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Monitoring and SMS Notification Systems for Mid-Day Meal Program

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Abstract: ***Areal-timemessagenotification system is proposed to enhance communication and coordination within the Mid-DayMeal Program. This system utilizes technologyto deliver timelynotifications andupdates tokeystakeholders, including beneficiaries, schools, suppliers, and program administrators. Additionally, it features a malnutrition assessment module, allowing real-time monitoring of students' nutritional health. Byensuringswiftdissemination ofcriticalinformationsuchas menu modifications, delivery schedules, and malnutrition analysis,thesystemaimstooptimizeoperationalefficiencyand streamline program execution. This communication tool enhancestransparency,accountability,andengagementamong stakeholders, ultimately supporting the program's goal of providing nutritious meals to school children. Furthermore, it assistsgovernmentauthoritiesin analysingmalnutritiontrends forinformeddecision-making.Theobjectiveofthispaperisto develop an efficient monitoring system that strengthens the effectiveness of the Mid-Day Meal Program while ensuring accountability and transparency at every level.***

Keywords: ***Mid-Day Meal Scheme, Nutritional Monitoring, School Management Committees, Food Quality, Logistics Challenges.***

I. INTRODUCTION

The Mid-Day Meal (MDM) programme is a government initiativeinIndiathatprovideshot-cookedmealstostudents in state and state-supported primary schools. The primary goal is to improve children's nutritional status, encourage regular school attendance, and enhance overall well-being. The meals typically consist of rice, lentils, vegetables, and fortified foods, ensuring a balanced diet. The program has played a crucial role in combating hunger and malnutrition among school children [1]. It also contributes to increased enrolment, improved retention rates, and better academic performance. Since the Fifth Five-Year Plan (1974-78), India has progressively prioritized the fight against poverty and malnutrition, leading to key policies such as the 1993 National Nutrition Policy (NNP) and the 1995 National Action Plan for Nutrition (NPAN).

This commitment was further strengthened in 2008 through initiatives like the Mid-Day Meal Scheme and its convergencewiththeSarvaShikshaAbhiyan,demonstrating aholisticapproachtoeducationandnutrition.The introduction of the PM Poshan Aahar initiative in 2018 underscores the government's ongoing efforts to combat malnutrition and promote inclusive development [2,3]. Most children and parents have expressed satisfaction with the implementation of the MDM scheme. According to parents, MDMhasimprovedchildren'seducation,health,andnutrition.

A study conducted by Amartya Sen's Pratichi Research Team in West Bengal revealed that school enrolment and attendance increased due to mid-day meals, with a faster rise among girls and children from SC/ST categories. The Public Report on Basic Education (PROBE) found that 84% of surveyed households confirmed that schools provided cooked mid-day meals, and students enjoyed a varied menu. Schools also promote good hygiene practices, such as handwashing before and after meals [3,4]. A study conducted in Madhya Pradesh by the National Institute of Public Cooperation and Child Development highlighted that the MDM scheme significantly reduced dropout rates, especially among girls. It also improved students' academic performance and played a vital role in fostering social equityacross different sections of society[3,4].

The Annual Status of Education Report (2010) found that 83.4% of schools served mid-day meals on the day of inspection, while 81.3% had proper kitchen sheds for meal preparation. The Supreme Court Committee has recognized MDMasoneofIndia'smostsuccessfulgovernmentprograms, notingitspositiveimpact on school enrolmentandattendance.

A 2011 performance audit conducted by the Centre for Environment and Food Security analysed food security programs in Odisha and Uttar Pradesh. The report found that Odisha performed better than Uttar Pradesh, with 86.7% of children receiving quality meals in Odisha, while only 51.8% of children in Uttar Pradesh received adequate meals [4,5].

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A 2010 study by the Planning Commission emphasized that cooked mid-day meals created a platform for children from diverse social and economic backgrounds to share meals, fosteringsocialintegration.However,itwasalsoobservedthat the program sometimes diverted the attention of teachers and students towardmeal-relatedactivities, leadingtoa temporary shift away from academics.

The effectiveness of this system is also a concern, as the numberofelementaryschoolstudentsinmostruralstatesisnot increasing significantly. The impact of a poorly managed transportsystemforfooddistributioninprimaryschoolshas negatively affected student enrolment in state schools.

According to the Planning Commission's performance assessment report on cooked mid-day meals, the Government ofIndia'sguidelinesrequired food grainstobe supplied from PDS retailers directly to schools. However, issues such as fake food grain supplies and theft were reported. Various studies have also highlighted that many schools lack the necessary infrastructure for meal preparation. Essential facilities such as proper kitchens, storage rooms, and clean water sources were missing in many schools, negatively impacting food quality and hygiene. The 5th Joint Review Mission (2013) in Uttar Pradeshfoundthatobstaclesinfoodgrainsupplyresultedin mid-day meals not being cooked on some school days, leadingtoa negative impact on children'snutritional intake.

A. Challenges and Policy Concerns

The success ofanyprogram depends on the commitment andparticipationoftheauthorities.Despiteitseffectiveness, theMid-DayMealScheme(MDMS)facesmanychallenges in its implementation. A significant number of Indian children come from low socio-economic backgrounds. A study conducted in Karnataka showed that the majority of parents whose children benefited from the mid-day meal program was engaged in agriculture and allied activities (Mirajkar & Narayanaswami, 2019) [6].

Providing consistent services to a large population remains a major challenge in developing countries due to resource limitations. Understanding the ground realities through needs-based assessments and strategic initiatives should be a key focus during policydevelopment. To make theprogramsustainableandwell-integrated,itisessentialto have a clear roadmap for its implementation, guided by a detailedanalysis ofreal-worldchallenges. Themost critical challenges faced and strategies to overcome them are discussed in the next section.

1) Quality and Quantity of Food

The health status of elementaryschool children is directlyinfluenced bythequalityandquantityof food provided under school lunch programs.Thequalityof mid-day meals depends on the active participation of School Management Committees (SMCs) and MDM authorities' supervision (Paltasingh, 2014) [6,7]. Therefore, SMCs must ensure that food served to children is both nutritious and hygienic. Many tragedies have occurred due to negligence by MDM staff and the indifferent attitude of school administrators. For instance, oneofthemosthorrifying incidents took place in Bihar, where 23 children lost theirlivesduetofoodpoisoningatGandamanPrimary SchoolinSaranDistrict.TheincidentoccurredonJuly 16,2013, afterthechildrenconsumedacontaminated school meal. As a result, around 150 students stopped taking school lunches for nearlyamonth. Investigations revealed that unsanitary cooking practices and contaminatedwaterledtothetragicevent(Singh,2015).

Similarly,inUttarPradesh,twostudentsdied,and15 otherswere hospitalized duetofood poisoning(Xinhua, 2016). Such incidentshighlighttheneed for strict safety measures and close monitoring of the cooking process. Unfortunately, there is no formal training provided for MDMS stakeholdersregardinghealthyandhygienic food preparation. In some schools, teachers taste the food before serving it to students as a safety measure (Chand Kuril, 2018) [7]. The School Management Committee (SMC), which includes community representatives, is expected to play an active role in the mid-day meal program, ensuring both quality and quantity of food served to students.

2) FocusonHealthandNutrition

TheMDMprogramhasbeen successful, but Indiaisstill in terms of the production of proper nutrition for children. Accordingto Global Nutrition Report 2018, India is on the national list, with Nigeria andPakistanhaving 46.6million children under malnutrition (Upadhyaya Bisla, 2019). MDMdoesnotmeetdailynutritionguidelines,accordingto school lunches (Man-Soor Rawoof, 2018). In 2013, the meals of around 90 students did not clash with elementary school students in Delhi. According to a comprehensive reportfromtheNationalNutritionSurvey,schoolchildren's meals are undoubtedlyverylarge. The surveyshowed ages 20 and 23. Approximately 24 were not among those not at school due to Sterns ten (Rukmini, 2019). Therefore, the authorityinvolved must ensure that children must consume nutritious foods. Regular health checks for children should beorganizedatschools, andreportsshouldbesharedamong parents[7,8].

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Nutritioneducation playsanimportantrolein training children for healthy and dietary behaviors. Researchers foundthattheyareyoungpeopleinmost cities with Indian diets (Kotecha et al., 2013; Rathi et al., 2017). Around the world, schools have not only promoted social and academic development for young children, but also played an important role in physical and psychological fountains.However,Indianschoolsneedtopromotehealthy nutrition practices among students (Mehan et al., 2012). Health education can be included in the principal. This promotes the use of fruits, vegetables and foods with nutrients.

3) ImprovementofInfrastructure

In some of the schools, teachers and MDM staff are yet tobeawareofMDMguidelines.Someoftheschoolsinthe country do not have kitchen sheds, adequate utensils and appropriate place for serving lunch. In some other schools, teachers think that the distribution of MDM is the responsibilityofMDMstaffonlyandtheydonot cooperate with them which leads to low motivation among the beneficiaries (Nambiar Desai, 2012; Robinson, 2007; Verma Biswas, 2009). MDM authority should ensure adequateinfrastructureincluding kitchen-cum-storerooms, safedrinkingwater,sufficientnumberofutensilsfor cooking and serving and water tanks to wash utensils in every school [8].

4) IntensiveKitchen

InIndia,thecateringservicesforMDMprogramsvary across the country. According toMDM guidelines, there are regulations for both centralized and school-based kitchens,dependingonthelocationandavailabilityofthe infrastructure. A temporary kitchen refers to a place where meals are available for cluster children cooked in one place and driven by vehicle to the affected school to serve lunchtime. Catering services managed by NGOs and CSOs are monitored by the government using screening procedures [8]. It's a very good destination to provide food to the kitchen in a school with no infrastructure. Despite the dedicated service of some organizations,thefoodisnotalwaysasexpected.Despite somesuccessful casesof food deliverythroughintensive kitchens, it is deemed to contain a major gap between food preparation and serving. For this reason, many schoolsreceivespoiled foodsthatcan affectthehealthof their children.AstudyconductedinUttar Pradesh shows that children are more satisfied with school-based kitchens compared to central cuisine. The main reason was that school kitchens werereported tobe served with shorter waiting times and fresh food with a sense of belonging (Ali Akbar, 2015). During the introduction of a central kitchen system, the removal of schools from kitchensandtransportation communication facilities must be considered.

5) Social Examinations

Social audits are methods of measuring, understanding, and improving the social and ethical performance of an organization or program. They help closethegapbetween visionandrealitywhilepromoting accountability and transparency. Recently, they have gained global recognition and are commonly used in CSOs and NGOs [8,9]. Social audits are particularly important from an MDMS perspective, as they help implementation authorities determine whether the program is effective. As a result, they have become a crucial tool in improving schools.

A study conducted in Andhra Pradesh found that the inclusion of communities in social audits led to many positivechanges.Oneofthemostsignificantfindingswas that all schools were able to regularly provide nutritious meals. This decision was made after the report was presented at the Gram Sabha (Village Meeting) (Sinha, 2008). The social and ethical aspects of the MDM program can be monitored bya village-level social audit team, which regularly visits schools and provides observational reports on program improvements.

6) Contribution Details

Our studyfocused on developing a structured framework that integrates mobile technology with a web-based dashboard to monitor lunch programs in real time. This systemisdesignedtotrackmealpreparationanddistribution, ensuring accurate record-keeping and data analysis to enhance resource management and planning.

WeintroducedanSMSnotificationfeaturetokeepparents informed about meal plans, menu updates, and nutritional content while also encouraging community participation through feedback. Recognizing the significance of user involvement, we adopted a participatory design approach, conducting workshops with teachers, parents, and local stakeholders to tailor the system to their specific requirements. For pilot implementation, we proposed selectinga diverserangeofschools, trainingstaffon system usage, and setting measurable indicators to evaluate its impact on meal distribution and student health [10]. To addresspotentialchallengessuchastechnicallimitationsand data privacy concerns, we recommended solutions like offline functionality and strict adherence to data protection guidelines.

Finally, we suggested conducting further trials to assess the long-term effectiveness of the system and its potential application in other government programs aimed at enhancing children's nutrition and well-being. By adopting this comprehensive approach, we aim to significantly improve the efficiency and transparency of school meal programs, ultimately contributing to better health outcomes for students.

II. LITERATURESURVEY

TheNoon Meal Scheme(MDMS) isa flagship program of the Government of India aimed at improving nutrition, educational outcomes, and the general well-being of school children. This literature overview presents existingresearch relatedtothescheme, emphasizingkeyinsights, challenges, and policy influences.

The introduction of mid-day meals dates back to the 1960s. The National Program for Nutrition and Nutrition Assistancefor PrimaryEducation (NP-NSPE)waslaunched in1995asaCentrallySponsoredScheme.Thislaterevolved into the Mid-Day Meal Scheme under the National Food Security Act (NFSA) in 2013.

DrezeandKingdon(2001)analyseddatafromhousehold surveys conducted in 122 randomly selected villages in Rajasthan, Bihar, Himachal Pradesh, Uttar Pradesh, and Madhya Pradesh in 1999. Their study found that the attendance of girls in schools providing mid-day meals increased by 15%. In addition to improving school admissions, the meals positively impacted girls' classroom performance [9].

DrezeandGoyal(2003)conductedamajorstudyacross

Three states - Chhattisgarh, Karnataka, and Rajasthan to assess theeffectsofMDMS,highlightingbothitsbenefitsand challenges.Thestudyfoundthatmid-daymealssignificantly improvedfoodsecurityforchildreninbackwardareaswhere even two daily meals were uncertain. It also attributed a 14.5% increase in schoolenrolments to the scheme.Additionally,the study concluded that Karnataka had better MDMS performance compared to Chhattisgarh and Rajasthan, though all three states struggled with infrastructure and logistical challenges [9].

Afridi(2005)comparedtheweakimplementation ofMDMS in Madhya Pradesh with its success in Karnataka. The study praised Karnataka's financial and institutional setup, which ensured better meal quality without compromising standards [10].

ThePratichiTrust(2005)examinedMDMSimplementation in the Birbhum district of West Bengal and identified several shortcomings, including poor food quality, lack of diversity, infrastructure limitations, and social prejudices affecting food distribution [11]. The study also noted that mid-day meals disrupted teaching activities in some schools.

Goi(2013)reviewedMDMSimplementationinBuldhanaand AhmednagardistrictsofMaharashtra,findingitinadequateinthe mostvulnerableareas[12].Thestategovernmentfailedtoadhere to revised cooking cost standards and delayed the release of central funds by over four months.

Due to the lack of training for Cook-Cum-Helpers (CCH), mealswerenotpreparedaccordingtoprescribedstandards.Food samples were not tested for nutrient content or E. coli contamination. Additionally, CCHsalarieswere delayed by 5–6 months, affecting the program's efficiency.

A. Research Objective:

This study(defined byMHRD) shows that MDMP guidelines and goals are maintained as benchmarks.

B. Research Methodology:

This study is descriptive, based on intensive research on fieldwork conducted in 2016-2017. The sample consisted of 24 bourgeoisschools(primaryschoolswithtopreasonsinMumbai) and was selected by layered random amplifier technology at 24 stations BMCs. This included the same phrases at each station, 240schoolchildreneligibleformealsontheday,andmeals(five girls) happened to include the same words as 120 teachers. Evidence was collected directly from the most important stakeholders regarding the implementation of MDMP in accordance with the MDMP guidelines using personal observations (unpublished statements at school) and detailed semi-structured interviews [12]. The main data were analyzed with the help of the Social Science Statistical Package (SPSS Version 20). Sample Kolmogorov-Smirnov tests were used to confirm normalcy acceptance. Descriptive statistics (measurement of percentages, central tendency, and variance) and inferential statistics (parametric one-sample T-test and non-parametricone-sampleWilcoxonsigned-ranktest)wereusedfor detailedanalysis.

C. Results and Discussion:

The success of MDMP depends on the way it is implemented with the greatest enthusiasm at the school level. This study attempts to assess BMC schools with various assessment parameters in relation to compliance with MDMP guidelines based on individual observational plans and highlights some of the multi-year issues with effective implementation.

1) MDMPRecognitioninBMCSchools:

MDMP is school-led and is responsible for generating recognitionamongMDMbeneficiariesbyensuringthatschool authorities directly claim the benefits under MDMP. Evaluations of all sample schools visited during the course of the study on the situation of MDMP awareness parameters indicate a very concerning state. This is because students are notawareofanyjustification for MDMPand donotrecognize the exact claims, with 37.5% of students in 54.2% of schools facing this issue [13]. The limited variety of meals, primarily "khichdi," is due to the poor financial condition of some institutions.

Regarding school teachers' recognition of their roles and responsibilities within the framework of MDMP (which is necessary to ensure that good quality food is provided to the children), meal participation takes place in a cohesive atmosphere.However,thereisnoassessmentofthetasteofthe food, the overall dining experience, or the impact on students' satisfaction and well-being.

2) MDMPDisplayatBMCSchools:

MDMP guidelines for 2006 and 2013 clearly state that program recognition should be generated by displaying the MDM logo, MDMP justification, weeklymenus, food details, nutritionalstandards,andmore.Additionally,FSPcontactdata should also be displayed in all schools [13].

DOs and DON'Ts related to MDMP are constantly displayed in prominent locations in only 25% of the sample schools. In most sample schools (75%), MDMP banners are either not visible in prominent locations or are placed somewhere inside the school room. They are very difficult to locate because they are torn, dusty, or not properly secured.

MDMP weekly menus rarely appear in easily visible locationswithinthesampleschools(66.7%).Inmanycases,the menu displayed on the notice board remains hidden due to overlapping papers or materials from other districts [14]. We found that details of the FSP were displayed onlyin 29.2% of schoolsduringunpublishedvisits,whereasin20.8%ofschools, the frequency of display was inconsistent. In contrast, FSP details were properly exhibited in 50% of the sample schools.

*3) BMCSchoolsSchoolHealthProgram***:**

The School Health Program (Rashtriya Bal Swasthya Karyakram)isimplementedatallprimaryandupperlevelsinall sample schools. Under the SHP, doctors from nearby public health clinics visit schools and provide services, including free treatmentfor mildsymptomsandhealthcheck-ups(atleastonce a year). They also facilitate referrals for serious illnesses.

School health maps/medical files are maintained for all students. Weekly iron and folic acid supplements (WIFS) were not provided, along with vitamin A, last year, sono evaluations havebeenrecordedtodate.Theextendeddosewasadministered only once a year; therefore, an evaluation was conducted. Teachers were instructed to measure and record the height and weight of school children every three months. All schools now have height and weight measuring equipment [15].

MicronutrientSupplementation:

In the absence of regular administration of deworming agents in prescribed doses, the issue of hidden hunger remains unaddressed, leading to disadvantages among the students studied in Mumbai.

4) MonitoringofMDMPinBMCSchools:

School assessments related to the MDMP monitoring aspects indicate that FSPs have compared the amount of meals supplied withthemoderatemealsinanyofthesampleschools.According to MDMP guidelines from 2006, teachers should ensure that high-quality,healthyfoodisprovidedforchildrenandthatmeals areconsumedinaconsistent, warmatmosphere. Preparedmeals must be tasted on a rotational basis before signing the taste register maintained at the school.

Lunch is frequently tested before serving in 41.7% of the sample schools, but meals arerarelytested in half of the sample schools, which conflicts with MDMP guidelines. 41.7% of teachers in the sample schools attended and supervised MDMP very frequently [16]. MDM taste registers are maintained in all schools, but there is a discrepancyin the entries related to lunch on thedayandtheirtastes,astheyarenotrecorded dailyinmost schools(58.3%).SinceMDMPwasbroughtundertheautomatic monitoring system, school visit details, principal supervision, MDM menu, and the food grains and legumes that need to be served are all documented.

III. METHODOLOGY

A. *DataAnalysisandCollection:*

1) *UserRolesandAccess*

- Admin:Managestheoverallsystem,including user permissions and data oversight.
- School Staff: Inputs meal data, updates schedules, and communicates with parents [15].
- Supplier:Abilitytoviewmealrequestsapprovedby the government for a particular school and provide them with their requirements.
- Parents/Guardians: Receive notifications and provide feedback.

2) *SystemSetup*

- Database Configuration: Establish a secure database to store user information, meal records, and notification logs [16].
- User Registration: Enable registration for schools, suppliers, and parents, with verification processes to ensure data integrity.

3) *MealPlanningand Scheduling*

- Menu Input: School staff can enter weeklyor monthly meal plans into the system.
- Nutritional Information: Include fields for nutritional content to inform parents about meal quality.
- ScheduleNotifications:SetupautomaticSMS notifications based on meal schedules.

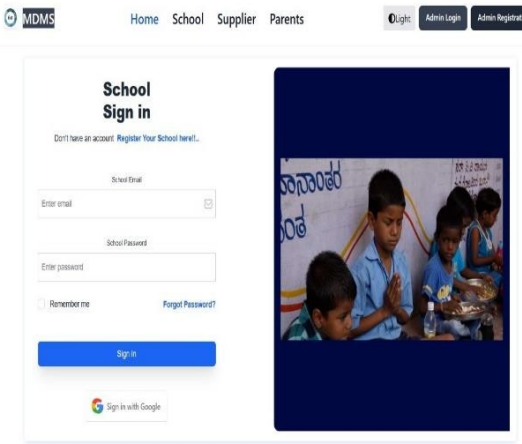


Figure.1.SchoolSigninPage

4) *Real-TimeMealMonitoring*

- Meal Preparation Logging: Staff log meal preparation status in real time, noting any delays or changes [17].
- Attendance Tracking: Monitor student attendance during meal times to analyze participation rates.

5) *SMSNotificationWorkflow*

- Automated Alerts: Dailynotificationsare sent toparentsabout theday'smeal.Alertsfor any changes to the meal schedule or menu. Daily attendance tracking of their child.
- Feedback Mechanism: Parents can reply to SMS notifications with feedback or inquiries, which are logged in the system [18].

6) *DataAnalysisandReporting*

- Consumption Analysis: Generate reports on mealconsumption trends,studentparticipation, and parental feedback.
- Nutritional Assessment: Analyze data to evaluate the nutritional effectiveness of meals provided.

7) *UserInterfaceandExperience*

- Dashboard for School Staff: Provide a user- friendly interface for entering data, viewing meal logs, and accessing reports.
- Mobile Application: A mobile-friendly version of the system is developed to allow parents to access their child's information, such as attendance and nutritional status, linked to the uniquemiddaymealIDgeneratedbyoursystem [18].

- Parents have separate login credentials, enabling secure access to information specific to their child.
- Theappprovidesaccesstomealschedules, nutritional details, and attendance records, giving parents real-time insights into their child's well-being and school meal participation.

B. Architecture Details

1) User Interface Development: HTML, CSS, JavaScript, and Thymeleaf

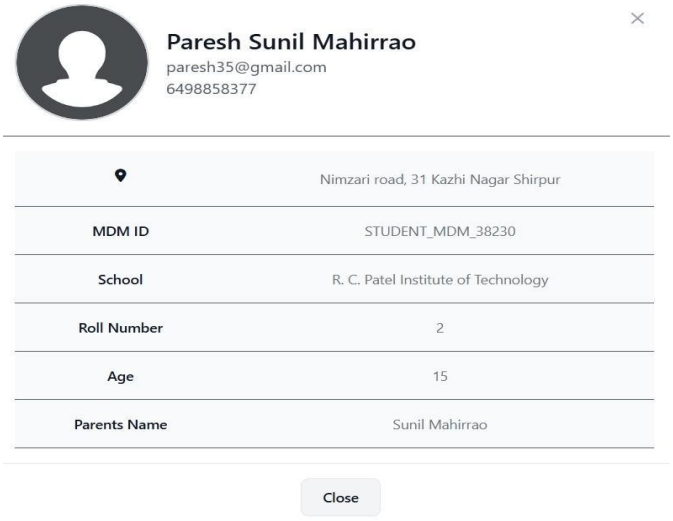


Figure.2.StudentProfile

- HTML, CSS, and JavaScript are used to create a responsive and interactive user interface accessible across various devices via web browsers.
- HTML defines the structure, CSS manages styling, and JavaScript enhances interactivity, ensuring a seamless user experience.
- Thymeleaf, integrated with Spring Boot, acts as a server-side templating engine, allowing dynamic renderingofHTMLpagesandsmoothintegrationof backend data into the frontend [16].

2) BackendDevelopment:SpringBoot

- Spring Boot serves as the backend framework, offering a robust, scalable, and enterprise-ready solution for building RESTful services.
- It simplifies development with embedded servers, dependency injection, and seamless database integration.

3) DatabaseManagement:MySQL

- MySQL is used as the database management system, providing a reliable relational database structurethatsupportscomplexqueriesandensures data integrity [16].
- Its ACID-compliant transactions and structured datastoragemakeitidealforapplicationsrequiring consistency and reliability.

4) Frontend Development: HTML, CSS, JavaScript, Thymeleaf, and Tailwind CSS

- HTML, CSS, and JavaScript collectively build a responsive and dynamic frontend, where HTML provides structure, CSS handles styling, and JavaScript enhances interactivity [15].
- Thymeleaf, a Java-based templating engine, is integrated with Spring Boot for efficient server- side HTML rendering.
- Tailwind CSS is utilized to streamline and customize the styling process, ensuring a modern and responsive UI.

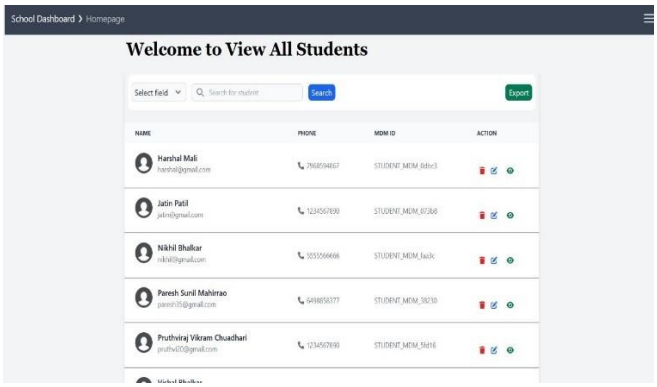


Figure.3.ViewData

5) AuthenticationandSecurity:SpringSecurity

- Spring Security is used for authentication and authorization,ensuringrobustsecuritymeasures for the application.
- It includes features such as role-based access control, password hashing, and protection against common security threats [14]. meals served, delivery times, and recipient feedback, improving accountability.
- Report Accuracy: The reports maintained a 99% accuracyrate,verifiedthroughcross-checkingwith manualrecords.
- IssueResolution:Administratorsusedthesereports to address problems efficiently, reducing discrepancies by 20%.
- Feedback Mechanism: A built-in feature allows recipientstoratemealqualityandreport concerns, offering valuable insights into meal program performance [17].
- User Engagement: The system processes an average of 150 feedback responses weekly, with a 90% resolution rate for reported issues.

6) Data-DrivenInsightsandAnalysis

- Consumption Trends: Data analytics help administrators track meal consumption patterns, improving meal planning and distribution.
- ResourceOptimization:Insightsfromdataanalysis resulted in a 10% reduction in food wastage and better forecasting of meal requirements.
- Historical Data Access: The availability of past data enables trend analysis, assisting in effective decision-making [18].

C. Results

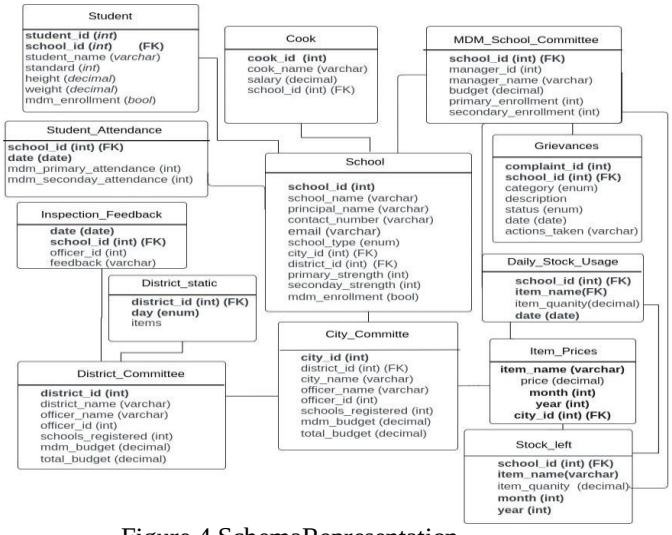


Figure.4.SchemaRepresentation

1) UserExperienceandAccessibility

- IntuitiveInterface:Thesystemisdesignedforeasy navigation, ensuring users can access essential features without difficulty [14].
- SatisfactionRatings:Asurveyshowed92%of

2) Real-TimeMonitoringEfficiency

- Dashboard Functionality: The centralized dashboardintegratesdatafrommultiplesources, such as meal distribution logs and attendance records. It provides real-time insights into meal status, delivery schedules, and recipient feedback [10].
- Performance Metrics: During initial testing, the dashboard achieved a 95% accuracy rate in tracking meal distribution details. Real-time updates were recorded with an average delayof under five seconds.

3) AutomatedSMSNotificationEfficiency

- Timely Notifications: The system ensures that SMSalertsreach parents, school authorities,and other stakeholders on time. These alerts include meal schedules, delivery confirmations, and emergency updates [13].
- User Feedback: A majority of parents—over 85%—foundthenotificationsbeneficial,helping them stay informed and plan accordingly.

4) EnhancingTransparencyandAccountability

- Meal Distribution Reports: The system generatesdetailedrecordsofthenumberof administrators and 89% of parents were satisfied with the interface and system functionality.
- Mobile-Friendly Design: The platform supports mobile access, enabling convenient use across different devices.
- User Adoption: Around 70% of users preferred accessing the system via mobile devices, highlightingtheimportanceofmobileoptimization [19].

5) SecurityandPrivacyMeasures

- Data Protection: The system employs encryption and access control features to safeguard sensitive information.
- Compliance Standards: No securitybreacheswere recorded during testing, and the platform aligns with relevant data privacy regulations [19].

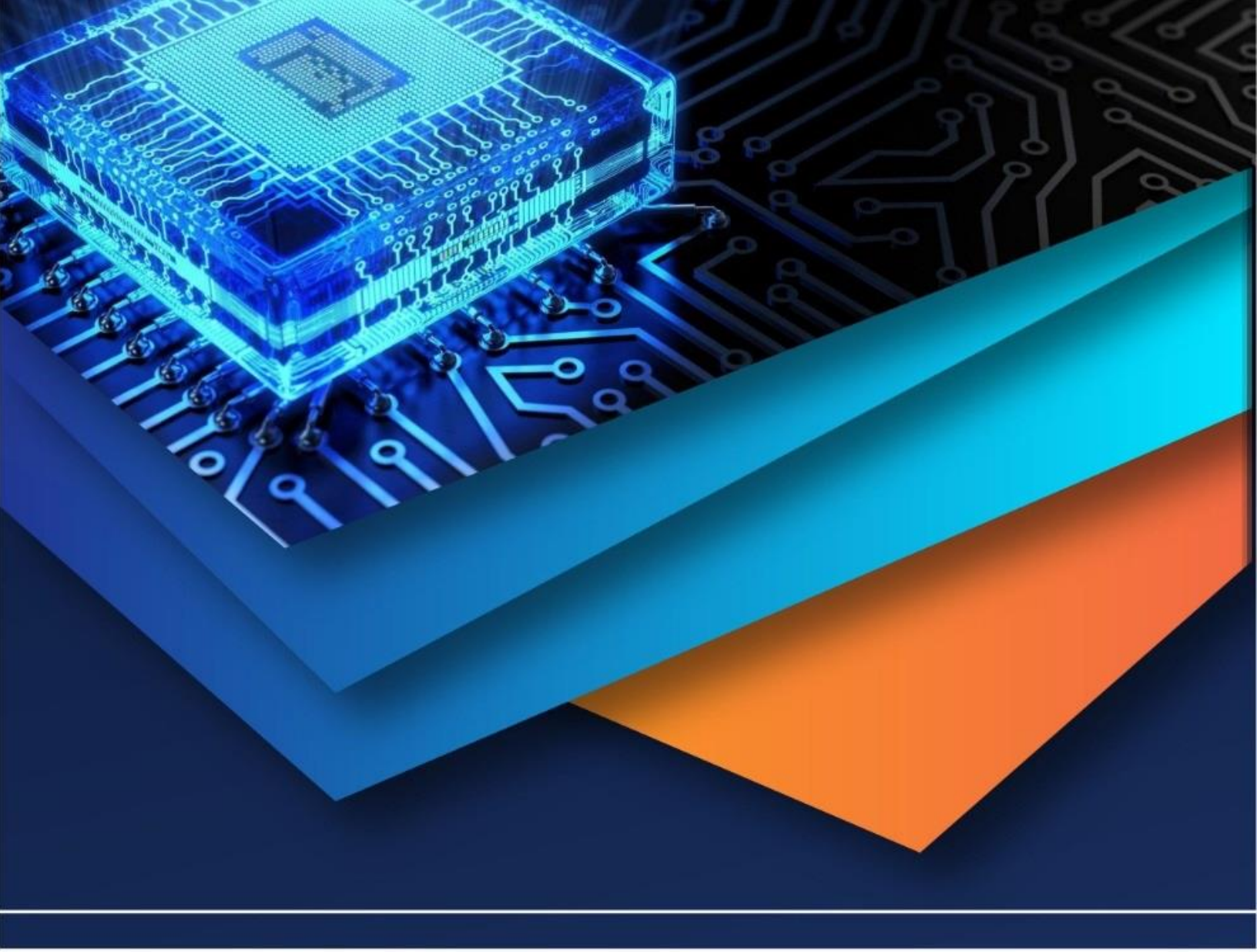
IV. CONCLUSION

Insummary,developingmobileapplicationstailoredtolunch programs is a crucial step toward modernization and optimization. The integration of features such as real-time SMS notifications, dietary planning management, and malnutrition assessment enhances communication, improves coordination, and increases efficiency for all stakeholders. A user-friendly interface and comprehensive features make web applications a powerful tool for seamless program implementation, promoting transparency, accessibility, and stakeholder engagement. Looking ahead, continuous user feedback and regular updates basedonevolvingneedswillfurtherenhancetheeffectivenessof these applications. This will ensure better support for program objectives, facilitate the provision of nutritious meals, and contribute to the overall well-being of school children.

REFERENCES

[1] Elizabeth Abery and Claire Drummond. Implementation of mandatory nutritional guidelines in south australian primary school canteens: aqualitative study.Improving Schools, 17(1):41–53, 2014.
[2] FarzanaAfridi,BidishaBarooah,andRohiniSomanathan. School mealsand student participation in urban india. Delhi School of Economics, 2010.
[3] Simmi Agnihotri. An assessment of the mid-day meal scheme in india—a study. Indian Journal of Public Administration, 56(3):635– 641, 2010.
[4] Simmi Agnihotri. An assessment of the mid-day meal scheme in india—a study. Indian Journal of Public Administration, 56(3):635– 641, 2010.
[5] SAli.timeshigherpovertyratesinindianhouseholdswith children: Survey.Business Standard, 3.
[6] Vijaya Sherry Chand and Samvet Kuril. Contextualising educationaldecentralisationpoliciesinindia.Economic& Political Weekly, 53(12):107–114, 2018.
[7] AjitKumarDeyandAjoyBhusanNath.Nutritionalstatus ofschool goingchildren(6-15years)inasemi-urban area of cachar district,assam.J Evolution Med Dent Sci, 6(54):4057–62, 2017.
[8] JeanDrezeandAparajitaGoyal.Futureofmid-daymeals.Economicandpoliticalweekly,pages4673–4683,2003.
[9] JeanDre`zeandGeetaGandhiKingdon.Schoolparticipation inruralindia.Reviewof Development Economics, 5(1):1– 24, 2001.
[10] Manisha Garg and Kalyan Sankar Mandal. Mid-daymeal for the poor, privatised education for the non-poor. Economic and Political Weekly, pages 155–163, 2013.
[11] Rajshri Jayaraman and Dora Simroth. The impact of school lunches on primary school enrollment: Evidence from india's midday meal scheme.2011.

[12] Mohd Zubair Kales. Mid-day meal scheme: A study of different schoolsof district jammu. Scholarly Research Journal for Humanity Science and English Language, 1(5):456–469, 2014.
[13] Reetika Khera. Mid-day meals in primary schools: Achievements and challenges. Economic and political weekly, pages 4742–4750, 2006.
[14] TattwamasiPaltasinghandPrakashBhue.Efficacyofmid- daymealschemeinindia:challengesandpolicyconcerns. Indian Journal of Public Administration, 68(4):610–623, 2022.
[15] TattwamasiPaltasinghandPrakashBhue.Efficacyofmid- daymealschemeinindia:challengesandpolicyconcerns. Indian Journal of Public Administration, 68(4):610–623, 2022.
[16] TattwamasiPaltasinghandPrakashBhue.Efficacyofmid- daymealschemeinindia:challengesandpolicyconcerns. Indian Journal of Public Administration, 68(4):610–623, 2022.
[17] Sushma Sharma, Santosh Jain Passi, Salila Thomas, and HemaSGopalan.Evaluationofmid-daymealprogramme in mcd schools. Nutrition Foundation of India, Scientific Report, 18, 2006.
[18] DipaSinha.Socialauditofmiddaymealscheineinap. EconomicandPoliticalWeekly,pages57–61,2008.
[19] RSinha.Ruralindia:focusonnon-agriculturesector.Live Mint E- Paper, 2018.



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