
STUDY AND COMPARATIVE ANALYSIS OF ANDROID MOBILE APPLICATIONS USED IN INDIAN AGRICULTURE SECTOR USING R

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ABSTRACT:

This paper aims to examine the role of IT technology in advancement of Indian agriculture. Agricultural practices and advancements differ globally—since plants have their own differences and the location plays a role on their development as well. But through the exchange of knowledge from different agriculturally-involved individuals from all over the world, improvement of techniques can be experienced as well.

It has constrained enforcement on how idea is scattered, and being experienced to handle this information for the advancement of the agricultural class gives a great positive strain that is auspicious for everyone. IT has developed into a bridge for people from all around the world.

Agriculture in India is the core sector for food security, nutritional security, and sustainable development and for poverty alleviation. It contributes approximately 18 % of GDP. Milestones in agriculture development in India includes : Green revolution, Evergreen revolution, Blue revolution, White revolution, yellow revolution, Bio technology revolution and the most recent one is Information and communication technology(ICT) revolution. The use of Information and Communication Technology (ICT) to support the transmission of localized information and services working towards making farming socially, economically and environmentally sustainable – this comprises Digital Agriculture. This has led to the rise and development of many Mobile applications like Kisan Suvidha , IFFCO Kisan agriculture, Smart Crop, whatsapp groups , and many more, and also many Start-Ups by Government of India like AgroStar , direct-to-farmer ,and many more . Now, with a click of a button, farmers can access information regarding weather, dealers, market prices, plant protection, agricultural advices, etc. These advancements will definitely help bring significant change in the lives of farmers and the field of agriculture, but not up to that much extent what Government and IT sector intended to achieve. This paper also includes the comparative analysis of few mobile applications on the basis of some of the parameters like – ratings, reviews, features and many more. On the basis of that analysis we are presenting few drawbacks of these mobile applications and how these drawbacks can be removed in future for better implementation and results.

INTRODUCTION:

Indian users are an element of about 30% of the absolute volume of the global Smartphone, making it the largest in the suggested field. In 2017, India had 720 million mobile call users, among which 320 million were sub urban mobile phone users. This estimate furthermore included 50 million Smart phone users with access to internet. According to ‘The Rising Connected Consumer in Rural India’, an abstraction by the Boston Consulting Group, this allot of sub urban India will hop to 48% by 2020 . Steps taken by the Indian government recently may ratiocinate this happen first than predicted. Digital India, placed in to orbit in 2015 by Indian Prime Minister Narendra Modi, aims towards the promotion of digital literacy and inauguration of digital masses for empowering sub urban communities. Considering that 58% of sub urban households calculate on agriculture as a well known of their practically eminent man of bread, the nature of Digital Agriculture needs to be proposed within Digital India.

The need of Information and Communication Technology (ICT) to abutment the transmittal of localized reference and services unavailable towards making farming socially, economically and environmentally sustainable, although contributing to the lying-in of nutritious and low-cost food for generally told – this

comprises Digital Agriculture. This has further led to the development of mobile apps which are helping existing government schemes, and distinct agriculture-based knowledge to command farmers in sub urban India. This digital critical point is open for consideration as a game-changer for Indian agricultural conditions.

Here's a list of 10 widely used mobile apps making agriculture easy –

1. Kisan Suvidha

Kisan Suvidha App was orbited by PM Narendra Modi in 2016 to push on endorsement of farmers and population of suburb. This apps GUI is accurate and offers a user-friendly interface. It caters reference on advanced weather and furthermore the forecast for the later five days, market rates of crops in the abutting city, information on fertilizers, seeds, furnishings and many more. The selection to manage the app in antithetical languages makes it more chiefly accessible.

2. IFFCO Kisan Agriculture

This app was put up in 2015 and is managed by IFFCO Kisan, a diversion of Indian Farmers' Fertilizer Cooperative Ltd. Its desire is to boost Indian farmers figure informed decisions on customized information familiar to their needs. The user can access a diversity of analytical modules including agricultural admonition, weather, market rates, and agriculture information library in the anatomy of text, images, audio and videos in the selected explanation at profiling stage. The app furthermore offers helpline numbers to contact with Kisan Call Centre Services.

3. RML Farmer – KrishiMitr

RML Farmer is a unique agricultural app where farmers can accumulate with the current brand and mandi rates, unambiguous usage of pesticides and fertilizers, farm and farmer related announcements, and weather for sea. This app also provides the agricultural tips and announcements regarding the government's latest agricultural policies and schemes. Users can accept from over 400 crop varieties, 1200 markets, and 3300 weather locations over 55,000 villages and 17 states. It works with the support of the precise tools designed to interpret or grant information on disparate aspects of farming. Example CropDoc guide the farmers in determining problems that disturbs their crops at the appropriate time and suggests cure actions; Farm Nutri provides personalized nutrient recommendations, which are given in the plan of a curriculum of fertilizer dosage.

4. PusaKrishi

PusaKrishi was put up in 2016 by the Union Agriculture Minister with the intentions to aid farmers to earn information related to technologies exaggerated by Indian Agriculture Research Institute (IARI), which will boost in increasing recapitulate farmers. The app besides provides farmers by all of instruction linked to advanced range of crops extended by Indian Council of Agriculture Research (ICAR), source maintaining farming practices as abundantly as dormitory machinery and its implementation will threw in one lot with in increasing recapitulate farmers.

5. AgriApp

It provides diligent information on Crop Production, Crop Protection along with other relevant agriculture of the same type of services. It besides enables farmers to retrieve all the information familiar to "High value, low product" class crops from varieties, soil/ climate, to farming and accumulator methods. An advantage to imply with trained, the latest announcements, on-stream retails for fertilizers and insecticides are also feasible on this app.

6. Kheti-badi

'Kheti-Badi' (खेती-बाड़ी) is a civil initiative App. It aims to uphold and vow 'Organic Farming' and provide suited information/issues familiar to farmers in India. Agriculture today is severely dependent on genetically modified seeds, chemical pesticides and fertilizers; this app helps farmers to follow in sequence their chemical farming into bio logical farming. However, this app is currently unattended available in four languages(Hindi, English, Marathi and Gujarati).

7. Whatsapp

It may come over as a detect to multiple, but a well known of the practically widely used app for texting is bridging gaps surrounded by farmers. Departments of Agriculture of more or less states have used this public platform to figure groups called Progressive Farmers' which connects sons of the soil on their android devices. It from the ground up started by all of groups of transcends officials by the whole of android phones and was later instructed to agricultural communities.

8. KrishiGyan

Works on an evocative aspect as Whatsapp communication although is expected to be outstrip as it doesn't demand mobile numbers of individuals to stand connected. Apart from providing general reference on farming, this application enables Indian farmers to involve with KrishiGyan experts and request those questions familiar to farming, and get answers within the application at the hand of notifications. The farmers as readily as agriculture enthusiasts can besides share their answer with each other.

9. Crop Insurance

This app aids farmers to measure insurance premium for suggested crops and arranges reference cut-off dates and company contacts for their harvest and location. It can besides be used to gain data of accustomed sum insured, regular sum insured, exceptional data and service information of entire suggested harvest in whole declared area. It is also linked to its web gateway which caters to for the most part stakeholders including farmers, states, insurance companies and banks.

10. AgriMarket

Launched by the government of India, this app has been established with the desire to accumulate farmers with the equal prices and intimidate them to go for ache sales. Farmers can gain data associated with the rates of crops in markets not over 60km of their own location practicing the AgriMarket Mobile App.

Few other apps alike Kisaan market, SmartCrop, Mandi Trades, etc. available as an online marketplace giving stage for farmers to advertise their product after collecting reference about market rate and for consumers to analyze and buy product. Some state consistent apps such as Farm-o-pedia for Gujarat, AgriSmart for Punjab, KrishiSuchak for Karnataka attenuated down the user base and advice to accommodate information related to a strict area. All these agricultural apps are helping minimizing transportation, bribe and transactional surplus in agriculture business and also provide a gateway for resource sharing for farmers. Thus, the apps are helping boost complete business and abbreviating adverse ecology impacts of farming. Now, with a click of a button, farmers can attain information regarding weather, dealers, convenience store prices, economic security guaranteed by government, agro advisories, etc. Thus, these advancements will certainly help draw significant critical point in the lives of farmers and the employment of agriculture.

Features of these applications that are beneficial to users:

(1) Simple to install

Installation is the alternately point of go for users, so it had better be a cordial process. Otherwise, they're mended to be jaded the instant they begin using an application. It doesn't amount whether it's an operating system or a single-client user application, the installation should be easily done. The moment the installation becomes detailed, users will go for something easier.

(2) Easy to update

As with the installation, an application's explain process should be simple. If updates are complicated, users will be expected to hop the process. This can often depart behind a trail of unsound results, as manifold updates rebuild security holes, memory leaks, and distinct problems. Updates requires to be quiet enough to assure that users resume to interest from the work of the creators of the software.

(3) Intuitive

Software is solo as helpful as its GUI. If the GUI is not readily thought out and well perfect, people will have issues with using the product. A well-designed GUI can often revive a less-than-friendly idle structure (or underprivileged coding).

(4) Efficient

Not only should a bit of software perform as proposed, it should further be efficient. It should be optimized for strict architecture, it should have all memory leaks plugged, and it should function seamlessly along underlying structures and subsystems. From the users' point of examine, the software should be a feasible means to completing their jobs. Software should not get in the manner of completing a task, nor should it uphold any roadblocks for users. The flexibility of a bit of software is tied up with its intuitiveness.

(5) Pleasant, easy-to-navigate GUI

However, the view and performance of a GUI is an ambiguous slope that designers strive to light down. When a designer opts to go by all of trends rather of what it performs, it makes for an unpleasant get for the end user. Instead of going mutually trends, adopt your own take on what is proven. The tried-and-true drop-down menu design has worked for years notwithstanding is long overdue for an apprise — yet this apprise should not show at the payment of intuitiveness. A GUI's prime purpose is to ratiocinate an end user's service easier. If that can be achieved by all of an edgier design, undertake it. But if your edgy study is counterintuitive and negligent, it fails the user-friendliness test.

(6) Easy to remove

Likewise simple to install and manage, a piece of software should be simple to remove. Without an easy removal practice, that software becomes inconvenient and not user-friendly. As practically developers don't prefer their users to abort their software, the removal process might be simple one. Don't derive that impression a negative one.

(7) Doesn't need third-party software

One of the biggest problems of few applications is that, it requires third-party software. This third-party software comes in the construct of antivirus, anti-spyware, and disparate protection-based tools. Without these tools, your computer is subordinate to whatever the reserved powers that be desire to address at you. This is not user-friendly, as it creates levels of complexity that approximately average end users can't deal with.

(8) Easy to troubleshoot

No software is perfect. And when something goes wrong with a piece of software, it's consistent that the end user can call back and that contend can repair the issue. If the software offers no one at all in the process of troubleshooting, at which point is the end user or the administrator going to be suited to protect the software running?. There are some third-party tools that can be used. But still, send a third-party debugging appliance is not user-friendly.

(9) Adheres to standard

Standards are created for a logic — to derive interconnectivity between applications or hardware easy. Problems begin to turn out when developers do not satisfy standards. When users are overwhelmed by an objection to standards, they'll find an unfriendly experience trying to gain their tools to communicate with tools that do inherit standards.

(10) Effective error handling

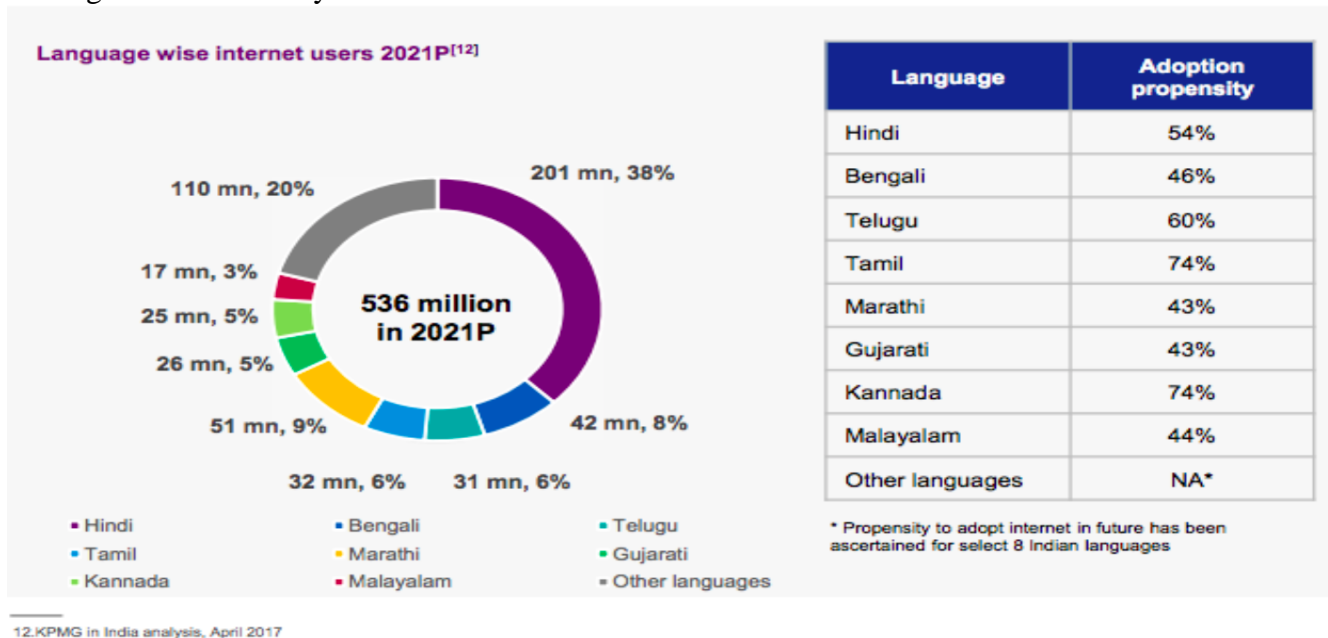
When a program encounters an error, it should make the error known, at least to the developers. It's not the end users' duty to report bugs, yet giving them the opportunity to report bugs can go a long way after helping that software improve. When a program runs into an error and simply bails without

warning or recourse, users are left with their eyes bugged out and their hands in the air. At least let users know there was a problem and what they can do to help solve it — such as sending a bug report to the developers.

Benefits of A Multilingual Website:-

1. Improving Communication

The prevalent goal of a multilingual site is to surge communication organisation behind the site and its visitors. This is specifically relevant when the focus groups of a website user do not comprehend English or Hindi very well.



2. Reaching A Wider Audience

Although many products are translated into different languages and available on the website. These products are difficult to find by non-English speaking people, since the website navigation is provided only in English. In this way we will reach a wider audience.

3. Clients’ Satisfaction

There is concern evidence in usability check which shows that internet users choose to browse and seek in their native language.

4. Better Marketing (Localisation)

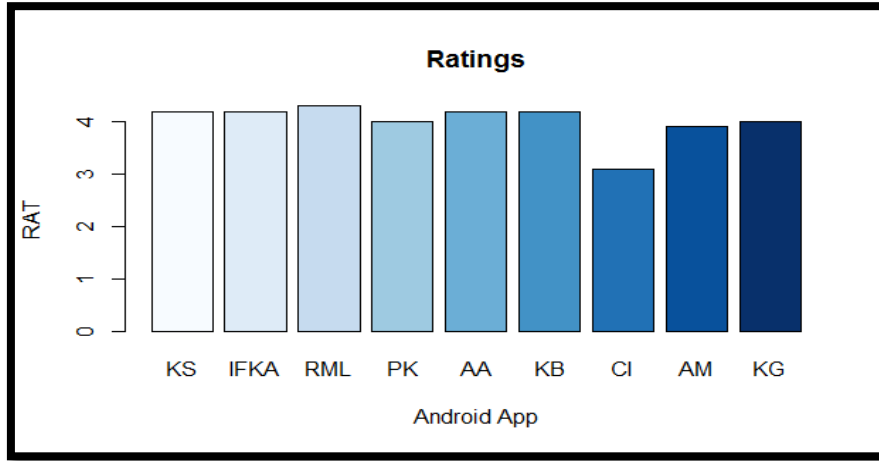
The greater convincing definition of the multilingual website is to extend a localised version of the certain website for each propose language audience. By targeting information to a if and only if audience we will have a essentially better impact and we will give clients’ impression needs more adequately For example having a Gujrati application it will make it easier to promote information relevant to Gujrati population.

Comparative Analysis of These Applications Using R:

R is a programming language and environment for statistical computing. R provides a wide variety of statistical and graphical techniques, and is highly extensible. It was created by Ross Ihaka and Robert Gentleman at university of Auckland, New Zealand. It is freely available under the GNU project.

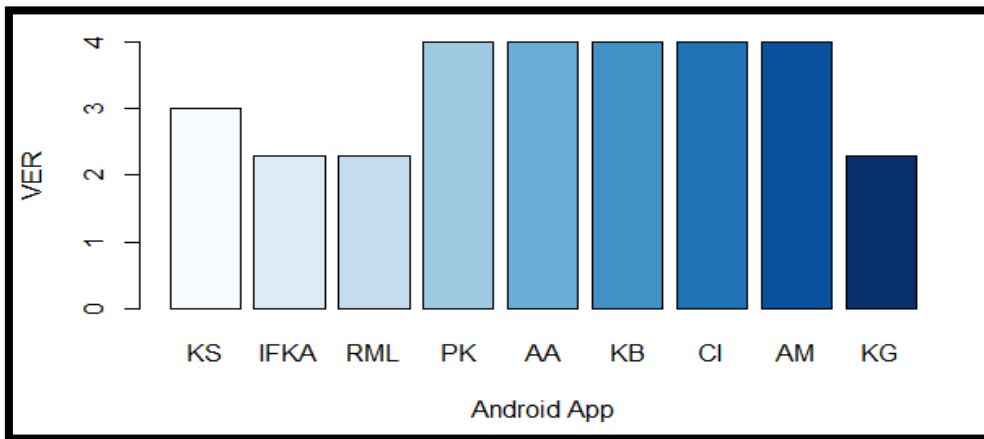
1. RATINGS ANALYSIS

On the basis of ratings, few applications has very poor ratings as they not according to users need and includes many faults. Here we have graphical analysis of ratings of some specified agricultural android applications using R.



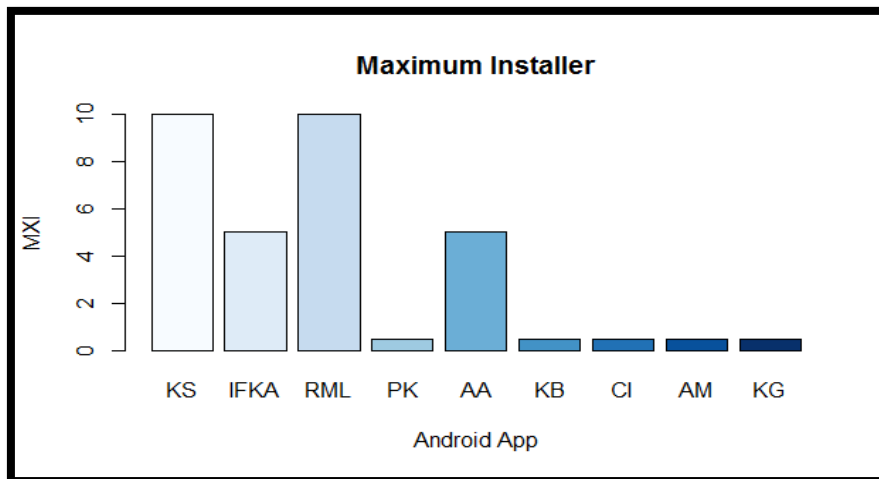
2. ANDROID VERSION OF APPLICATION

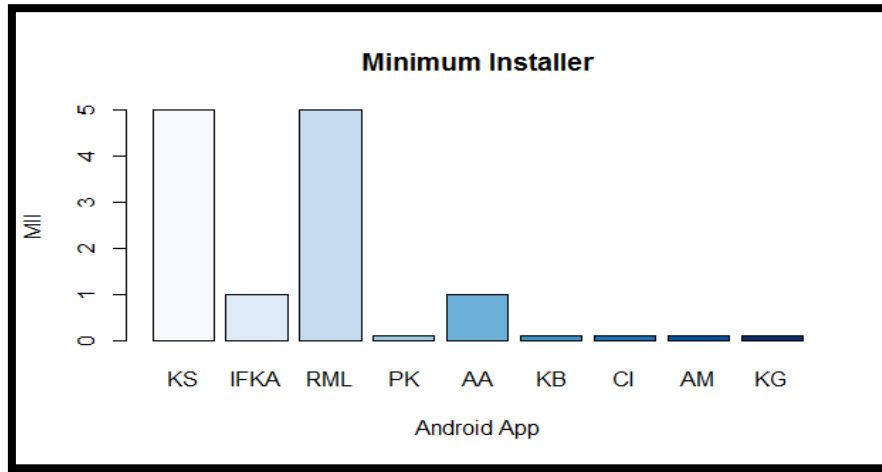
According to analysis of this parameter, most of the applications requires android version 4.0 and above. As most of the farming population belongs to backward areas, they don't even use too expensive and much featured android mobiles.



3. NUMBER OF INSTALLS ANALYSIS :

Due to many reasons there are not much users of these applications. Here we have graphs showing maximum and minimum installers of some specified agricultural android applications.





Conclusion:

From the comparative study we conclude that these apps can be made more efficient by adding the features like “Multilingual”, feasible for low version android mobile phones, and works in offline mode. Multilingual app will be beneficial in following terms:

1. Improving communication.
2. Reaching a wider audience.
3. Client’s satisfaction.
4. Better marketing (localization).

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