mon Thong durian growers of each community from the total of community about 10 villages. The number of samples is not exactly so the searcher uses the purposive sampling for 40 samples.

Research tools

This research is to survey via in-depth interview which the research built from the document study and the relevant research throughout the interview with durian growers in Tum Boon-Tum Yai municipality, Thung-Song district, Nakon Sri Thammarat province.

Build questionnaire tool

The data requirement is from questionnaire form following to the head of interview such as the general information, the process of durian tree storage, the increasing of the quality of the product, source of product distribution and the dissemination of knowledge of durian production

System Analysis and Designs

The development of the information system for knowledge management is to define the scope of the system development according to the group of samples number 40 samples and define the guideline for the development of the information system according to the area of users, input, process, output and report.

The development of the information system

To study theory and tool for the development of the information system, database, user-interface design, language for the development of the information system and the configuration of the information system. The information system divides the user into 3 section including 1) the system administrator section enable to increase user's data, farmer's data, the body of knowledge about durian production's data and also creating several reports 2) the farmer section enable to add and edit the personal data, to increase the body of knowledge about durian production's data and to search the information about the durian production 3) the visitor section enable to view the information system and search for others data.

The evaluation of satisfaction the information system

The evaluation of satisfaction the information system is for the user samples 50 cases through the questionnaire evaluation form according to the topic as useful program, useful screen, correct output, manageable data and correct input. There is the criteria in th

mean average 4.21-5.00 is most
mean average 3.41-4.20 is much
mean average 2.61-3.40 is medium
mean average 1.81-2.60 is less
mean average 1.00-1.80 is least

IV. RESULT

Information system for knowledge management, quality enhancement, Mon Thong Durian production has 3 users, namely system administrators, members and general visitors. Which contains information that must be stored in the database And the relationship between the data as shown by the E-R Diagram as in Figure 1.

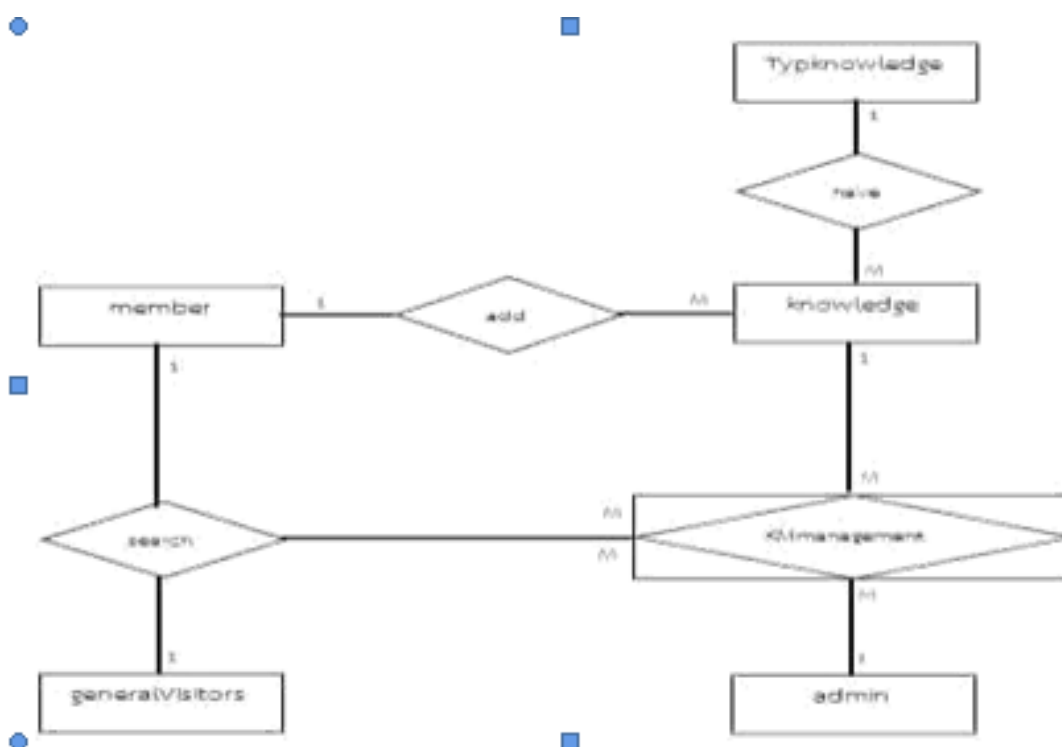


Figure 1. Show the relation between data with Entity Relationship Model

From Fig 1. Show the relation between data which consist of 6 entities: members, knowledge, knowledge management, data searching, type of knowledge and administrator system. To create database through

MySQL and develop the information system through PHP language. The result from the development of information system is with the interface user as Fig 2.



Figure 2. Show system home page

From Fig 2. The website at front show the menu according to group of knowledge body which collect data from the step1 such as farmer menu and durian tree storage menu then the farmer can manage data by self and also search for any knowledge so general visitor do. The information system show data in a form of sentence, picture and multi-media.

The section of the evaluation of satisfaction of information system has been evaluated by samples using the information system for knowledge management of the increasing quality of Mon Thong durian product about 50 samples according to the evaluate topic 5 aspects including convenient and quick to use the program, monitor design, easy to use, the accuracy of the system in showing general information, ability to edit, add, delete data in the system and accuracy in importing data storage.

The result shown as table1

I. Table of evaluation of satisfaction of information system

Issue	\bar{x}	Meaning
1. Convenient and quick to use the program	3.96	High
2. Monitor design, easy to use	4.46	Highest
3. The accuracy of the system in showing general information	3.76	High
4. Ability to edit, add, delete data in the system	4.06	High
5. Accuracy in importing data storage	4.12	high

V. CONCLUSIONS

From the research on “the development information system for knowledge management of the increasing quality of Mon Thong durian product” has been collect knowledge about the production of Mon Thong durian from the farmer who grows durians in their domicile in

Nakon Sri Thammarat and utilizes knowledge body to the design of information system for knowledge management. In the process of the development information system, it uses a theory of the development life cycle

and a theory of analysis and designs the system through Context Diagram and E-R Diagram. Scope of system are 3 sections within the user scope including administrator system, farmer and general visitors. For the result of the evaluation satisfaction of the user’s information system about 50 persons, it found that the average of the evaluation is at good. There is any suggestion for the development in the future, it is about the presentation in the graphic pattern make an information getting more interesting.

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REFERENCES

- [1] Abdul. A, Yuni. S, Nia. K, and Qomarul. M. H, "Designing and Building an Information System of Career Development and Alumni Based on Android (Case Study: Information Systems Department, Syarif Hidayatullah State Islamic University Jakarta)", 6th International Conference on Cyber and IT Service Management (CITSM), 7-9 Aug. 2018.
- [2] Byung. H. S, Hyunsoo. L, and Tae. S. K, "A Study on Knowledge Management System for Knowledge Competitiveness With One Stop Knowledge Service", 1st IEEE International Conference on Knowledge Innovation and Invention (ICKII), 23-27 July 2018.
- [3] Chiamchitrong. L, Piriyaawong. P, and Nilsook. P, "The Development of an Information System for Knowledge Management Used for

- Corporate Administration Group, Electricity Generating Authority of Thailand", 2010.
- [4] Chirawichitchai. N, "Development of Faculty Management Information System", 2008.
- [5] Gulasirima. R, Rasamipiboon. N, Phumduang. E, and Yambunjong. P, "Knowledge Management Strategy by Participation for Lifelong Learning Community: A Case Study of Khokkotoao Subdistrict, Muang District, Suphanburi Province", 2014.
- [6] Labseeda. P, and Srisanit. N, "Development of a Management Information System for Information technology services Department: A Case Study of an Insurance Company in Bangkok", Naresuan Research 12th Research and Innovation and National Development, pp. 237-247.
- [7] Oktalia. J, and Fajrin. N. A, "Design of information system development strategy based on the conditions of the organization", 4th International Conference on Computer Applications and Information Processing Technology (CAIPT), 8-10 Aug. 2017.
- [8] Onkaeo. S, and Korthong. S, "The Design and Development of Information System for Knowledge Management of Thai Public Organizations".
- [9] Philuek. S, and Jankhaew. J, "The Development of Information System for the Management of Community Welfare Fund: A Case Study of Nakhonsawan Province", Issue 1, pp. 48-59, January - June 2016.
- [10] Rusli. A, and Amir.M. T, "Knowledge management system model in enhancing knowledge facilitation of Software Process Improvement for Software House Organization", International Conference on Information Retrieval & Knowledge Management 2012, 13-15 March 2012.
- [11] Sungsir. S, and Nitsuwat. S, "The Development an Information System for Knowledge Management of Intelligence of Locality. Case Study of Floating-Basket Fishery in the Sakaekrang River, Uthathani Province", 2010.
- [12] Waroonkun. T, and Prugsiganont. S, "The Improvement of Information System for Managing Local Wisdom of ethnic dwellings in Chiang Mai", Academic journal Art architecture Naresuan University, issue 2, October 2011 - March 2012, pp. 5-12.