Chapter 2

**2.1 Introduction:**

There are numerous types of plants due to biodiversity, and the efforts to understand them created the need for classifications, which are only truly understood and known by taxonomy experts. However, in recent years there have been efforts to create automated solutions for this [1], which include the utilization of machine learning. This can also help to save biodiversity and greenify places [1], and aid in the Saudi greenifying 2030 vision. The flat nature of plant morphology helps in its identification. Thankfully, computer vision and machine learning methods, which have proven highly successful in various fields, are now being utilized to accurately identify organisms, particularly plants, with precision levels exceeding (90% or more) when identifying a plant by its leaf [1]. Based on this study, we can see that the average person can’t recognize a plant species without it being a majorly common plant, such as apples, cherry blossoms, basil, etc. but when it comes to less commonly known plants, especially ones associated with gardening and agriculture for multiple purposes, things can get complicated. This creates the need for an automated solution which has been developed through machine learning and computer vision, and that’s where our proposed solution, the Bloom application comes into hand.

**2.2. Existing Systems/4 Similar Projects Comparison**

**2.2.1. PictureThis**

PictureThis is an application that utilizes image recognition technology to identify plants and flowers from photos taken by users. It provides detailed information about the identified plant species, including their common and scientific names, care instructions, growth habits, and even tips for plant maintenance. The application also allows users to explore a database of plants and flowers, share their own plant photos, and connect with other gardening enthusiasts. Additionally, PictureThis offers a premium version with additional features such as unlimited identification requests and access to a larger plant database.

**2.2.2. Carl**

Carl is an app for plant identification that helps users identify plants, weeds, and trees with a snapshot using artificial intelligence (AI). Additionally, the application offers details about the identified plant, including its common name, scientific name, and description. Carl gives users access to plant specialists for expert assistance and guidance. Other features include a plant disease identification tool, a plant encyclopedia, a plant care guide, a watering reminder, and a plant light meter tool.

**2.2.3. PlantIn**

PlantIn is an application employing image recognition technology to aid users in identifying plants, and mushrooms effortlessly through photos. It offers details on identified plants, encompassing common and scientific names, traits, general info, care tips, and maintenance needs. Users can interact with others, ask questions, and exchange plant images. Additionally, PlantIn offers a premium tier featuring perks such as season pass collection, light meter, and water calculator functionalities.

**2.2.4. Planto**

An AI plant identifier application typically utilizes artificial intelligence and image recognition technology to identify plants based on photos uploaded by users. These applications analyze visual features such as leaf shape, color, and texture to match them against a database of known plant species. They can be useful for gardening enthusiasts, botany students, or anyone interested in identifying plants in their environment.

**Table 1: Comparison Between Current Solution Apps Features**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **aNumber** | **App Name** | **Features** | | | | | | | |
| **Plant Care Information** | **Plant Identification Throw Image** | | **Watering Reminder** | | **Community Tab** | | **E-Store for Selling and Buying Resources** |
| **1** | PictureThis | Yes | Yes | Yes | | No | | No | |
| **2** | Carl | Yes | Yes | Yes | | No | | No | |
| **3** | PlantIn | Yes | Yes | Yes | | Yes | | No | |
| **4** | Planto | Yes | Yes | Yes | | No | | No | |

**2.4. Research Gap:**

Based on the comparison table above we concluded that all applications have the feature of identifying plants and caring for them, in addition to the watering reminders. Some of the applications aren’t concerned about creating communities, and none of the applications facilitate selling and buying resources between users.

**2.5. Conclusion:**

We examined some scientific papers to look further into the problem we’re handling, and have concluded that plant identification can be a challenge to the general public. AI has been and is being used for the purpose of plant identification, which resulted in the emergence of different applications based on image recognition technology. However, not all applications have the same features, and none of them have the option of resource selling and buying.

**Reference**

1. Mata-Montero, E. and Carranza-Rojas, J. (2016) ‘Automated Plant Species Identification: Challenges and opportunities’, *ICT for Promoting Human Development and Protecting the Environment*, pp. 26–36. doi:10.1007/978-3-319-44447-5\_3.
2. App ref.