

PLANTS IN A SQUARE: EXPLORE PLANTS DESCRIPTION WITH *QR CODE* FEATURE

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ABSTRACT: Indonesia especially South Sulawesi contained the diversity of plant species. The number of species that exist it is necessary to identify each type. To facilitate the identification process, conducted the research of exploration of plant's description by *QR Code* feature. *QR Code* or quick response code, which is a type of two-dimensional bar code contains information that facilitates generating and reading (encoding and decoding) of information on a smartphone. The purpose of this research to facilitate describing of the plant with the *QR Code* features. This research located in Tope Jawa Coast, Takalar, South Sulawesi, with a descriptive study using survey and identification methods. The results of the study revealed 25 species of plants that have been identified and loaded into a *QR Code* that can be scanned by smartphone.

Key words: Exploration, descriptions of plants, *QR Code*

INTRODUCTION

Indonesia became the world's leading in terms of global biodiversity. One of the species diversity in Indonesia is regarded as a center of plant diversity, economic plant of the world. Some plants from Indonesia, such as bananas and coconuts have spread throughout the world. The types of timber being traded, also tropical fruits (durian, duku, bark, rambutan, bananas and so on), orchids, bamboo, rattan and others mostly from Indonesia. Therefore, Indonesia is known as one of the countries with greatest biodiversity in the world (megadiversity) and is the center of the world's biodiversity (megacenter of biodiversity) (Mac Kinnon, 1992). Indonesia, particularly in South Sulawesi, there are a variety of plants with colors, shapes, and sizes vary. Many species are grouped based on the differences and similarities of characteristics in plants. So that conducted the classification process (grouping). Classification is the process of grouping plants by the similarities and differences in the characteristics possessed. Characteristics is the basis classification is different depending on the objectives to be achieved. Characteristics that can be used as the basic criteria for the classification of plants is the morphological features. Through the morphological features of a species can be distinguished one with the other species more easily and objectively (Cronquist, 1981). To further reinforce the limitations taxon of a species, then do the identification.

Identification, is a basic activity, to determine whether a species identified is identical to the species that have been classified and have been named before. Rideng (1989) explained that the identification is to determine the similarities and differences of the two elements (plants), whether these two elements together or not.

In general, the identification is done using identification keys. Identification key prepared using morphological characteristics contrary, separating the names of plants in the key into smaller groups. The statement in the key based on the traits of plant taxonomy. For example, the key will be split taxa by using the following options: (a) woody \times herb; when herbaceous, woody plants are not selected; (B) further option in flower, zigomorf \times aktinomorf; if zigomorf, plants with flowers aktinomorf not selected; etc. If the number of taxon contradicted it quite a lot, so from a number of possibilities exist, only going to stay one possibility only (Rideng, 1989).

Based on the explanation above, so that the process of identifying the plant species more effectively, required practical storage devices contain the same information is available in the identification key that will relieve reading and writing (encoding and decoding) a description of the plant information. One effective tool is so-called *QR Code* (quick response code). *QR Code* which is a type of matrix codes or two-dimensional bar code, introduced by the Japanese company Denso Wave in 1994, is one of the social networking service on the smartphone in the form of a complex storage appliance (Denso, 2008).

Characteristics of the QR Code that can accommodate large amounts of data. Theoretically many as 7089 characters maximum numerical data can be stored on it, the high density (100 times higher than linear symbols code) and code readability quickly. QR Code also has other advantages both in terms of performance and functionality. This barcode type originally used to track inventory in the manufacturing part of vehicles and is now used in various industries of trade and services. Basically that the QR Code was developed as a code that allows its contents to be decoded at great speed (Rouillard, 2008 in Ariadi, 2011).

QR Code is capable of 360 degree (omni-directional), high speed reading. QR Code accomplishes this task through position detection patterns located at the three corners of the symbol. These position detection patterns guarantee stable high-speed reading, circumventing the negative effects of background (Denso Wave, 2008).

According to Ariadi (2011), the function of the parts of the structure QR Code is:

- a. Pattern detection position serves to identify the location of the QR Code
- b. Data area serves to store the encoded data
- c. The module serves to identify the coordinates of the center of the QR Code, modular black and white

QR Code that has finished can be decoded by scanning a barcode with a mobile device equipped with a camera and a reader or scanner such as software that is QR Code reader or QR Code scanner (app QR Code) that must first be installed on the mobile device / smartphone.

Based on the explanation above, it is necessary to doing the explore of the plant description by using the QR Code in facilitating the process. The three main types of content associated with the use of QR Code can be viewed on mobile devices. The first type provides additional text information. This is one content QR Code that can contain text format, for example, the description of the species that have been identified. The second type is a link (URL), where we can scan the address / website as a QR Code barcodes. The third type

provides additional Geo location information, for example, scan a plant sites have been identified in the QR Code and can be directly connected to Google Maps, can also be given in the format of GPS coordinates (Lee, 2011).

METHOD

This research is descriptive research that aims to ease description of the plant by using the QR Code. This research is located in the area around Tope Jawa beach, Takalar, South Sulawesi. This research use survey and identification method, where survey was done by determining the location of sampling first, then make three transects where each transect point is determined based on the diversity of species at that point. Each transect consists of 5 plots each plot measuring 20x20m, and the distance of each plot 10m.

Identification phase the species, carried out on each species of higher plants species found on plots that have been created using systematic random sampling technique, the technique of sampling by choosing species that already represent similar species in a transect. After that, do encode (encode QR Code) of each species using QR Code Generator application on a PC computer. The final step is to print a bar code that has been encoded QR Code had to be used immediately. QR Code that has so can be translated by scanning a barcode with a mobile device equipped with a camera and a reader or scanner in of QR Code reader software that must first be installed on the mobile device / smartphone.

Carefully observe a specimen to be identified is a good habit that needs to be developed. Beginners should choose plants that are still fresh, complete with roots, stems, leaves, fruits and seeds. Specimens with all parts of the above will help in the identification. For practical purposes, try to select plants that flower relatively large, so that the parts are easily observed. In order for the observation to the parts of plants can be done well, required tools such as a hand lens, needles, razor blades, etc. (Rideng, 1989).

RESULTS AND DISCUSSION

According Rideng (1989), there are several steps in the observations of plants that will identified, as follows.

1. Determine whether classified as herbaceous or woody plants, when classified as herbs are classified as seasonal or perennial
2. Viewing the names of the parts of the flower
3. Calculate the number of Calix and sepals
4. Observe whether the leaf sheath and the corolla are separate or unite
5. Calculate the number of stamens, observe where they are attached. Note whether stalk pollen and anthers separate or unite
6. Count the number of pistils, stalk pistil and stigma

7. Remove the flowers and stamens. Use a razor blade to make a cross-sectional view of the future. Calculate the amount of room in it, observe seed
8. Checking the type, position and leaves pertulangan
9. Viewing distribution.

Based on research that has been done, generated 25 plant species have been identified (description and classification) contained in transects 1-3 with the steps as mentioned above, The few species that do not have the completeness of the description as the number of stamens, pistils and others because the species found are not currently in the flowering conditions and so on. Plant species that have been identified have been encoded into the 25 QR Codes and has been ready to scan directly via the smartphone.

The following species have been identified, as follows *Amorphophallus campamulatus*, *Annona squamosa*, *Crynum asiaticum*, *Gmelina arborea*, *Caesalpinia bonduc*, *Mandevilla sanderi*, *Cassia alata*, *Chromolaena odorata*, *Crotalaria micans*, *Hibiscus tiliaceus*, *Ipomoea pes-caprae*, *Lanea coromandelica*, *Cocos nucifera*, *Lantana camara*, *Mangifera indica*, *Mimosa pudica*, *Musa paradisiaca*, *Tabernaemontana divaricata*, *Momordica balsamina*, *Ricinus communis*, *Syzygium cumini*, *Catharanthus roseus*, *Pandanus odoratissimus*, *Calotropis gigantea* and *Clitoria ternatea*. Plant species that were identified above have been encoded into the 25 QR Codes and has been ready to scan directly via the smartphone.

CONCLUSION

Based on the results of the study it was concluded that the exploration revealed 25 species of plants have been identified. The results of the identification of all 25 species are observed morphologic characteristics that is habitus of plants, roots, stems, leaves, flowers, fruits and seeds who loaded into the QR Code. QR Code that have been so then can be directly translated to use QR Code reader software on a mobile device equipped with a camera.

SUGGESTION

Based on the conclusion, proposed some suggestions for further research who will use a feature QR Code, as follows. First, further research, could determine the location with a more diverse kinds of species that can extend the range of data retrieval. Secondly in order to make the identification process is not only limited growth in higher plants but can also be done at a lower plants.

ACKNOWLEDGMENT

This study is the result of the helping of various parties, therefore in this opportunity, to Dr. Ir. Muh. Wiharto, M.Si and Sitti Saenab, S.Pd., M.Pd, I would like has a big thanks to you for all the knowledge as my adviser and provide feedback during this study; special thanks to my lovely one and only Mother, Dra.

Syamsiah, M.Si as my all the time supporter, personal adviser who always supported, thanks for the unlimited knowledge, accompany me during the study from the data collection in the field until writing this well done; for my friends Ibnu, Syamsul, Kak Ica and Kak Ina who also participated in this study, thanks for the help and accompany me in the process of data collection in the field.

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