Chapter II

Literature Review

2.1 Herbal Medicine Information Dissemination

A lot of herbs have been researched and tested to ensure their efficacy in health care. Most health institutes have realized on this and promote herbs through various media; journals, magazines, newspapers, pocket books, newsletters, leaflets, radio and television programs and advertisements, television programs, and Internet documents. They try to promote herbal properties and usage in order to increase the general public understanding of herb usage in primary health care.

Herbal medicine information dissemination on the Internet through the World Wide Web (WWW) includes information on their properties, efficacy, usage, an identification gallery, products, and related research. Most herbal medicinal information on the WWW has been presented in document format rather than database format. Some web sites provide inquiry tools for searching of information in herbal databases.

Sample herbal medicine web sites in Thailand;

1. The Governmental Pharmaceutical Organization web site (http://www.moph.go.th/gpo/herbal) offer information about herbs and herbal products as follows:

   Herbs

   - Herbal botany
   - Cultivation
   - Medicine
   - Usage
   - Scientific knowledge

   Products

   - Directory for usage

2. The Research and Development Institution of Governmental Pharmaceutical Organization web site

(http://www.rdi.gpo.or.th/oldmidicine/t47-t48-g56-g116.html)

presents:

- Definitions of herbs
- List of herbs for basic health care
- Warnings about herbal medicine usage

3. The Herbal Information Office of Phamacy School, Mahidol University (http://www.mahidol.ac.th/mahidol/py/mpcenter/html) offers the following information:
   - List of herbs for basic health care
   - Botany
   - Medicinal usage
   - Identification gallery
   - Search mechanism
4. The Royal Project Foundation (http://www.kanchanapisek.or.th/kp12/product/herb/herbdetail.html) introduces western herbs in the following categories:
   - Properties of herbs
   - Culinary uses
5. Healthnet in Thailand (http://www.welcome.to/obesity) introduces herbal properties for weight control.

Sample international herbal medicine web sites;

1. Gardens of the Blue Planet (http://www.open.ht/space/gardens/culinary.htm) introduces culinary herbs in the following categories: identification gallery, botany, medicine, cultivation and culinary uses.
2. Herbal Resources Inc. (http://www.herbsinfo.com) publishes the history and knowledge of herbs, botany, clinical usage, herbal usage, product research, bulletins, and questions and answers.

3. Health Land Supplies Ltd. (http://www.chinaginseng.com) introduces Chinese herbs with a properties and products list.
4. Herb Net (http://www.herbnet.com) presents herbal botany, cultivation, properties, medicines , list of herbal gardens, herbal groups, shops, services, herbal classes, and a question and answer service.
5. Kathie's herb page (http://www.muscanet.com/~kschmitt) publishes lists of herbs, herbal cultivation and gardening, medicine, herbal usage, and culinary and biblical herbs.

2.2 Information Management

Information can be divided into two main types; record-based information and document-based information. Record-based information is defined as well-structured data which can be identified as entities with a set of attributes. It is organized with a database management system (DBMS). Document-based information is defined as unstructured data which contains a wide variety of informational forms (Sprague and Watson. 1993). It has been organized as object oriented and can be easily created through word processing and desktop publishing. Technology to support document management includes publishing, imaging, database management and networking (Bielawski and Boyle. 1997).

Web technology may incorporate any technology for document-based information management. Web technology can be used to publish articles, data sheets, schedules, reports and other information. It allows users to access and complete transactions (Tenenbaum, J.M., 1998). Web technology can support unstructured information in structured form. Web documents are essentially hypertext documents which are authored in a standard format. The structure and the elements of a document can be defined in a hypertext document (Bielawski and Boyle. 1997). Fedorawicz (1990) mentions that hypertext-based systems can be used to present various types of documents and to link them to relevant objects and documents.

2.3 World Wide Web Technology

The World Wide Web (WWW) is one of the services on the Internet. It provides hypermedia documents and interfaces with modules of other services on the Internet. The WWW is the most attractive service on the Internet because webpages are truly multimedia documents which can contain text, graphics, images, sound, and video clips (Cockburn and Wilson. 1996). WWW technology allows users to quickly browse through text and graphics in documents. Users can access other parts of the same document and jump to other documents in a nonsequential and multilevel context (Vanier. 1994). WWW technology requires very little resources in order to set up web pages and web sites (Fielding et al. 1998).

Web pages are made of Hypertext Markup Language (HTML). It's a flexible format which defines the structure of documents and facilitates putting additional elements into documents (Bielawski and Boyle. 1997). HTML forms can handle documents, electronic mail, conferencing systems and a front end mechanism to access the database (Vanier. 1994). Hypertext documents can be used as tools for knowledge transfer and information dissemination. Hypertext is used for information browsing, training, education, analysis, summarizing and illustrating (Jonjoubsong. 1998). In addition, HTML documents can be a gateway for users to access other programs that are stored within the WWW servers (Fielding et al. 1998).

The WWW has been used in various fields. Cockburn and Wilson (1996) found more than 20,000 business corporations have web pages. They have been used for several proposes, such as advertising products and services, doing marketing research, as a communication channel to release information to staff and customers, conduct research and development, and collaborate with partners in join-ventures.

Most web pages on the WWW has many attractive points which can lead users out of their target topics. However each topic does present too much information with lengthy steps to reach the needed information. Those cause users to take too much time to find out specific information and some of them get lost on the way (Jonjoubsong. 1998).

2.4 Decision Supported Tools

2.4.1 Decision Model

The decision process can be divided into 3 phases; intelligence, design, and choice. The decision process starts with the intelligence phase. That is a phase of information finding and problem identification. The design phase is a phase of solution generation which is then feasibility tested. The choice phase is a phase of selecting and implementing the solution (Sprague and Watson. 1993). Turban (1993) has mentioned using a model to represent problem and solution in order to support the decision making process. Turban (1995) has introduced 5 types of models for supporting decision making;

1. Enumeration Model prepares the best solution for a small number of alternatives.
2. Optimization Model generates the best solution with steps and formulas.
3. Simulation Model provides a solution using assumptions. It predicts alternatives instead of an optimal solution.
4. Heuristics Model uses rules of thumb to answer less structured problems and does not give a specific solution. It is appropriate for complex problem and involves symbolic rather than numerical processing. It has limited data input.
5. Predictive Model evaluates possible solutions that will occur in the future.

2.4.2 Decision Supported Systems

Decision Supported Systems (DSS) are interactive computer based systems which help decision makers utilize data to solve unstructured problems. These consist of three components: a database subsystem, a model-base subsystem, and a dialogue model (Sprague and Watson. 1993).

The database subsystem is a component of data collection for processing alternative solutions in the system. This subsystem must be able to extract

internal and external information. A DSS database should be separated from other subsystems.

The model subsystem is a component that is used to analyse problems and gives decision guidance for the DSS. Analytic capability can be provided using statistical analysis, financial analysis, linear programming and artificial intelligence.

The dialogue component provides DSS with flexibility and utility. Dialog components can be divided into three parts; action language, presentation language, and a knowledge base.

2.5 Decision Supported Web-Based Systems

Web pages information can be quite complex; therefore, web pages should have information identification support tools in order to help web users determine specific information. Decision technology should be provided and accessible on web pages. Web users can access decision technology on the provider machine (web server) via the Common Gateway Interface (CGI). In addition, web pages with executable programs (applets) of Java language allow web users to download and execute a decision model without any compilation or installation (Bhargava et.al. 1997). Web pages are client-server application. The client-server system allows users to process information at the user (client) side utilizing information provided by server (Bernard. 1999). The Process Software Corporation mention that web technology provides a powerful mechanism to access informational resources through each server simply by pointing and clicking.

Grove and Hulse (2001) integrated expert system into the Internet system for Internet-based expert system by putting expertise of human expert in rule-based form with Java Expert System Shell (Jess). Their system, the Peptile Indentification Helper or RIH helps users through a deductive process of identification of reptile species.

Sridhar (1998) found potential for Intranet technology supported decision making with the three components of the DSS. He introduced Intranet-based decision support in his study on decision support using Intranet. Intranet is seen as a high speed Internet system which disseminates and shares information within a restricted

physical network and membership of an organization. It uses the same concepts of Internet technology (Process Software Corporation, 1999).

Sridhar (1998) has presented the potential for Web technology based on 3 Decision Support System components as follows:

1. Interface component Web pages with browsers provide a variety of interfaces for users, such as menus, questions and answers, and many varieties of tools. Hypertext documents allow users to navigate through informational and operational systems. In addition, it is easy to use and presents the same interface to users across the computer platform.

2. Database component Web technology can provide mechanisms for easy access to structured data (transaction data), unstrucutured data, and database management systems without the user having knowledge of database management.

3. Model component Intranet and Internet server allow the users to remotely access decision models and manage the models to allow local and remote execution. Moreover, it allows the models to link to appropriate databases.