Development of Android Mobile Application on Groundnut Crop Cultivation for Transfer of Technology

Kadiri Mohan[1]

1. Scientist (Agril. Ext.), Regional Agricultural Research Station, Tirupati (ANGRAU, Andhra Pradesh)
Corresponding author e-mail: kadirimohan@gmail.com

ABSTRACT

Farming made easy when ready to use information to take effective decisions in time is available and easily accessible. Smart Mobile phones usage was exponentially increasing in rural areas. Mobile applications were effectively giving the information to the large number of farmers. "Mana Verusanaga" - a mobile application with entire package of practices that are required for scientific cultivation of groundnut and as a ready reckoner for field Extension Officers was developed. An Android based offline mobile application (app) was built with easy navigation to access the information available in the mobile app on varieties, seed handing, sowing, nutrient management, pest and disease management, intercultural operations, harvesting and storage, mechanization, seed production, value added products and contact numbers for further information. The mobile app is two way communication facilities by which farmers can send the quarries through Short Message Service in offline mode and by e-mails when connected to the internet. The mobile application was of 24 MB size. It can be easily installed in all Android smart mobile phones and other android based gadgets. The entire information can be navigated through the photographs and icons.

Key words: *Groundnut cultivation; Mobile app; Mobile app for transfer of technology; Crop specific app;*

Reaching every individual farmer has always been a challenge. Advent of mobile phones has led to the development of new services and applications in agriculture for the benefit of farmers and other stakeholders.The mobile application is a software programme designed to run on smart phones, tablets and other devises (*Serrano et.,al., 2013*). Smart phone apps revolutionized the connectivity and used for transferring agri-information for farmers (*EMarketer, 2016*). In India, with a 1.3 billion people, the wireless subscription as on August 2019 was 1171 millions. (*TRAI, 2019*). Smart phones as on 2017 were 701 million and expected to rise by 859 million by 2022 (*The Economic Times, 2019*). Increasing penetration of smart phones in India and affordable prices, it has been considered necessary to create mobile Apps. In India today, more people have access to mobiles than to running water, these new apps present an opportunity like no other to revolutionize life for farmers (*Viswanathan, 2016*). Further, the mobile apps can reach the many unreached farmers 24×7 in remote areas and can use out the mobile phone a learning tool for effectively technology transfer.

Farmers need timely information during the crop cultivation period. Due to many reasons, farmers cannot reach to their extension personnel often for day-to-day information on cultivation practices. To keep the farmers with information supply round the clock, the mobile application is important software which is easily accessed though the mobile hand set. The mobile application can provide information in detail about any issue, aspect or complete information on one subject. Mobile applications available for all the crops and some apps were developed only on plant protection aspects of few crops or one crop. The crop specific mobile apps with complete seed to seed information were few. All functionalities are bundle into the one single app and in

the native language of the farmer and then it is easy to utilize it (*Hetal Patel and Dharmendra Patel, 2016*). When compared to the multi crops information apps, crop specific apps will cater the entire information needs of the farmer for that particular crop.

Groundnut is an important dry land legume cultivated in large extent as livelihood crop and also in irrigated areas it is being cultivated as high returns crop in the state of Andhra Pradesh. Groundnut responds well to the critical technological interventions. Research based complete production technology was developed by Acharya N.G. Ranga Agricultural University for the farmers. The objective of the project was to build an offline mobile application for smart phones and other gadgets with complete production package of Groundnut crop in Telugu language and to provide agro advisories through mobile app.

METHODOLOGY

The app was developed on Groundnut crop. Android operating systems platform was selected as the percentage of Smart phones with Android Operating System were more in usage. The entire app was developed using Android Studio through Java object oriented programming language. For easy and quick working of the mobile app, it was developed as an offline app released during the year 2017. Two way communication facility was provided in the mobile app through which any user can send their queries and information through SMS (offline) or email (online).

The content chosen was groundnut crop cultivation seed to seed production technologies developed by Acharya N.G. Ranga Agricultural University from selection of varieties, selection of soil, land preparation, seed treatment, sowing, fertilizers application, irrigation management, weed control, inter-cultivation, crop rotation, pest and disease management, harvesting and storage, farm mechanization, value addition and seed production.

RESULTS AND DISCUSSION

Development of the mobile app: The app contains 71 mobile screens with suitable photographs and text for different aspects. The mobile app was in Telugu language. The app was named as "Mana Verusanaga" which means "Our Groundnut". The app navigation schema was designed simple with touch on the relevant photograph or icon to access the required information. (Fig 1).

Key features:

Android mobile operating system: The app was built for Android operating system. Among the mobile operating systems, Android is the most common and open platform being used in majority of the smart phones. Further, the Android studio is available for building the software.

Offline mode mobile app: The app was build to work offline which will enable to access 24 x 7 in remote areas without any internet connection. The app file (.apk) can be downloaded from any available hosting platforms or by sharing through social media from one user to another user. The .apk file size is kept small with 24 MB size which enable to hosting and downloading the mobile app. There is no need for internet connectivity of downloading or installing the mobile app. The benefit of the offline mode app is that, after installing the app in the mobile phone, the app can be used easily without any requirement of internet connectively or data usage. Offline app enables farmers to use the app where ever and whenever they want event in the remotest areas where there is no cellular connectivity. Further, offline mode enables to faster retrieval of the data.

Easy to install and operate: After downloading the .apk file from any of the hosted platforms or by sharing through social media, it can be easily installed by a simple one time registration format in the welcome screen and can send easily through SMS (when not connected to internet) or by email (when ever connected to internet). Till now more than 10,000 downloads were completed from various app hosting platforms.

Easy pectoral navigation: After installing the app, navigation was designed to operate the app with ease by touching on the pictures and icon, which will enable all the users to operate the app without any difficulty like feeding the key words, selecting from the drop downs etc. Due to easy navigation of the app using photographs and icons, even the farmers with less education can operate the app. (Fig.3)

App in Telugu language: Entire content in the app was given in Telugu language for the benefit of the farming community. Entire test was created using Unicode fonts which can open in all the smart phones and can fit the various screen sizes of different android based gadgets. The Unicode font are inbuilt in the app, there is no need to install any forms for Telugu language to open in any gadget.
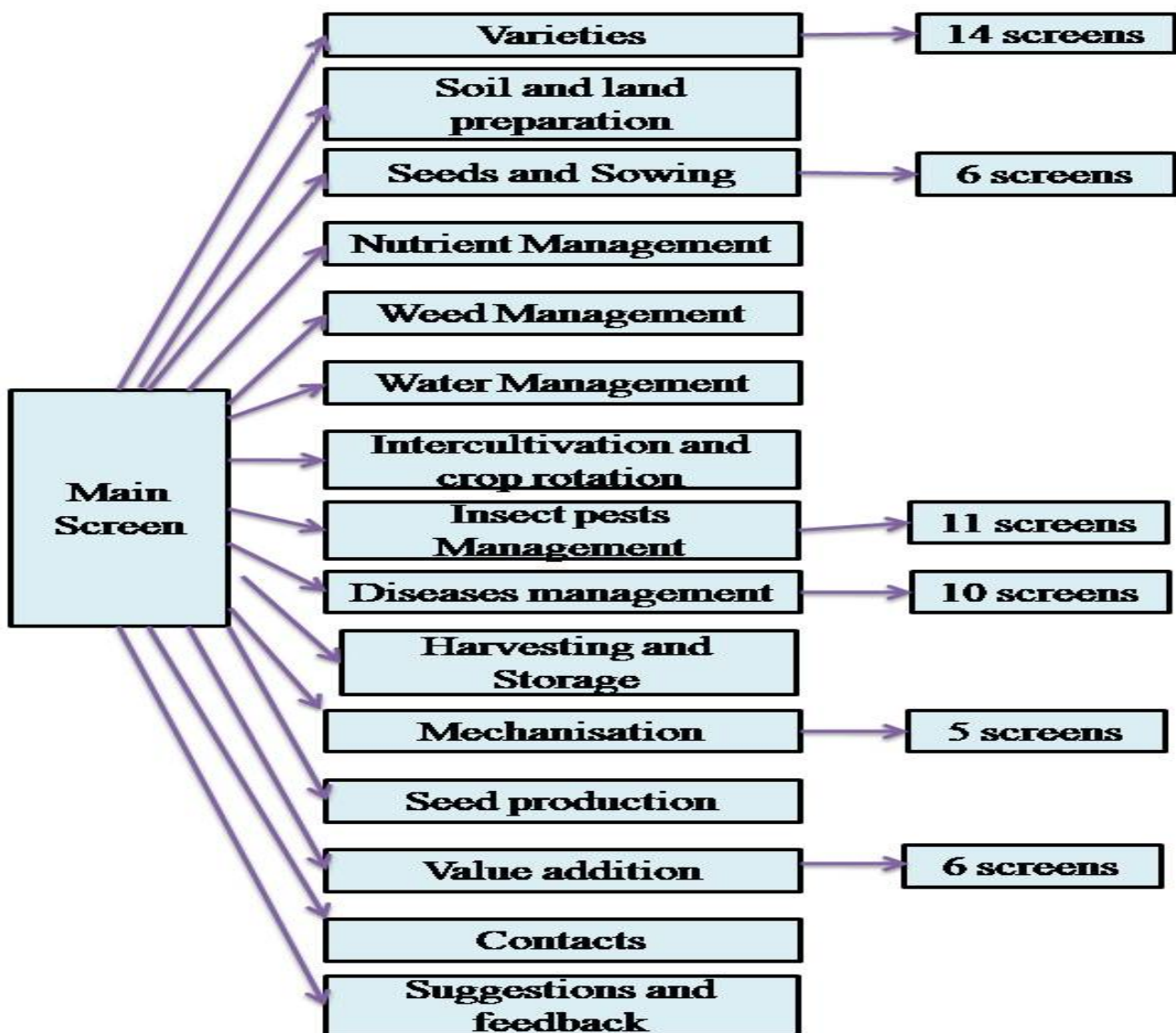
Fig. 1. Schema of the mobile application

Complete groundnut production technology provided: The entire production technology of groundnut from the seed selection, varietal choice, time of sowing, seed treatment, sowing methods, nutrient management, insects pest and disease identification with control measures, intercultural operations, harvesting and storage, mechanization, seed production practices, value added products of groundnut (Fig.9) and contact numbers for further information were kept in the mobile app. Varieties, nutrient deficiency symptoms, pests (Fig.5), disease (Fig. 6) and machinery (Fig.8) were explained with suitable photographs for better understanding. Aspects like nutrient management, pest and disease identification and control were extensively

given in the app with proper identification, mode of spread, damage and suitable Integrated Pest Management, Integrated Nutrient Management and Integrated Disease Management practices (Fig. 7).

Two way interaction facility for the user: The mobile app was interactive which enabling the user for two way communication with the Scientists through SMS, email and phone calls and a option was provided in the app to give feedback on the entire mobile app for its further improvement. A separate screen was created with a form fill to send the user queries using SMS (when not connected to internet) and by email along with attaching the photographs (when connected to internet). The SMS queries goes to the app administrator and by

Fig. 2. Home Screen

Fig.4. Varieties main screen
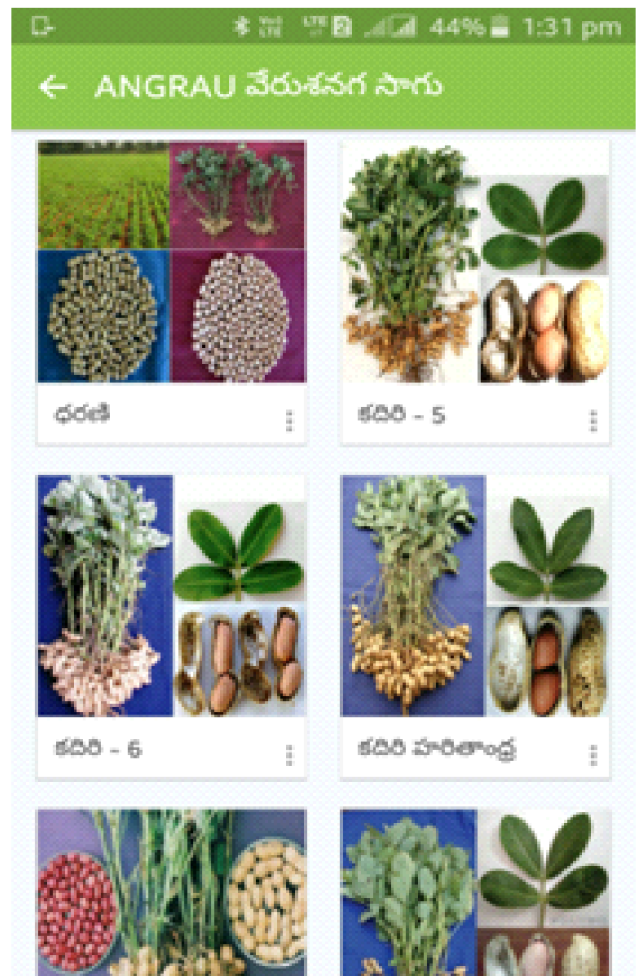

Fig.3. Navigation screen for content access

Fig. 5. Pests screen

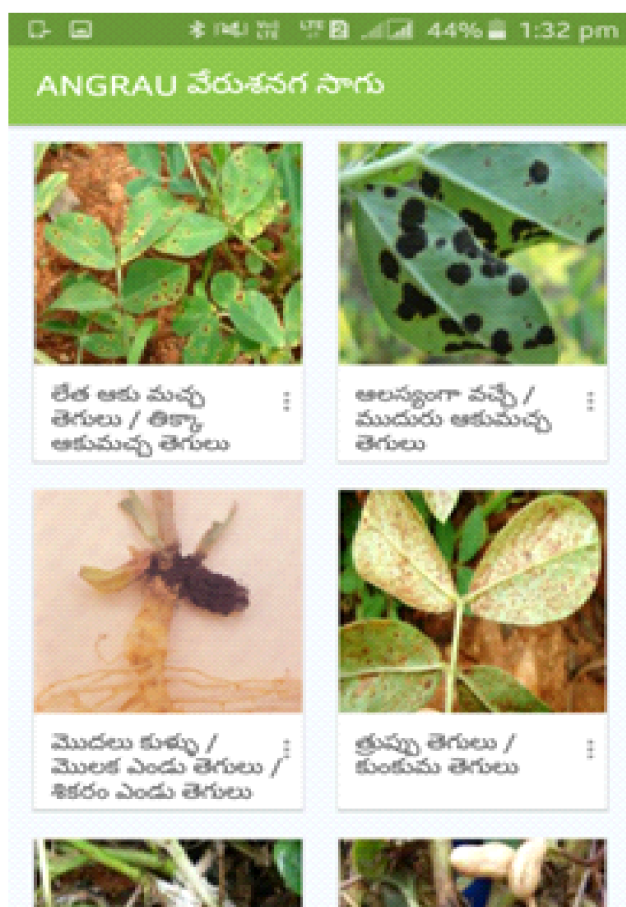**Fig. 6. Disease screen**

Fig. 8. Farm Mechanization screen

Fig.7. Photograph and information about one pest

Fig.9. Value added products

Fig.10. Contacts numbers in the app

which the users can get agro-advisories or other information replies required. Further, when ever connected to the internet, the app enables the user to send an email along with photographs of the insects and diseases for further clarifications through e-mail from the app administrator.

Contacting the university extension scientists through the app: Another facility created available mobile app was, an exclusive screen with contact number of the University Extension scientists at various districts of the State and also Farmers Call Centre Toll Free Number was given for making a phone call through the feature available in the app. (Fig.10)

CONCLUSION

The aim of developing the mobile app was to transfer the scientific groundnut production technology developed by the ANGRAU to farmers through smart phones and a ready reckoner for Extension Officers at the field level. The developed mobile app aids the farmers as a learning tool for getting first hand information about groundnut production technology for adoption in a easy way for. The app is a cost effective information dissemination channel for large number of users without any additional cost. Every precaution was taken in the development of the mobile app for easy installing, operating and for using the contents by all kinds of users. Crop specific mobile apps will help the farmer to get the complete information about that particular crop and will be an information friend to the farmer and extension officers for getting the information 24/7 effortlessly.

REFERENCES

Barah, Anupam and Balakrishnan, M. (2018). Smart phone applications: Role in Agri-information dissemination. *Agril. Reviews*, **39**(1): 82-85.

EMarketer. (2016). Smartphone users worldwide will total 1.75 billion in 2014. Available: https://www.emarketer.com/Article/Smartphone-Users-Worldwide-Will-Total-175-Billion-2014/1010536.

GoI (2016). Mobile Seva Appstore". Retrieved February 14, 2016, Internet: https://apps.mgov.gov.in/listcount.do.

Patel, Hetal and Patel, Dharmendra (2016). A comparative study on various data mining algorithms with special reference to crop yield prediction. *Indian J. of Sci. and Tech.*, **9**(10): 1-8.

Serrano.N.; Hernantes. J. and Gallardo, G. (2017). Mobile Web Apps. *IEEE Software*, **30** (5):22-27.

The Economic Times. (2019). Smartphone users ASSOCHAM-PWC Study. Available: https://economictimes.indiatimes.com/tech/hardware/smartphone-users-expected-to-rise-84-to-859m-by-2022-assocham-pwc-study/articleshow/69260487.cms

TRAI (2019). Telecom Regularity Authority of India. New Delhi. Internet: www.trai.gov.in

Viswanathan (2016). In India mobile apps are transforming agriculture. Available: http://modernfarmer.com/2016/01/agriculture-apps-india/

● ● ● ● ●