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Development "Sincatensa", a Plant Sensing System Application in Land Dry Areas Using Qr-Code

Risna Nona*
Accounting Information System, Agricultural Polytechnic of Samarinda, Samarinda, 75131, Indonesia
risna.nona04@gmail.com
**Corresponding Author*

Fajar Ramadhani*
Accounting Information System, Agricultural Polytechnic of Samarinda, Samarinda, 75131, Indonesia
fajar.ramadhani@politanisamarinda.ac.id

Reza Andrea
Software Engineering Technology, Agricultural Polytechnic of Samarinda, Samarinda, 75131, Indonesia
reza@politanisamarinda.ac.id

***Abstract*—**Recognition or identification is important to make it easier for us to recognize a type of plant or plant community. Each type has characteristics that have adapted to its habitat. Plants that exist in dry land areas including those around the University of Timor campus, it is necessary to identify or carry out scanning to identify names, characteristics and benefits and status in nature. Scanning is often done manually so that it is sometimes less effective and efficient familiar to the lay public. The aim of this research is to integrate scanning methods with optimizing ICT media such as using the "Sincatanesa" (Plant Scanning System) application with QR Code. The method used is a combination between observation methods and identifying specific tree growth forms and input into the "Sincatanesa" application which has been designed by researcher. Taxonomic data ranging from kingdom to species, habitus, benefits and IUCN status of each existing tree. Then make it QR Code attached to each tree. There were 18 types of trees identified and a QR Code was created for identification in the "Sincatanesa" application. The data stored is internet based so there will be a lot of data that can be stored, can be edited easily It's easy and just scan the barcode to identify the tree. Hopefully this application is known and used by all academic community at the University of Timor and the wider community. Furthermore, the "Sincatanesa" application can be developed based on smartphone so that it becomes more flexible and easier to use.

***Keywords*—** Information Systems, QR-Code, Plants, Land Areas, Scanning System.

I. INTRODUCTION

Capturing or describing plant types is something that will help us to be able to recognize plants taxonomically (Aji & Supriyono, 2019; Anastasia & Istiadi, 2010; Andita et al., 2016; Izza et al., 2019; Khaira et al., 2020). Apart from that, we can develop it to be able to recognize the uses and/or benefits of the vegetation (Barbour et al., 1980; Mawaddah et al., 2018; Supriatna & Nafisa, 2020; Wardana et al., 2020). This is usually done with the help of a key book on plant determination (Anami, 2019) and also expert knowledge (Sulawesi et al., 2020). The fact is that this sometimes takes quite a long time to be able to perceive or recognize plants and even their benefits and uses. For this, we can carry out scanning using a digital system. The digital system in question is to apply it to a plant information system website.

In this information system all data about plants can be stored based on plant taxonomy starting from Phylum to species names. Apart from that, the benefits and uses of each plant can also be added. In this research, a tree information system website based on QR Code was built. QR Code was first developed in Japan in 1994. QR Code is a printed 2-dimensional image code so that it can store the required amount of information (Soon, 2008). To read information from a tree, users simply scan the QR Code using the scanner application on their smartphone (Shen et al., 2023). The tree vegetation around the State Agricultural Polytechnic of Samarinda (Politani Samarinda), consists of several types. Some have been recognized and some have not, therefore scanning needs to be done. However, the scanning will be carried out using a website application which will be built using a QR Code.

II. METHODOLOGY

A. Waterfall Development Cycle

This research was carried out in the Politani Samarinda area especially in locations that have tree vegetation. Time that used in this research is July to October 2023. Type The research used is quantitative and descriptive research qualitative. Quantitative to obtain tree type data while data qualitative to describe the taxonomy, benefits, IUCN status of vegetation tree. This data is recorded in the "Sincatanesa" Application so that users You will immediately get informationjust by scanning the Qr-Code. The design and development of this system uses the Waterfall Method (Ajam, 2018; Balaji & Murugaiyan, 2012).

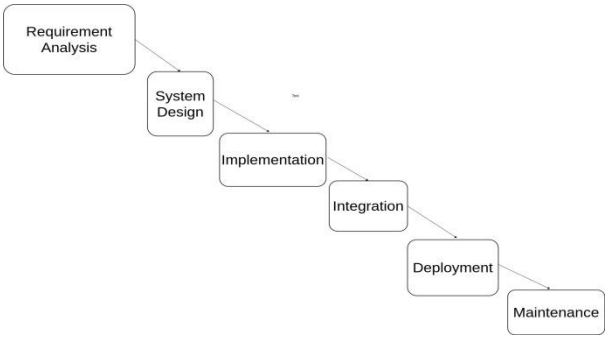


Figure 1. Waterfall Development Cycle

This research data is in the form of quantitative data in the form of tree vegetation data taken from tree data in the Timor University area. The data was sampled directly at the location by observation and recorded in a data book. This research combines observation and documentation methods to obtain data. Observation activities aim to obtain tree vegetation data. This research was carried out in two stages, namely collecting data for identification and entering datainto the "Sincatanesa" website.

III. Result and Discussion

A. *Diversity of Tree Vegetation in the Politani Samarinda Area*

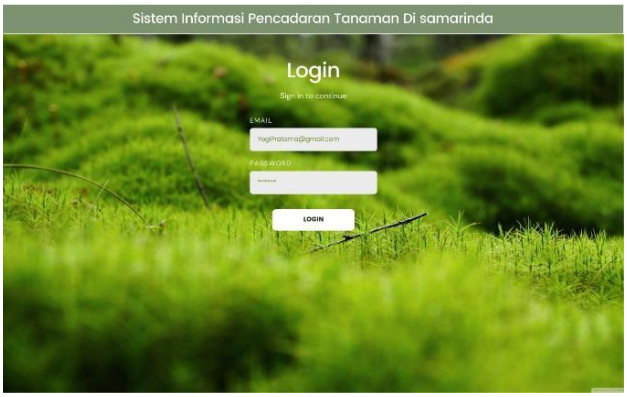
Vegetation is a collection of plants that live and/or have a habitat in an area and respond to abiotic and biotic factors. The term in biology related to areas is ecosystem. In an ecosystem there are biotic and abiotic components. Biotic components include animals, plants and microbes. Abiotic components include air, light, soil, water, rocks. These two components interact with each other directly and indirectly. The interaction between these two components will influence each other and can support growth or conversely kill other components, for example tree growth. Trees are one of the growth forms in recognizing or identifying plant characters. Tree vegetation is a plant that has distinguishing characteristics, including woody plants with a trunk circumference greater than 62.8 cm. This characteristic differentiates it from pole, sapling, bush or other growth form groups. As said earlier, abiotic components influence biotic components, so trees are of course influenced by soil conditions, water, light, humidity and others. Abiotic components in the ecosystem or University of Timor area influence the types and number of trees present. The number of trees or species in the Timor University area is 18 species. These various species have roles that are generally known and also have special benefits according to the conditions of the North Central Timor district as the location for the founding of the University of Timor. The various species are as shown in.

Table 1. Tree List

No.	Latin	Name	Benefit	IUCN Status
1	*Samanea saman Merr*	Trembesi	Windbreak, Prevent erosion	Least Concern
2	*Acacia auriculiformis Cumn ex Benth*	Acacia	Mebel Konstruksi Bangunan	Least Concern
3	*Gmelia arborea Roxb*	White Teak	Building materials, animal feed	Least Concern

B. *Diversity of Tree Vegetation in the Politani Samarinda Area*

The "Sincatanesa" Application will store various data required by developers and will be stored in a server or server-based database. The data will be stored on a website basis so that it will make it easier to store, search and edit it(Anami, 2019; Firmansyah & Pratama, 2018; Hasan & Ismaeel, 2020; Idjudin & Marwanto, 1907; Nugraha et al., 2017; Seran & Blegur, 2022). The stored data can be projected in the form of a code or barcode or QR Code. A QR Code can store information up to 2089 digits or 4289 characters, including punctuation or special characters in it (Irawan et al., 2021). With this advantage, the QR Code is able to display various texts, up to opening the URL (Uniform Resource Locator) of a website (Rosa et al., 2020). This data and information can be called up or displayed when the user uses the "Sincatanesa" application. The following is a displayof the interface (face to face) of the Plant Information System ("Sincatanesa") application.

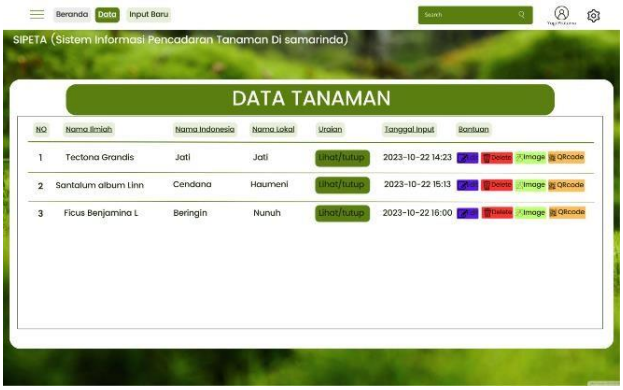


Picture 2. Form Login

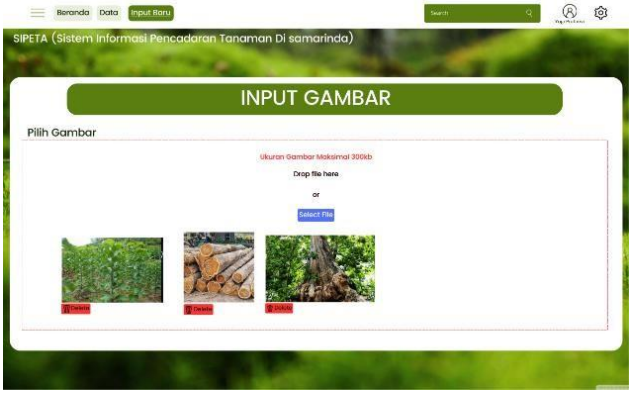
This form appears when you first enter the "Sincatanesa" application. Registered users can fill in their username and password so they can enter the application.

Picture 3. Home From

This form appears after the user successfully enters the "Sincatanesa" application.



Picture 4. Display From Input Data



Picture 5. Display From Input Picture

Figure 4 show data form to display plant (tree) vegetation information. Apart from that, this form provides access to add images of trees and QR Code information from plants (trees). Figure 5 show form used to add a tree image.

Picture 6. Example of a QR Code from one type of plant

Picture 7. Input Data Form

The QR Code shows in Figure 6 above is an example of an existing plant is in the "Sincatanesa" application. To get enough user information Scan the QR Code with the QR Code reader application is on the smartphone. Figure 7 shows a form used to add new plant data to the file

Picture 8. Implementation of form setting

Picture 9. Tree Information on Smartphone

Figure 8 shows form used to add user data (Admin &User) into the "Sincatanesa" application. As for exiting this application The user just clicks the Logout button next to the form arrangement. Next, Figure 9 is a tree information display on user's smartphone after being scanned using a QR Code.

C. Diversity of Tree Vegetation in the Politani Samarinda Area

By using this application, you can store vegetation information Plants (trees) can be stored properly because the data is stored on a server on the internet. This data will be stored for a period of time which is old and not easily disturbed or damaged by age. the data can be changed such as adding new information or updates as well makes it easier to edit information or tree data. More tree data is stored compared to methods conventional, namely recording on paper/books. SIPETA admin directly connect to the internet and can immediately change the data anywhere anytime and anywhere. The amount of data stored is unlimited. To get user tree information, just scan barcodes that have been provided with the existing barcode reader application in on the smartphone. The data submitted is sufficient to help the user know tree vegetation information such as taxonomy, benefits and status IUCN. This will make it easier for users to learn and add knowledge quickly.

IV. CONCLUTION

The "Sincatanesa" application has been successfully built and can be used for stores information on tree vegetation characteristics. Tree data reading with the QR Code application using a smartphone successfully. Data information A tree of scan results is displayed on the user's smartphone screen including the name species, benefits and IUCN status as well as images to increase knowledge the users. The "Sincatanesa" application needs to be developed further using Android platform so that data filling can be done using smartphones. This application can be developed further to identify tree vegetation in a larger area such as in a national park or a tree identification in North Central Timor Regency.

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