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SEMINAR REPORT

ON

Mobile Applications in Dairy Sector

Submitted to:
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I. Introduction

Livestock sector is an integral component of Indian Agriculture. It plays a predominant role in the Indian economy. It contributes about 4.11 per cent to India's GDP and 25.6 per cent towards total agriculture GDP. Dairy farming dominates the livestock sector and is a cardinal pillar of agriculture. It alone claims a major share by contributing 67 per cent to total livestock output. In India, the total livestock population is 535.78 million of which dairy population is 438.8 million, therefore, reaching millions of dairy farmers is a gigantic task for extension agents in countrylike India. (Source: National Accounts Statistics, 2019) Lacunae in extension activities are they are traditional in nature, not reaching the needy farmers in the right form and at the right time, inability to cover all the farmers. Farmers spend a lot of time and money to chase officials for seeking information, which affect their productivity (Singh and Misra, 2005). The biggest hurdle that the farmers facing is to have access to updated and timely information.

Use of ICTs is one such solution that can meet the information requirements of all the farmers. ICT enables one to overcome the limitations of physical distance and time lag in communication. Among the ICT tools mobile is gaining much popularity and importance because of ease to access and faster information dissemination. ICT has spread its wings through social media and mobile applications. ICT tools like Mobile Apps acts as Decision Support Tools (DST) and help users to make more effective decisions. In this digital era, technology driven smart mobile apps cater to the needs of the farmers. Dissemination of knowledge through appropriate emerging extension delivery methods can play an important role addressing farmer’s needs. Exposure to and use of ICT tools by dairy farmers will improve their knowledge.

The digital boom in the recent past has made India one of the largest users of internet and mobile telephony in the global map. India is 2nd largest user of Internet next to China with 560 million internet subscribers in 2018 (IAMAI, 2019). Rural Internet penetration has increased from 9 per cent in 2015 to 25 percent in 2018 with estimated 251 million internet users. India being a young country with around 200 million rural youths i.e; 41 % of total population in India, are motivated and attracted professionally to agriculture and allied fields. And therefore, there is significant positive indication of digital transformation among the rural masses predominantly represented by rural youth.

Penetration of Smart phones in Agriculture:

Among the technologies invented in the past few decades, smartphones have gained large market shares among various user sectors due to their usefulness, ease-of-use, and affordability. A smartphone is the device that is used to make telephone calls, having additional features and abilities like to send and receive e-mail, Wi-Fi and modem ability, internet access, Office documents, easy touch screen operation and most of all the capability to run custom software. The 'user interface' is one more important characteristic of smart phone. The number of smart phone users in India is expected to double to 859 million by 2022 from 468 million users in 2017 growing at a compound annual growth rate (CAGR) of 12.9% (ASSOCHAM-PwC,2019). In India, over the last decade, the markets in both have been flooded by mobile phones, tablets, and other pervasive devices. Depending on the availability of network 2G and 3G, the applications have helped the farming community at large to be connected, updated, prepared and profitable, (Vodafone, 2010). These mobile-based smart applications potentially deliver timely information to different subscribers such as farmers, traders and producers. The information delivered includes weather, rainfall, crop information, dairy information related to supplying inputs, balanced ration, disease diagnosis, Vaccination and Artificial Insemination (AI) schedule and dairy herd management. while some applications also help update the market data of commodity prices and facilitate the local buying /selling via handheld devices.

II.Objectives

1. To understand the concept of mobile applications and its services in dairy sector
2. To know the advantages and disadvantages of mobile applications in dairy sector
3. To get insights into features of various mobile applications in dairy sector
4. To review the relevant literature available / research studies

III.Definitions

Mobile phone:

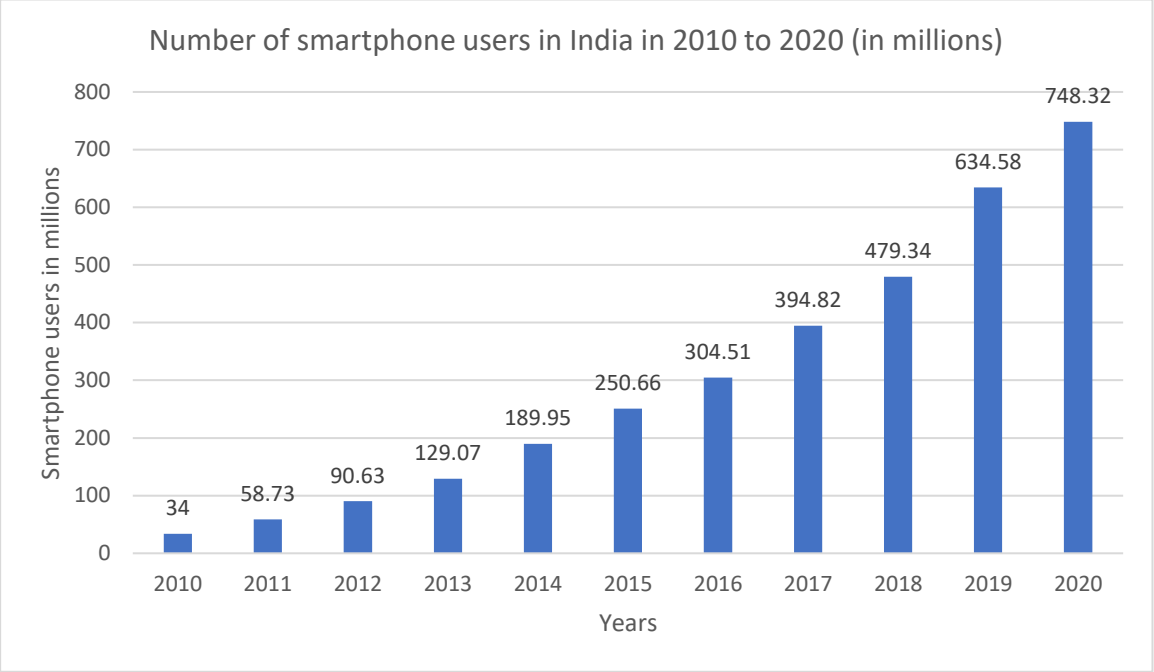
A mobile phone is a small wireless handheld device that allows users to make and receive calls, to send text messages and other features

Teledensity:

Telephone density or teledensity is defined as the number of telephone connections for every hundred individuals living within an area.

- ✓ It varies widely across the nations and also between urban and rural areas within a country. The tele density value of India is 88.51%.It is also used as an indicator to define the purchasing

power of the people of the country or specific region.



Mobile Application

A mobile application is a computer program or software application designed to run on small, wireless computing devices such as smart phones and tablets rather than on desktop and laptop computers.

IV.History of Mobile Applications

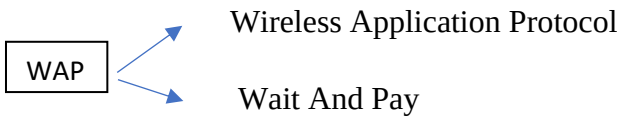
Mobile communication is so integrated into our lives that many people feel uncomfortable without a cell phone. Once upon a time, the most popular functions of phones were calling and sending texts. A smart phone is a multifunctional device that not only communicates, but helps to learn, earn, and have fun. This is made possible by the development of mobile applications. Mobile applications date back to the end of the twentieth century. Typically, they were small arcade games, ring tone editors, calculators, calendars, and so forth. The beginning of the new millennium saw a rapid market evolution of mobile content and applications. Operating systems for smart phones (Windows Mobile, Symbian, RIM, Android, Mac iOS), are open to development of third-party software, unlike conventional programming environment of standard cell phones. Manufacturers tried to make their products more attractive for the customers by introducing more and more applications. Mobile users started demanding more choice, more opportunities to customize their phones, and more functionality. This is made

possible by the development of mobile applications. Soon mobile phones were more than just a novelty. These phones changed the way people thought about communication. Customers began pushing for more features and more games. But mobile manufacturers lack the resources to build every application user wanted. Even direct phone access to the Internet didn't scale well in the initial days to the Internet didn't scale well in the initial days.

Alternative

WAP is the answer

The Wireless Application Protocol (WAP) standard was developed to address these concerns. WAP was a stripped-down version of HTTP, which is the basic protocol of the World Wide Web. WAP browsers were designed to run within the memory and bandwidth constraints of the phone. Third-party WAP sites served up pages written in a markup language called Wireless Markup Language (WML). The pages were much simpler in design than the WWW pages. WAP standard was developed in 1999. It was a stripped-down version of HTTP, which is the basic protocol of the World Wide Web. WAP browsers were designed to run within the memory and bandwidth constraints of the phone. The WAP solution was great for mobile operators. They could provide a custom WAP portal directing their subscribers to the content they wanted. Developers and content providers couldn't deliver everything what users wanted, except in a limited way. Commercializing WAP applications was difficult, because there was no built-in billing mechanism. Payment was through various premium-priced delivery mechanisms such as Short Message Service (SMS) and Multimedia Messaging Service (MMS). Users browsed a WAP site and requested a specific item, then fill a simple order form with their phone number and the model of their phone. It was up to the content provider to deliver an image or audio file compatible with the phone.



Solution

Mobile Application Platforms:

A variety of different proprietary platforms emerged and developers are still actively creating applications for them. One of the first was the Palm OS (now Garnet OS) and RIM Blackberry OS. Sun Micro systems popular Java platform became Java Micro Edition (Java ME).

Qualcomm developed its Binary Runtime Environment for Wireless (BREW). Symbian OS was developed by Nokia, Sony Ericsson, Motorola, and Samsung. The Apple iPhone iOS joined the ranks in 2007. Google's Android came along a year later.

Mobile Application Platform:

Mobile application platform is a suite of software tools used for designing, creating and maintaining mobile applications. Apps are available through application distribution platforms such as Apple App store, Google Play store, Windows Phone store and BlackBerry app world etc

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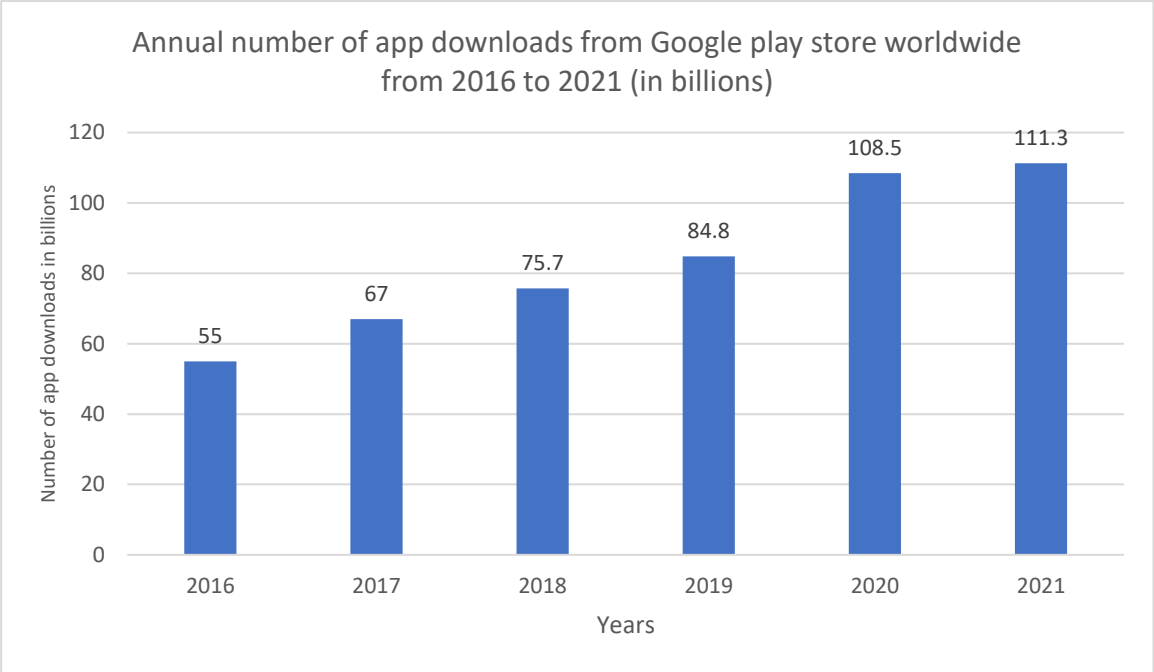


V.Mobile phones and its applications in dairy sector

- Among all the ICT tools, mobile phone has emerged as one of the widely accepted and adopted instruments for delivery of agriculture and allied sectors related information.
- Mobile applications is a new phenomenon in seeking dairy related information related to supplying inputs, balanced ration, disease diagnosis, management and marketing of dairy products etc.
- Mittal and Tripathi (2009) reported the key role played by mobiles in lowering transaction costs and raising the income levels of farmers, by efficiently addressing agricultural information requirements.

VI. Advantages of mobile apps in dairy sector

- An effective ICT tool for information dissemination.
- Easy to access information through mobile, affordability, instant and convenient service delivery.
- Information on various dairy related activities are available at any point of time on through various apps.
- The market connectivity is also improved with the visibility of the potential buyers and sellers in the locality with an opportunity to develop direct contacts.
- The available information is compiled and very well organized that farmer does not have to waste time for searching the information.

VII.Disadvantages of mobile apps in dairy sector

- Lack of e-illiteracy among farmers
- Wherever the information is dynamic in nature, like market prices of various products, advisory services, the mobile app requires internet connectivity to fetch the real-time data.
- Diversity in languages, even if the best applications do not support regional languages, it reduces the acceptability and popularity among farmers
- At times, due to network issues and technical glitches, farmers could not get the updated and complete information.

VIII.Classification of Dairy Apps based on its Utility

- Apps related to Balanced ration and cattle feed
- Apps related to Health and Disease diagnosis
- Apps related to Dairy Management activities
- Apps related to Vaccination and Artificial Insemination in Dairy animals
- Dairy products Marketing Apps
- Dairy Apps Providing Multiple Services

Apps related to Balanced ration and cattle feed:

Some of the apps under this category are Cattle feed formulation app, Pashu Poshan, Calf-Heifer ration formulator, Fodder Kannada and Dairy cattle ration formulator app.

Pashu Poshan (Ration Balancer) app

- ✓ The mobile application, named 'Pashu Poshan', was launched by National Dairy Development Board (NDDB) in association with the Union Agriculture Minister Radha Mohan Singh.
- ✓ It is a mobile application that will recommend balanced diet for cows and buffaloes to boost farmers income by raising milk yield and cutting feed cost.
- ✓ The application, which will be available on both web and android platforms, can be accessed by registering on the INAPH portal (http://inaph.Nddb.Coop).
- ✓ To use this application, the farmer needs to provide complete animal profile, which includes breed, age, animal identification number, milk production quantity and fat content in milk.
- ✓ In a press meet, NDDB Chairman told reporters that as a part of their experimental survey

  "They have already collected profiles of 6 lakh milch animals in 40,000 villages and farmers feedback about the balanced feed and fodder for their cattle.

  "App resulted in reducing the feed cost by Rs. 5-15 per animal per day and an average increase in milk production by 300 ml per animal per day".

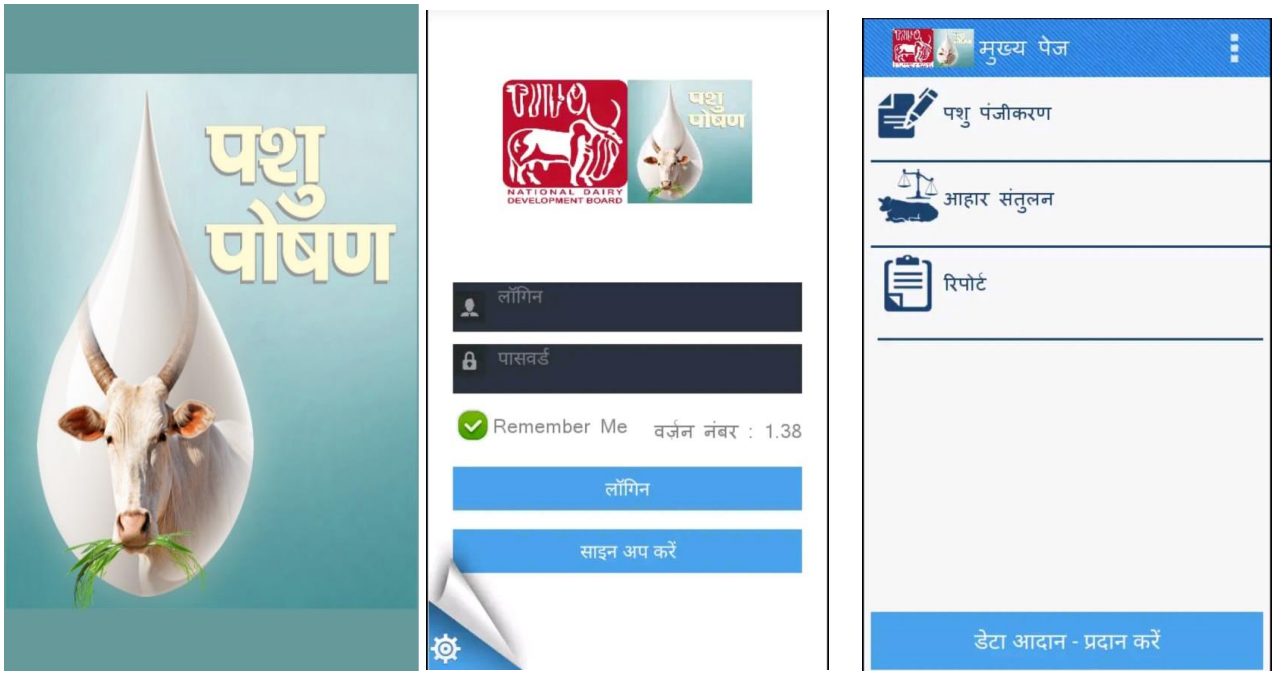


Fig: Pashu Poshan app

Dairy Apps related to Health and Disease diagnosis:

Some of the apps under this category are IVRI-Disease Control app, IVRI-Veterinary Clinical Care app, IVRI-Animal Reproduction app, Farm Animal Zoonotic diseases and Parasite Control in dairy animals.

IVRI – Disease control App:

IVRI –Disease control app is designed and developed by ICAR-IVRI,Izatnagar and IASRI, New Delhi about important diseases of life stock, poultry and dogs. In addition to theory, it also provides pictures depicting the symptoms for identification, diagnosis, treatment and control.

- ✓ This app provides information about the
- ✓ Exotic and emerging diseases
- ✓ Various diagnostic facilities offered by ICAR-IVRI
- ✓ Various diagnostic laboratories in India
- ✓ Important organizations involved in Disease Control and Government schemes and guidelines for Disease Control in India.

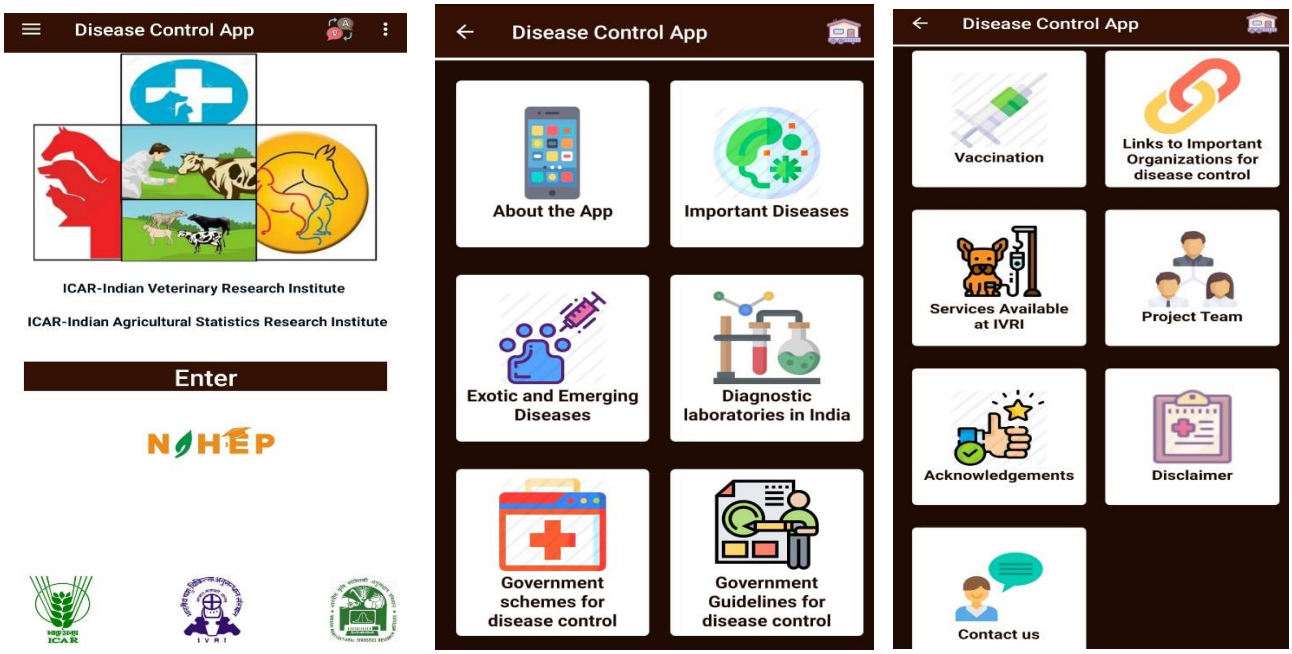


Fig: IVRI-Disease Control app

Apps related to Dairy Management activities:

Some of the apps under this category are IVRI-Dairy Manager app, Heritage VET+, Dairy management system, NDDB AGR, IVRI-Biosecurity and Biosafety (Jaiv Suraksha) app, ANGRAU Pashu poshan and Dairy husbandry practices app.

IVRI – Dairy Manager:

- ✓ IVRI-Diary manager app is designed and developed by ICAR-IVRI, Izatnagar , NDRI -Karnal and IASRI, New Delhi .
- ✓ This is an educational app providing information on
  - o Breeds and housing
  - o Feeding
  - o Calf and general management
  - o Clean milk production
  - o Animal identification and Vices in dairy animals
- ✓ There are educational videos on clean milk production on neonatal calf management for enhancing the knowledge and skills of personnel involved in dairy farming.

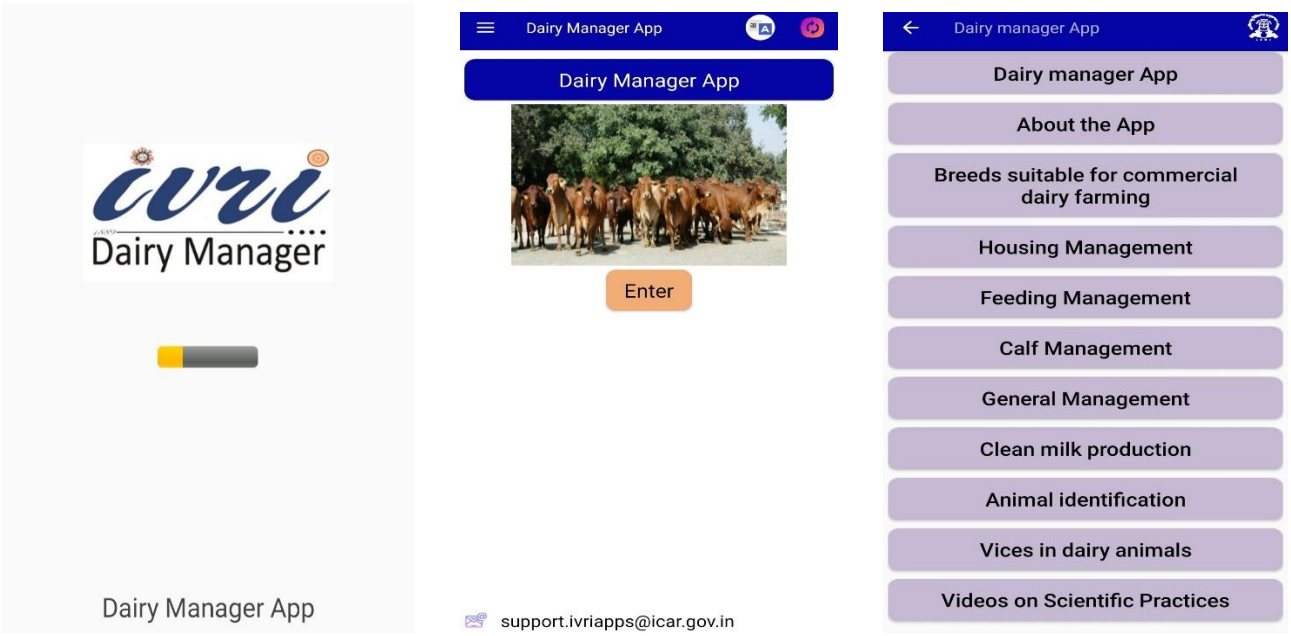


Fig: IVRI-Dairy Manager app

Apps related to Vaccination and Artificial Insemination in Dairy animals:

Some of the apps under this category are IVRI-Vaccination guide app and IVRI-Artificial Insemination (AI) app.

✓ **IVRI-Vaccination Guide app**:

This app is designed and developed by ICAR-IVRI,Izatnagar and IASRI, New Delhi to educate about vaccination in domestic animals, poultry and pets. This app provides basic information about vaccination in livestock, poultry and pets. In addition to that it also provides specific information about vaccination related to all major bacterial and viral diseases.

✓ For each of the disease, following information is provided

- The causative agent
- Types of vaccine available
- Serotype used for the vaccines
- Vaccination schedule
- Commercially available vaccines
- Government and private institutions involved in vaccine production in country.

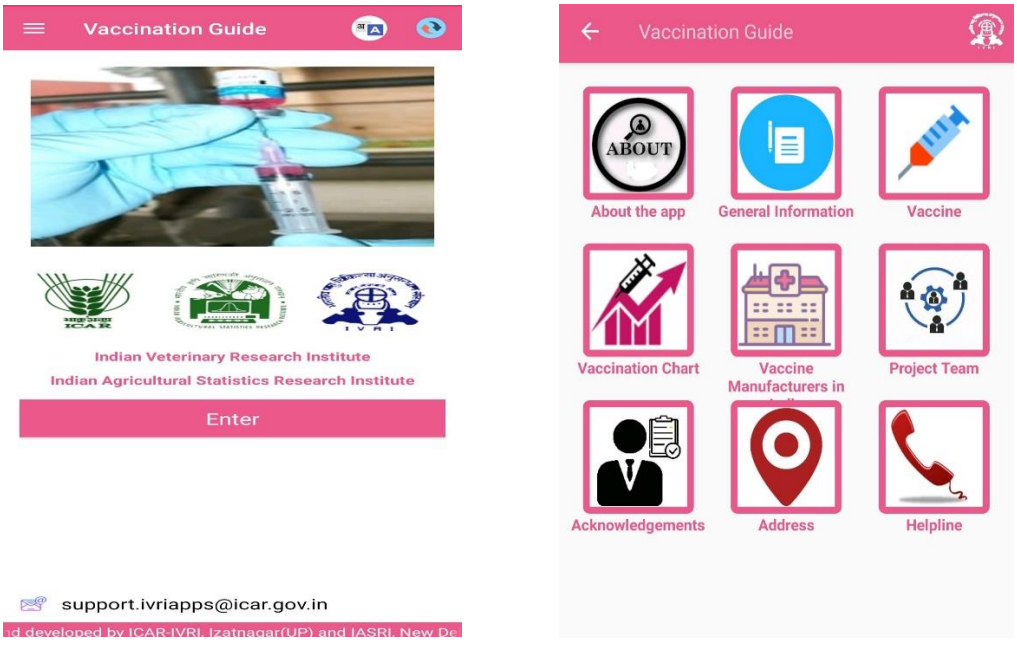


Fig: IVRI-Vaccination guide app

Dairy products Marketing Apps:

Some of the apps under this category are Akshaya kalpa organic milk, Country delight app, Mathruka organics, Amul farmers app, Meri dairy-milk software, Dairy mart, Shimul dealer and Milkosoft DKMUL.

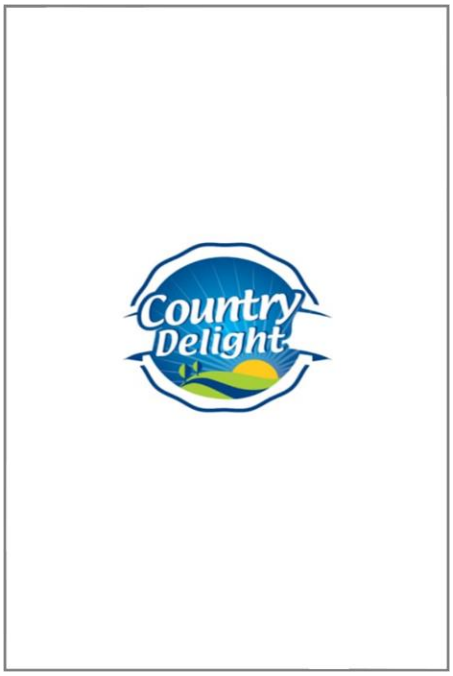
Country Delight app:

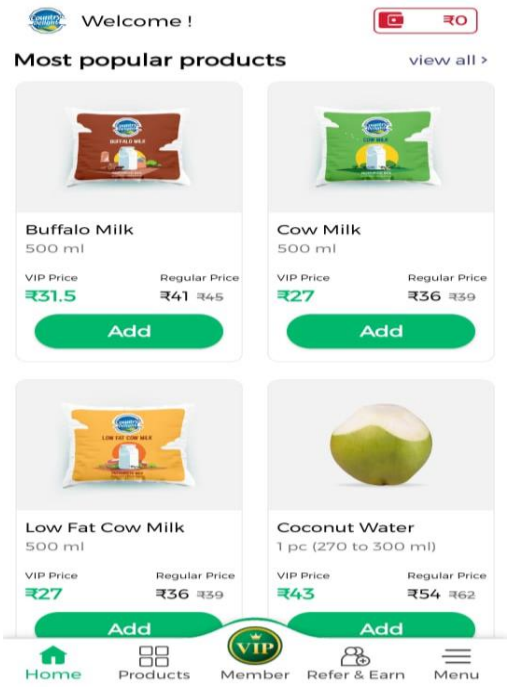
Country Delight is an initiative to disrupt India's online milk & grocery delivery market. Order placements take place through mobile app that aids convenient online milk delivery. With an focus on quality & testing, they test milk on more than 26 parameters by an FSSAI approved lab and deliver it under the best cold chain right up to your doorstep within 24-36 hours of milking. Currently, it serves in Delhi, Gurgaon, Mumbai, Pune, Bangalore, Noida, Jaipur, Chennai and Hyderabad.

- ✓ Country Delight Products:

  Farm-fresh milk, dairy products etc.

- ✓ Their milk is sourced directly from the farmers and delivered to you without any intervention of middleman.





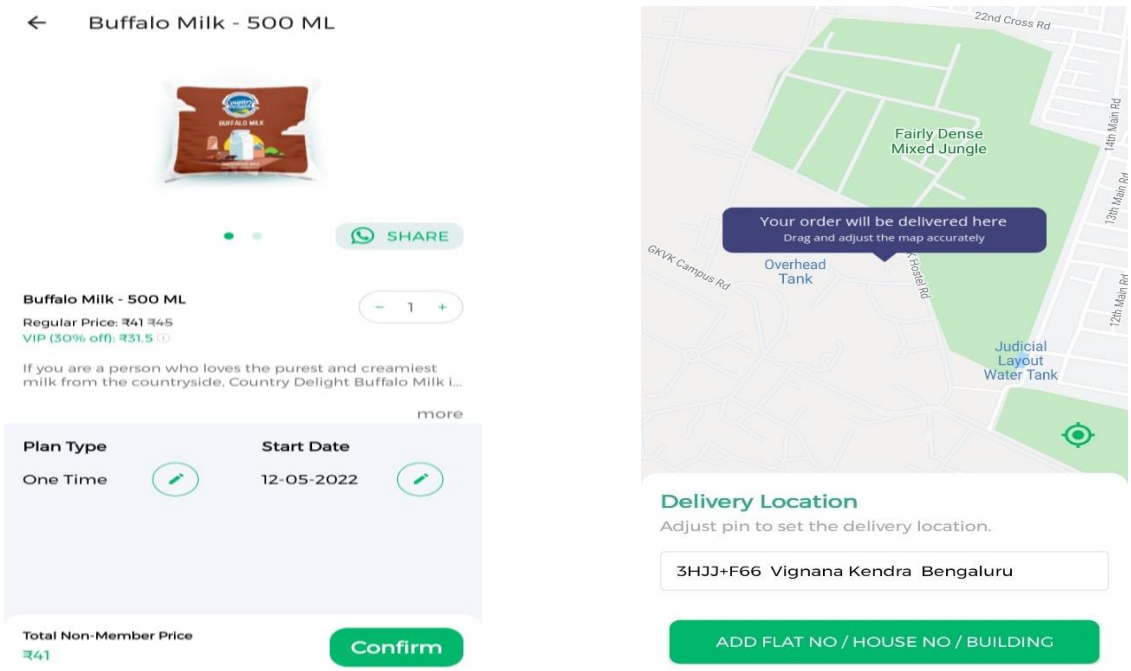


Fig: Country delight app

✓ **Key Features of the App:**

1-Subscribe and forget: Want to avoid the hassle of ordering every day? Set up delivery frequency of your favorite essentials - daily, alternative days or selected days.
2- Manage your orders and subscription: Order/add items by 10: 00 pm and get milk delivery the next morning by 5:00 - 8:00 am.

3- Easy Recharge: Recharge your wallet through Debit Card, Credit Card, Net Banking, PaytmWallet,BharatUPI/GooglePay/PhonePay.
4- Cashback and offers: Select from personalized recharge packs and get exclusive cashbacks and offers.

5- Easy View Bill: Track your monthly bill, a summary of your monthly consumption and detailed delivery of each day.

✓ **Dairy Apps Providing Multiple Services:**

Some of the apps under this category are cattle expert system, My dairy farm records, Livestock manager, Paadi parisrama dairy farming telugu, Ezee dairy, Dairy Kannada, Dairy cattle, Dairy farm, Farm 365, My cattle manager-farm app, Vac app-livestock management, Farm manager and analyzer, Jaguza livestock app.

Dairy Kannada app:

This is an app designed and developed by Jaya Laxmi Agro Tech Pvt Ltd in association with Karnataka Veterinary Animal and Fisheries sciences University (Bidar) and Department of VAHE, Veterinary College (Hebbal, Bengaluru) under ICAR Extra Mural Project 2016-17.

- ✓ This app is equipped with decision support system with Kannada language support. App is user friendly in nature with audio video content. This is designed to deliver the information mainly to the dairy farmers by breaking literacy barrier.

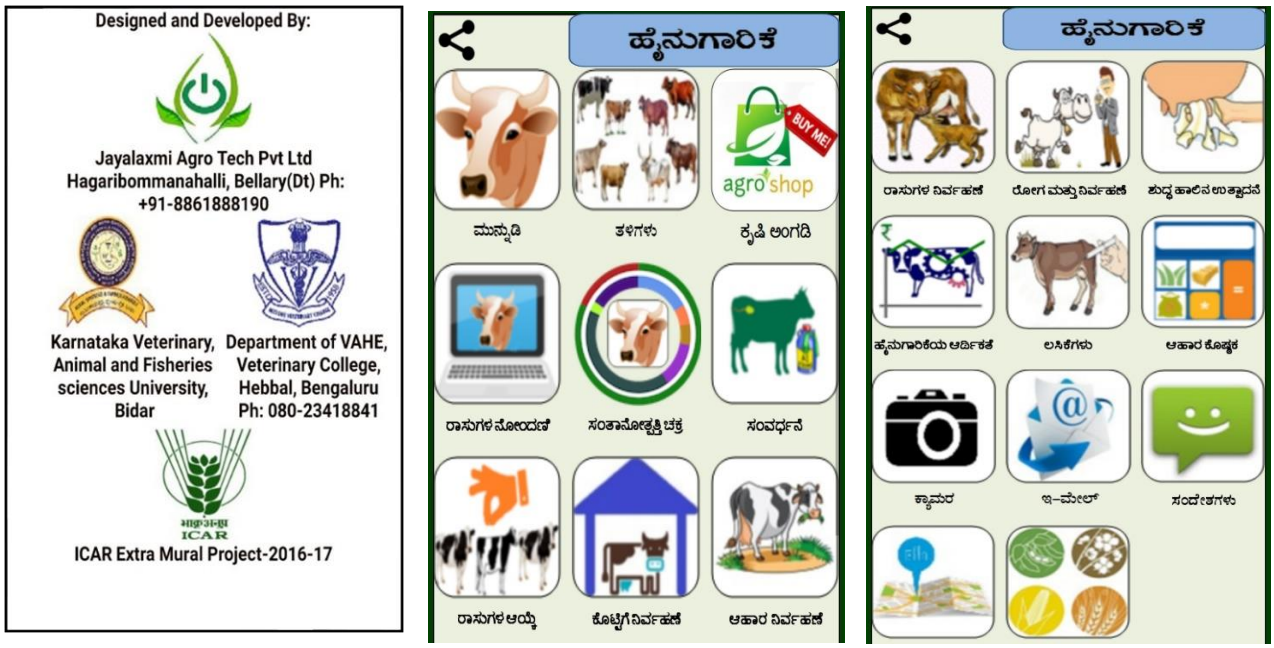


Fig:Dairy Kannada app

IX.Strategies for effective utilization of mobile apps in dairy sector:

- ✓ **<u>Extension system</u>**
- ✓ Providing training programs to farmers for improving digital literacy.
- ✓ Integrating mobile apps while disseminating information.
- ✓ **<u>Data service providers</u>**
- ✓ Special internet packs for farmers
- ✓ Establishing more towers especially in rural areas for good internet connectivity.
- ✓ **<u>Government</u>**
- ✓ Providing separate budget for content development.
- ✓ Facilitating subsidy in purchasing mobile phones.
- ✓ Service oriented apps can be developed from public sector apart from co-operatives and institutions.

X. Research Studies

Study 1: Development of a Need Based IVRI-Dairy Manager App and its Perceived Utility

Sood *et al.*, (2020)

Research Area:

Study was conducted purposely in Punjab state as it accounts for the highest milk productivity of 12.42 kg/day for exotic and crossbred cattle and 8.21 kg/day for buffalo in India (BAHF, 2017). Two high productivity regions of Ludhiana and Chandigarh were selected.

Methodology:

The sample of the study was commercial dairy farmers who were categorized into two groups having herd size of 25-50 animals and more than 50 animals respectively. Total of 60 respondents, 30 from each group of commercial dairy farmers were selected. Ex post facto research design was used. Snowball sampling technique was used as no list of commercial dairy farmers was available. Data was collected through pretested semi-structured interview schedule.

Results: Table 1: Distribution of respondents according to the perceived utility of IVRI-Dairy Manager App

Perceived utility	Dairy farmers (n=60)			
	Good	Fair	Poor	MS
Usefulness	56 (93.3)	4 (6.7)	0 (0.00)	2.93
User friendliness	46 (76.6)	14 (23.3)	0 (0.0)	2.76
Attractiveness	48 (80.00)	12 (20.00)	0 (0.0)	2.80
Compatibility	52 (86.66)	0 (0.00)	8 (13.33)	2.73
Complete coverage of content	50 (83.33)	8 (13.33)	2 (3.33)	2.80
Soundness of visuals	40 (66.66)	20 (33.33)	0 (0.0)	2.66
Credibility	54 (90.00)	6 (10.0)	0 (0.0)	2.90
Average Perceived Utility Score	19.58			

Table 2: Distribution of respondents according to information needs on dairy management

Kind of information needed	N = 60			
	Most Needed	Needed	Least Needed	Mean Score
Scientific way of shed construction	15 (25.00)	22 (36.66)	23 (38.33)	**1.87**
Breed Selection	7 (11.66)	20 (33.33)	33 (55.00)	**1.56**
Infertility problems	7 (11.66)	22 (36.66)	31 (51.66)	**1.59**
Preparation of balanced ration	11 (18.88)	11 (18.88)	38 (63.33)	**1.54**
Care of cow/ buffalo	9 (15.00)	16 (26.66)	35 (58.33)	**1.56**
Care of new born calf	14 (23.33)	28 (46.66)	18 (30.00)	**1.93**
Clean milk production	24 (40.00)	25 (41.66)	11 (18.33)	**2.21**
Common cattle/buffalo diseases	18 (30.00)	21 (35.00)	21 (35.00)	**1.95**
Vaccination schedule	9 (15.00)	14 (23.33)	37 (61.66)	**1.53**
Prevention and control of diseases	10 (16.66)	11 (18.33)	39 (65.00)	**1.51**
Government schemes	10 (16.66)	20 (33.33)	30 (30.00)	**1.66**

Conclusion:

The IVRI- Dairy Manager app was developed after assessing the information needs and adoption gap in the scientific management practices of the dairy farmers. It had received a good user rating of 4.7 out of 5.0 and had crossed more than 5000 downloads in a short period of time. On studying the perceived utility of the app, it was revealed that the perceived utility of app was good with a mean score of 19.58. Among the seven components, mean score of 'usefulness' was high with 2.93, followed by credibility (2.90), complete coverage of content and attractiveness (2.80), user friendliness (2.76), compatibility (2.73) and soundness of visuals (2.66). Among the information needs on dairy management, majority of the respondents felt they need more information regarding

clean milk production with high means score of 2.21, followed by information on common cattle / buffalo diseases etc.

Study 2: Exploring the Perceived Feedback of Commercial Dairy Farmers about Effectiveness of Android Mobile Apps 'Brucellosis Advisor App'

Verma *et al.*, (2019)

Research Area:

The study was conducted in Haryana and Punjab state. Each state comprises 22 districts. Out of them, six districts (3 from each state) were selected based on highest cattle population.

Methodology:

Among these selected districts, 20commercial dairy farmers were selected from each district based on snowball sampling method. Pooling which made a total of 120 respondents that were interviewed to get primary information on brucellosis with the help of well-structured interview schedule. Out of which only sixty respondents were randomly chosen, ten from each selected district to explore the perceived feedback of the commercial dairy farmers

Results:

Table 1: Exploring the Perceived Feedback of Commercial Dairy Farmers about Effectiveness of Android Mobile Apps 'Brucellosis Advisor App'

Sl. No.	Component of application	Highly Satisfied	Satisfied	Least Satisfied	Weighted Mean Score (%)	Rank
1.	Engagement	43 (71.67)	17 (28.33)	0 (0.00)	90.56	I
2.	Functionality	42 (70.00)	14 (23.33)	4 (6.67)	87.78	II
3.	Aesthetic Value	32 (53.34)	26 (43.33)	2 (3.33)	83.33	IV
4.	Information Function	39 (65.00)	18 (30.00)	3 (5.00)	86.67	III
5.	Subjective Quality	22 (36.67)	32 (53.33)	6 (10.00)	75.56	V

Conclusion:

As per the perceived feedback of commercial dairy farmers about the effectiveness of different components of Brucellosis advisor app, engagement component was ranked first in the satisfaction continuum with weighted mean score of 90.56, followed by functionality (87.78), information component (86.67), aesthetic value (83.33) and subjective quality aspect (75.56).

Study 3: Attitude, knowledge and constraints associated with the use of mobile phone applications by farmers in North-West Nigeria.

Abdullahi *et al.*, (2021)

Research Area:

This study was carried out in the North-Western region of Nigeria. The zone comprises seven states namely: Kano, Kaduna, Katsina, Sokoto, Zamfara, Jigawa and Kebbi States

Methodology:

A multi-stage sampling procedure technique was employed in the selection of farmers for data collection. The first stage involved a purposive selection of three states namely, Katsina, Kano and Kaduna. The second stage of the sampling procedure was the random selection of an agricultural zone in each of the selected states. The third stage of the sampling involved the random selection of three local government areas from each of the agricultural zone. The fourth stage of the sampling involved random selection of fifteen communities from the selected Local Government Areas. ROASOFT sample size calculator was used to select 385 farmers from the farming households across fifteen communities. Data for the study were collected using a structured, pre-tested questionnaire.

Results: Table 3 Incidence and Severity of constraints to the use of apps by respondent

Constraints	(%) Yes	(%) No	Very severe	Severe	Undecided	Not severe	Mean (SD)	Remark
Poor network	298 (77.4)	87 (22.4)	61 (15.8)	196 (50.9	87 (22.6)	41 (10.7)	1.6 (1.00)	Very serious
Poor power supply	226 (69.1)	159 (30.1)	115 (29.9)	103 (26.8)	159 (41.3)	3 (0.8)	1.7 (1.20)	Very serious
No power supply	21 (5.5)	364 (94.5)	6 (1.6)	11 (2.9)	364 (94.6)	4 (1)	0.2 (0.63)	Not serious
High cost of charging battery	132 (34.3)	253 (65.7)	23 (6)	51 (13.3)	253 (65.7)	58 (15.1)	0.5 (0.94)	Not serious
Apps are too complex	237 (61.6)	148 (38.4)	38 (9.9)	175 (45.5)	148 (38.4)	0 (0)	1.3 (1.08)	Not serious
Inability to operate apps	216 (56.1)	169 (43.9)	21 (5.5)	195 (50.7)	169 (43.9)	24 (6.2)	1.2 (1.06)	Not serious
No access to apps	126 (32.7)	259 (67.3)	15 (3.9)	90 (23.4)	259 (67.3)	21 (5.5)	0.7 (0.97)	Not serious
Lack of access to credit	230 (60)	155 (40)	56 (14.6)	155 (40.3)	155 (40.3)	19 (4.9)	1.3 (1.14)	Not serious
Lack of access to education	249 (65)	136 (35)	52 (13.5)	180 (46.8)	136 (35.3)	17 (4.4)	1.4 (1.11)	Not serious
Lack of access to extension	194 (50.4)	191 (49.6)	60 (15.6)	127 (33)	191 (49.6)	7 (1.8)	1.2 (1.19)	Not serious
Lack of access to network	40 (10.4)	345 (89.6)	1 (0.3)	16 (4.2)	345 (89.6)	23 (6)	0.1 (0.43)	Not serious
Lack of technical knowhow	280 (73)	105 (27)	56 (14.6)	205 (53.2)	105 (27.3)	19 (4.9)	1.6 (1.04)	Not serious
Lack of information from radio	174 (45)	211 (55)	23 (6)	72 (18.7)	211 (54.8)	79 (20.5)	0.6 (0.98)	Not serious
Lack of awareness of apps	299 (77.7)	86 (22.3)	42 (10.9)	228 (59.2)	86 (22.3)	29 (7.5)	1.6 (0.95)	Very serious
Cost of training is high	169 (43.9)	216 (56.1)	25 (6.5)	53 (13.8)	216 (56.1)	91 (23.6)	0.7 (0.88)	Not serious
Lack of social interaction	215 (55.8)	170 (44.2)	29 (7.5)	102 (26.5)	170 (44.2)	84 (21.8)	1.2 (1.09)	Not serious
Lack of willingness to learn	170 (44)	215 (56)	21 (5.5)	100 (26)	215 (55.8)	49 (12.7)	0.8 (1.02)	Not serious
Lack of demonstration of app use	244 (63.4)	141 (36.6)	44 (11.4)	178 (46.2)	141 (36.6)	22 (5.7)	1.3 (1.09)	Not serious
Lack of app update technology	111 (28.8)	274 (71.2)	13 (3.4)	53 (13.8)	274 (71.2)	45 (11.7)	0.5 (0.81)	Not serious
Lack of encouragement	300 (77.9)	85 (22.1)	0 (0)	275 (71.4)	85 (22.1)	25 (6.5)	1.5 (0.82)	Serious
Problem of updating apps	96 (24.9)	289 (75.1)	14 (3.6)	43 (11.2)	289 (75.1)	39 (10.1)	0.5 (0.84)	Not serious
High cost of apps	185 (48.1)	200 (51.9)	27 (7)	57 (14.8)	200 (52)	101 (26.2)	0.7 (0.84)	Not serious
High cost of phones	300 (77.9)	85 (22.1)	84 (21.8)	204 (53)	85 (22.1)	12 (3.1)	1.8 (1.03)	Very serious
Complexity in operating phones &apps	279 (72.5)	106 (27.5)	60 (15.6)	192 (49.9)	106 (27.5)	27 (7)	1.5 (1.06)	Serious
Socio-religious values	171 (44.4)	214 (55.6)	14 (3.6)	29 (7.5)	214 (55.6)	128 (33.2)	0.5 (0.70)	Not serious
Customary values	184 (47.8)	201 (52.2)	18 (4.7)	25 (6.5)	201 (52.2)	141 (36.6)	0.6 (0.68)	Not serious
Political influence	174 (45.2)	211 (54.8)	8 (2.1)	29 (7.5)	211 (54.8)	137 (35.6)	0.4 (0.71)	Not serious
Actions of association/grp	57 (14.8)	328 (85.2)	2 (0.5)	20 (5.2)	328 (85.2)	35 (9.1)	0.2 (0.53)	Not serious
Problem of acceptance by local leadership	224 (58.2)	161 (41.8)	12 (3.1)	128 (33.2)	161 (41.8)	84 (21.8)	0.6 (0.83)	Not serious

Findings of the study:

The study revealed the severity of the constraints in using mobile applications as perceived by the farmers in North-West Nigeria. Among the several constraints listed, farmers perceived poor network (mean-1.6, S.D-1.00), poor power supply(mean-1.7,S.D-1.20),lack of awareness of apps(mean-1.6,S.D-0.95) and high cost of phones(mean-1.8,S.D-1.03) as very serious constraints. Lack of encouragement (mean-1.5, S.D-0.82) and complexity in operating phones and apps (mean-1.5, S.D-1.06) are perceived as serious constraints.

XI. Final Conclusion

Mobile technology is transforming access to information among farming masses. Emergence of digital revolution and internet penetration in the rural areas has enthralled farmers to access to new apps that would keep pace with the modern technology. A number of new apps are emerging in response to new requirements and challenges in agriculture and allied sector. As the number of apps continue to increase, it is important to be selective in choosing the app, review and ensure that the app provides credible and current information and meets the farmers requirements. Hence, mobile app should aim at holistic rural development and forge closer links between farmers and consumers through gender-sensitive technology, training and capacity building of the farmers through technology-driven platforms for income generation activities. Further few more apps need to be explored on the requirements of farmers.

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XIII.Discussion

1Q. Which is the state having highest and least Tele-density value in India?

Ans: Among states the tele-density value is highest in Himachal Pradesh (152.14). If we also consider union territories Delhi stands top with tele-density value 275.13. The state with least tele-density value is Bihar (53.08).

2Q. What is the difference between Tele-density and Mobi-density?

Ans: In the initial days, tele-density means number of fixed (landline) telephone connections per 100 people in a specific geographical area. Mobi-density can be defined as number of mobile connections conections per 100 people in a specific geographical area. But now tele-density includes both wired and wireless connections per 100 people in a specific geographical area. TRAI releases tele-density value in India.

3Q. Is mobile app development a static process or dynamic process?

Ans: A mobile app development is a dynamic process because once the app is developed it will not serve the purpose for lifetime. It has to be updated both in technical aspects i.e,it should have updates to meet the latest android versions and mobile models and content aspects i.e, the content need to be updated frequently based on the requirements of the users.

4Q. Which state is having highest dairy population and in which state more researches on dairy have been conducted?

Ans: Uttar Pradesh is highest in dairy population. More research studies in dairy sector have been conducted in Punjab and Haryana states.

5Q. To what extent mobile apps are reaching dairy farmers or dairy professionals?

Ans: One way to know the reach of apps among the people is number of app downloads count in various mobile application platforms such as Google play store, App store etc. For example Amul farmers app has 500k+ downloads in google play store.

6Q. Any research studies conducted on dairy mobile apps in Karnataka?

Ans: In 2019, a study has been conducted in dairy science college, Hebbal with title Sustainability of mobile application (Dairy Kannada) in dissemination of dairy related information conducted by Pavithra.

7Q. Shimul dealer app is operating in which districts of Karnataka?

Ans: Shimul dealer app for placing and managing daily orders of milk and milk products for Shivamogga, Davanagere and Chitradurga co-operative milk producers societies union limited.

8Q. What are the reasons for time gap between app development and app usage by the farmers?

Ans: Lack of awareness about apps that are available, Lack of e-literacy among farmers, Many of the farmers till date do not use smart phones, most of the farmers do not perceive apps as credible source for obtaining information.

UNIVERSITY OF AGRICULTURAL SCIENCBANGALORE
DEPARTMENT OF AGRICULTURAL EXTENSION
COLLEGE OF AGRICULTURE, GKVK, BENGALURU - 560 065

Name	:	Chinni Venkata Sai Bharath	Venue	:	Dwarakinath Hall
Class	:	Sr. M.Sc	Time	:	9:15 A.M
ID. No.	:	PAMB0144	Date	:	30-04-2022

Seminar-I

Mobile Applications in Dairy Sector

Synopsis

Livestock sector is an integral component of Indian Agriculture. It plays a predominant role in the Indian economy. It contributes about 4.11 per cent to India's GDP and 25.6 per cent towards total agriculture GDP. Dairy farming dominates the livestock sector and is a cardinal pillar of agriculture. It alone claims a major share by contributing 67 per cent to total livestock output.In India, the total livestock population is 535.78 million, of which dairy population accounts for 438.8 million, therefore reaching the millions of dairy farmers is a gigantic task in a country like India (National Accounts Statistics, 2019).The extension activities in general, are traditional in nature and suffer from a various drawbacks like not reaching the needy farmers in the right form, at the right time and inability to cover all the farmers. In this context, ICT in Indian agriculture enables the dissemination of requisite information at the right time by overcoming the limitations of physical distance and time lag in communication. ICT tools like mobile apps serve as smart Decision Support Tools (DST) and are designed to help users in making more effective decisions. ICTs coupled with traditional channels of communication (Experts, Extension agents etc.) will have a greater impact in meeting the needs of farmers. With this brief background, the current seminar has been conceptualized with the following objectives:

1. To understand the concept of mobile applications and its services in dairy sector
2. To know the advantages and disadvantages of mobile applications in dairy sector
3. To get insights into features of various mobile applications in dairy sector
4. To review the relevant literature available / research studies

Mobile Application

A mobile application is a computer program or software application designed to run on small, wireless computing devices such as smart phones and tablets rather than on desktop and laptop computers.

Classification of Dairy apps based on its utility

There are many apps in dairy sector which can be classified under following categories. Apps related to balanced ration and cattle feed, health and disease diagnosis apps, dairy management apps, vaccination and artificial insemination apps in dairy animals, dairy products marketing apps and apps providing multiple services in dairy sector.

Advantages of Mobile applications

The main advantages of mobile apps for farmers are, easy to access information through mobile, affordability, instant and convenient service delivery. All types of information on various dairy management activities are available at any point of time on fingertips of farmers through various apps. The market connectivity is also improved with the visibility and knowledge of the potential buyers and sellers in the locality with an opportunity to develop direct contacts.

Disadvantages of Mobile applications

Wherever the information is dynamic in nature, like market prices of various products, advisory services, the mobile app requires internet connectivity to fetch the real-time data. With the diversity in languages, even if the best applications do not support regional languages, it reduces the acceptability and popularity among farmers. At times, due to network issues, glitches and speed of the data delivery, farmers could not get the updated and complete information.

Research studies

Verma *et al.,* (2019) reported that among different components of effectiveness of Brucellosis Advisor app, engagement component ranked first in the satisfaction continuum with weighted mean score of 90.56, followed by functionality (87.78), information function (86.67), aesthetic value (83.33) and subjective quality aspect (75.56).

Sood *et al.,* (2020) reported that among the seven components of perceived utility of the IVRI-Dairy Manager app, usefulness ranked top with mean score 2.93 followed by credibility (2.90), complete coverage of content and attractiveness (2.80), user friendliness (2.76), compatibility (2.73) and soundness of visuals (2.66).

Conclusion

Mobile technology is transforming access to information among farming masses. Emergence of digital revolution and internet penetration in the rural areas has enthralled farmers in accessing new apps that would keep pace with the modern technology. Several apps are emerging in response to new requirements and challenges in dairy sector. As the number of apps continue to increase, it is important to be selective in choosing the app, review and ensure that the app provides credible and current information to the farmers. Further, few more apps need to be explored on the requirements of the farmers.

References

ANONYMOUS, 2019, Summary of National Accounts Statistics 2019, Ministry of Statistics and Programmes Implementation, GoI.

SOOD, H., TIWARI, R., SINGH, A. AND DUTT, T., 2020, Development of a need based IVRI-Dairy manager App and its perceived utility. *Int. J. Curr. Microbiol. App. Sci.,* **9** (12): 3003-3009.

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WELCOME

SEMINAR 1

1

1

MOBILE APPLICATIONS IN DAIRY SECTOR

Presented by
C.V.Sai Bharath
PAMB 0144
Sr.M.Sc

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Flow of presentation

- Introduction
- Objectives of presentation
- Mobile phone and applications
- History of mobile applications
- Classification of dairy apps based on its utility
- Review of literature available/Research studies
- Live demonstration of apps
- Conclusion

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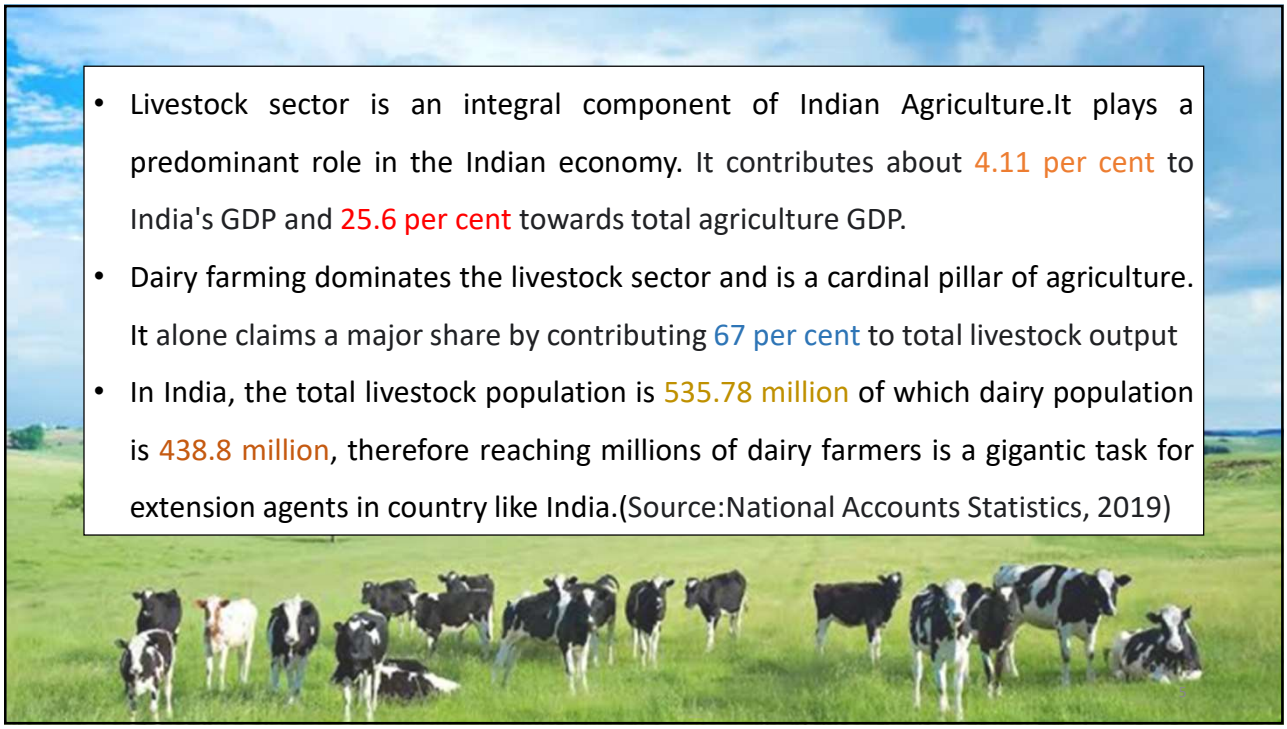

- Livestock sector is an integral component of Indian Agriculture.It plays a predominant role in the Indian economy. It contributes about 4.11 per cent to India's GDP and 25.6 per cent towards total agriculture GDP.
- Dairy farming dominates the livestock sector and is a cardinal pillar of agriculture. It alone claims a major share by contributing 67 per cent to total livestock output
- In India, the total livestock population is 535.78 million of which dairy population is 438.8 million, therefore reaching millions of dairy farmers is a gigantic task for extension agents in country like India.(Source:National Accounts Statistics, 2019)

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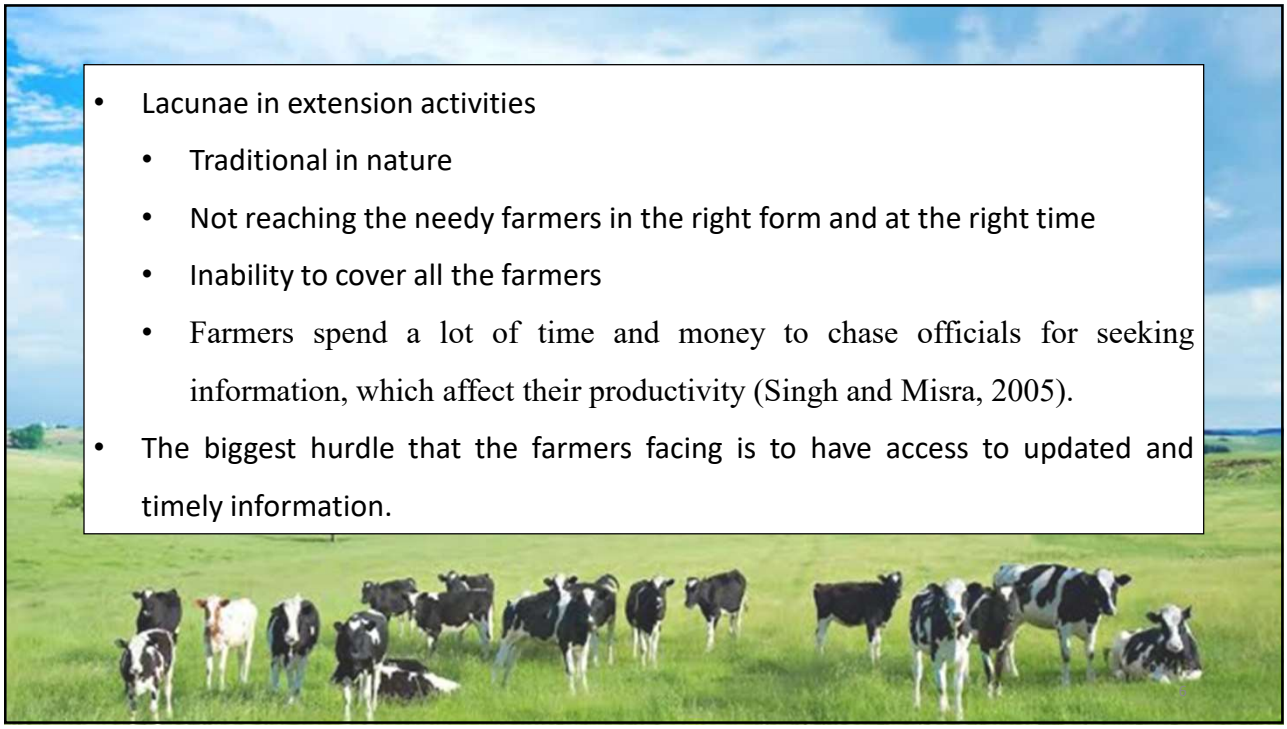

- Lacunae in extension activities
  - Traditional in nature
  - Not reaching the needy farmers in the right form and at the right time
  - Inability to cover all the farmers
  - Farmers spend a lot of time and money to chase officials for seeking information, which affect their productivity (Singh and Misra, 2005).
- The biggest hurdle that the farmers facing is to have access to updated and timely information.

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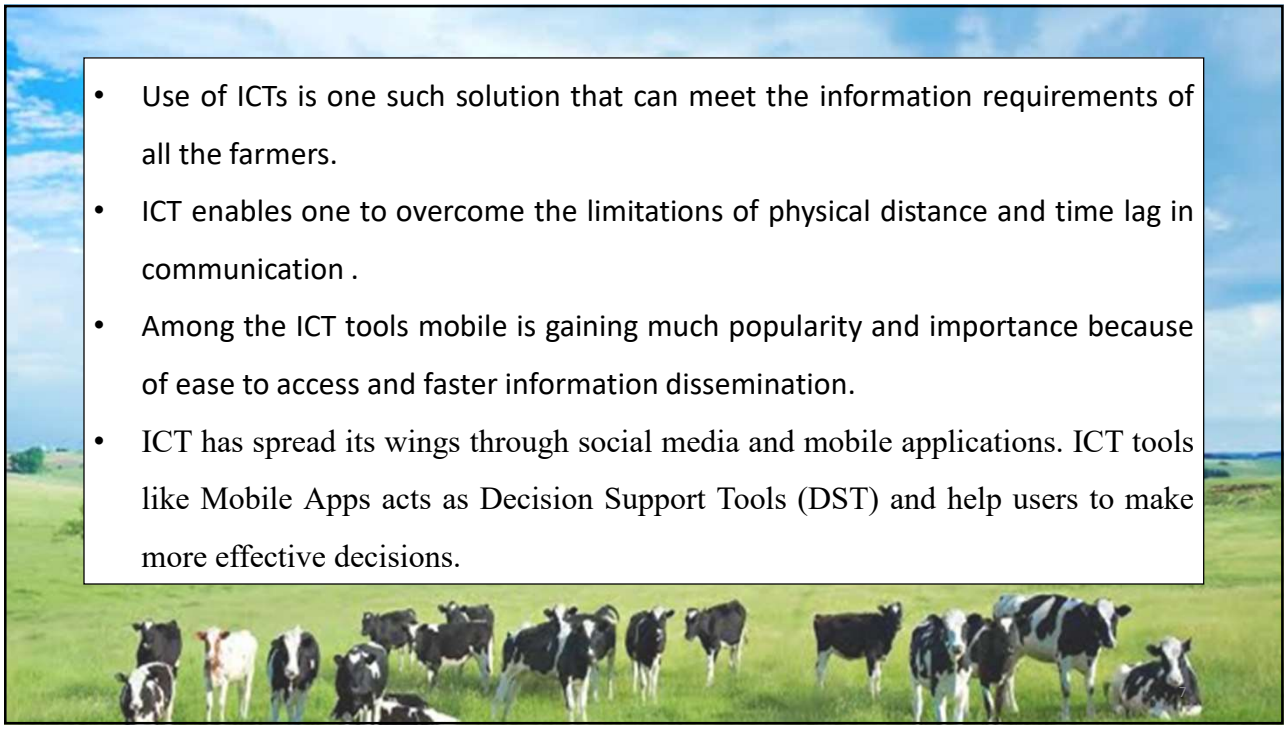

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OBJECTIVES OF PRESENTATION

01

To understand the concept of Mobile applications and its services in dairy sector.

02

To know the advantages and disadvantages of mobile applications in dairy sector.

03

To get insights into features of various mobile applications in dairy sector

04

To review the relevant literature available/ research studies

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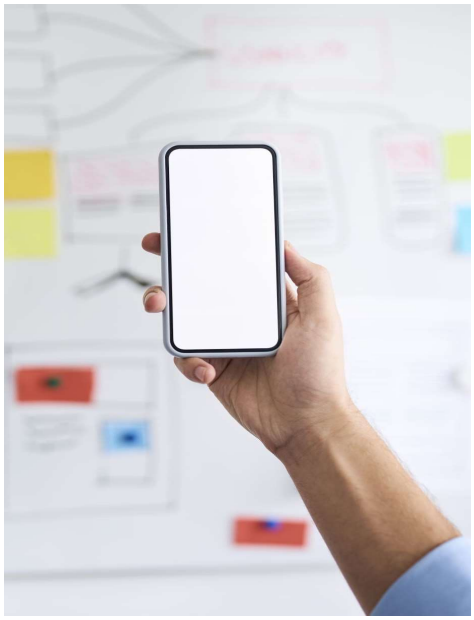

What is Mobile Phone?

- A mobile phone is a small wireless handheld device that allows users to make and receive calls, to send text messages and other features.

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1995

2021

Evolution of the Mobile Phone

What next

?

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TELE DENSITY

- ✓ Telephone density or teledensity is defined as the number of telephone connections for every hundred individuals living within an area.
- ✓ It varies widely across the nations and also between urban and rural areas within a country.
- ✓ The teledensity value of India is 88.51%.
- ✓ It is also used as an indicator to define the purchasing power of the people of the country or specific region.

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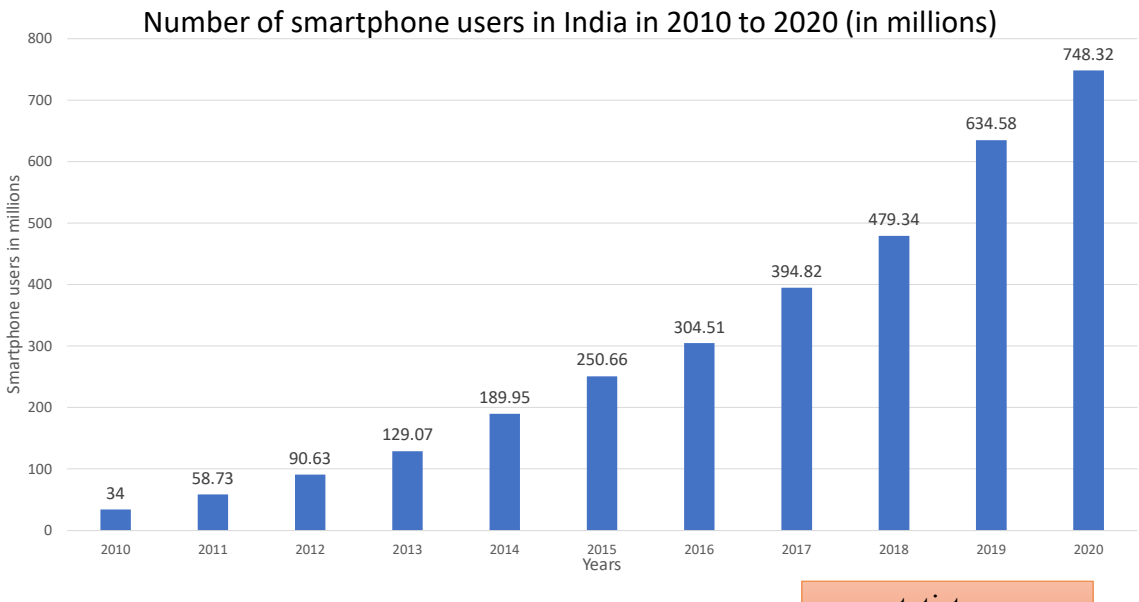

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Mobile Application

- A mobile application is a computer program or software application designed to run on small, wireless computing devices such as smart phones and tablets rather than on desktop and laptop computers.

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History of Mobile Applications

- ✓ Mobile communication is so integrated into our lives that many people feel uncomfortable without a cell phone.
- ✓ Once upon a time, the most popular functions of phones were calling and sending texts.
- ✓ At present , smart phone is a multifunctional device that not only communicates, but also it helps to learn, earn, have fun and as a recreational tool through various apps.

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Communication

BYJU'S The Learning App

Learning

Groww

Earning

Fun @games

Recreation

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- ✓ This is made possible by the development of mobile applications.
- ✓ Soon mobile phones were more than just a novelty.
- ✓ These phones changed the way people thought about communication
- ✓ Customers began pushing for more features and more games.
- ✓ But mobile manufacturers lack the resources to build every application users wanted.
- ✓ Even direct phone access to the Internet didn't scale well in the initial days.

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Wireless Application Protocol (WAP)

- ✓ WAP standard was developed in 1999.
- ✓ WAP was a stripped-down version of HTTP, which is the basic protocol of the World Wide Web.
- ✓ WAP browsers were designed to run within the memory and bandwidth constraints of the phone.
- ✓ The WAP solution was great for mobile operators.
- ✓ They could provide a custom WAP portal directing their subscribers to the content they wanted.

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- ✓ Developers and content providers couldn't deliver everything what users wanted, except in a limited way.
- ✓ Commercializing WAP applications was difficult, because there was no built-in billing mechanism. Payment was through various premium-priced delivery mechanisms such as Short Message Service (SMS) and Multimedia Messaging Service (MMS).
- ✓ Users browsed a WAP site and requested a specific item, then fill a simple order form with their phone number and the model of their phone. It was up to the content provider to delive

WAP → Wireless Application Protocol ✗

WAP → Wait And Pay ✓

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Mobile Application Platforms

- A variety of different platforms emerged and developers are actively creating applications from them.
- One of the first was Palm OS
  - RIM Blackberry OS.
  - Java Micro Edition (Java ME).
  - Binary Runtime Environment for Wireless (BREW).
- Symbian OS was developed by Nokia, Sony Ericsson, Motorola and Samsung.
- The Apple iPhone iOS joined the ranks in 2007.
- Google's Android came along a year later in 2008.

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Mobile Application Platform

Mobile application platform is a suite of software tools used for designing ,creating and maintaining mobile applications.

Apps are available through application distribution platforms such as Apple App store ,Google Play store, Windows Phone store and BlackBerry app world etc

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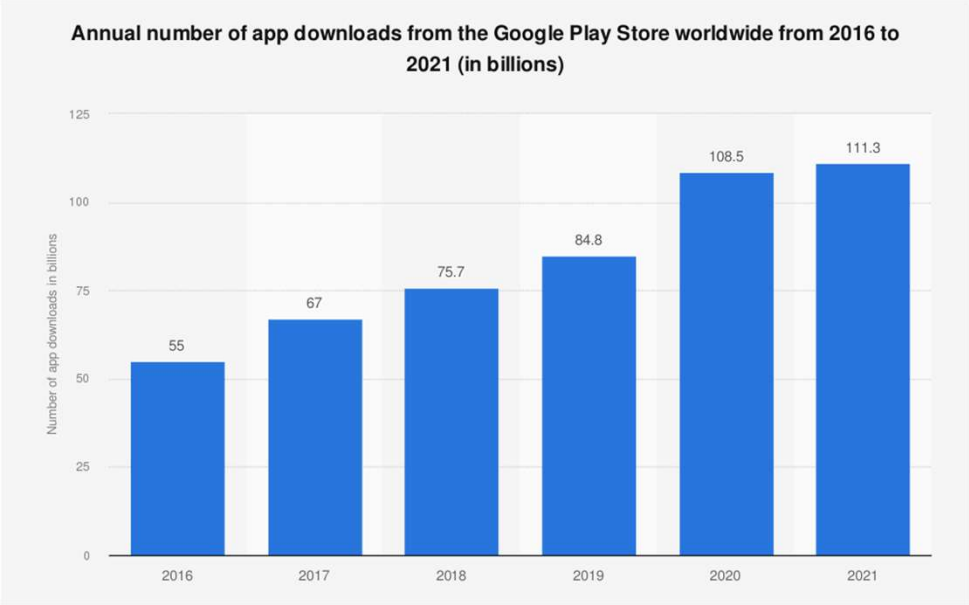

www.statista.com

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Mobile phones and its applications in dairy sector

Among all the ICT tools, mobile phone has emerged as one of the widely accepted and adopted instruments for delivery of agriculture and allied sectors related information.

Mobile applications is a new phenomenon in seeking dairy related information related to supplying inputs, balanced ration, disease diagnosis, management and marketing of dairy products etc.

Mittal and Tripathi (2009) reported the key role played by mobiles in lowering transaction costs and raising the income levels of farmers, by efficiently addressing agricultural information requirements

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Advantages of mobile apps in dairy sector

- An effective ICT tool for information dissemination.
- Easy to access information through mobile, affordability, instant and convenient service delivery.
- Information on various dairy related activities are available at any point of time on through various apps.
- The market connectivity is also improved with the visibility of the potential buyers and sellers in the locality with an opportunity to develop direct contacts.
- The available information is compiled and very well organized that farmer does not have to waste time for searching the information.

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Disadvantages of mobile apps in dairy sector

- Lack of e-illiteracy among farmers
- Wherever the information is dynamic in nature, like market prices of various products, advisory services, the mobile app requires internet connectivity to fetch the real-time data.
- Diversity in languages, even if the best applications do not support regional languages, it reduces the acceptability and popularity among farmers
- At times, due to network issues and technical glitches, farmers could not get the updated and complete information.

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Mobile Apps in Dairy sector

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ANIMAL REPRODUCTION
Veterinary Clinical Care
TNAU
CATTLE EXPERT SYSTEM
FARM 365
DAIRY FARM
पशु पोषण
FARMERS APP
Disease Control App
ANGRAU
Dairy Manager
Parasite Control in Dairy Animals
AweSome DAIRY SELLER
Vaccination Guide
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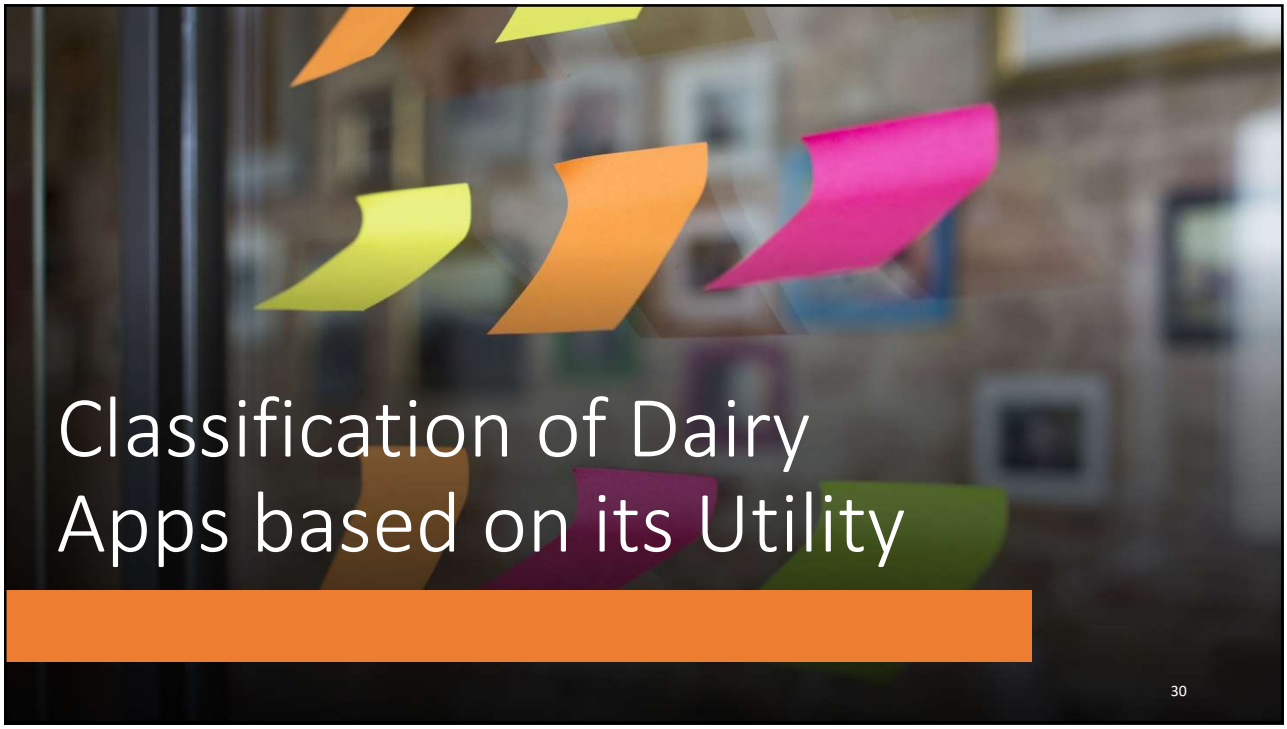
Classification of Dairy Apps based on its Utility
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Apps related to Balanced ration and cattle feed	Apps related to Health and Disease diagnosis	Apps related to Dairy Management activities
Apps related to Vaccination and Artificial Insemination in Dairy animals	Dairy products Marketing Apps	Dairy Apps Providing Multiple Services

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Cattle Feed Formulation App	Pashu Poshan NDDB	Calf Heifer Ration Formulator
Fodder Kannada Jayalaxmi AgroTech	Apps related to Balanced ration and cattle feed 	
Dairy Cattle Ration Formulator		

32

Pashu Poshan (Ration Balancer) app

- ✓ The mobile application, named 'Pashu Poshan', was launched by National Dairy Development Board (NDDB) in association with the Union Agriculture Minister Radha Mohan Singh.
- ✓ It is a mobile application that will recommend balanced diet for cows and buffaloes to boost farmers income by raising milk yield and cutting feed cost.

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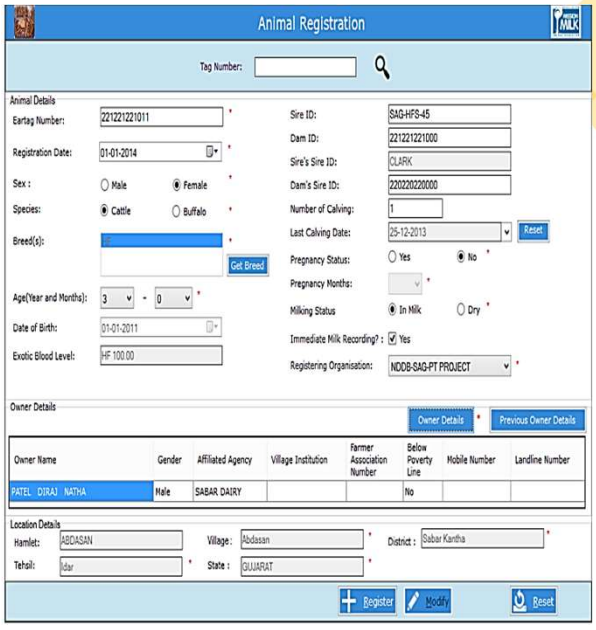
- ✓ The application, which will be available on both web and android platforms, can be accessed by registering on the INAPH portal (http://inaph.Nddb.Coop).
- ✓ To use this application, the farmer needs to provide complete animal profile, which includes
  - breed,
  - age,
  - animal identification number,
  - milk production quantity,
  - fat content in milk.



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- ✓ In a press meet , NDDB Chairman told reporters that as a part of their experimental survey
  - "They have already collected profiles of 6 lakh milch animals in 40,000 villages and farmers feedback about the balanced feed and fodder for their cattle.
  - "App resulted in reducing the feed cost by Rs. 5-15 per animal per day and an average increase in milk production by 300 ml per animal per day".
- App available at: https://play.google.com/store/apps/details?id=coop.nddb.pashu_poshan&hl=en_IN&gl=US

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IVRI- Disease Control(रोग नियंत्रण एप्प) App
ICAR-IASRI

Farm Animal Zoonotic Diseases

Parasite Control in Dairy Animals
ICAR-Indian Veterinary Research Institute

IVRI-VeterinaryClinicalCare App पशु चिकित्सा सेवा
ICAR-IASRI

IVRI-Animal Reproduction App(पशु प्रजनन)
ICAR-IASRI

Dairy Apps related to Health and Disease diagnosis

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IVRI – Disease control App

- ✓IVRI –Disease control app is designed and developed by **ICAR-IVRI,Izatnagar** and **IASRI,New Delhi** about important diseases of life stock ,poultry and dogs .
- ✓In addition to theory, it also provides pictures depicting the symptoms for identification, diagnosis, treatment and control.

ivri
Disease Control App

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- This app provides information about the
  - Exotic and emerging diseases
  - Various diagnostic facilities offered by ICAR-IVRI
  - Various diagnostic laboratories in India
  - Important organizations involved in Disease Control and
  - Government schemes and guidelines for Disease Control in India.

App available at:

https://play.google.com/store/apps/details?id=com.icar.ivri.iasri.diseasecontrolapp&hl=en_IN&gl=US

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IVRI-Dairy Manager App(डेयरी मैनेजर) ICAR-IASRI	ANGRAU Pashu Poshan KVK Banavasi	Dairy Husbandry Practices NDDB
Heritage VET+ Heritage Foods Ltd	Apps related to Dairy Management activities	
Dairy Management System	NDDB AGR NDDB	IVRI-Biosecurity and Biosafety(Jaiv Suraksha) App ICAR-IASRI

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IVRI – Dairy Manager

- ✓IVRI-Diary manager app is designed and developed by
  - ICAR-IVRI , Izatnagar
  - NDRI -Karnal and
  - IASRI, New Delhi .
- ✓App available at:

https://play.google.com/store/apps/details?id=com.ivri.iasri.dmapp&hl=en_IN&gl=US

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✓This is an educational app providing information on

- Breeds and housing
- Feeding
- Calf and general management
- Clean milk production
- Animal identification and Vices in dairy animals

✓There are educational videos on clean milk production on neonatal calf management for enhancing the knowledge and skills of personnel involved in dairy farming

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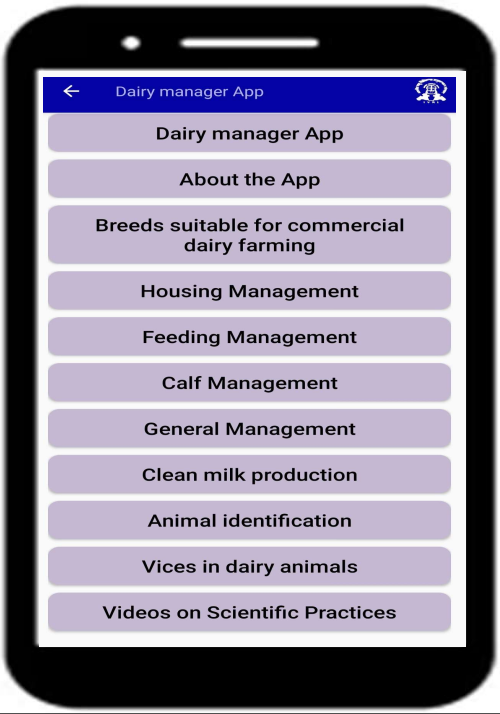

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Apps related to Vaccination and Artificial Insemination in Dairy animals

IVRI-Vaccination Guide App(टीकाकरण गाइड)
ICAR-IASRI

IVRI - Artificial Insemination App
ICAR-IASRI

45

45

IVRI – Vaccination Guide

✓IVRI-Vaccination Guide app is designed and developed by **ICAR-IVRI,Izatnagar** and **IASRI, New Delhi** to educate about vaccination in domestic animals, poultry and pets.

✓This app provides

- basic information about vaccination in livestock, poultry and pets
- specific information about vaccination related to all major bacterial and viral diseases.

Vaccination Guide

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✓For each of the disease, following information is provided

- The causative agent
- Types of vaccine available
- Serotype used for the vaccines
- Vaccination schedule
- Commercially available vaccines
- Government and private institutions involved in vaccine production in country.

✓App available at:

https://play.google.com/store/apps/details?id=com.icar.ivri.iasri.vcguideapp&hl=en_IN&gl=US

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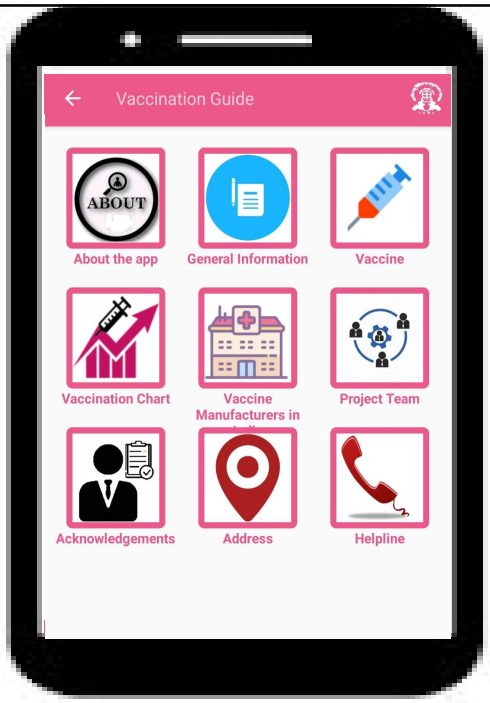

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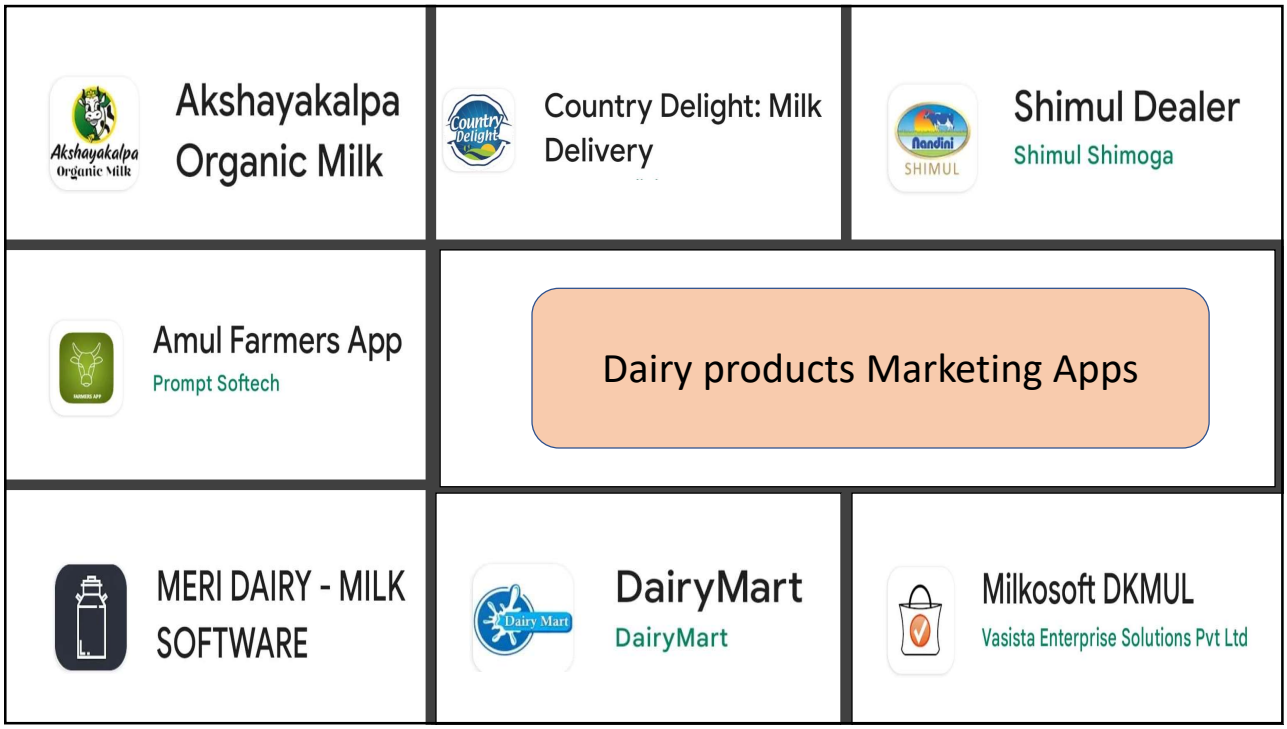

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Country Delight app

- ✓Country Delight is an initiative to disrupt India's online milk & grocery delivery market .
- ✓Order placements take place through mobile app that aids convenient online milk delivery.
- ✓With an focus on quality & testing, they test milk on more than 26 parameters by an FSSAI approved lab and deliver it under the best cold chain right up to your doorstep within 24-36 hours of milking.

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✓Currently, it serves in Delhi, Gurgaon, Mumbai, Pune, Bangalore, Noida, Jaipur, Chennai and Hyderabad.

✓Country Delight Products:

Farm-fresh milk ,dairy products etc.

✓Their milk is sourced directly from the farmers and delivered to you without any intervention of middleman.

App available at:
https://play.google.com/store/apps/details?id=app.mycountrydelight.in.countrydelight&hl=en_IN&gl=US

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Key Features of the App

1- Subscribe and forget

2- Manage your orders and subscription

3- Easy Recharge

4- Cashback and offers

5- Easy view bill

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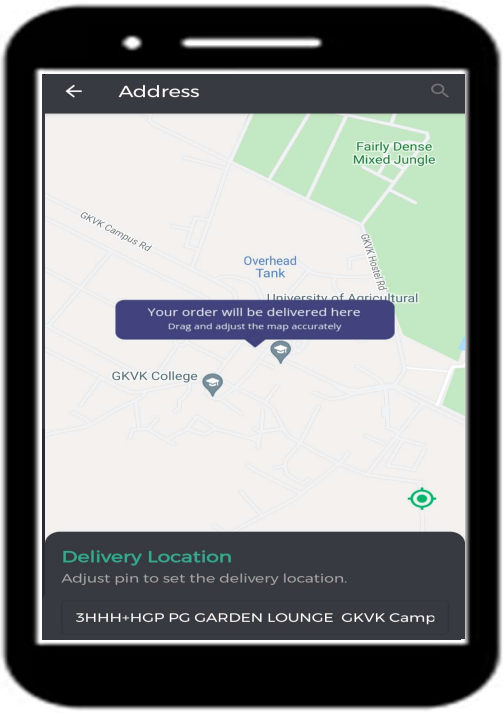

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Cattle Expert System
Mobile Seva

Dairy Kannada
Jayalaxmi AgroTech

Farm365
Prompt Softech

Paadi Parisrama Dairy Farming Telugu

Dairy Apps Providing Multiple Services

My Cattle Manager - Farm app

Ezee Dairy
KratiTech

VacApp - Livestock management

My Dairy Farm Records

DairyCattle
Walbro Software

Farm Manager & Analyzer

Livestock Manager
Cabral Tech Ltd

Dairy Farm
Daily Cow A

JAGUZA Livestock App

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Dairy kannada app

This is an app designed and developed by

- Jayalaxmi Agro Tech Pvt Ltd in association with
- Karnataka Veterinary Animal and Fisheries sciences University(Bidar)
- Department of VAHE, Veterinary College(Hebbal, Bengaluru)

under ICAR Extra Mural Project 2016-17.

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- ✓ This app is equipped with decision support system with Kannada language support.
- ✓ App is user friendly in nature with audio video content.
- ✓ This is designed to deliver the information to the mainly to the dairy farmers by breaking literacy barrier.
- ✓ App available at:

https://play.google.com/store/apps/details?id=com.agri.dairy&hl=en&gl=US

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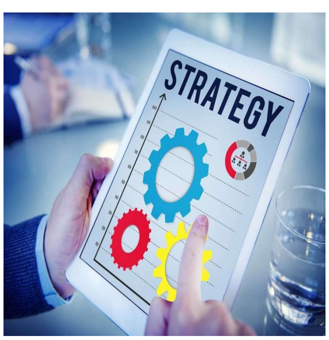
Strategies for effective utilization of mobile apps in dairy sector



ಚಿಲ್ಲರೆ ವ್ಯಾಪಾರಕ್ಕೆ ಸರ್ಕಾರಿ ಆ್ಯಪ್

ನಂದನ್ ನಿಲೇಕಣಿ ಸಾರಥ್ಯ | ಬೆಂಗಳೂರು ಸೇರಿ 5 ನಗರಗಳಲ್ಲಿ ಮೇನಲ್ಲಿ ಬಿಡುಗಡೆ
ಅಮೆಜಾನ್, ಫ್ಲಿಪ್‌ಕಾರ್ಟ್ ಜತೆ ಚಿಲ್ಲರೆ ವ್ಯಾಪಾರಿಗಳ ಪೈಪೋಟಿಗೆ ಕೇಂದ್ರ ವೇದಿಕೆ
ಸೋಪ್‌ನಿಂದ ದಿನಸಿ, ವಿಮಾನ, ಹೋಟೆಲ್ ಟಿಕೆಟ್‌ವರೆಗೆ ಎಲ್ಲವೂ ಆ್ಯಪ್‌ನಲ್ಲಿ ಲಭ್ಯ

ಹೊಸ ಹಾಗೂ ಅತಿ ವೇಗದ ಬೆಳವಣಿಗೆಯ ಡಿಜಿಟಲ್ ಕಾಮರ್ಸ್ ಕ್ಷೇತ್ರದಲ್ಲಿ ಸುಲಭವಾಗಿ ಹೇಗೆ ಭಾಗಿಯಾಗಬೇಕು ಎಂಬುದನ್ನು ತೋರಿಸಿಕೊಡುವ ಹೊಣೆಯನ್ನು ನಾವು ಕೋಟ್ಯಂತರ ಸಣ್ಣ ವ್ಯಾಪಾರಿಗಳಿಂದ ಹೊತ್ತಿದ್ದೇವೆ. ಇದೊಂದು ಆಲೋಚನೆಯಾಗಿದ್ದು, ಆದರ ಸಮಯ ಈಗ ಬಂದಿದೆ.
• ನಂದನ್ ನಿಲೇಕಣಿ
ಇನ್ಫೋಸಿಸ್ ಸಹ ಸಂಸ್ಥಾಪಕ

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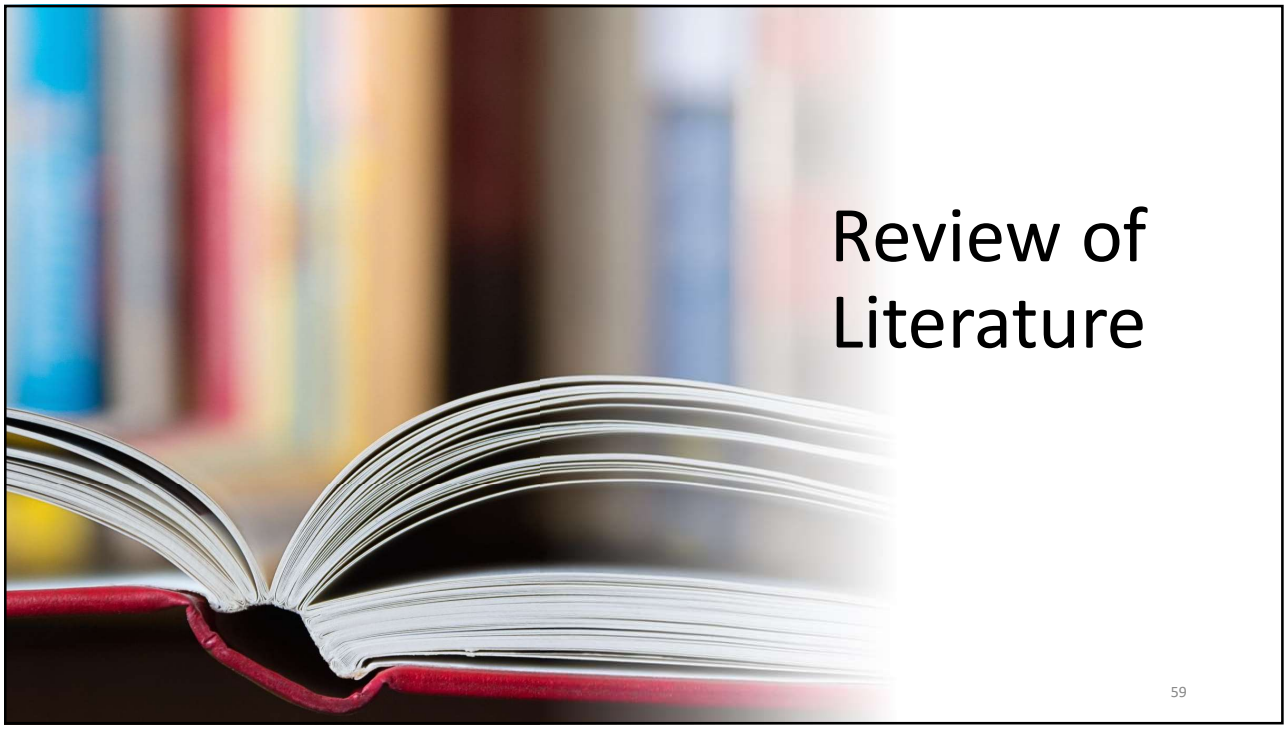

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Research Study 1

Development of a Need Based IVRI-Dairy Manager App and its Perceived Utility

Sood *et al.,* (2020)

Methodology:

- ✓ Ex post facto research design was used.
- ✓ Snowball sampling technique was used as no list of commercial dairy farmers was available.
- ✓ Study was conducted purposely in Punjab state as it accounts for the highest milk productivity with sample size 60

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Distribution of respondents according to the perceived utility of IVRI-Dairy Manager App

Perceived utility	Dairy farmers (n=60)			
	Good	Fair	Poor	MS
Usefulness	56 (93.3)	04 (6.7)	0 (0.00)	2.93
User friendliness	46 (76.6)	14 (23.3)	0 (0.0)	2.76
Attractiveness	48 (80.00)	12 (20.00)	0 (0.0)	2.80
Compatibility	52 (86.66)	0 (0.00)	08 (13.33)	2.73
Complete coverage of content	25 (83.33)	08 (13.33)	02 (3.33)	2.80
Soundness of visuals	40 (66.66)	20 (33.33)	0 (0.0)	2.66
Credibility	54 (90.00)	06 (10.0)	0 (0.0)	2.90
Average Score	19.58			

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Distribution of respondents according to information needs on dairy management

Kind of information needed	N = 60			
	Most Needed	Needed	Least Needed	Mean Score
Scientific way of shed construction	15 (25.00)	22 (36.66)	23 (38.33)	1.87
Breed Selection	7 (11.66)	20 (33.33)	33 (55.00)	1.56
Infertility problems	7 (11.66)	22 (36.66)	31 (51.66)	1.59
Preparation of balanced ration	11 (18.88)	11 (18.88)	38 (63.33)	1.54
Care of cow/ buffalo	9 (15.00)	16 (26.66)	35 (58.33)	1.56
Care of newborn calf	14 (23.33)	28 (46.66)	18 (30.00)	1.93
Clean milk production	24 (40.00)	25 (41.66)	11 (18.33)	2.21
Common cattle/buffalo diseases	18 (30.00)	21 (35.00)	21 (35.00)	1.95
Vaccination schedule	9 (15.00)	14 (23.33)	37 (61.66)	1.53
Prevention and control of diseases	10 (16.66)	11 (18.33)	39 (65.00)	1.51
Government schemes	10 (16.66)	20 (33.33)	30 (30.00)	1.66

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Research Study 2

Exploring the Perceived Feedback of Commercial Dairy Farmers about Effectiveness of Android Mobile Apps 'Brucellosis Advisor App'

Verma *et al.*,(2019)

Methodology:

- ✓ The study was conducted in Haryana and Punjab state .
- ✓ Six districts (3 from each state) were selected based on highest cattle population.
- ✓ Among these selected districts, 20 commercial dairy farmers were selected from each district based on snowball sampling method. Then total of 120 respondents were interviewed to get primary information on brucellosis with the help of schedule. Out of which only sixty respondents were randomly chosen, ten from each selected district to explore the perceived feedback of the commercial dairy farmers.

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Respondents" perceived feedback on effectiveness about different components of "Brucellosis Advisor App"

S.No	Component Of Application	Highly Satisfied	Satisfied	Least Satisfied	Weighted Mean Score	Rank
1.	Engagement	43 (71.67)	17 (28.33)	0 (0.00)	90.56	I
2.	Functionality	42 (70.00)	14 (23.33)	4 (6.67)	87.78	II
3.	Aesthetic Value	32 (53.34)	26 (43.33)	2 (3.33)	83.33	IV
4.	Information Function	39 (65.00)	18 (30.00)	3 (5.00)	86.67	III
5.	Subjective Quality	22 (36.67)	32 (53.33)	6 (10.00)	75.56	V

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Research Study 3

Attitude, knowledge and constraints associated with the use of mobilephone applications by farmers in North-West Nigeria.

Abdullahi *et al.,* (2021)

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Constraints	Frequency (%) Yes	Frequency (%) No	Very severe	Severe	Undecided	Not severe	Mean (SD)	Remark
Poor network	298 (77.4)	87 (22.4)	61 (15.8)	196 (50.9	87 (22.6)	41 (10.7)	1.6 (1.00)	Very serious
Poor power supply	226 (69.1)	159 (30.1)	115 (29.9)	103 (26.8)	159 (41.3)	3 (0.8)	1.7 (1.20)	Very serious
No power supply	21 (5.5)	364 (94.5)	6 (1.6)	11 (2.9)	364 (94.6)	4 (1)	0.2 (0.63)	Not serious
High cost of charging battery	132 (34.3)	253 (65.7)	23 (6)	51 (13.3)	253 (65.7)	58 (15.1)	0.5 (0.94)	Not serious
Apps are too complex	237 (61.6)	148 (38.4)	38 (9.9)	175 (45.5)	148 (38.4)	0 (0)	1.3 (1.08)	Not serious
Inability to operate apps	216 (56.1)	169 (43.9)	21 (5.5)	195 (50.7)	169 (43.9)	24 (6.2)	1.2 (1.06)	Not serious
No access to apps	126 (32.7)	259 (67.3)	15 (3.9)	90 (23.4)	259 (67.3)	21 (5.5)	0.7 (0.97)	Not serious
Lack of access to credit	230 (60)	155 (40)	56 (14.6)	155 (40.3)	155 (40.3)	19 (4.9)	1.3 (1.14)	Not serious
Lack of access to education	249 (65)	136 (35)	52 (13.5)	180 (46.8)	136 (35.3)	17 (4.4)	1.4 (1.11)	Not serious
Lack of access to extension	194 (50.4)	191 (49.6)	60 (15.6)	127 (33)	191 (49.6)	7 (1.8)	1.2 (1.19)	Not serious
Lack of access to network	40 (10.4)	345 (89.6)	1 (0.3)	16 (4.2)	345 (89.6)	23 (6)	0.1 (0.43)	Not serious
Lack of access to functional apps	190 (49.4)	195 (50.6)	34 (8.8)	81 (21)	195 (50.7)	75 (19.5)	0.7 (1.07)	Not serious
Lack of time to practice app use	171 (44.4)	214 (55.6)	45 (11.7)	107 (27.8)	214 (55.6)	19 (4.9)	0.9 (1.13)	Not serious
Lack of technical knowhow	280 (73)	105 (27)	56 (14.6)	205 (53.2)	105 (27.3)	19 (4.9)	1.6 (1.04)	Not serious
Lack of information from radio	174 (45)	211 (55)	23 (6)	72 (18.7)	211 (54.8)	79 (20.5)	0.6 (0.98)	Not serious
Lack of awareness of apps	299 (77.7)	86 (22.3)	42 (10.9)	228 (59.2)	86 (22.3)	29 (7.5)	1.6 (0.95)	Very serious
Cost of training is high	169 (43.9)	216 (56.1)	25 (6.5)	53 (13.8)	216 (56.1)	91 (23.6)	0.7 (0.88)	Not serious
Lack of social interaction	215 (55.8)	170 (44.2)	29 (7.5)	102 (26.5)	170 (44.2)	84 (21.8)	1.2 (1.09)	Not serious
Lack of willingness to learn	170 (44)	215 (56)	21 (5.5)	100 (26)	215 (55.8)	49 (12.7)	0.8 (1.02)	Not serious
Lack of demonstration of app use	244 (63.4)	141 (36.6)	44 (11.4)	178 (46.2)	141 (36.6)	22 (5.7)	1.3 (1.09)	Not serious
Lack of app update technology	111 (28.8)	274 (71.2)	13 (3.4)	53 (13.8)	274 (71.2)	45 (11.7)	0.5 (0.81)	Not serious
Lack of encouragement	300 (77.9)	85 (22.1)	0 (0)	275 (71.4)	85 (22.1)	25 (6.5)	1.5 (0.82)	Serious
Problem of updating apps	96 (24.9)	289 (75.1)	14 (3.6)	43 (11.2)	289 (75.1)	39 (10.1)	0.5 (0.84)	Not serious
High cost of apps	185 (48.1)	200 (51.9)	27 (7)	57 (14.8)	200 (52)	101 (26.2)	0.7 (0.84)	Not serious
High cost of phones	300 (77.9)	85 (22.1)	84 (21.8)	204 (53)	85 (22.1)	12 (3.1)	1.8 (1.03)	Very serious
Complexity in operating phones and apps	279 (72.5)	106 (27.5)	60 (15.6)	192 (49.9)	106 (27.5)	27 (7)	1.5 (1.06)	Serious
Socio-religious values	171 (44.4)	214 (55.6)	14 (3.6)	29 (7.5)	214 (55.6)	128 (33.2)	0.5 (0.70)	Not serious
Customary values	184 (47.8)	201 (52.2)	18 (4.7)	25 (6.5)	201 (52.2)	141 (36.6)	0.6 (0.68)	Not serious
Political influence	174 (45.2)	211 (54.8)	8 (2.1)	29 (7.5)	211 (54.8)	137 (35.6)	0.4 (0.71)	Not serious
Actions of association/grp	57 (14.8)	328 (85.2)	2 (0.5)	20 (5.2)	328 (85.2)	35 (9.1)	0.2 (0.53)	Not serious
Problem of acceptance by local leadership	224 (58.2)	161 (41.8)	12 (3.1)	128 (33.2)	161 (41.8)	84 (21.8)	0.6 (0.83)	Not serious

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APPS LIVE DEMONSTRATION

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CONCLUSION

- Mobile technologies
- Internet penetration
- Emerging of new apps
- ICT's with traditional channels

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