

Information Systems Applications on The Organizational Level

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Abstract— Management can be divided into three levels, namely the lower level (operational level), intermediate level (tactical level) and upper level (strategic level). Because each level of management performs different activities, they also need different information. Because the information needed is different, the information system used is also different.

Information systems at the operating level support operations managers to carry out their activities. The main purpose of information systems at this level is to answer routine questions for the purpose of controlling the flow of transactions that occur in the organization. Information systems include expert systems (SP) or expert systems (ES), artificial neural networks (JNB) or artificial neural networks (ANN), decision support systems or decision support systems (DSS) or group support systems (DSS) GSS), geographic information systems (GIS) or geographic information systems (GIS). Information system at the top level used for strategic planning and problem solving. Information systems at this strategic level are executive information systems (SIE) or executive information systems (EIS) or executive support systems (ESS). Information systems that connect to three management levels are office automation systems (SOK) or office automation systems (AOS).

Index Terms—Information Systems, Application, Organizational Level, Expert System, Decision Support Systems, Executive Information Systems.

I. INTRODUCTION

Each level of management performs different activities so that the need for information is also different, so the information system used will be different. The type of information needed by various levels in an organization is directly related to the level of management decision making and its decision structure. Information systems can be implemented internally and externally by the company. Externally, the existing information system is pulled out to reach customers. Internally, information systems can be applied in organizational functions or organizational levels. Information systems that are implemented in organizational functions are:

Accounting information system.

Marketing Information System.

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Human Resources Information System.

Production Information System.

Financial Information System.

Management information systems can be used to support activities in business functions. Business functions include the areas of accounting, production, marketing, finance, human resources. Functional information systems or business systems consisting of marketing information systems, production information systems, human resources information systems, accounting information systems and financial information systems.

The first three DSS are the easiest. The simplest CMS is the simplest model, which only takes certain information elements from a file. The last three DSS are complicated DSS based on sophisticated models. Some experts argue that these last three DSS are really called DSS because they are based on complex models.

The second type of DSS is data driven DSS. Unlike the DSS driven model that relies on the model but with enough data, the data driven DSS relies more on big data. This SPK will allow system users to retrieve information from very large amounts of data. On-line analytical processing (OLAP) and datamining can be used to analyze this large data. On-line analytical processing (OLAP) is an existing functional information system that has a complete database coupled with the ability to retrieve data and analyze it on-line. Datamining is a technique used to find patterns and relationships between data items in a data warehouse. Data warehouse is a copy of data in the form of an integrated database, while datamart is a copy of a portion of an integrated database.

In general, SIE is not only different from SPK, but also different from other information systems, because SIE has special characteristics. The characteristics of SIE are as follows:

- 1) Designed for top executives
- 2) Using internal and external data
- 3) For unstructured solutions
- 4) To help with strategic planning and formulation.
- 5) Used online by executives.
- 6) Has the ability to retrieve and filter data.
- 7) Having the ability to retrieve and dig up data to the smallest data.
- 8) Must be easy to use
- 9) Using text, graphics and tables that are easy to digest.

II. LITERATURE REVIEW

2.1 Information Systems in the Organization Level

Types of information systems in the Organization Level

1. Information systems at the lower organizational/operational level: supports operations managers in carrying out their activities. SI type of operation level: TPS ((transaction processing system transaction system), PCS (), (Process control system Process system).
2. SI at intermediate level: used for semi-structured control and decision making. Types of SI: Expert system (expert system expert system); artificial neural network (ANN:); artificial neural network artificial network); decision support

system (DSS:); decision support system decision system); GSS (); (roup support systemroup system); system); geographic information (GIS: geogragraphic information system geogragraphic system).).

3. Information systems above level: used for strategic planning and problem solving. Types of SI at this level are: executive information system (EIS: executive information system) or ((executive support system executive system). Information systems that connects the three management levels is the office automation system (OAS: office automation system office system).

2.2 Information Technology Systems

Information technology system or commonly called STI is a system formed in connection with the use of information technology. This STI can be applied to organizational levels, previously the definition of the organization was a place, a forum and a media where people gathered, cooperated rationally and structured, planned, guided and controlled, in managing a resource, means existing infrastructure, data, etc. that are used efficiently and effectively to achieve certain goals and objectives of the organization itself. And the levels in the organization are:

1 Operational Level

The level at which basic activities and routine transactions occur and the latest data is available.

2 Levels of Knowledge

The level that aims to support and provide knowledge or information and work data intended for employees.

3 Management Levels

It is the level for overseeing, coordinating and also decision making in organizations.

4 Strategic Level

Is the level to form long-term planning and short-term organization.

1. Expert system

Expert system is a system for adopting human-owned knowledge to a computer that is designed to maximize the ability to solve problems like an expert or someone who is used to dealing with the problem. With this expert system, ordinary people can either solve their problems or just look for quality information that can only be obtained with the help of experts in their fields. In its preparation, the expert system combines inference rules with certain knowledge bases provided by one or more experts in a particular field. The combination of these two things is stored in a computer, which is then used in the decision-making process for solving certain problems.

A good expert system must meet the following characteristics:

- a) Have reliable information.
- b) Easy to modify.
- c) Can be used in various types of computers.
- d) Have the ability to learn to adapt.

Broadly speaking, many benefits can be taken with the existence of an expert system, including:

- a) Enables ordinary people to do the work of experts.
- b) Can repeat the process automatically.
- c) Save the knowledge and expertise of experts.

- d) Increase output and productivity.
- e) Improve quality.
- f) Able to take and preserve the expertise of experts (especially those that are rare).
- g) Able to operate in a dangerous environment.
- h) Having the ability to access knowledge.
- i) Increase the capabilities of the computer system.
- j) Having the ability to work with information that is incomplete and contains uncertainty.
- k) As a complementary medium in training.
- l) Increase capabilities in solving problems.
- m) Save time in decision making.

Besides having several advantages, the expert system also has several disadvantages, including:

- a) The costs required to make and maintain it are very expensive.
- b) Difficult to develop. This is of course closely related to the availability of experts in their fields.
- c) Expert system is not 100% true.

The expert system itself can be developed further for several reasons, namely:

- a) Can provide expertise at any time and in various locations.
- b) Automatically do routine tasks that require an expert.
- c) An expert will retire or leave.
- d) An expert is expensive.
- e) Expertise is also needed in hostile environments.

III. DISCUSSION

Information Systems Applications at Organizational Level.

Management can be divided into 3 levels, namely the lower level (operational level), middle level (tactical level), upper level (strategic level). Because each level of management performs different activities, they also need different information. Because the information needed is different, the information system used is also different. Information systems at the operating level support operations managers to carry out their activities. The main purpose of information systems at this level is to answer routine questions for the purpose of controlling the flow of transactions that occur in the organization. This kind of information-based system is called TPS (Transaction Process Systems) and PCS (Process Control Systems). These TPS and PCS include lower level product information systems. Middle-level information systems function as management controls that are half structured. Information systems at the top level are used in strategic and problems. Decision Support System (DSS) is defined as an information system to help middle level managers to make half-structured decisions, to be more effective by using analyzed models. The objectives of the decision support system (SPK) are as follows:

Helping managers make half-structured decisions faced by middle-level managers.

Help or support managers make decisions rather than replace them.

Increasing the effectiveness of management decisions is not to increase efficiency, although managerial time is

important, or effectiveness is the main goal of SPK.

Expert System (Expert System)

Knowledge-based SI that uses expert knowledge of specific and complex application fields where the system acts as a consultant to end users. Expert systems contain knowledge from one or more experts who provide answers to questions about a very specific problem area.

Benefits of Expert Systems:

Always available in an organization where experts are not necessarily always in place, always in place

Can store and remember knowledge that is very unlimited and relentless very tired

Faster and more consistent.

How the Expert System Works:

Knowledge in expert systems is represented by rules. Knowledge of rules that are linked forms tree diagrams. The rules governed by the inference engine inference engine are processed in two processed ways, namely:

The way forward reasoning/forward chaining forward chaining is where the rules are checked one by one in order starting from the front (forward forward) to ensure that the rules are in) correct conditions. How to backward reasoning/backward chaining backward chaining where the rules will be considered as a problem/hypothesis that the problem will be resolved. Inference engine engine will check the rules starting from the last rule that will produce results.

Expert System Components Expert Components:

1. User Interface. Interface

media used to relate to input (receiving data and consultation questions) and output (answering questions) with the wearer.

2. Inference Engine Inference Engine

Expert system software that evaluates software rules provided by the knowledge base in a specific order to provide answers to system user questions and user consultation.

3. Knowledge Base

Formed rules relating to one another. Knowledge stored in the knowledge base is taken from the knowledge of experts.

Strengths and Weaknesses of Expert Systems

Advantages:

Better decision making: answers given by expert systems are consistent and logical given logical

Provide the right solution. Give the right

Better customer service Better service

Store knowledge in the organization. Save the organization

Deficiency :

Can only handle knowledge that is consistent, unchanging

Can not handle things that are subjective and subjective judgment

Limited knowledge base format (only in the form of if-then ifstatement statements)

Expert systems are difficult and expensive to develop and maintain with good care

Expert System Development Expert Development

Preliminary studies Initial studies
Software selection Software selection
Expert selection. Expert selection
Retrieval of knowledge Retrieval of knowledge
Build an expert system Build an expert
System testing System testing
System implementation System implementation
Operating system Service operation

System maintenance

Artificial Neural Networks/Artificial Neural Networks

Artificial Neural Networks were first made in 1943 by neurophysiologist Warren McCulloch and logician Walter Pitts, but the technology available at the time did not allow them to go further. Artificial Neural Network is a paradigm of processing information that is inspired by the biological nerve cell system, just as the brain processes information. The basic element of the paradigm is the new structure of the information processing system. Artificial Neural Networks, like humans, learn from an example. Artificial Neural Networks are formed to solve a particular problem such as pattern recognition or classification because of the learning process. Artificial Neural Networks have developed rapidly in recent years.

Artificial Neural Networks have been developed before the existence of a conventional computer that is sophisticated and continues to grow despite having a vacuum for several years. Artificial Neural Networks come out of artificial intelligence research, especially experiments to simulate fault-tolerance and the ability to learn from the biological nervous system with low-level structural models of the brain. The brain consists of about (10,000,000,000) interconnected nerve cells. Nerve cells have branches of the input structure (dendrites), a cell nucleus and branching output structures (axons). The axons of a cell are connected to other dendrites through a synapse.

Executive Information System

Definition of E.I.S (Watson, 1993):

A computerized system that provides executives easy access to internal and external information that is relevant to the critical success factor.

Characteristics of E I S:

Made for individual executive users.

Extract, filter, shorten and trace "critical data"

Provides on-line access status.

Access and integrate internal and external data.

Are user friendly.

Used directly by executives without intermediaries.

The term Executive Support System (ESS) is used for systems that have more capabilities than EIS, namely:

Electronic communication facilities available, e.g. E-mail, computer conferencing, word processing.

Having the ability to analyze data, for example, spreadsheet, query language.

Has organizing tools, for example electronic calendaring.

5 Step Suggestions For Improving EIS:

1. Take an inventory of incoming Information Transactions

Executives do not always have a clear perception of information systems. For this, the executive is assisted by his secretary to log transaction information which is then entered into the database.

2. Stimulate High-value Sources

With the identification of high-value resources, the executive can take steps to make these resources more easily communicated.

3. Take Advantage of Opportunities

When high-value information appears, the executive must immediately handle it.

4. Tailor the System to the Individual

Each executive has its own unique way of obtaining information.

5. Take Advantage of Technology

Executives are generally open-minded about information systems and consider various ways to improve the ability of information systems.

Companies with Executive Information Systems

Computer-based EIS configurations generally include Personal Computer (PC). In large companies the PC is connected (networked) to the mainframe. PC executives function as executive workstations. Hardware configuration includes secondary storage in the form of a hard drive as a place to store database executives (containing information that has been processed from the company's mainframe).

Application of Management Concepts in E I S

Critical Success Factor (CSF)

With EIS it allows executives to monitor how well the company is doing in terms of objectives and critical success factors. In 1961, D. Ronald Daniel of Mc Kinsey & Company, one of the largest consulting firms in the United States, created the CSF concept. He feels that CSF determines the success or failure of all types of organizations. CSF varies from company to company.

IV. CONCLUSION

Knowledge-based information systems that use expert knowledge about specific and complex application fields where the system acts as a consultant for end users. Expert systems contain knowledge from one or more experts who provide answers to questions about a very specific problem area. JNA System (Artificial Neural Network)/Artificial Neural Networks.

Artificial Neural Network (ANN) is an artificial network that tries to mimic human neural networks. ANN has begun to be widely applied in business applications, although it is still in the development stage. ANN is widely used to predict company bankruptcy, predict when shares are sold or bought, and predict rankings and bonds, etc.

Decision Support System

Decision Support System (Decision Support System –DSSDSS)

DSS: computer-based information system that provides interactive information support for managers and business practitioners during the decision-making process (brien)

DSS: information system to help middle-level managers to make half-structured decision-making processes more effectively by using models for analytical models and available data.

Executive Information System

Definition of E.I.S (Watson, 1993):

A computerized system that provides executives easy access to internal and external information that is relevant to the critical success factor.

Office Automation System.

Office automation systems or sometimes called office information systems (office information systems or OIS) are:

The system provides facilities for daily information processing tasks in offices and business organizations. This system provides a variety of devices for processing information, such as spreadsheet processors, word processors, graphics processors, presentation applications, accessing personal database, electronic mail (e-mail), voice mail (voice mail), and teleconference.

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