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BIOBASE@ CAMPUS: AN INTERACTIVE BIODIVERSITY IDENTIFIER TOOLS FOR CAMPUS

Nur Huzeima Mohd Hussain, Atikah Fukaihah binti Amir, Norizan Mt Akhir,
Suriati Ahmad, Nadiyanti Mat Nayan

Department of Built Environment Studies and Technology, Faculty of Architecture, Planning and Surveying,
Universiti Teknologi MARA Perak Branch, Seri Iskandar Campus

E-mail: nurhu154@uitm.edu.my

ABSTRACT

Biodiversity on campus has become vital, especially in complying with the green campus initiatives and achieving the Sustainable Development Goals (SDG). This integral role supports not only the physical and psychological health of the community but also contributes to the environmental benefits. Therefore, managing biodiversity and utilizing their function and resources are significantly important. Without proper management, the biodiversity will hardly survive and lead to maintenance failure. This project is concerned with overcoming issues and strategizing interactive tools to equip biodiversity management on the campus. This project proposes a comprehensive database on campus; called BIObase@campus. The project adopts the iNaturalist application with GPS integration to identify, locate, analyze and evaluate the plant condition, suitability and health to pursue maintenance purposes. This iNaturalist application is accessible through android and iOs applications, easily use, understandable and manageable at no monetary costs. The method involves mapping and zoning, tracing plant ID, verification by experts and analyzing tree conditions. These data would then be consolidated into the BIObase@campus dataset as central referencing. Thus, this comprehensive biodiversity database on campus could raise plant surveillance and giving a profound impact on the management system, campus community, and the environment.

Keywords: Biodiversity, iNaturalist, database, Sustainable Development Goals (SDG)

1. INTRODUCTION

Greening campus requires efforts from various aspects to theoretically, practically, and economically achieve a sustainable campus environment. Innovative projects aligned with the fundamentals and guidelines of sustainability together with the SDGs agenda have subsequently addressed the issues and imperatives for university development, management, and operation (Aris et al., 2018; Junior et al., 2020). However, without a referable database, the management and operation of the green agenda on campus would lead to the initiative becoming unattended, insecure, and unachievable (Yanthi et al., 2019). Thus, the needs in planning, strategizing, and organising accessible databases are significantly sufficient. For instance, there is no specific database of plants and planting composition on the UiTM Perak campus. This concern has led to improper plant management and maintenance on campus, raising safety issues regarding tree maintenance failure and ineffective cost feasibility. Therefore, this innovation project proposes a comprehensive database on biodiversity on

campus to improvise the management system and strategies for risk management. The objective is to; (i) identify and track the plants and biodiversity species; (ii) locate and map the database through the iNaturalist application; (iii) digitise the biodiversity database and allow visibility throughout the world; (iv) analyse and evaluate plants conditions to assists maintenance purposes. This innovation is easily accessible, providing accurate and quick information, a reliably up-to-date database and ready-to-use to notable users, local and international.

The iNaturalist database application adopted GIS mapping, tracking location through satellite images, and uploading and storing existing images which allows various analyses and updating of information from users (Altrudi, 2021; Echeverria et al., 2021). This accessible, ready-to-use and quick application allow the users especially the campus community to act as an administrator in managing the related database.

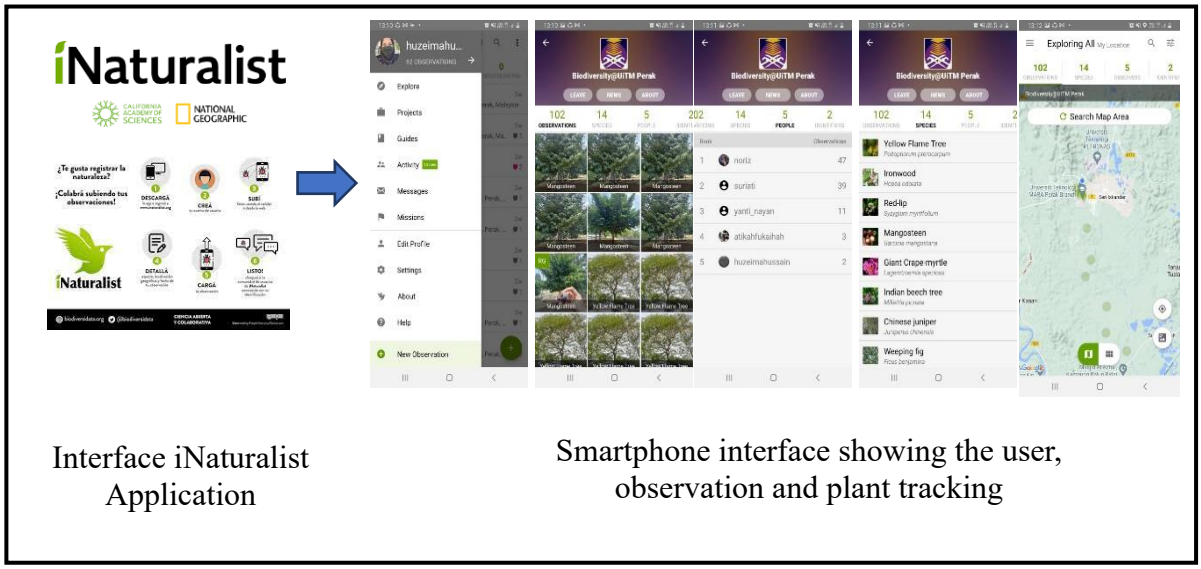

Figure 1: The iNaturalist Interface and Database Platform

2. METHODOLOGY

This projects initiates a plant tracking at street planting as first phase initiatives in tabulating plants database on UiTM Perak, Seri Iskandar campus. The methodology involves:

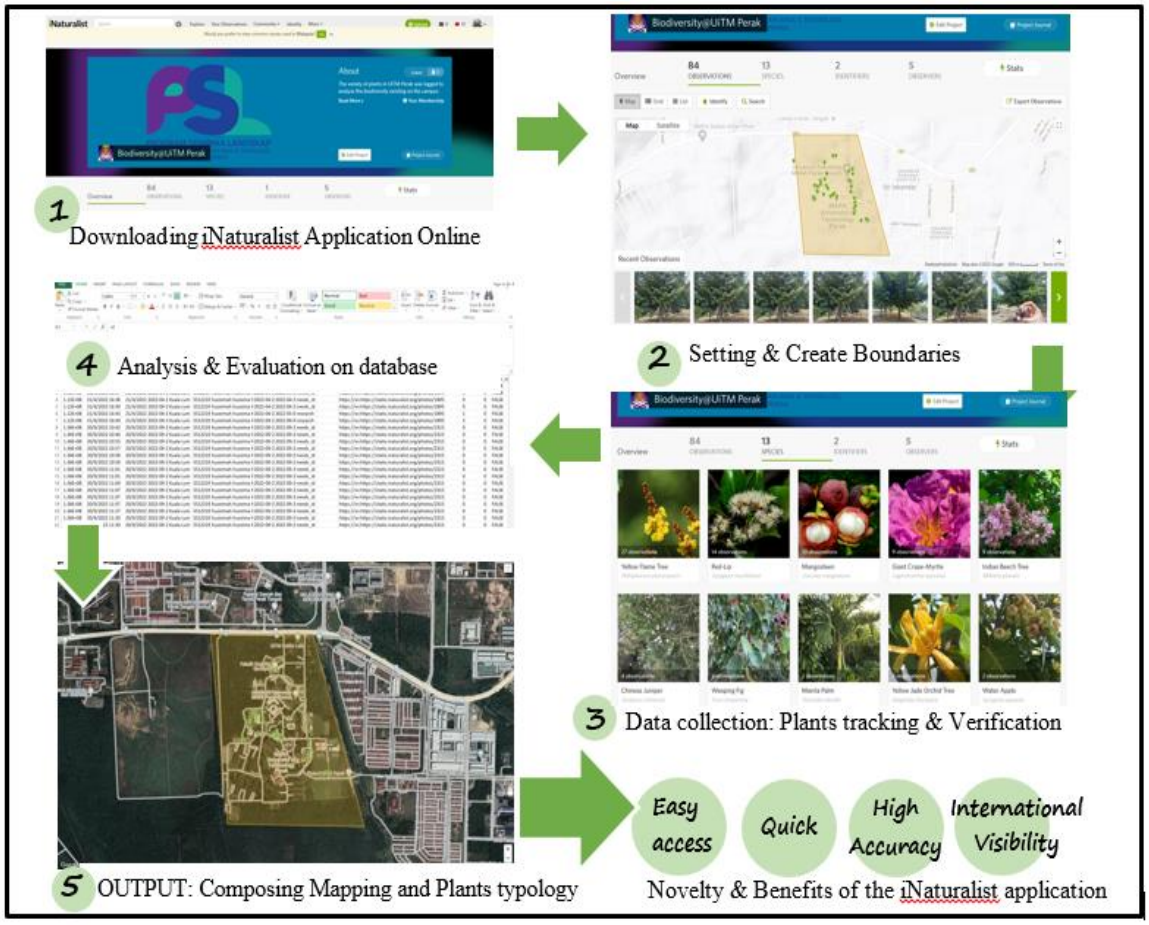

Figure 2 The BIObase@ Campus Component, Method and Benefits

3. FINDINGS

The first phase of this project involves areas of street planting on the campus. The researcher spotted 62 species of trees, palms, and bamboo. Name of the street that has been tracked is Jalan Ipoh, Jalan Kampar, Jalan Pintu Belakang UiTM and Jalan Teluk Intan. This phase has compiled 518 observations and categorised them into 6 planting groups, namely clumping bamboo, clustering palm, evergreen tree, flowering tree, fruit tree and solitary palm.

The findings identified that most of the trees on campus are evergreen trees with the highest observations of 312 nos. Examples of evergreen trees frequency appeared on campus are Khaya senegalensis (87 observations) along Jalan Ipoh, Syzigium campanulatum at Jalan Pintu Belakang UiTM (34 observations), and Swietenia macrophylla (23 observations). Followed by the flowering tree with 153 observations with the most frequent species are Mimusops elengi (29 observations), Peltophorum pterocarpum (29 observations) and Xanthostemon chrysanthus (25 observations). Further details on plant tracking through iNaturalist are in Figure 3.

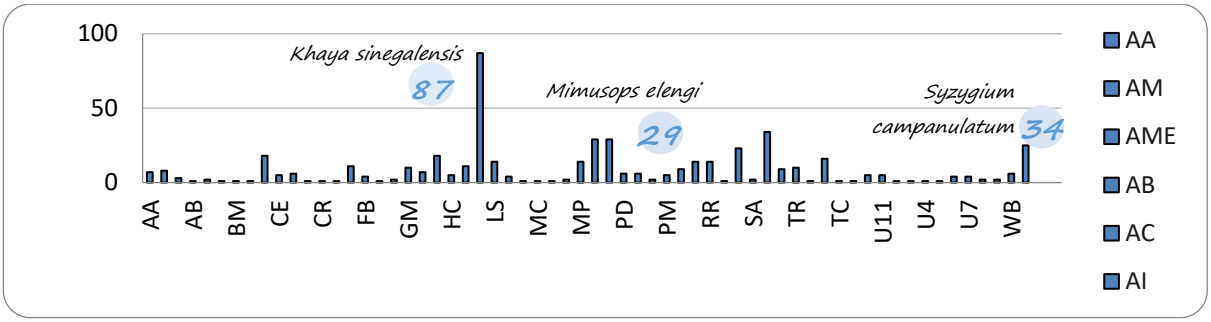

Figure 3 Plants Analysis on 518 Observations of Street Planting on Campus

This application is beneficial in achieving the aims of developing a comprehensive database of biodiversity on campus that lead to assist plant management and maintenance. The novelty of these innovations is; (i) able to digitize, established and track plant ID; (ii) the tracking is accessible and visible throughout the world, able to coordinate local plants in international maps; (iii) able to initiate knowledge transfer with the worldwide expert; (iv) able to equip interactive tools of biodiversity management for UiTM Perak campus; (v) the initiatives are aligned with Sustainable Development Goals (SDG) that accommodate experiential learning towards sustainable future.

4. CONCLUSION

In conclusion, this iNaturalist application is a reliable and well-established platform for providing a database and mapping the plant typology on campus. The application has been widely recognized internationally and is sufficient to be replicated and managed to assist in the management and maintenance of tree planting on campus. In addition, the free download, easy access, and quick and friendly apps make iNaturalist an interactive tool and reliably competent for current and future needs.

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