Phuket Mangrove Gastronomy Information System Development

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Abstract— Nowadays, data can be compared as a weapon. Any agency or organization has information that is well managed and be able to transform that data into use like having a weapon that can fight. However, the data must have reliable and up-to-date and meet the needs of users. Management Information System is a collection of data, processing, and creation of an information system to help with the decision-making; coordination and control. It allows administrators to provide data for the benefit of operation or planning analysis of effective information system management in the organization. This paper presents the development of the Phuket Mangrove Gastronomy Information System by software engineering and using Power Query in the collection of mangrove plants data on the use of mangrove plant components in cooking from data that has been published online or in other database systems as well as in the form of files stored on the computer to be the main data of the system. The purpose of developing this system is for the collection of mangrove plants data from various published sources to analyze the data in the form of Management Information System as a resource for food scientists or nutritionists to be able to use information from the system to invent new food menus using components of mangrove plants as raw materials because some components of mangrove plants have properties in the treatment of diseases or prevention of various diseases.

Keywords—Data, Information Systems, Power Query, Software Engineering, Database, NIAM, Management Information System (MIS)

I. INTRODUCTION

In 2015, UNESCO declared Phuket as the City of Gastronomy [1] with a variety of factors including having local food that is unique, having a mix of food from various cultures, bringing innovation to give rise to a new food that is nutritious and valuable such as bringing a variety of local raw materials to create new menus that are nutritious. As Phuket is an island, it has many mangrove forests that are the source of marine animals, which are considered an important ingredient of cooking. However, research into the mangrove forest found that it is not only the animal nursery or coastal protection, but the various components of mangrove forest plants including leaves, flowers, and stems have been used as raw materials in various menus of food, such as fried seep weed-paste balls or many other menus [2], which have nutritious or therapeutic properties. A lot of information related to mangrove forest has been researched and published, both in the forms of a website, Facebook, e-book, and book [3] [4] [5]. However, the information of the mangrove plants that has been published has not been analyzed and used as a knowledge in the treatment and properties of the food produced from the   as information for food scientists or nutritionists to invent new menus from mangrove forest plants, especially applying to the existing food of Phuket which will support the city as a city of gastronomy. Therefore, this research has a concept for developing the Phuket Mangrove Gastronomy Information

System to gather data of mangrove plants that have been published and collect additional mangrove data from existing data, particularly from the mangrove forest in Phuket, including collecting data of food menus using components of mangrove plants as a component of food and bring the collected data to analyze for administration and decision-making of users , especially those who want to invent a menu using components of mangrove plants.
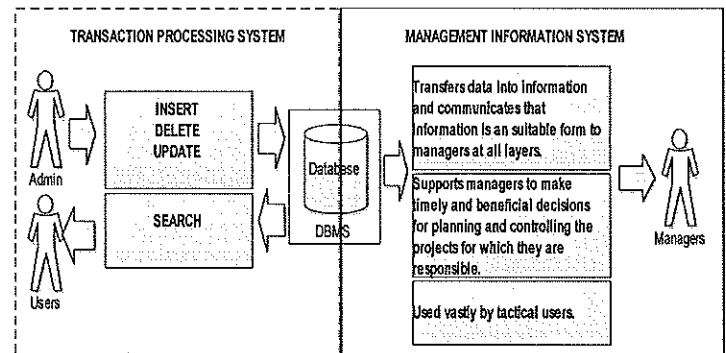

Fig. 1. Framework diagram of the problem statement of the research.

Figure 1 shows the framework of the problem statement of the research. When it was found that there is a lot of data that has been collected on mangrove plants that many agencies have researched [3] [4] [5], the researcher thinks that this data can be analyzed to be useful in the form of Management Information System, Decision Support System and Excusive Management Information System. For this paper, data will be presented at the Management Information System according to the requirements and objectives of the acquisition of Management Information System consisting of 1) Change the data to be in the form of information that is suitable for use and understanding in the information obtained at both the management level and the operational level, 2) The data obtained can help administrators to make decisions efficiently and in time for planning and controlling the activities that are responsible, 3) The data obtained can be used to define the strategy of the agency [6] [7]. Having the Management Information System will bring to a wide variety of benefits to the organizations, including: 1) Enable the agency efficiently achieves a higher level because the management has data that identifies the strengths and weaknesses of its agency, 2) Make quality decisions, 3) Contains information that has analyzed the possible results before making a decision, 4) Executives can browse data from the analysis directly, 5) Business competitive advantage, and 6) Providing targeted service to customers [8].

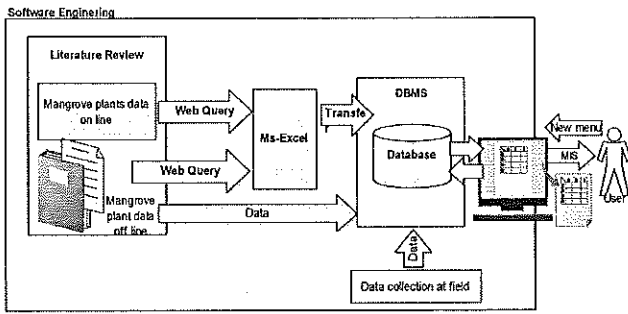## II. INFORMATION SYSTEM ANALYSIS AND DESIGN

Fig. 2. Conceptual Research Framework.

The conceptual framework of this research is based on the development of the information system by software engineering [9] [10] [11] to gather data related to mangrove plants. The mangrove plants data that has been entered into the system consists of: 1) Using Power Query[12] to pull data related to mangrove plants that has been published online or stored in various file formats that are not in the online form to be stored in the form of Excel file. After that, convert the data stored in the Excel file into the database. 2) Collect mangrove plants data that is not in the form of computer storage such as in the form of a book or journals to be stored into the database and 3) Collect mangrove plants data, especially mangrove in Phuket Province to provide data that can indicate that the mangrove plant is in the area of Phuket and in any area and bring the collected data into the database.

Nowadays, there is a lot of data that is published online through various websites, allowing users to search more conveniently. For the use of data published online through various websites, there are many popular methods including [13] [14] [15] and using Power Query which it is chosen as a tool for this research. Power Query is one type of Web Query available in Microsoft Excel, especially in Version 2016, which has full support for Web Query, especially in the field of Business Intelligence (BI). The ability to collect data of Power Query can be collected from sources such as Web page, Excel or CSV file, XML file, Text file, Folder, SQL Server database, Microsoft Azure SQL Database, Access database, Oracle database, IBM DB2 database, MySQL database, PostgreSQL Database, Sybase Database, Teradata Database, SharePoint List, OData feed, Microsoft Azure Marketplace, Hadoop File (HDFS),Microsoft Azure HDInsight, Microsoft Azure Table Storage, Active Directory, Microsoft Exchange, and Facebook [12].
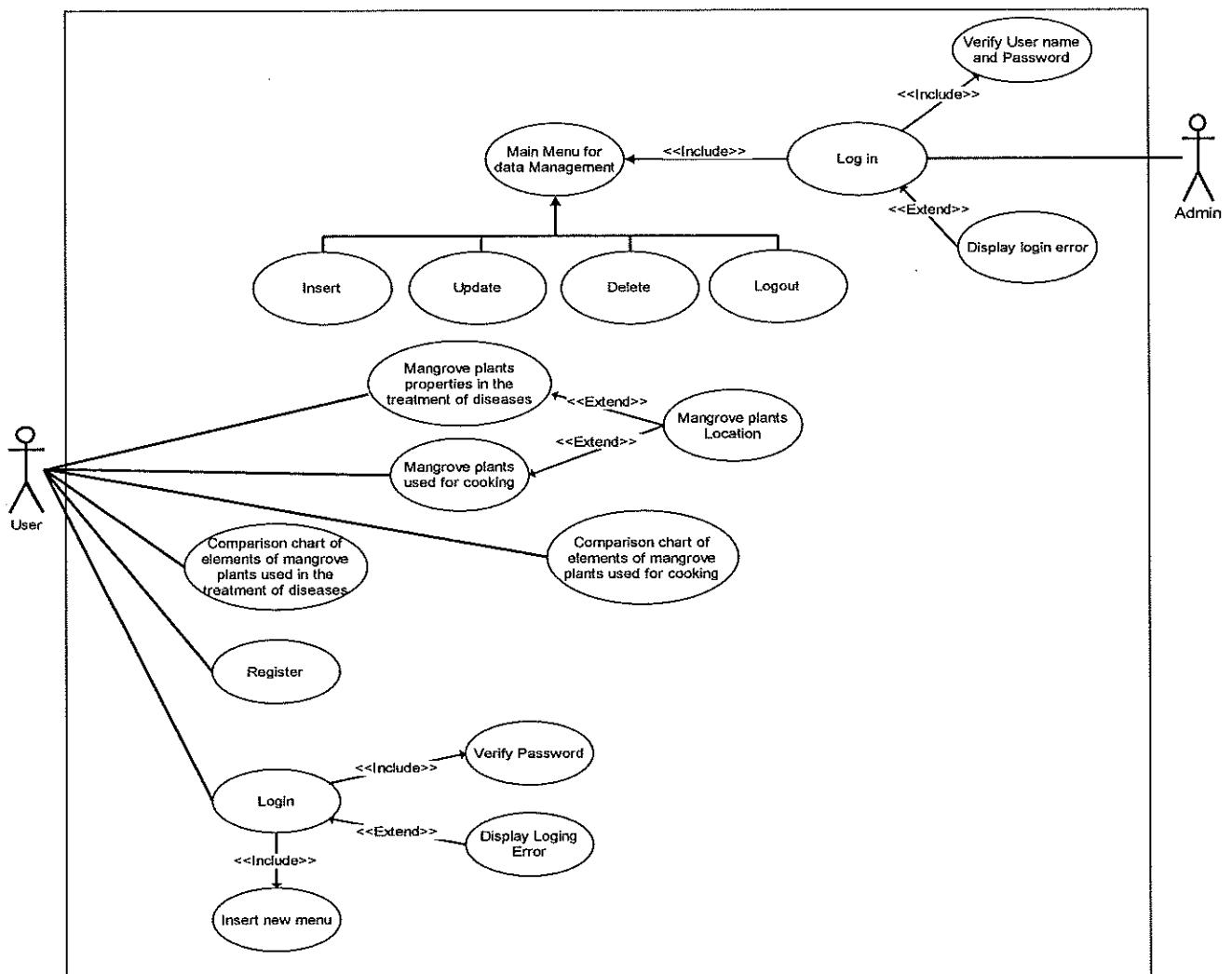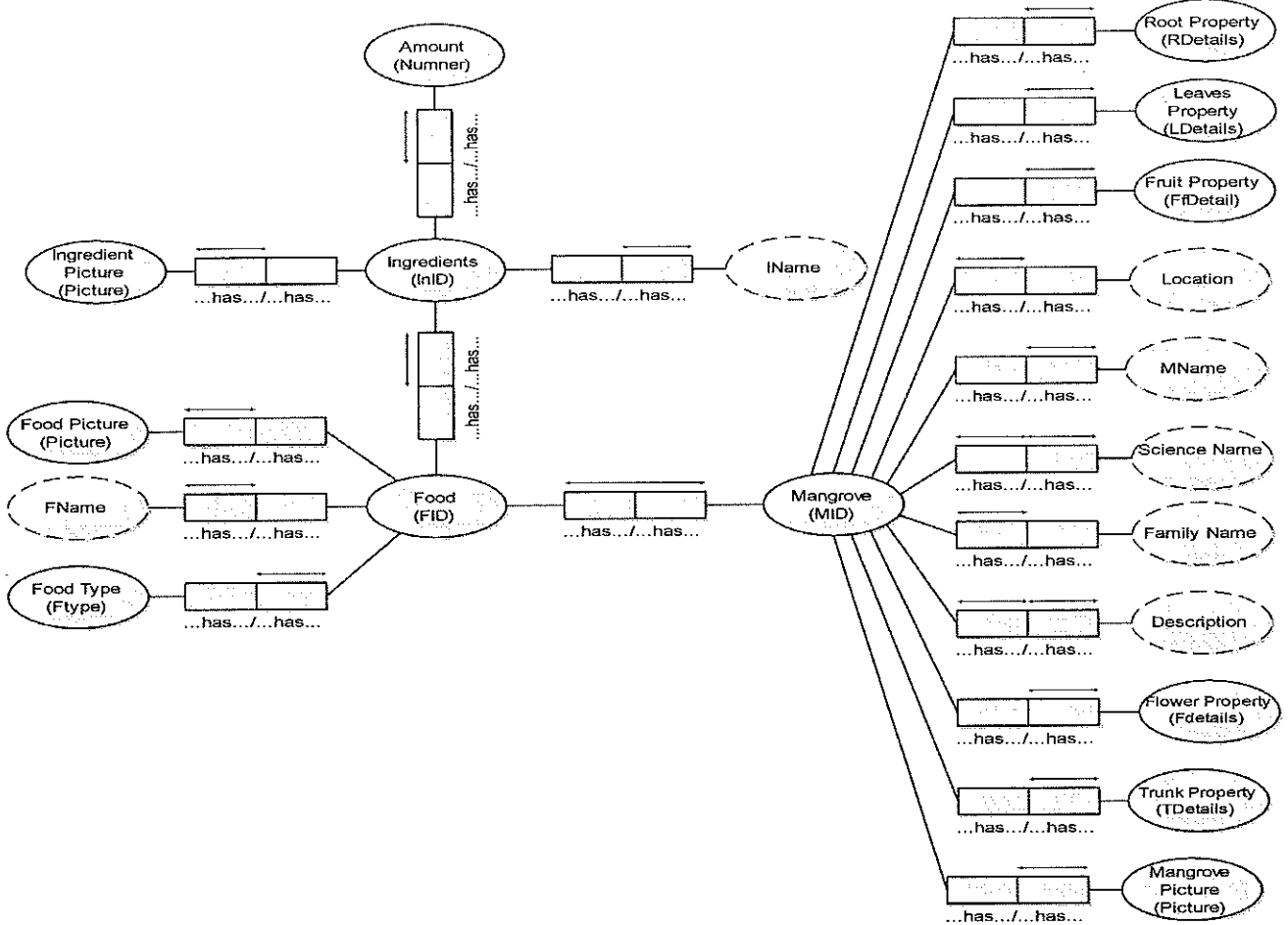

Fig. 3. Phuket Managrove Gastronomy System Boundary.

Fig. 4. Conceptual Data Modeling (NAIM) of the system.

III. MANAGEMENT INFORMATION SYSTEM

Information System has become an important and essential for every organization today. If an agency does not have an information system, it is difficult to survive. Information system consists of Transaction Processing System (TPS), Management Information System (MIS), Decision Support System (DSS), and Excusive Information System (EIS) which each type depends on the user of that information. For Management Information System, it is information that helps check and support the management and decision-making of executives to achieve the objectives and be in accordance with the strategies set by the organization with maximum efficiency both at present and in the future. Information characteristics of Management Information System will be in the form of a brief, concise, easily understood information that gives users the ability to make a decision conveniently and effectively [6].

Figures 5 to Figure 7 present some Management Information System of the system with analysis and summary of information of 96 mangrove plants of Andaman coastal provinces including Ranong, Phang-Nga, Phuket, and Krabi[3] [4] [5] to analyze data along with data on menus made from mangrove plants [2].
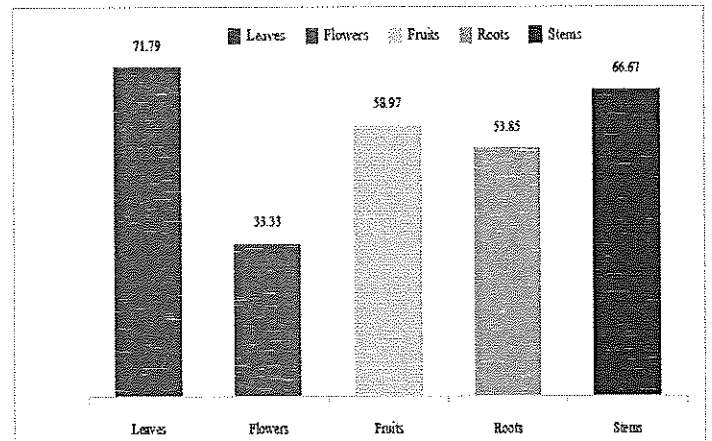

Fig. 5. Percentage of element of managrove plants with therapeutic properties.

Figure 5 is a graph showing percentage of components of 36 mangrove forest plants that include leaves, flowers, fruits, roots, and stems that have healing properties or are beneficial to the body when consumed. It was found that the leaf component has the highest healing properties, while the flower component has the lowest healing properties and if considering 100% of the components of the mangrove plants that has therapeutic properties, it can be shown in Figure 6.
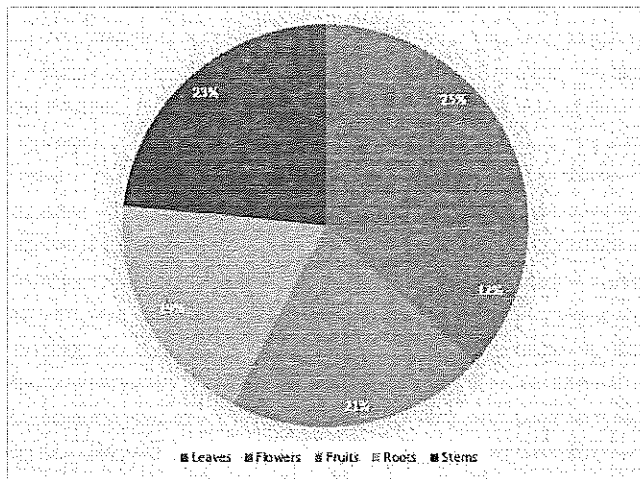
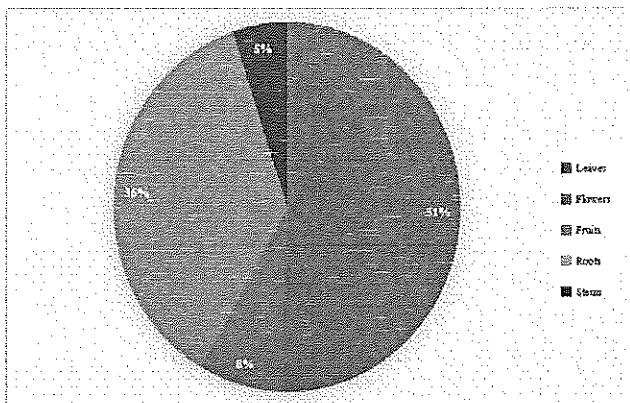Fig. 6. Components of managrove plants with medical properties.

Fig. 7. Components of managrove plants that are uses as food components.

Figure 7 shows the percentage of components of 20 mangrove plants that are used as components of the current food menus that have been invented. It was found that the leaf components of the mangrove plants is used the most as cooking infredient, while the root component of the mangrove plants has not been used as a component of cooking at all, even though the root component of the

mangrove plants has therapeutic properties or benefits to the body when taken more than the flower part. Based on this information, in the future food scientist and nutritionist will be able to invent a new menu that uses the root component of the mangrove plant as a component of food.

IV. CONCLUSION

Phuket Mangrove Gastronomy Information System development began from seeing the value of mangrove plants that have many benefits from leaves, flowers, fruits, stems, and roots, as well as the introduction of these components to be used as a component of a variety of foods, which the researcher has prepared and published. Because UNESCO has declared Phuket to be the City of Gastronomy due to a variety of factors and one factor is the invention and design of menus that use local raw materials and the food has to be nutritious. Based on this factor, there has been the development of the Phuket Mangrove Gastronomy Information System, which collects mangrove plants data that indicates various properties and food menu information that uses mangrove forest plant

components as a component to analyze information for food scientist or nutritionist to be able to use data obtained from this system to invent a new menu that uses mangrove plants as a component of that menu. The general users can also use data from this system as well.

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