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A Simplified Approach to Integrated Child Development Services Scheme through an Android Application

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ABSTRACT: The Integrated Child Development Service Scheme (ICDS) is one of the joint ventures taken up by the Central Government and the Ministry of Human Resource Development. The main aim of the ICDS scheme is the holistic development of children and empowerment of mother. The successful implementation of this scheme is done through a package of six services namely supplementary nutrition, immunization, health check-ups, referral services, nutrition and health education for mothers/pregnant women, nursing mothers and to adolescent girls. 'Anganwadi' is the basic unit of function, where ICDS services are made available to public through Anganwadi workers. The responsibilities of anganwadi workers are ever increasing these days. The present study has been undertaken with the objective of assessing and simplifying the responsibilities of anganwadi workers in all the districts by implementing an Android application in each Anganwadicenter. This android application can be used for registration of the children, authentication during nutrition distribution process and management purposes.

KEYWORDS: Integrated Child Development Service Scheme (ICDS), Ministry of Human Resource Development, Empowerment, Supplementary Nutrition, Immunization, Anganwadi, Android Application, Registration, Authentication, Management

I. INTRODUCTION

Basic unit of Integrated Child Development Service scheme is Anganwadi which is a type of rural child care centre across India. These were started in the year 1975 to fight against child hunger and malnutrition. The scheme facilitates nutritional supplements, preschool education, immunization, primary health check-up and health and nutrition education to children under age of 6 years, mothers/pregnant women, adolescent girls through Anganwadi workers (AWW). According to a survey conducted on 31 January 2013, as many as 13.3 lakh Anganwadi Centres (AWC) that are found operational in the country with 12.8 lakh AWWs and 11.6 lakh helpers. In Karnataka State, currently there are 62580 AWCs and 3331 mini AWCs are functioning in 204 ICDS projects. As per official data, these AWCs and mini AWCs cover all the 175 taluks including 181 rural projects, 12 tribal and 11 urban projects. All the AWC services are made available to beneficiaries through Anganwadi Workers, Helpers, Anganwadi Medical Staff (AWM), Doctors and Lady Health Visitor (LHV).

This paper deals with the implementation of an Android application mainly for the Anganwadi supervisor to manage all kinds of activities in the AWCs. These activities include nutrition supply, health check-up, immunization etc., This system mainly consists of three actors. Namely, Admin, Anganwadi supervisors (users) and Beneficiaries (children/parents). Through this application all the Anganwadis across the taluk can be integrated and maintained under a single platform. To handle basic functionalities of an AWC such as supplementary nutrition, OTP (One Time Password) based authentication is implemented for the distribution of ration for every month. Thus, the system makes sure that the nutrition is supplied only to intended users. The system admins are given the ability to add/remove AWCs based on the requirement. Supervisor can manage all employees working in a particular AWC. All the information regarding the users such as personal data, health check-up reports, immunization details etc., are registered in the application which helps in accessing them as and when necessary.

II. LITERATURE SURVEY

The Integrated Child Development Services (ICDS) is a program which provides education, nutrition and health services to pregnant and nursing mothers, children below six years and adolescent girls. The ICDS services are implemented at different levels such as village, block, district, state and central government. AnganwadiCentres (AWC) which is a part of ICDS scheme lies with the Department of Women & Child Development. ICDS in India served about 82 million children less than 6 years and over 19 million pregnant women and lactating mothers. These 102 million beneficiaries received services in about 1.3 million centres.[1]
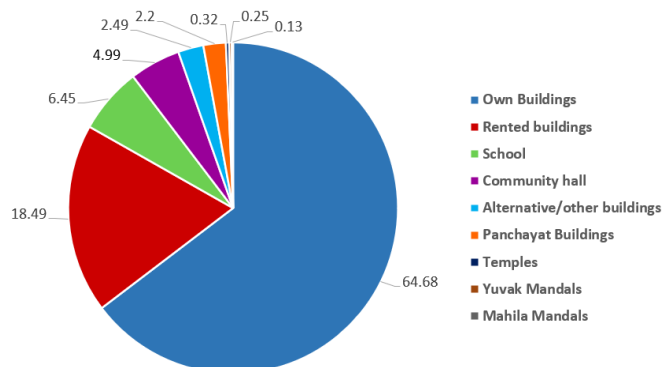

Fig.1. Functioning AWCs in Karnataka[7]

Services at Anganwadi Center (AWC) are delivered by an Anganwadi Worker (AWW). She is a woman of same locality, chosen by the people, having educational qualification of middle school or Matric or higher. To study the profile of Anganwadi workers (AWWs) and to assess knowledge of AWWs and their problems faced by them while working a cross sectional study was conducted. The study was assessed by considering their literacy status, years of experiences, their knowledge about the services rendered by them and problems faced by them. Result: 82.14% of workers had an experience of more than 10 years, 77.14% of them had best knowledge about nutrition and health education and 14.28% complained about lack of help from community and other problems related to infrastructure and supply.[2]

Supplementary Nutrition is one of the vital components amongst the services under Integrated Child Development Services (ICDS) Scheme. A cross-sectional study was conducted among beneficiaries of AnganwadiCentres (AWC) in Urban Areas of Belagavi. There were 760 participants who included Mothers of Children aged less than 6 years, Pregnant and Lactating Women, and Adolescent Girls enrolled at the AWC. Of the 760 beneficiaries interviewed, 97.2% received some type of Supplementary Nutrition through the AWCs. Of them, 62.8% said that the provision of the supplementary feeds was regular. As many as 176 (23.2%) of the participants admitted that the food was shared by a person for whom the feeds were not intended. Overall, 81.6% of the participants said they were satisfied with the food supplied.[3]

Some of the other services provided by ICDS scheme are Immunization and health check-up to the beneficiaries of the scheme. A cross-sectional study was conducted from April 2019 to July 2019 in three villages of Telangana state. The study showed that out of 135 pregnant women, 116(85.92%) took vaccines from AWC and 111(82.22%) utilized health check-up services provided by Anganwadi Centers. [4]

The existing system is a digital platform called "SNEHA", which provides comprehensive solution detection to cure for malnutrition management. This concept solution is developed in partnership with the government of India. The SNEHA toolkit consists of height and weight monitoring, attendance tracking and health supervision features but the system lacks authentication and notification capabilities.[5]

The Department of Women Development and Child Welfare, Government of Andhra Pradesh has developed the Nutri TASC tool. This monitoring system enables close follow-up of pregnant women, lactating mothers, children below 1 year and malnourished children below 5 years for availing nutrition services.[6]

III. OBJECTIVES

The ICDS Scheme was established with the intention to support psychological, physical and social development of the child, to improve the nutritional and health status and to minimize infant mortality, malnutrition and school dropout

and many more. The proposed study is based upon an android application which tries to ease up the ICDS scheme implementation. The objectives of the study include:

- To assess and simplify the functioning of Anganwadi Centers (AWCs)
- To authenticate and regulate food supply to children, pregnant women and adolescent girls (Kishoris as mentioned in the scheme)
- To minimize the fraud in the food supply chain
- To keep the up-to-date details of the new government schemes and policies in the application
- To notify beneficiaries of the scheme about upcoming vaccination, immunization camps and health checkups
- To estimate the proportion of pregnant women, children below 6 years of age and adolescent girls utilizing various services provided by the Anganwadi centers
- To keep track of attendance of the workers and children

IV. PROPOSED METHODOLOGY

Digitalizing any platform makes the job easier and efficient. Government departments are not exception to this. Many digital reinforcements have been implemented in various government activities. For ICDS Scheme, there are few applications such as SNEHA, Nutri-TASC, Jatak [6]. These applications are used in different levels of management. The hierarchy is as shown below:
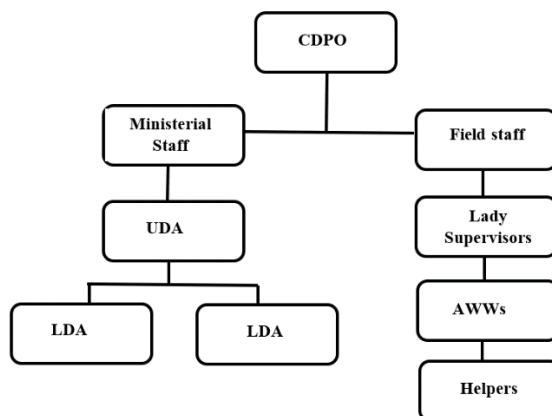

Fig.2. Hierarchy of ICDS scheme administration

A. *Abbreviations and Acronyms:*
- CDPO- Child Development Project Officer
- UDA- Upper Division Assistant
- LDA- Lower Division Assistant
- AWWs- Anganwadi Workers

The proposed study deals with an android application which spreads across the Department of Women and Child Development and the Ministry of Health and Welfare. This app can be administered at the lower levels of the ICDS scheme which includes Anganwadi Workers, ASHA or Accredited Social Health Activist and Anganwadi Supervisors. At the higher level, MukhyaSevikas' act as admin. The responsibilities of the admin include supervising between AWWs, keeping track of people benefiting from the scheme and mentoring the AWWs in examining children's age, height and weight. In this application, admin has control over Anganwadi management by adding/removing Anganwadis, AWWs under her authority.

Under the supplementary nutrition service, the admin has the potential to follow-up reception, stock management and distribution of food supplies. The system manages the stock supplies, quantity of ration given to each registered user and the stock remaining in the AWC by till date updates. The admin can view and edit these data. Supervisor makes use of One Time Password (OTP) authentication every time while distributing ration. This prevents food being supplied to unintended or unauthorised users. Admin can assist supervisor in authentication.

Considering the Immunization and Vaccination service which is one among the main interventions for protection of children and pregnant women from life threatening conditions, this system notifies the registered beneficiaries a day before the vaccination camps regarding venue and timing details of the camp. These immunization camps include Pulse polio, Vitamin A, TT, Hepatitis B etc., The application also provides capability for the supervisor to track the addresses of the beneficiaries who did not attend the camp.
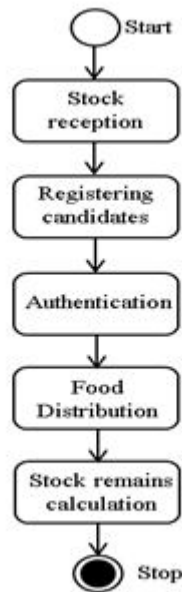
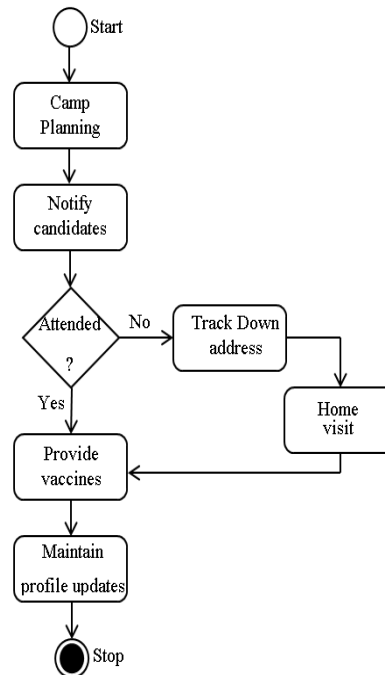Fig.3. Flowchart of Supplementary nutrition service   Fig.4. Flowchart of Immunization and Vaccination service

To maintain physical, psychological and mental health of people across the country, Health check-up service plays a vital role. The proposed tool generates health reports of the registered users after each health check-up. This helps in regular monitoring of the overall health.

In addition to these functionalities, the application helps in managing attendance of Anganwadi workers and children. This provision can be extended to Pre-schools also by mid-day meals and KsheeraBhagya services can also be supervised using this system.

V. OBSERVATIONS OF THE STUDY

The current study simplifies the management of Anganwadi with less utilization of time. Following is a table of estimation of various works done manually and through proposed application.

TABLE I.   TIME ESTIMATION OF ANGANWADI TASKS

Sl No.	Task	Time required for manual operations (in seconds)	Time required for android app (in seconds)
1.	Registration	900	300
2.	Authentication	--	15
3.	Notifying	Cannot be Determined	10
4.	Profile updates	600	120

Sl No.	Task	Time required for manual operations (in seconds)	Time required for android app (in seconds)
5.	Attendance	5	5
6.	Address tracking	Cannot be Determined	10

*The values in the table are just an estimation.

As tabulated above, the proposed application is ten times faster than the manual method. It also simplifies the job and responsibilities of the AWWs. Authentication, notification and address tracking of the beneficiaries, which is impractical in manual methods is easily achieved with this application. Through this application all the Anganwadis under a single admin can be integrated and maintained under a single platform.

Since the application will be both in English and regional language, the app is easily accessible and understandable by both rural and urban workers. This feature makes the proposed application user friendly and thus is helpful in promoting digital administration. By promoting digital administration in the lower levels also decreases the complications in the higher levels of government with less usage of paper and pen!

VI. ADVANTAGES

The current study on the android application for ICDS Scheme has come up with many advantages. As mentioned earlier, it decreases the time and complexity in administration of the Anganwadis. The tool allows easy registration of the children, pregnant women and adolescent girls. It provides the nutritional status of the child by maintaining personal profile records. Authentication during the distribution decreases the rate of fraud in the process, hence it ensures that right amount of food is supplied to right people. Registration and authentication help in capturing accurate details about the users. Health reports generated by the system are helpful in monitoring health status and vaccination progress.

VII. CONCLUSION AND FUTURE WORK

To conclude the study, this system can be used to decrease the burden on the Anganwadi workers (AWWs). The system, when implemented proves to be efficient in authentication and regulation of food supply to children, pregnant women and adolescents. Overall, this minimizes the fraud in food distribution process and help beneficiaries to utilize the facilities provided by ICDS scheme by notifying them about supplementary nutrition, upcoming vaccination, immunization and health check-ups. The attendance tracking option of workers and children helps admin to supervise workers and distribute food supply to children according to attendance. The beneficiaries can get the health check-ups and vaccination services at their doorstep with the help of address tracking option in the system. The system ensures timely delivery of all services to target group and helps ICDS scheme to take further steps in improving nutritional status of the children.

Future scope of the system comprises of fingerprint authentication, which is more secure and efficient. This application can also be further extended to pre-school, primary and higher primary school authorities.

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