DOI : 10.5958/0974-0112.2019.00120.8

Indian J. Hort. 76(4), December 2019: 752-756

Short communication

Mobile App - Android application on "Orchid Farming" based on North Eastern States of India

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ABSTRACT

Android Application on Orchids has been developed & hosted on Google Play Store[9] as well as on the official website of ICAR-National Research Centre for Orchids[10] for focusing orchid growers, entrepreneurs and stakeholders. This application provides vital information regarding the management of different types of commercial orchidswith a suitable environment. It supports Android smartphone with minimum version 4.1 and above that covers 96.4% android users[14]. In the current era, 90.67% Android Operating system works in India[13]. 'Orchid Farming' mobile app covers fourgenera & one hybrid viz, *Cymbidium, Dendrobium, Phalaenopsis, Vanda & Mokara*.

Key words: Android Application, *Cymbidium*, *Dendrobium, Phalaenopsis, Vanda*, *Mokara*.

In India, there are 1263 species (155 genera)[11] of orchids distributed throughout the country. Till date, more than 1,00,000 orchid hybrids are known globally and cultivated for cut flowers and potted plants. Further new ones are being registered every month. In North-East India, *Cymbidium* & *Dendrobium* genera are highly productive whereas, in South India, *Dendrobium, Phalaenopsis*, *Vanda* & *Mokara* hybrids are widely cultivated. Orchid breeders have evolved superior clones; tissue culturists have multiplied them in large number, and horticulturists have developeda package of practices and production technologies to enhance their widespread adoption. In order to disseminate the know-how and technology developed in this field, a suitable and easily accessible media was prerequisite. To fulfil this gap, the ICAR-NRC (Orchid) has developed an Android-based Mobile-App which not only provides the necessary information on every aspect of Orchid breeding and cultivation but also is highly user-friendly for common men as well as the professionals.

This Android application has been developed for five genera of orchid viz., *Cymbidium*, *Dendrobium*, *Phalaenopsis*, *Vanda* & *Mokara*. The details about the five genera which are being hosted in the Application is schematically provided in Fig. 1. The support system is divided into three categories viz., Orchid Management, Extension Activities and Technologies. Orchid Management covers all five genera detail that gives an introduction to management details which are mentioned in architecture. Extension Activities covers different

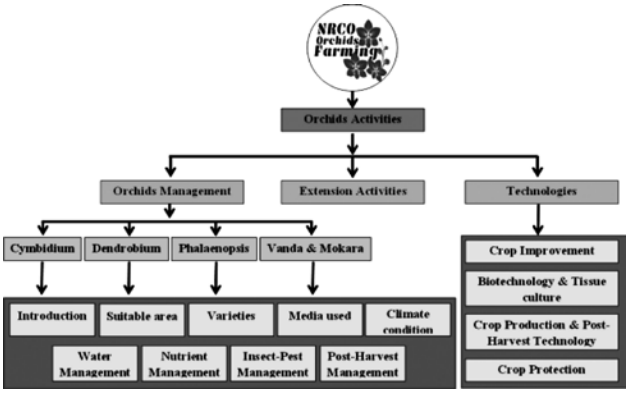

Fig. 1. Architecture/ Flow Chart of Mobile Application.

approaches and Technologies is subdivided into four sections namely crop improvement, Biotechnology & tissue culture, Crop production &Post-Harvest Technology and Crop Protection. The original data for each of the sections were sourced from Annual Reports[1-4], Technologies[5] published and different NEWS letter of ICAR-NRC for Orchids and arranged as per the data structure of the application by a team of experts. There are different slabs in each genus that gives point to point information about the genera and their related species. This application is built in Eclipse Juno android 23.0.1 framework[12]. Java Core Library provided most functions of the application and the Dalvik virtual machine was used for specific improvement at the backend. For the creation of this application, two file formats were used. Firstly dot XML files that give design support of application shown in Fig. 3 and secondly dot JAVA files which give backend programming support as shown in Fig. 4.

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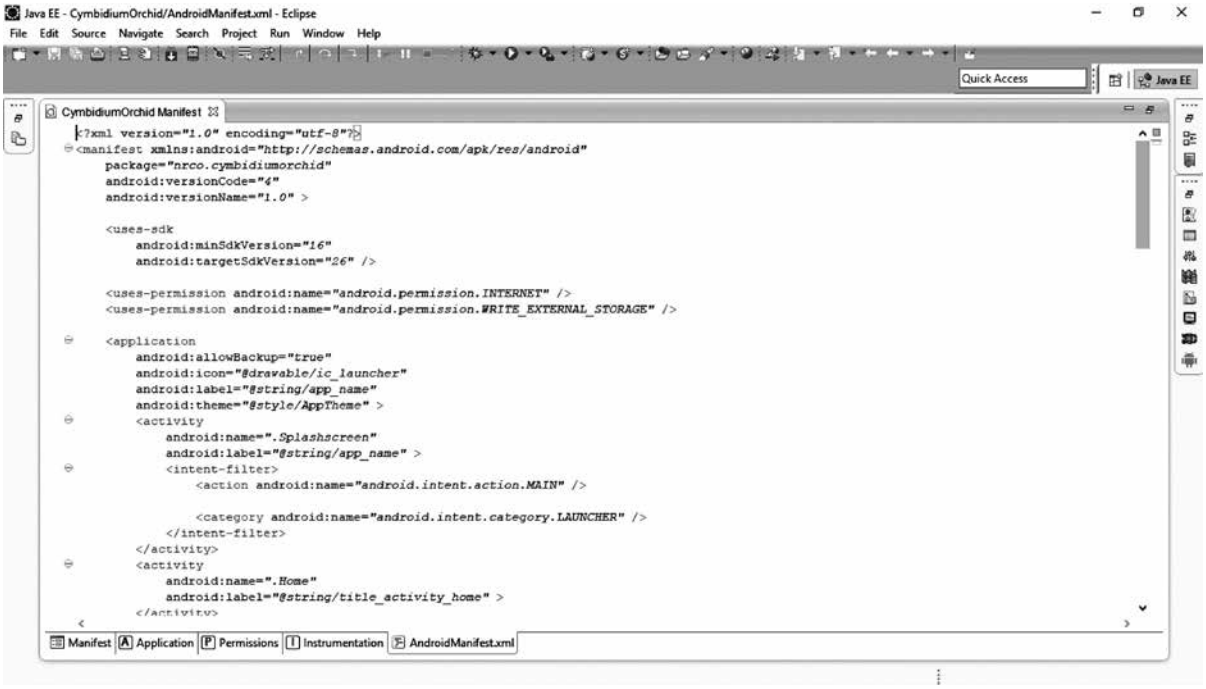

Fig. 2. Androidmanifest.xml file that shows internal permissions which are essential for this application.

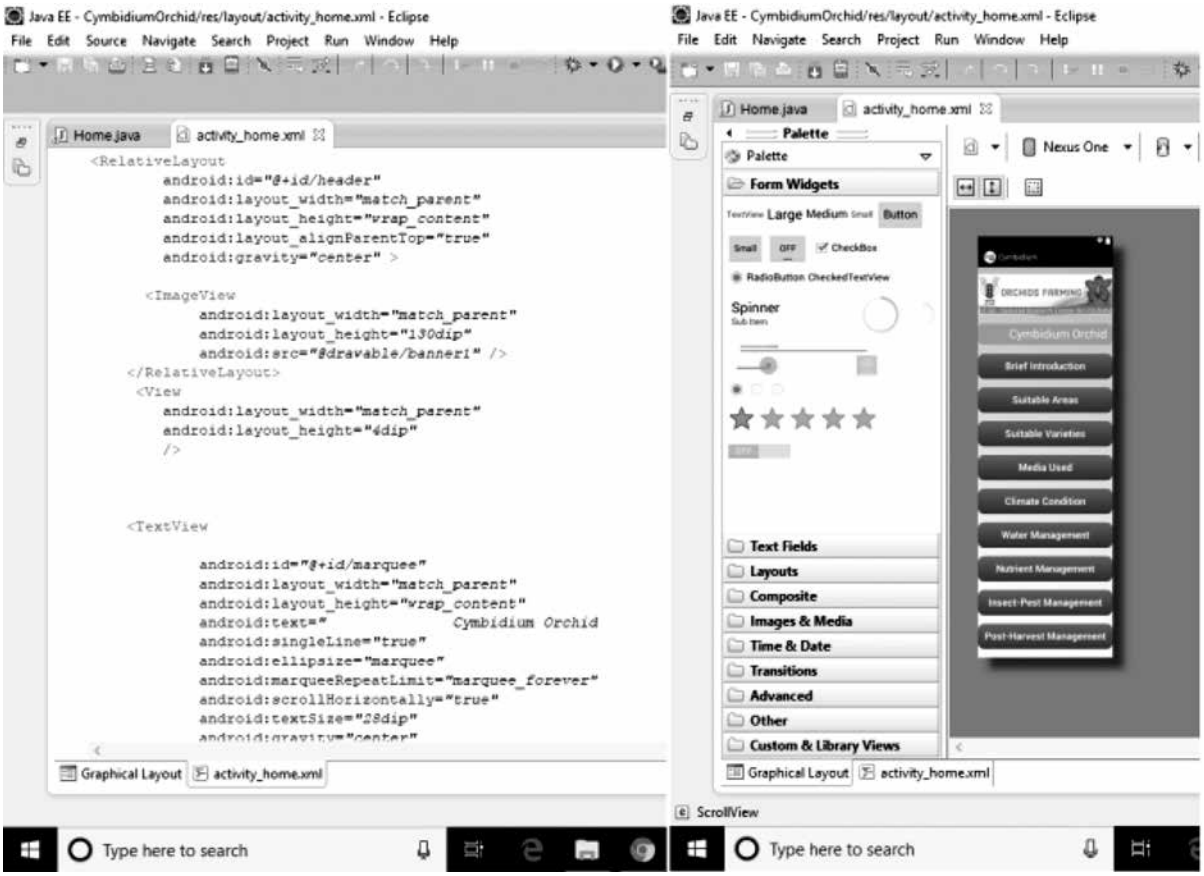

Fig. 3. Activity_home.xml file gives illustrative demonstration of .xml file format.

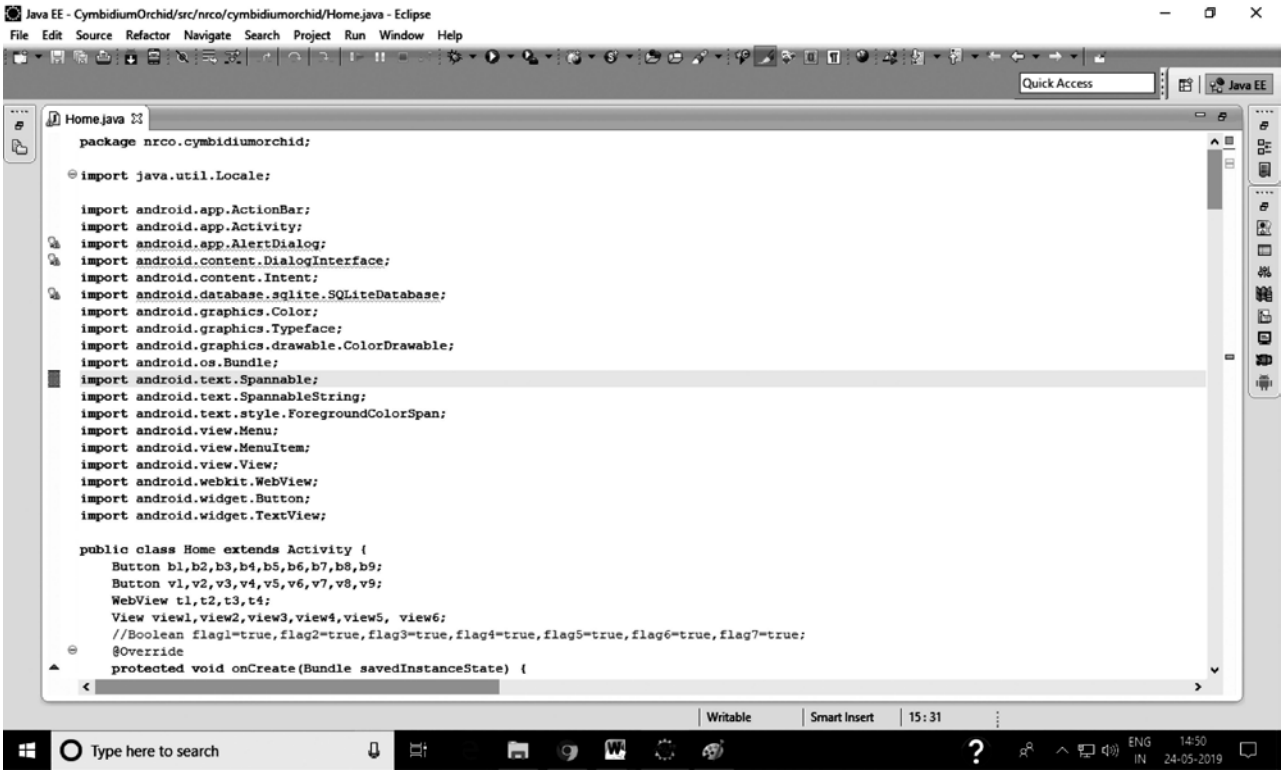

Fig. 4. Home.java import permissions gives illustrative demonstration of .java file format.

Default permissions namely "*android.permission.INTERNET*" and "*android.permission.SEND_SMS*" had enabled in AndroidManifest.xml file of application which is shown in Fig. 2, user need to allow these permissions for using Feedback options. Linux 2.6 kernel facilitated the operations such as internal storage, process management, internet protocol, bottom-drive and other core services. Application size is not more than 7.84 MB which will work on any device without acquiring much space.

This Application includes the searchable fields like introduction, suitable area for different varieties, climate condition, nutrition & pest management techniques that facilitates farmers for management of orchids."**Orchid Farming**" app allows the users to know information as per requirement in different ways and screenshots which are given as an example on functionality.

1. Selection of Orchid Management and access to details on different genera that holds multiple management schedule (Fig. 5).
2. Selection of an independent option of management followed by further options relating to a specific head.
3. Multiple Technologies[5] were also developed and included with brief details. User will gather more information with their related orchids (Fig. 6).
4. Feedback includes email service and messaging service that helps orchid growers to communicate with us in respective concerned (Fig. 7).

Fig. 5. Main Screen of App and different genera seen after selection of Orchid management option.

Fig. 6. Cymbidium genera selected and selection of technologies

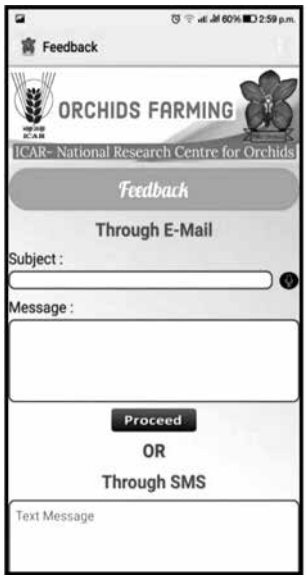

Fig. 7. Feedback form

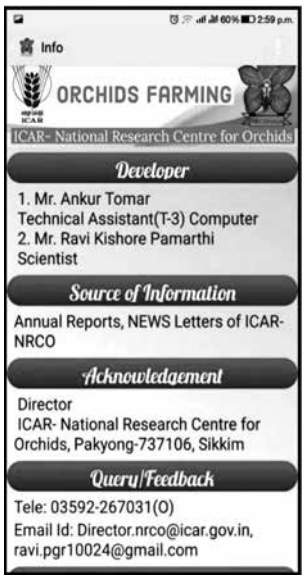

Fig. 8. More Info details

5. More Info & About Us gives detail about the institute and their developer info which will assist the user to perform the desired work smoothly (Fig. 8).

Orchid growers, students, researchers, extension functionaries and farmers across North-East India are the targeted stakeholders for whom mobile app would be of immense use. Publication of Application under Google Play store provides access to anyone, including the non-governmental organization, consumers and policy makers to download and use. It is a standalone Application and freely available. The current version of the application is in English, and their conversion to local languages of different States of India would make it more user friendly along with efforts on popularization. More genera can be included for enhancing knowledge on orchids. Other orchid based products details are required to be added viz., packing of the spike, single flower packing and handmade products from dried leaves of Orchid that gives an innovative idea of decoration purpose. Inclusion of details of progressive orchid growers in "farmer's corner" is also equally important. Additional information on technologies and schemes related to orchid cultivation may also be added.

Tab. 1 Users and rating

Application Name	Orchids Farming
Number of Downloads	1071 (Fig. 9)
Comments	4 (in play store)& feedback received from emails and telephonic from different organizations and individuals.
Ratings	5 star (Fig. 9)
Current version	4.1 and up
Content rating	Rated for 3+
Top Countries	India 50% Philippines 33% Switzerland 17% (Fig. 10)

Multiple farmers, students and entrepreneurs of horticulture from different institutes, Government officials as well as non-government bodies give their feedback and suggestions about the features and functionality of application. Orchid lovers download the application not only in India but also from other countries which is shown in Fig 10. Due to small

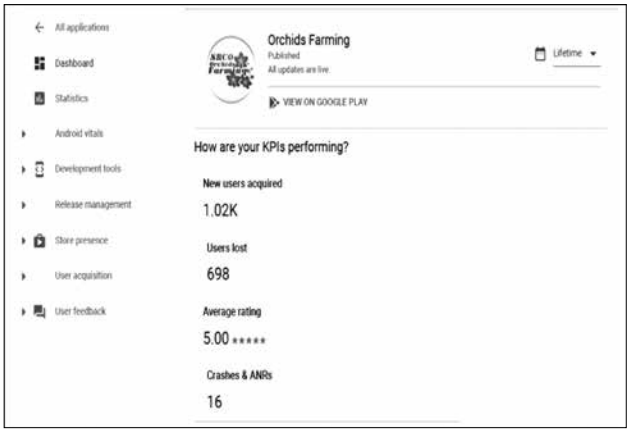

Fig. 9. Number of Downloads till now.

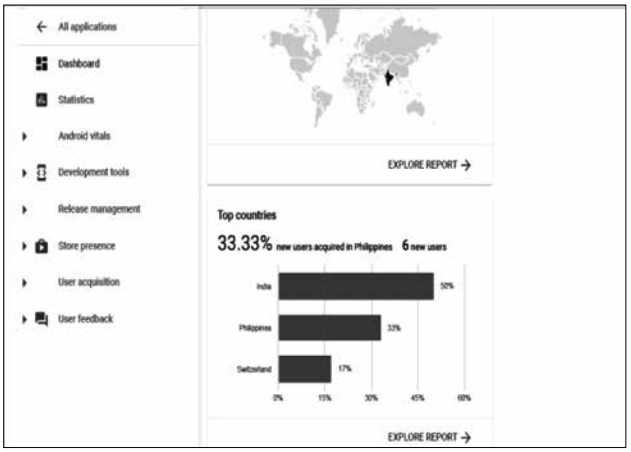

Fig. 10. Represents the users from across the World.

size of application, many users attracted to get vast information about the orchid and their respective details easily in their hand handled device.

'Orchid Farming' is a standalone and open source application that gives quick information about orchids and related management techniques. It has been designed and developed by ICAR- National Research Centre for Orchids, Pakyong, Sikkim to impart scientific knowledge and skills to the farmers/growers / Entrepreneur and orchid lovers who want to grow orchids. It is educational App providing information on various aspects of orchid management by choosing their selective measures. Creating awareness amongst the stakeholder's *viz.,* extension personnel of the State Department of Agriculture, farmers and orchid growers are expected to yield dividends in the era of 'Digital India'. Awareness needs to be created on the availability of the application to all the stakeholders related orchid growing systematically based on suitable climate condition.

ACKNOWLEDGEMENT

Authors are acknowledging the current and previous Director, ICAR-NRCO, Pakyong for their support in developing this application

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Received : August, 2019; Revised : November, 2019; Accepted : November, 2019