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Artificial Intelligence with Mirror Exchange for Libraries

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Abstract

Advances in information technology must be balanced with the progress of the times. The development of information technology is currently very rapid, the various sources of information currently circulating are not necessarily accurate in their information content. Currently, there are various innovations and creativity in information technology that bring benefits to humanity in general, whether felt directly or indirectly, the world of information today seems to be inseparable from technology. The use of technology by society makes the world of technology increasingly sophisticated. One of them is in the field of communication technology, such as smartphones and the internet, making people increasingly improve their way of communicating. Various kinds of media for communication also exist to make it easier for humans to interact. As time goes by, internet technology has become a necessity for society, one of which is smartphones, all of which are based on Android. Libraries are a source of accurate and reliable information that the public can use directly to make the nation and state smarter. Various kinds of innovations have been created in this world to make everyday life easier. Libraries exist as sources of information whose accuracy is guaranteed and reliable. responsible for collections both printed and recorded, the current trend of libraries when viewed from the collection format has undergone a significant change, namely from conventional libraries to Hydrid, Digital and Bookless libraries, Hydrid Libraries have printed and recorded as well as online collections, while digital libraries provide access to users. remote and easily accessible, bookless libraries are more about providing facilities such as laptops, desktops with applications and providing e-readers to users. In this modern era, innovation and creativity are needed to provide solutions to every existing problem and become a breakthrough in accelerating the implementation of activities in every library management throughout the world. One of the innovations carried out is by using a smartphone or what we usually know as a smartphone, where the smartphone functions as a reader of all kinds of objects written on paper or other media, by mirroring/pasting the smartphone monitor screen onto books and so on. . and then went on about all sorts of things. The information that has been read will be transferred via a special system application that is connected to the smartphone screen. The working principle is like a lens on a camera, namely by strengthening autofocus on every written object that is reflected on the smart screen. tphone, so that all existing information will be transferred in full to the application that has been prepared. The implementation of this innovation needs to be supported by a special application that is capable of receiving input, processing and output from the smartphone monitor screen to a MARC-based information data processing application so that all kinds of metadata in every information exchange remains intact. exchange of information, the use of artificial intelligence with this exchange mirror will be useful in carrying out library management, starting from recording, processing library materials, storing library materials, servicing library materials, preserving library materials and retrieving library material information in addition to library management. This innovation can also be used in carrying out all kinds of archiving of every important document. and others. This innovation is expected to create new methods in library management in every line of existing activities, apart from being an effective and efficient step in accelerating library management, it also saves costs and library personnel.

Keywords: artificial intelligence, libraries, system applications

INTRODUCTION

The increasingly rapid development of technology is changing all forms of social life. New discoveries born from technological developments create an increasingly rapid growth bomb. The flow of information as a result of technology is unstoppable in its flow and impact. Without limits of distance, space and time, the influence of information is very dangerous for society if it is not anticipated and selected. Libraries as documentation and information centers are closely related to the task of managing information sources needed by society. Library expected able to make it easy for people to explore information and able to change a nation through its role in producing a knowledgeable society.

Libraries are in the midst of the world community, emerged because of community needs and are maintained and developed by the world community. So, it is appropriate for libraries to provide services to the world community, especially the user community. Over the centuries the library extension was maintained despite many obstacles. The existence of libraries in society is maintained because libraries have functions related to the interests of society. According to Sulistyo

Basuki (1993) the function of libraries in world society is as follows:

a. As a means of storing human works
   The library functions as a place to store human works, especially printed works such as books, magazines and the like as well as recorded works such as cassettes, vinyl records and the like. The library functions as a "public archive" for community products in the form of books in the broadest sense. In relation to the storage function, the library is tasked with storing the nation's cultural treasures.
b. Information function.
   Members of the public who need information can request it or ask the library. The information requested can be in the form of information regarding daily tasks, lessons or other information. With the available collections, the library must try to answer every question asked to the library.
c. Recreational function
   The public can enjoy cultural recreation by reading and this reading is provided by the library. In carrying out this recreational function, the library collaborates with various components such as authors who write books, publishers who publish books, paper producers, bookstores, elements of readers who come from all parties and itself also manages the library. Reading activities as part of a recreational function are also associated with literacy levels.
d. Educational function
   Library is a non-formal and informal educational facility, meaning that the library is a place for learning outside of school and also a place for learning within the school educational environment.
e. Cultural function
   The library is a place to educate and develop people's cultural appreciation. This education can be done by organizing exhibitions, lectures, art shows, playback films even tell stories for children. In this way, students get to know their culture. Here culture means all human creations, often this cultural function is misused as a means of propaganda.

The internet explosion did not stop with the emergence of the digital world, but is growing rapidly, with extensive connectivity starting from the internet of things (IoT) then expanding into various areas of human life, each of which is still very intensively internally linked. The world of the internet is developing in many directions, including:

- Bio internet of nano-things (BIoNT)
- Medical internet things (MIoT)
- Customer internet of things (CIoT)
- Industrial internet of things (IIoT)
- Human internet of things (HIoT)
- Identity of things (IDoT)

Artificial intelligence is a branch of computer science that has the capability, including smart machines, to solve complex problems in a more precise way and is still directed by human needs. Artificial intelligence is also a part of computer science that makes computer machines able to do things. work like and as good as that done by humans. There are many definitions of AI according to the development of AI technology, the initial definition according to the creator (innovation) of AI technology, John McCarthy in 1956, was AI as "The science and engineering of making intelligent machines, especially intelligent computer programs". In other words, AI makes computer programs smarter, whereas according to the Merriam-Webster dictionary, AI is "a branch of computers the simulation of intelligent behavior in computers," that AI is a machine that has the capability to see, hear, taste, smell. , touch, talk, walk and even fly and learn continuously. Or in essence, AI has intelligent behavior or intelligence that imitates human capabilities.

a. Artificial intelligence work process
   To understand artificial intelligence which has developed to date in various capabilities, it is important to understand the fundamental factors of artificial intelligence related to its work process, to make it easier to understand, it can

be compared with computers, which we know every day, both are actually the same, that artificial intelligence and computers have hardware and software. But the difference between artificial intelligence and computers is that computers only process as much data as necessary, while artificial intelligence has a process of carrying out tasks similar to human behavior. Besides that, from a hardware perspective, artificial intelligence is the same as a computer like a robot, it is physical but different in terms of software. AI works like humans. Apart from that, regarding AI, humans also continue to control the hardware of artificial intelligence to carry out various related tasks, while the computer hardware carries out assignments at each command.

Furthermore, between artificial intelligence and computers there are fundamental differences in terms of software technology, namely in terms of software technology, where software from artificial intelligence follows human thought processes, while computers still completely follow standard algorithms in mathematical processes (Donk et al., 2020) . From the AI software work process there is a structural functional process (that is, the sequence of what must be done, not how to do it), along with a hierarchical process (following the steps of conceptualization, framing and sequential implementation). From the perspective of the hierarchical process, the thinking process has 3 layers: First is the manifestation of language related to conceptualization; second, content or content that has been given the scope of the language; The third meaning is in the form of awareness to act to achieve goals. The first two layers are "inward" or internal processes such as in the human mind. Meanwhile, the third layer of software that forms the human thought process is the element of meaning which is an external function or communication with other parties. These three layers, namely language, content and meaning, constitute intelligence or intelligence like humans.

The object-oriented (OO) approach to the world of programming began with the presence of object-oriented programming languages such as Again and Smalltalk Fada Simula began to use the term Object (Bahrami, 1999), Coad and Yourdon (1991) states that the OO concept refers to how humans learn about existing objects surrounding as humans grow, they recognize objects around them and their attributes, parts of an object, classes and members of a class. The Smalltalk language was developed originally for children to learn and use.

Objects represent something around us. Objects have data (e.g. title, author's name, publisher's name, etc.) and processes or actions (e.g. increase, decrease, etc.). We will only model objects that are relevant to the application or system being developed. Each Object stands alone so changes to objects Certain objects will not affect other objects. Applications or software are collection objects who interact with each other by exchanging messages. This message will trigger a process in an Object. Collection of objects in a system grouped in a hierarchy called classes. Objects and each object can have special attributes that are different from other objects in the same class.

The distinctive characteristics of OO are inheritance, encapsulation, and polymorphism. Inheritance intended as the inheritance of Object attributes in a class whose hierarchical position is higher to another Object whose position is lower in the hierarchy.

1. Information Systems Development Design

System design is a phase where design expertise is required for the

computer elements that will use the system, namely selecting equipment and computer programs for the new system (Kristanto, 2008: 61). System design is a stage in the system development model where the system will be created in a detailed diagram model using tools. This system design is carried out after the general system analysis and design is made, namely the current system analysis design and the proposed system analysis design. . In order to get a clear picture of what is being done in the analysis of the proposed system, then continue by thinking about how to form the system in detail.

System Design Objectives To meet the needs of system usage (users). To provide a clear picture and produce a complete building design on computer programming and other technical experts involved in developing or creating information systems in accordance with the methods and models of development approaches used in system development.

In developing a system, a programmer needs a system design that has been created by a System Analysis and Design person as a reference or concept and documentation framework for the system components that are given to the programmer to write into code or translate into a particular programming language.

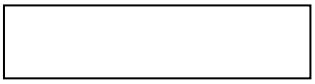
The advantage of having a system design is that if one day the system will be recycled or redeveloped based on the needs and requirements of the user, then an analysis and design person does not need to design or plan the system from scratch, just by looking at the concept in the old design and re-identifying the design. The system is in accordance with user needs and the system is re-engineered beforehand given to a programmer.

Model driven approach to system analysis design, there are several driven models that are used as references in analysis and design, including the structured approach, information engineering and data modeling as well as the object-oriented approach, each approach has diagram tools that will be used in compiling the system design in The structured approach is used with DFD, ERD, Layout Design, and database design tools. In information engineering, the tools used are almost the same as structured, only in information engineering it starts with ERD notation and relationship diagrams, then maps the process with DFD. Meanwhile, in the orientation approach objects using UML tools begin with designing Use Case Diagrams, Activity Diagrams, Sequence Diagrams, Class Diagrams and other UML Diagrams. system design, namely using a structured approach with DFD, ERD and tools approach object-based using UML tools.

There are several DFD symbols used, namely:

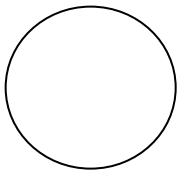
a. External Entities

Is the origin or purpose of the data outside the system.



Symbol 1.1 External Entity

b. Process
That is, it is used to transform or process data in general.



Symbol 1.2 Process

c. Data Flow
Is describing a flow of data from one process to another process
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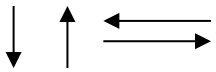
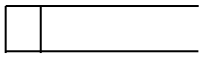


Symbol 1.3 Data Flow

d. Data Storage (Data Store)
Is a place to store data in an existing file.



Symbol 1.3 Data Storage (Data Store)

The Information System Development Model is a stage of various methods created as an alternative in compiling an information system to make it easier for developers as a reference that will be used in the process of developing a new system with the aim of improving the old system.

In developing an information system, there is a model that will be used by a system developer or system analyst. The Information System development model is a reference guide used in system development, therefore as a developer or system analyst or programmer you need to understand the methodology, approach and tool models or techniques used in developing information systems, such as conventional models with the SDLC (System Development Life) method. Cycle), this method is very popular and widely used among analysts and programmers. The following are the stages:

a) Analysis and definition of needs. Services, Constraints, and system objectives are defined through consultation with users or users.
b) System and software design. The system design process divides the requirements into a hardware or software system. This activity determines the system architecture in general and as a whole. Design involves identifying and describing fundamental software system abstractions and including them in language programming.
c) Implementation and unit testing. At this stage, planning software is realized with programs or program units. This testing involves verifying that each unit meets its specifications.
d) System integration and testing. Program units or individual programs are integrated and tested as a complete system to ensure that system requirements are met.
e) Operation and maintenance, namely operating the program in its environment and carrying out maintenance. This is usually a long-life cycle phase. Maintenance includes correction of various errors that were not found in previous stages, carrying out improvements in implementation system units and system services

development, and new requirements are added.

System design generally lies in the entire system itself, namely in the collection of component elements Work together to carry out a task on computerization and systems that are used in various contexts, therefore the basic concept of information systems here describes not only activities and work, but also an achievement that desired namely on the vision, mission and goals of the running system and expected in the existing system it would be more useful to run the previous system so that all achievements can be carried out as should be as follows:

- Determining the system name
  Information systems are relative, relatively situational, relative to the time of decision taken also relative to the decision maker and even to the background of the decision maker. In determining the name of the information system that will be built, several criteria are needed in designing the information so that it is representative of future information.
- Setting the detailed steps of the system

In carrying out detailed steps, supporting elements are needed, including:

a. Smart phone (smartphone)
   An Android-based smartphone is a platform for mobile devices based on Linux includes the operating system, middleware, and key applications. Application development on platform Android uses the Java programming language. Some of Android's core applications include e-mail client, SMS, calendar, maps, browser, contacts, etc. Android is a platform for mobile devices which are modified kernel Linux version 2.6, which is used for core system services such as security, memory management, process management, network stack, and driver model. Kemel also acts as a layer abstract between the hardware and the entire software stack. Currently, Android has reached version 4.1 with the codename Ice Cream Sandwich. Previous versions between others are version 3.0 (Honycomb), version 2.3 (Gingerbread), version 2.2 (Froyo), version 2.0 (Eclair), version 1.6 (Donut), version 1.5 (Cupcake), and version 1.1.
b. Native Application
   A native app is an application created specifically for a particular operating system in making the operating system providing special tools and APIs for developers to create applications such as ADT (Android development tools) for Eclipse, Android SDK tools and Android emulator. These tools are provided free of charge by Android Inc which has been acquired by Google, the advantage of native apps is being able to access all the features owned by system related operations such as GPS, alarm and camera.
c. Web Application
   Web-based applications are usually created using HTML5, JavaScript and CSS, the advantage of this type of application is that it can be run on various operating systems (iOS, Android, etc.) and can even be opened using a browser on a PC/laptop. One of the advantages of a web application is:
   - Using standard technology
   - Can be run on different platforms such as (iOS, Android, windows phone, blackberry)
   - No need to compile, change the code and reload in the browser

(development lifecycle will be faster)
- The application publication and dissemination process is faster

d. Programming language

Programming language (syntax) is a combination of numbers, symbols and words that have rules in the programming language code to make it more structured. so that I can achieve a goal.

2. Implementation in information systems

System Implementation is a stage in the System development method where the system will be coded or created into a certain programming language so that later it can be applied to hardware and software according to the needs that have been determined in the previous needs analysis.

In system implementation, it is necessary to know that before the system is implemented, it is necessary to prepare the basic requirements for supporting software and supporting hardware which have been previously analyzed, adjusted to the functional and non-functional needs of the user and the system requirements. In implementing the system, the system that is run on hardware and software will take samples or examples from the images of the display stages. The system images will be captured from the beginning of the stage to the end of the menu stage as documentation material for the system. It has been implemented on the selected device.

The rational agent becomes the central point for the AI approach. The concept of rationality can be applied to a wide variety of agents operating in any imaginable environment. In this case, a system that can reason is called intelligent.

Rational Agent

A rational agent is an agent who does something correctly. Conceptually, it can be said that every input in the agent function table has been filled in correctly.

Performance Measurement (Performance)

When an agent is placed in an environment, it will evoke a series of actions based on the received perception. This network of actions will cause the environment to be in a network of states. If the network conditions are as expected then the agent is said to be working well.

The series of environmental conditions is evaluated using performance measurements. In general, it is said:

It is better to design performance measurements based on what is expected to happen in the environment, rather than thinking about what an agent should do

Rationale at any given time depends on the following things

- Performance measurements that define success criteria.
- Knowledge about the environment that an agent must have.
- Actions that can be performed by an agent.
- A series of perceptions from an agent.

Definition of Rational Agent

For every possible series of perceptions, a rational agent must be able to have an action that is expected to maximize its performance measurement based on the facts provided by the series of perceptions and knowledge possessed by the agent.

This section conveys the message that there are many methods or ways to develop a system, depending on the brand that wants to carry out work development or organizational development. The system can be developed by each person according to their wishes. According to Squire Enid, information system development methods need to be used as guidelines

for how and what should be done during development. The system development methodology is structured with two approaches, namely:

a) Classic Approach
This approach refers to system development that follows the stages in the system life cycle without being equipped with adequate tools and techniques.

b) Structured Approach
This approach refers to system development equipped with several tools and techniques to make it work.

c) Input Approach
This approach uses a total input absorption method to be able to move the work to be assessed. Input determines the quality of the product or service that will be produced. If the input is neglected then what will result is bad results and the product will fail.

d) Approach Process
When you reach the process stage, all input is complete and ready to be processed. A system process drives all lines of activity from preliminary work to core work phallus to the closing job.

e) Output Approach
The output approach uses the system to determine how to use each output produced. How to use (purpose trick).

The method of using a system is a method used to move every job to produce every desire that can provide meaning for an organization, company, group or individual who runs it. The system method was pioneered by attributes that form units of objects or items that are believed to have useful value, such as vehicles. Companies and work organizations. Decades of system development have formulated various systems to be able to complete the work desired by each individual, group or work organization. We all have system methods that make us productive and counterproductive people. The system will be discussed in its various uses further such as management, accounting information systems, and informatics techniques. Errors in implementing the system always appear in the results or actions that occur in the implementation of the work. The problem arises that "why can't the system work well and who causes the system to go wrong in its implementation?"

The people responsible for the system are the workers and the machines they use to work. The system cannot work well due to reasons that work planning is not complex, work is not structured and other things like that. "Where the system is" the answer to this question is that the system is in the work. When a job is carried out, a system will appear that leads workers to carry out work in an orderly manner and is directed towards organizational goals. The integrated system development method is the implementation of work, so the system is part of the means of driving work within the organization. Who and how the system is developed, the answer lies with the workers.

Microdata research adds that in a job the system is closely attached to the introductory, core and final parts of the work. On the same occasion, the system will generate ideas or ideas to encourage the creation of new styles and ways of working. The system development methods used in carrying out the work include open methods, closed methods and mixed methods. These three system development methods are used variously by each user according to their needs.

a. Closed method, in this method the system is closed, meaning there is no further development system This method is used for work on a small scale such as work in savings and

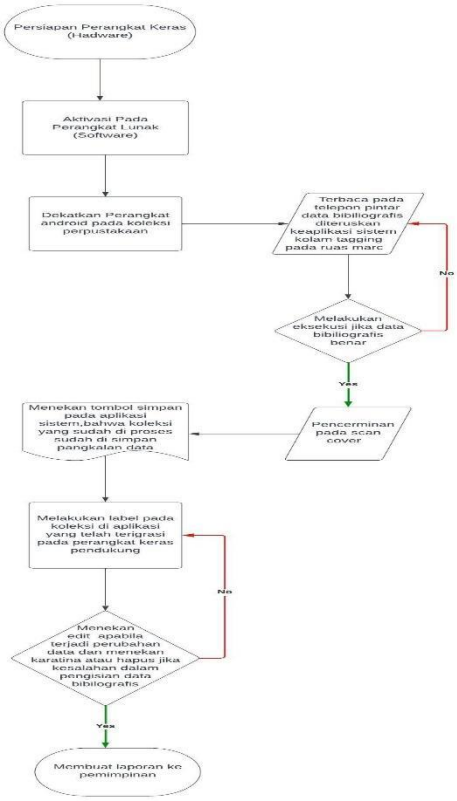
loan units In The system carries out savings and loan management activities as its main activity and is closed.

b. Open method, in this method the system is open in financial management in cooperatives or banks where there are several systems that will be used together to provide financial services.
c. Mixed method, in this method the system is used to structure the company's organization in building a complex system within the company so that all work units take place in a controlled system.

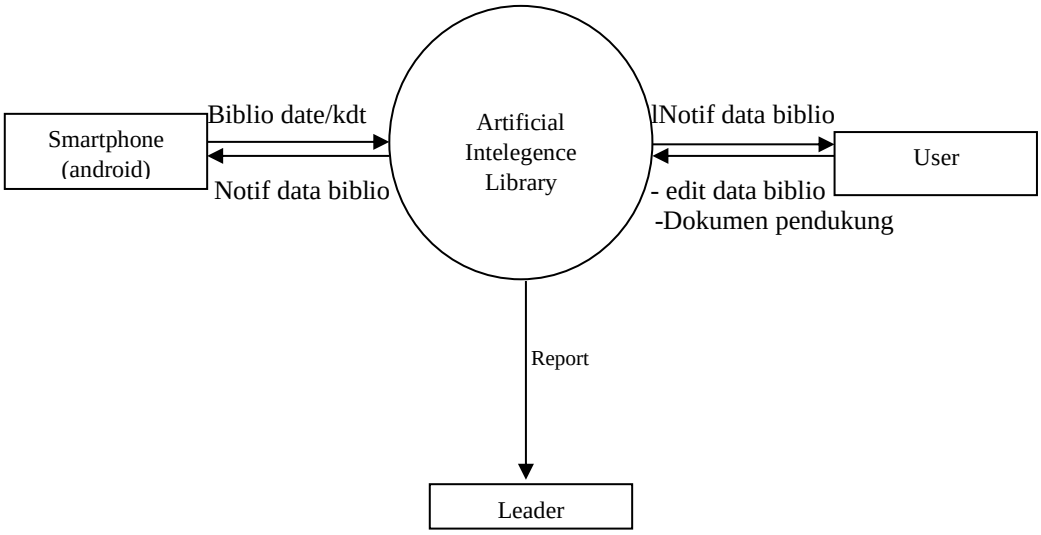
Thus, it is found that the system development method is aimed at improving the quality of work and the smooth running of organizational activities in order to achieve the expected goals.

The technical flow of implementing the integration of artificial intelligence with library management system applications:

1. Hardware preparation (hardware)
   In preparing the main device for data entry is required including Android-based smartphones, personal computers (PCs) and supporting devices such as scanners and printers for uploading and labeling collections.
2. Activation of software (software)
   Things will be prepared on the software by opening and installing system applications on smartphones, personal computers, scanners and printers by integrating all software into each system that is interconnected with the others.
3. We will bring the Android device in the smartphone closer/mirrored via the screen/camera telephone smart in library collections in the published catalog section (KDT) or title page which contains bibliographic data from a collection.
4. After reading the data information on the smartphone bibliography will be continued to the application system by placing into tagging columns in previously programmed marc fields.
5. Perform execution if bibliographic data is already available Correct, when the data bibliography If there are still errors, it is necessary to correct or edit the data until the bibliographic data from a collection is correct.
6. Mirror the smartphone screen or scan the cover of the next collection continued to system applications that have been programmed on the PC.
7. Pressing the save button on the system application indicates that the collection is complete processed ready to be saved in the database.
8. Perform labels on collections in existing system applications integrated on device strong supporter.
9. Press edits if data changes occur and press quarantine or delete if there is an error in filling in the bibliographic data.
10. Make reports to leadership.



Picture. 1.1. Library management system flow



CONCLUSION

In library management innovation is needed in accelerating recording, processing, storage, service and preservation of library materials, with innovation in the field Artificial intelligence can help in solving all kinds of library management problems so that it will make it easier to enter data in the application system.

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