

ASSIGNMENT OF ITM 613 DECISION SUPPORT SYSTEM

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1. Why is utiket DSS?

Utiket as website has the concept to help everyone for searching cheapest ticket. Utiket not sell tickets but provide information of cheap price and comparison of price all airlines, so people can easily reserve the ticket as their needs. The accuracy of data in utiket for airline ticket prices makes utiket very helpful for giving information systems about airline tickets searching. Therefore, utiket be the most of website popular in Indonesia for airline tickets searching.

Decision Support Systems (DSS) is computer-based tools having interactive, graphical, and modeling characteristics to address specific problems and assist individuals in their study and search for a solution to their management problems (Loucks and da Costa, 1991), the support to decision-makers in solving problems that are poorly or insufficiently structured (Guariso and Werthner, 1989).

People using utiket online to get good information about airline ticket prices, that price list is very important to help people to make a decision. Decision making is the process of developing and analyzing alternatives to make a decision, a choice from the available alternatives. By looking utiket website, we can get several choices of available ticket price alternatives. Most decisions are made in response to problems, a discrepancy between a desirable and an actual decision and involve judgment, the cognitive aspects of the decision making process.

Therefore, utiket as computer based tool is as decision support system (DSS), because utiket provides choices for people to make a good decision and to hasolve problems. In which utiket clearly provides DSS basic components, that are data management subsystem, model management subsystem, knowledge-based management subsystem, user interface subsystem and the user. In addition, proceedings of utiket website online is the same as working definition of DSS (decision support system) which DSS gives an interactive, flexible, and adaptable CBIS, specially developed for supporting the solution of a non-structured management problem for improved decision making. It utilizes data, it provides easy user interface, and it allows for the decision maker's own insights. For example in figure 1, we can take a decision to buy a ticket from the list which it provides graph high and low prices



Figure 1 : a graph price list of flight departure in October 2013 (utiket.com)

COMPONENTS OF DECISION SUPPORT SYSTEM IN UTIKET

a. Data management subsystem

for utiket involved some components, consist of includes the database that contains the data, database management system (DBMS), can be connected to data warehouse and utiket had data directory and query facility. Utiket data had been giving true information about ticket prices which the data is taken from all of flight airlines. Data directory and query facility can be used to find information that we hope to get.

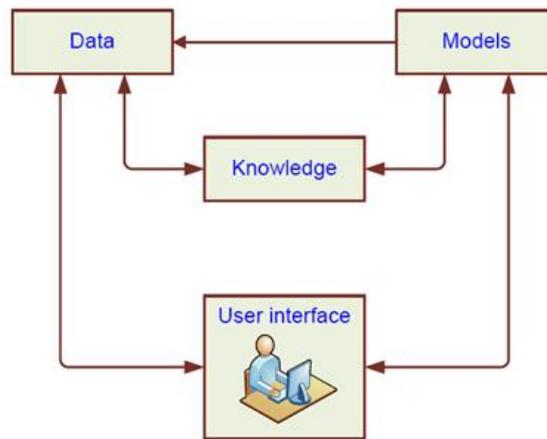


Figure 2 : Data Management Linkages

b. Model management subsystem in utiket

Model management subsystem in utiket consists in the following components:

- The model base, utiket offers analyzing and finding solutions to problems, especially someone who wants to find tickets at low prices,
- Utiket model had created new models about ticket information by using programming languages,
- The utiket website helps users to execution and integration from several airlines. That is very important to make a decision.

c. Knowledge Based Subsystem

The user states a problem using the language system, and the system responds by starting the problem processing system and looking up specific information in the knowledge system. Knowledge bases are used to determine appropriate model analysis (to be performed with the assistance of technical users) given the context of the problem (the selected judgement criteria).

Knowledge base of utiket gave the needs which the data stored in utiket system, that are:

1. Data of pricing, time and route for all airline flight, so people can find a cheap ticket prices according to the time desired
2. Data of airline websites, so people can reserve ticket directly on airline websites
3. Data of travel agent location, so people can reserve ticket in the nearest travel agent

d. User Interface Subsystem

Utiket used analysis to search airlines that offer the cheapest price at the time and the routes desired. Moreover, people can also search the latest price information available by other airlines at the same time, so people can decide when they can buy ticket and where they can buy ticket as their needs. Airlines as a provider of pricing data, time and route of flight. It also can used for reservation of ticket. Agents flight as the place of flight reservation, travel agent as the tour provider and Society as people who need ticket.

The user interface is a component that provides the communication between the user and the decision support system. The proper design of this component is really important, as it is the only one the user actually deals with. Utiket had built user interface to support decision maker.



Figure 3 : Utiket User Interface

DSS CLASSIFICATIONS OF UTIKET

Steven Alter, quoted by Muntean (2003) proposed in 1980 a classification of the Decision Support Systems according to "the degree to which the system's output can directly determine the decision", independently from problem type, functional area or decisional perspective.

Thus, seven categories of Decision Support Systems were proposed, divided into two super-classes:

1. Data-oriented DSS
2. Model-oriented DSS

By exploring utiket website online, I give conclusion that utiket.com has data-oriented DSS for DSS classification, because of:

- File Drawer Systems, whose purpose is to automate certain manual processes and provide access to data items. They address people who have operational responsibilities (operators, clerks, workshop supervisors). Currently, this category includes simple query and reporting instruments which access transactional systems;
- Data Analysis Systems, which facilitate the analysis of current and historical data, in order to produce reports for managers. Data analysis is required for budget analysis, business opportunities analysis, investment effectiveness analysis, etc. Today, this category includes a large number of data warehouse applications;
- Analysis Information Systems, which provide access to a multitude of support databases for the decisional process, as well as a series of simple models in order to supply information necessary for solving particular decisional situations. This category includes today the OLAP systems, frequently used in sales forecasting, competition analysis, production planning, etc.

2. DECISION SUPPORT SYSTEM

FOR PLANNING AND DEVELOPMENT OF LAND RESOURCES

INTRODUCTION

In this current study, A decision support system (DSS) is a computer-based information system that supports business or organizational decision-making activities. DSS serve the management, operations, and planning levels of an organization and help to make decisions, which may be rapidly changing and not easily specified in advance. In Indonesia government, planning and development of land resources are very important to sustainable regional plans as central policy instrument.

Land is subjected to a wide range of chemicals from many sources, including municipalities, industries and agriculture. Landuse change is influenced by local needs, as well as by nearby urban demands and remote economic forces. The land resources itself is influenced by many necessary substances, i.e.: Human, urban activities, landuse, slope, watershed, soil, geology, roads, river, morphology, forest area and others. As the analyst factor, the land resources are input to make planning and development as decision. But if the planning and development of land resources does not completed, as the risk, it might collapse.

Landuse changes have had both positive and negative effects on human well-being, and on the provision of ecosystem services. The enormous increase in the production of farm and forest products has brought greater wealth and more secure livelihoods for billions, but often at the cost of land degradation, biodiversity loss and disruption of biophysical cycles, such as the water and nutrient cycles. These impacts create many challenges and opportunities for planning and development.

Decision support system (DSS) as a computer-based information system should be tools for decision making about planning and development of land resources. In this project, decision making that integrated with DSS can be policy analyzing alternatives for Indonesia government.

LITERATURE REVIEW

A system is a group of elements, either physical or nonphysical in nature, that exhibit a set of interrelationships among themselves and interact together toward one or more goals, objectives, or ends. Applying this broad definition to a computer-based information system, the primary group of elements is data, the set of relationships is the flow of data, and the goal is to have a well-informed user capable of making efficient decisions (Alexander, 1974).

Decision Support Systems (DSS) is computer-based tools having interactive, graphical, and modeling characteristics to address specific problems and assist individuals in their study and search for a solution to their management problems , the support to decision-makers in solving problems that are poorly or insufficiently structured (Guariso and Werthner, 1989).

According to Sprague and Carlson (2003), decision support systems would consist in the following components (Figure 1): data management component; model management

component; user interface management component; decision support system architecture. But nowadays, the components of decision support systems are very much like the ones identified: user interface; knowledge based subsystems; data management module; model management module..

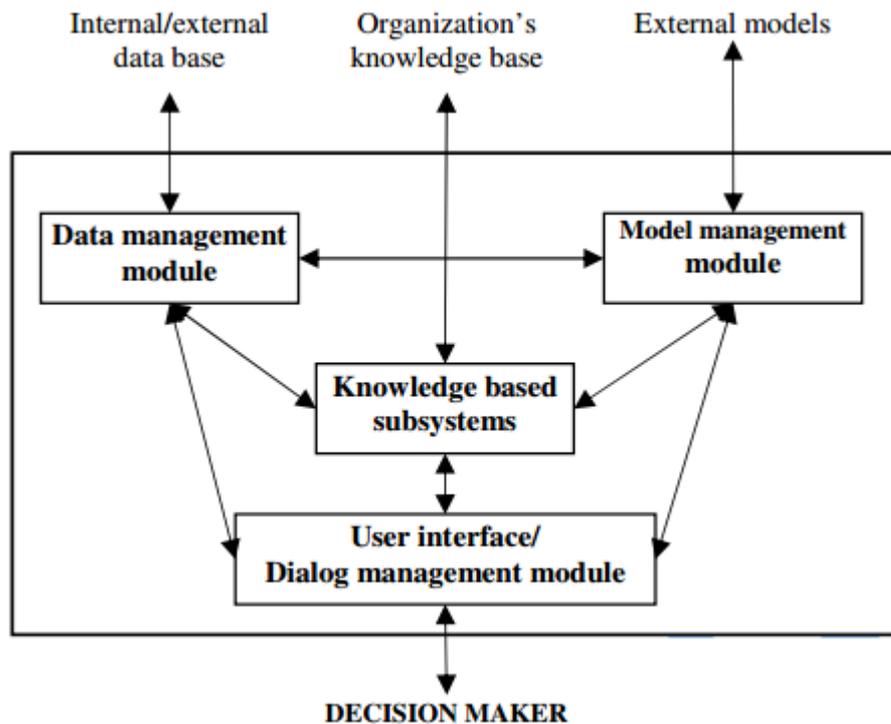


Figure 1 : Decision support systems' components (Adapted after)

The user interface is a component that provides the communication between the user and the decision support system. The proper design of this component is really important, as it is the only one the user actually deals with.

The data management method is a subsystem of the computer-based decision support system, and has a number of subcomponents of its own (Figure 2.):

- the integrated decision support system database, which includes data extracted from internal and external sources, data which can be maintained in the database or can be accessed only when is useful;
- the database management system; the database can be relational or multidimensional;
- a data dictionary, implying a catalog containing all the definitions of database data; it is used in the decisional process identification and definition phase;
- query tools, assuming the existence of languages for querying databases.

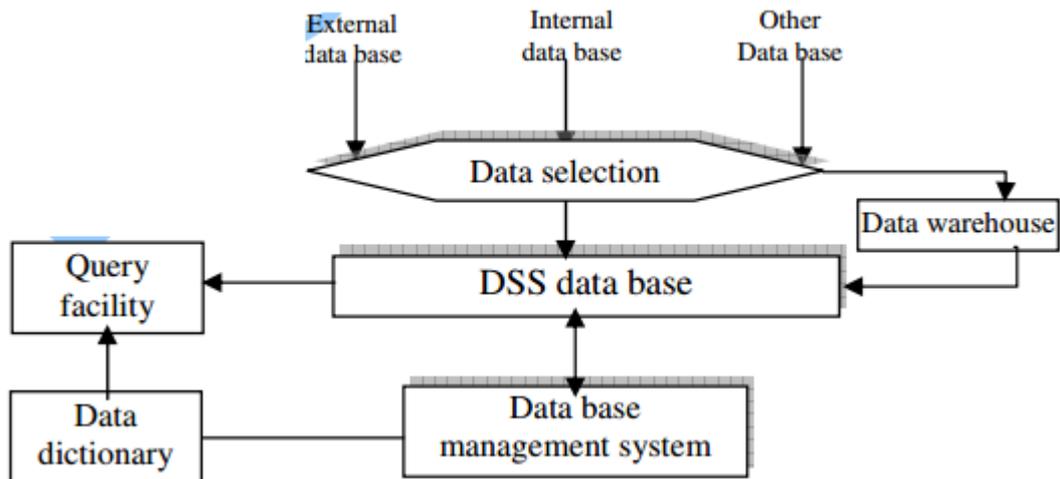


Figure 2 : Data management module (Adapted after)

The model management module consists in the following components (Figure 3):

- the model base, that contains the quantitative models that offer the system the capacity of analyzing and finding solutions to problems
- the model base management module, that is meant to create new models by using programming languages;
- the model dictionary, that contains the models' definition and other information related to them;
- the creation, execution and integration module of models, that will interpret the user's instructions according to models and will transfer
- them towards the model management system.

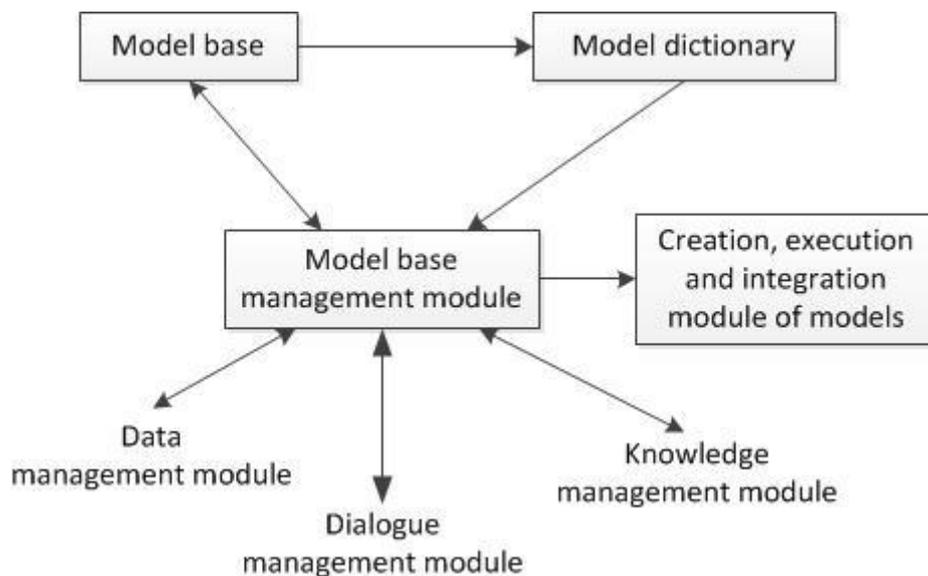


Figure 3 : Model management module (Adapted after)

PLANNING AND DEVELOPMENT OF LAND RESOURCES

After more than six decades of its independence, Indonesia has made tremendous progresses in its economic development. Originating from a traditionally agricultural-based economy, Indonesia has shifted a larger portion of its economic activities toward manufacturing and service oriented industry. Its economic development has also improved the nation's level of prosperity, which is reflected in its increased income per capita as well as in other social and economic indicators including the Human Development Index (HDI). From 1980 to 2010, the HDI had nearly doubled, from 0.39 to 0.60 (The Masterplan for Acceleration and Expansion of Indonesia Economic Development (MP3EI, 2011)).

Indonesia is the world's largest archipelago, stretching from east to west with a length of 5,200 km and a width of 1,870 km. Indonesia has a direct access to the world's largest market since it is passed by one of the most active Sea Lane of Communication. Geographically, Indonesia has different land resources from east to west. In this project, decision support system as computer-based information system that supports business or organizational decision-making activities, it's aimed to give information land resources in all Indonesia area. Furthermore, Indonesia government can make a good decision for planning and development of land resources by using DSS.

Technology GIS (Geographic Information System) can describe spatially land resources, because GIS display mapping and data attribute in an area. Geographic information system has been widely used for spatial data manipulation for land resources model operations and as a supporting tool to develop spatial decision support system.

COMPONENTS OF DECISION SUPPORT SYSTEM IN PLANNING AND DEVELOPMENT OF LAND RESOURCES

In planning and development of land resources, decision support system has to components as requirements to bring up the system for decision making. The components are data management subsystem, model management subsystem,

a. Data management subsystem

Data management subsystem of the computer-based decision support system for planning and development of land resources, has a number of subcomponents of its own:

- The integrated decision support system database, which includes data extracted from internal and external sources. In this project, data internal derived from map of planning and development of land resources which had built by central government and local government especially BAPPENAS (National Development Planning Agency) and BAPPEDA (Local Development Planning Agency);
- Data external derived from map of land resources which had built by all government agencies.
- The data requirements are human, urban activities, landuse, slope, watershed, soil, geology, roads, river, morphology, forest area and others;
- Data must be maintained in the database or can be accessed only when is useful;
- The database management system for geospatial data and attribute data that integrated with technology GIS (Geographic Information System) ;

- A data dictionary, implying a catalog containing all the definitions of database data; it is used in the decisional process identification and definition phase;
- Query tools, assuming the existence of languages for querying databases.
- Example of geospatial data:

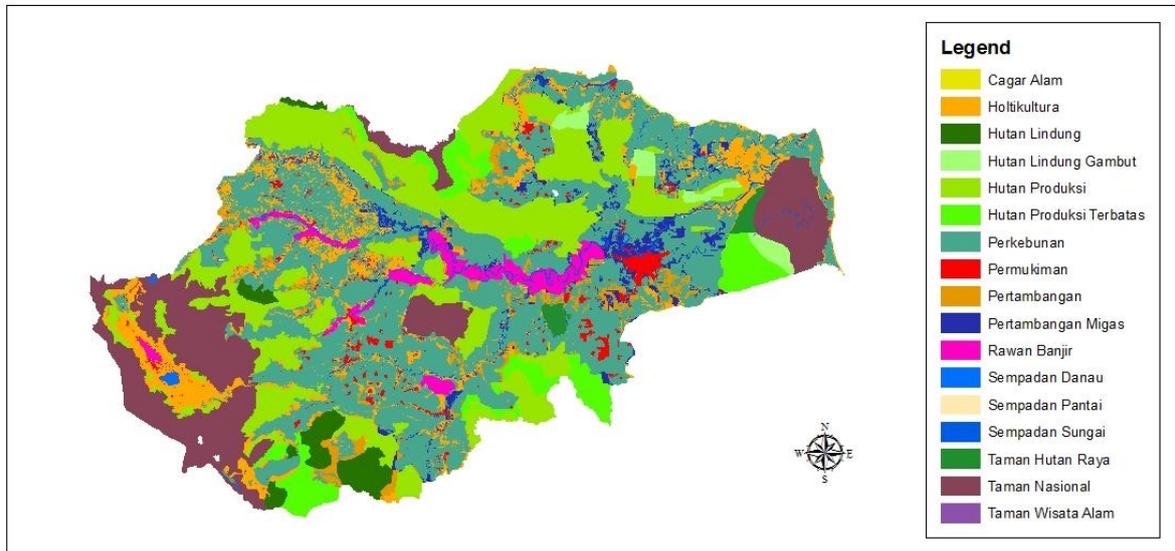


Figure 4: Map of Spatial Pattern in Province of Jambi 2011
(Source: Local Development Planning Agency (BAPPEDA) of Jambi Province)

b. Model management subsystem

The model management module of planning and development of land resources consists in the following components:

- The model base, this project offer the system analyzing and finding solutions to problems especially planning and development of land resources in Indonesia;
- To collaborate geospatial data in all government agencies, model is created by programming languages because all data have to connect in different database;
- The model dictionary has information about planning and development of land resources that is supported by GIS technology.
- The creation, execution and integration module of models that will interpret the user's instructions according to models and will transfer them towards the model management system.

c. Knowledge Based Subsystem

Knowledge bases are used to determine appropriate model analysis to be performed with the assistance of technical users, that's given the context of the problem. Knowledge base of planning and development of land resources gave the needs which the data stored in system, that are:

- Maps of planning pattern that had built by government, these maps are very important to give information about urban or area planning. By understanding map of plan, government and public can build landuse appropriately.
- Maps of land resources that derived from various government agencies could be option for decision making. Government and public can analyze spatial problems in an area.

- Planning and development of land resources could be right by understanding spatial pattern in every area, because plateau areas and coastal area that have differences characteristic spatial area must be also differences for planning and development of land resources.

d. User Interface Subsystem

The user interface is a component that provides the communication between the user and the decision support system. The proper design of this component is really important, as it is the only one the user actually deals with. In planning and development of land resources that need integrated and connected government and public as users, user interface use web base GIS online.

DSS CLASSIFICATIONS OF PLANNING AND DEVELOPMENT OF LAND RESOURCES

According to Steven Alter, quoted by Muntean (2003) proposed in 1980 a classification of the Decision Support Systems according to “the degree to which the system's output can directly determine the decision”, independently from problem type, functional area or decisional perspective. Steven categories of Decision Support Systems were proposed, divided into two super-classes:

1. Data-oriented DSS
2. Model-oriented DSS

This project for decision Support Systems that use to planning and development of land resources has DSS classification, that's data-oriented DSS. This can happen because geospatial data have given spatial and attribute data that derived from several government agencies. Which data are analyst support to make decision for government or public in planning and development of land resources.

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