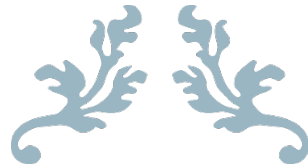


Request for Proposal



**SELECTION OF SERVICE PROVIDER FOR DESIGN,
DEVELOPMENT, IMPLEMENTATION AND
MAINTENANCE OF DIGITAL INITIATIVES IN
ANIMAL RESOURCE DEVELOPMENT (ARD) SECTOR
OF FISHERIES & ANIMAL RESOURCE
DEVELOPMENT (F&ARD) DEPARTMENT**

RFP No: OCAC-SEGP-SPD-0076-2024-25111



Vol-II | Terms of Reference



ODISHA COMPUTER APPLICATION CENTRE

[TECHNICAL DIRECTORATE OF E&IT DEPARTMENT, GOVERNMENT OF ODISHA]

OCAC Building, Acharya Vihar Square, Bhubaneswar-751013, Odisha, India

W: www.ocac.in | T: 0674-2567295/2567283 | F: 0674-2567842

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1. Background

The Directorate of Animal Husbandry and Veterinary Services (DAH&VS) falls under the Fisheries and Animal Resources Development (F&ARD) Department of the Government of Odisha and is implementing programs with the intervention of the State and Central Government schemes and initiatives for breeding, feeding, and management of livestock and poultry on scientific methods. The schemes implemented by DAH&VS benefits the livelihood of over 40 Lakh+ cattle and goat farmers across all 30 districts of the state.

The Livestock Sector in Odisha is highly livelihood intensive as it provides a livelihood and boosts the income of the livestock farmers, particularly for the small and marginal holdings, besides rendering protein supplementation and food security. The contribution of livestock output to the state incomes is substantial as it contributes to the state's GDP has been rising year-on-year. In India, livestock production accounts for 21% of the nation's GDP. With a human population of 4.4 crores, livestock plays a vital role in the rural economy of Odisha.

Functions of DAH&VS are :

- a. To improve the genetic potential of the livestock through organized breeding.
- b. To provide quality livestock health care services in the state.
- c. To educate the livestock owners in modern animal husbandry practices.
- d. To promote animal welfare measures to reduce the suffering of animals and birds.
- e. To provide livelihood to the farmers of the state through economic livestock and poultry rearing.

The Animal Resources Development (ARD) sector has embraced digital technologies to modernize operations, enhance efficiency, and improve farmer welfare. These initiatives integrate advanced tools and platforms to support animal health, productivity, and market access. This sector is undergoing a digital transformation aimed at improving productivity, efficiency, and sustainability in animal husbandry, dairy, and related activities. The key digital initiatives aim to transform the industry by leveraging cutting-edge technologies, enhancing service delivery, and addressing critical challenges.

The Odisha Computer Application Centre (OCAC), under the Department of Electronics & IT, Government of Odisha, leads the state's e-Governance initiatives. As the government's tech backbone, OCAC drives digital transformation, aiming to enhance public service delivery through ICT. It collaborates with various departments to implement innovative, citizen-centric digital solutions that promote transparency, efficiency, and accessibility across Odisha.

1.1 Objective

The department intends to implement a unified platform with an aim to serve as a dynamic solution for enabling transparency in:

- a. Inventory Management of Medicine, Vaccine and Semen Straw
- b. Mobile Veterinary Units Operations
- c. Expenditure statements of various schemes
- d. Monthly Farm Reports
- e. Diseases Diagnosis and Surveillance system
- f. Training activities in ARD sector
- g. On-Call Artificial Insemination (AI) Service

2. Scope of Work

2.1 Requirement Study

The Selected Agency shall perform the detailed assessment of the solution requirements as mentioned in this section. Based on the understanding and its own individual assessment, the Selected Agency shall develop & finalize the System Requirement Specifications (SRS) in consultation with F&ARD Department/OCAC. While doing so, the Selected Agency is at least expected to do following:

- a. The Selected Agency shall liaise with F&ARD Department officials, Govt. of Odisha.
- b. The Selected Agency shall consult with the domain experts and translate all the requirements mentioned in the document into System Requirements
- c. The Selected Agency shall follow standardized template for requirements capturing
- d. The Selected Agency must maintain traceability matrix from SRS stage for the entire implementation

2.2 Design

- a. After completion of system study, Selected Agency shall design the solution architecture and specifications for meeting the requirements mentioned as part of this document. The Selected Agency shall be entirely responsible for the design and architecture of the system implemented to satisfy all requirements as described in this document including suggestion on sizing of the required hardware.
- b. Selected Agency shall be responsible for the preparation of System Requirement Specification (SRS) document covering all modules & features planned to be covered as specified based on the outcome of detailed System Study and refined/ improvised FRS.

- c. Selected Agency shall demonstrate the SRS including screen templates, reporting requirements, process flow, and new features suggested for review and shall incorporate all the suggestions / modifications for approval by OCAC/Department.
- d. Selected Agency is required to update the SRS documents as and when any enhancement/ modifications is made into the module/ system till the duration of contract.

2.3 Development

The Selected Agency shall design and develop the Web portal and mobile app (both android and ios app) with components / functionalities to address the requirements of F&ARD Department, Govt. of Odisha including but not limited to the approved SRS, Solution Architecture & Standards as specified in this RFP document. The Selected Agency shall supply the following documents along with the developed components:

- a. Business process guides
- b. Data model descriptions
- c. Sample reports
- d. Frequently asked question (FAQ) guides
- e. Any other documentation required for usage of implemented solution

2.4 Integration

The Selected Agency shall be responsible for integration with other Applications, databases, SMS, eMail as well as with WhatsApp services as specified in this document as well as other IT systems of the Department.

2.5 Testing

- a. The Selected Agency shall design the testing strategy including test cases and conduct testing of various components of the solution developed. The solution testing shall at least include Unit Testing, System Integration Testing, Performance Testing, and User Acceptance Testing (UAT).
- b. The Selected Agency shall perform the testing of the solution based on the test plan, document the results, fix the bugs found during the testing and take remedial action based on outcome of the tests.
- c. The Selected Agency shall ensure that each module & features developed under this RFP is tested as per the latest version of the IEEE 730 (Software Quality Assurance Processes) standards and shall comply with GIGW guideline.
- d. Selected Agency must ensure deployment of necessary resources, tools and related logistics during the testing phases.

2.6 Security Audit

- a. The Selected Agency needs to ensure that the solution is in compliance with the CERT-In Security Policy and Guidelines.
- b. The Selected Agency shall appoint CERT-In empanelled auditor who shall be responsible for performing the Security Audit of the solution.
- c. The Selected Agency shall perform the UIDAI compliance audit as per guidelines.
- d. The cost of audit & rectification of non-compliances shall be borne by the Selected Agency.
- e. The agency shall carry out Security audit before Go-live of application to obtain the Safe-to-host certification
- f. Perform Periodic audit & certification as and when it is required as per Data Centre policy.
- g. The audit shall be performed at least on the below mentioned aspects.
 - Functional Testing
 - Accessibility Testing
 - Application Security Audit
 - Vulnerability Testing

2.7 SSL Certification

The Selected Agency shall carry out SSL certification, as per requirement.

- a. Secure connection between Client and Server through Secure protocol HTTPS
- b. Encryption of Data during transmission from server to browser and vice versa
- c. Encryption key assigned to it by Certification Authority (CA) in form of a Certificate.
- d. SSL Security in the application server

2.8 Deployment & Configuration

- a. The Web portal is proposed to be hosted on the infrastructure to be arranged by F&ARD Department /OCAC after successful UAT.
- b. The Selected Agency will be responsible for configuration, installation and hosting of the Web application in High Availability mode over the hardware infrastructure provided.
- c. The Selected Agency shall be responsible for the end-to-end management of hosting and deployment of the application.
- d. Post award of contract, the Selected Agency will be expected to furnish detailed hardware & software sizing including server, storage, security devices and related system software required for operationalization of the solution. Based on sizing submitted by the Selected Agency, the required hardware & software will be arranged.

- e. Enterprise grade database shall be provisioned for the proposed application. The selected agency shall procure required database license for this project in name of the Department DAFE valid for the duration of the project.
- f. The Selected Agency shall carry out necessary installation, configuration, maintenance & support for the Application production environment and the supplied software(s) to ensure that the services are made accessible to the users.
- g. The Selected Agency will be required to develop the solution in their own test environment.

2.9 UAT and Go Live

- a. After completion of the development work for application, F&ARD Department /OCAC will conduct the reviews of development work performed by the Selected Agency as UAT. OCAC / Department may constitute a UAT committee for this purpose.
- b. The Selected Agency shall be responsible for:
 - Preparation and submission of test strategy, test cases and test results
 - Demonstration of module-wise functionalities/ features before the F&ARD Department /OCAC in staging environment
 - Support F&ARD Department /OCAC and its designated authority for conducting the testing and provide access of the systems as required by them.
 - Rectification in the new application for any issues/ bugs/ and improvements/ Enhancements / upgradations suggested Departments (if any) during the UAT without any additional cost.
 - It would be Selected Agency's responsibility to ensure that all issues raised during UAT are closed and signed-off from respective authority
- c. After incorporation of the suggestions made during the UAT phase, the Selected Agency shall host the application in the production environment and Go-live of the system will be declared.
- d. After the Go-live, the application will be rolled out for Operation and Maintenance.

2.10 Training & Handholding Support

- a. The Selected Agency` is required to undertake training for the end users to make them acquainted with the application.
- b. The schedule / training calendar and the training material for imparting training shall be developed by the Selected Agency in consultation with F&ARD Department. It is also proposed that the training contents / User Manuals be made available to Users in downloadable (PDF) format so that the Users may refer / download it for their own personal reference as and when needed

- c. The Selected Agency shall also provide hand-holding support to Department users as required during the contract period and shall deploy two (2) resource for a duration of three years from the Go-Live of application.

2.11 Application Framework

The application shall be developed using any open-source technology. The application shall comply with relevant industry standards wherever applicable. The solution architecture must be scalable and flexible for modular expansion and should ensure ease of integration with other applications. The solution architecture should cater to the evolving requirements of the Directorate. The bidder shall use only the Enterprise version of the Database software and procure the same in the name of the Department as per its quoted price.

The bidder shall incorporate suitable Artificial Intelligence (AI)-based components within the proposed work plan to enhance efficiency, automation, and decision-support capabilities. The proposed AI interventions may include, but are not limited to, predictive analytics, intelligent data processing, automated workflows, anomaly detection, and user-experience enhancement tools. Bidders are required to clearly outline the AI technologies, methodologies, and implementation approach, along with expected outcomes and measurable benefits. The AI solutions should comply with applicable standards, ensure data security and privacy, and be scalable for future upgrades.

2.12 Annual Maintenance Support

Support and maintenance will be provided for a period of 3 years from the date of go live of the application including following:

- a. Application, System Software Administration & Database cleansing
- b. Fixing the bugs identified during the period
- c. Issue handling and resolution of issues related to application software.
- d. Maintaining the updated version of source code
- e. Tuning of the system to improve performance
- f. Enhancement of MIS report if required
- g. Database & System Administration including patches and upgrades
- h. User & access management
- i. Ensure compliance to SLAs as indicated in this RFP and plan any upgrades / major changes to the software ensuring the SLA requirements are met at no additional cost.

3. Functional Requirement

The following are the functional elements to be provided in the proposed solution:

3.1 Digitization of Semen Inventory Management System

The DAH&VS is dedicated to enhancing livestock productivity and supporting farmers through its artificial insemination (AI) initiatives. By offering AI services, the Directorate helps farmers improve the genetic quality and productivity of their livestock, particularly in dairy cattle. This results in higher milk yields, boosting the income and economic resilience of rural communities.

For conducting large scale artificial inseminations in the state for cattle, buffaloes and goats, the DAH&VS conducts procurement of normal and sex sorted semen for artificial insemination (AI) at the state level from a third party vendor. In addition to this, production of normal semen for artificial insemination is also conducted within the state. In this process, high-quality semen is sourced from genetically superior bulls and goats, selected based on traits that enhance yield, disease resistance, and adaptability to local environments. Frozen Semen Bank (FSB) located in Cuttack, Odisha under the Directorate maintains strict hygiene and safety protocols, ensuring that the collection, processing, and storage meet quality standards. Once collected, the semen undergoes rigorous testing for viability and genetic integrity, then is processed and stored in liquid nitrogen to preserve its quality for AI use. Post quality check, semen doses are distributed to all 30 districts based on their requirements. The allocation is in a cascaded manner, with the Directorate allocating the semen doses to the districts from Frozen Semen Bank (FSB), Cuttack to offices of the respective Chief District Veterinary Officers (CDVOs) which subsequently allocate to the respective blocks and subsequently to the Livestock Aid Centres (LACs). All the semen production, procurement and distribution related initiatives are implemented through Odisha Livestock Resource Development Society (OLRDS).

3.1.1. Objective

The Directorate of Animal Husbandry and Veterinary Services (DAH&VS) aims to digitize the above mentioned process of semen distribution and utilization in order to achieve the following goals:

- a. End to end tracking and monitoring of procurement and distribution process of normal and sex sorted semen for cattle as well as goat
- b. Live tracking and monitoring of utilization of semen in the districts and blocks
- c. Redistribution of semen within districts or with other districts in case of shortage in particular districts

- d. Improved service delivery and efficient subsidy management by integration of digital semen inventory management system with 3rd party semen vendor's system, GO-SUGAM portal, Krushak Odisha Database and Bharat Pashudhan portal.
- e. Efficient issue resolution for officials as well as farmers with integrated grievance redressal system.

3.1.2. System Design

The proposed semen inventory management system will consist of the following broad components pertaining to major activities conducted by Frozen Semen Bank (FSB) and Odisha Livestock Resource Development Society (OLRDS):

- a. **Central Database:** A state-wide inventory and requisition database hosted on a cloud platform accessible by all tiers. This serves as the central hub for tracking semen inventory, allocation, distribution and utilization of semen across the state.
- b. **Modules:** Separate modules for procurement, allocation, distribution, utilization and grievance redressal for goat and cattle semen doses
- c. **User Portals:** Each administrative level (Directorate, District, SDVO, Deputy Director of District Veterinary Hospitals, Block, End User) and farmers will have access to a web-based portal. The portals will offer different access levels to view, update, and request inventory.
- d. **Mobile Application:** Designed for block and end user levels, the mobile app will enable requesting semen stock, tracking distribution and managing utilization of semen and grievance redressal. Mobile application will also function in offline mode to enable utilization in areas with low connectivity. Barcode scanning will be enabled as an optional feature to retrieve semen related data. Additionally, farmers can also login to the portal and apply for availing semen services from the Directorate.
- e. **API Layer:** The system will include an API layer to ensure 2-way connection with external databases like the potential third-party procurement systems, GO-SUGAM portal, Krushak Odisha Database and Bharat Pashudhan portal ensuring modularity and future extensibility

3.1.3. Proposed Application Components

Following are the details of the proposed components to be developed under the aforementioned semen inventory management system:

Sl. No.	Category	Major Requirement	Explanation
1	Semen Database	Database integration and database visibility	<p>Integration of database of all procured semen along with all semen production related data from 3rd party vendor's database to the proposed system.</p> <p>At every level, the semen doses available will be made visible at all levels below, categorized by:</p> <ul style="list-style-type: none"> - Location (e.g. LAC name, block name etc. depending on level) - Semen Unique Code - Semen Type - Animal Type (Details of bull/ buck) - Quantity allocated - Quantity delivered - Date delivered - Source of procurement at central level - Production date (in house production) <p>The semen doses available at the level immediately above can also be seen.</p> <p>This will have colour-coded indicators (e.g., green, yellow, red)</p>
2	Semen Allocation	Allocation of semen doses to districts from state level	<p>A module will be developed where the procured semen will be distributed across all 30 districts from the Directorate of Animal Husbandry and Veterinary Services (DAH&VS).</p> <p>In the distribution process, the semen will be mapped to their respective districts through unique semen code for easy tracking of semen.</p>
3	Semen Utilization	Mobile Application and user portal at end user level to update data of utilization of semen doses	<p>The application will have individual logins for every end user, which is the point at which the semen is administered.</p>

Sl. No.	Category	Major Requirement	Explanation
			<p>This covers the Block Veterinary Officers (BVOs) and Artificial Insemination Technician (AITs). Additionally, farmers can also login to the portal and apply for availing semen services from the Directorate.</p> <p>The end user will enter the mobile number or Aadhaar number of the farmer to fetch data from Krushak Odisha database. In case, the farmer is not registered on Krushak Odisha database, the end user will enter farmer's name, phone number and Aadhaar number manually. End users may also put cattle's tag number to fetch cattle and farmer details from Bharat Pashudhan portal. A unique id will be generated for each farmer in the system to track their journey of utilizing services onboarded on the system from the backend. This unique id can also be used by the end user for identification. Utilization of each semen dose will be updated on the proposed system by the end user by adding the:</p> <ul style="list-style-type: none"> - Farmer name, phone number/ aadhar number - Semen dose's unique code (chosen from a dropdown menu) - Animal Breed - Bull Id - Date of Collection - Batch of collection - Damp seal - Station Number - Date administered - Source of semen distribution (chosen from a dropdown menu)

Sl. No.	Category	Major Requirement	Explanation
			<p>The data should be updated every 7 days. If data for the week is not updated, then reminder alerts are to be sent to the end user and it is flagged at the block and district level.</p> <p>The semen doses administered are automatically subtracted from the state, district, block, and end-user inventory database.</p>
4	Semen Restocking	Restocking of semen doses in case of complete utilization	<p>The end user can place requests for restocking of semen doses via their mobile application and user portal.</p> <p>This can be done by going to a 'Raise Restocking Request' option, which will cover:</p> <ul style="list-style-type: none"> - Animal Type via a dropdown - Semen Type via a dropdown - Quantity Needed - Urgency (Request to be categorized as urgent and not urgent via dropdown) <p>The request can be forwarded to the block level from the end user once they choose to submit.</p> <p>The end user can mark 'approved' against each request via the app or can reject the request by clicking on 'reject'.</p> <p>The block official can also edit the request through the 'edit' option.</p>

Sl. No.	Category	Major Requirement	Explanation
			<p>The request then goes to the district level, at which point it can be edited, rejected, and approved.</p> <p>Then the district can choose to forward to the Directorate for approval. At the Directorate level, they can edit, accept, and reject. They can subsequently choose to reassign semen doses between districts or add to a procurement list to be sent to vendors (empanelled vendors to appear in a dropdown near submit option). Post fulfilling the restock request of the end user, the Directorate will close the request by marking it as 'Fulfilled'.</p> <p>Stock history at every level to be also made visible. A summary of stocking status — pending, approved, fulfilled — along with the average time to approval at each level, to be also shown.</p>
5	Semen Redistribution	Re-allocation of semen doses in case from a district with surplus doses to a district with deficit doses	<p>In case a district is experiencing a deficit of semen doses, the Directorate may allot doses from a nearby district which has semen doses in surplus. Allocator has the option to enter quantity in numbers or percentages (to be converted to numbers based on inventory levels).</p> <p>The allocator also indicates slots for pickups. Allocators can give multiple slots or one slot.</p>

Sl. No.	Category	Major Requirement	Explanation
6	Data Analysis Reports	Data reports and dashboard for data analysis and visualization at all levels	<p>Following data reports and dashboards will be created at state, district, block and end user level (for both web and mobile application) to provide real-time and predictive insights of semen procurement, usage, and inventory management:</p> <ul style="list-style-type: none"> • <u>Dose Utilization Report:</u> Summarizes the utilization of semen doses against their target (in number and percentages). Visualization will be shown in a heat map format with red indicating low utilization, yellow indicating adequate utilization and green indicating high utilization. This data will be available at state, district, block and end user level and can be categorized by semen type, animal type, date etc. Breedable population related data may also be shown in a separate column to indicate breeding potential in the respective area. • <u>Dose Restocking Need Report:</u> Summarizes the need for restocking of semen doses based on their utilization. Visualization will be shown in a heat map format with red indicating urgent need for restocking and gray indicating no need for restocking. This data will be available at state, district, block and end user level and can be categorized by semen type, animal type, date etc.

Sl. No.	Category	Major Requirement	Explanation
			<ul style="list-style-type: none"> • Data Updation Rate: Summarizes the frequency of data updation (daily, weekly, monthly etc) at all levels. • Master Report: Provides detailed semen wise details of dose utilization with all farmer data, demographic data, dose related data, date and time etc. <p>All reports should be downloadable in PDF, CSV, and Excel format.</p>
7	Integration with other databases	Linkage with other relevant databases	<p>Major agricultural and livestock databases—3rd party vendor’s system, GO-SUGAM, Krushak Odisha (KO), Bharat Pashudhan will be linked with the proposed system:</p> <ul style="list-style-type: none"> • Krushak Odisha (KO): System will be linked to Krushak Odisha through Aadhar number or phone number as a unique identifier. For KO, an option to edit its data would be made available. Edits will have to be approved at Block and District level to reflect on the KO database. • Bharat Pashudhan: Cattle tag number, aadhaar number or phone number can be used as the unique identifier for Bharat Pashudhan Portal. • GO-SUGAM Portal: System will be linked to the On-call AI service run proposed to be implemented through GO-SUGAM Portal. • Krushi Samrudhi: System will be linked to Krushi samrudhi call Centre for seamless data exchange, call logging and call redressal.

Sl. No.	Category	Major Requirement	Explanation
			<ul style="list-style-type: none"> 3rd party semen vendor's system: The system will also be linked to a 3rd party semen vendor's procurement system for fetching detailed data of all the semen doses procured by the state. <p>The data for the individual farmers will be fetched from the respective databases and will be viewable from the platform/ app.</p>
8	Grievance Redressal	Reporting of any technical and non-technical issues at all levels for efficient resolution	<p>A separate grievance redressal module will be created for all officials and farmers to cater to all technical and non-technical queries and issues which will be resolved in 24-48 hours of receiving the query by the concerned technical team.</p> <p>Following details will be provided while reporting any grievance:</p> <ul style="list-style-type: none"> Name User Type (District, SDVO, Deputy Director of District Veterinary Hospitals, Block, AITs, Farmers) Issue Type (Technical, Non-Technical) Service Type (Semen, Vaccine, Medicine etc) Issue Description Upload Geo-tagged photo, if applicable

3.2 Digitization of Vaccine Inventory Management System

The DAH&VS provides essential vaccination services through Odisha Biological Product Institute (OBPI) to safeguard animal health and protect livestock from various infectious diseases. Through a network of veterinary professionals and field workers, the Directorate organizes regular vaccination drives, reaching out to rural and urban areas to immunize cattle, poultry, and other livestock against prevalent diseases. These vaccinations prevent disease outbreaks that can devastate livestock populations and impact livestock farmers' livelihoods.

The Directorate also engages in awareness programs to educate farmers about the importance of timely vaccination, disease prevention, and overall animal health management. By ensuring widespread access to vaccines and encouraging preventive care, the Directorate helps improve livestock productivity, reduces economic losses, and supports the well-being of both animals and farming communities.

3.2.1 Objective

DAH&VS aims to digitize the above mentioned process of vaccine distribution and utilization in order to achieve the following goals:

- a. End to end tracking and monitoring of procurement and distribution process of animal vaccines
- b. Live tracking and monitoring of utilization of vaccines in all the districts
- c. Redistribution of vaccines within districts or with other districts in case of shortage in particular districts
- d. Improved service delivery and efficient subsidy management by integration of digital vaccine inventory management system with 3rd party vaccine vendor's system, Krushak Odisha Database and Bharat Pashudhan portal
- e. Efficient issue resolution for officials as well as farmers with integrated grievance redressal system.

3.2.2 System Design

The proposed vaccine inventory management system will consist of the following broad components pertaining to major activities conducted by Odisha Biological Product Institute (OBPI):

- a. **Central Database:** A state-wide inventory and requisition database hosted on a cloud platform accessible by all tiers. This serves as the central hub for tracking vaccines inventory, allocation, distribution and utilization of vaccine doses across the state.
- b. **Modules:** Separate modules for procurement, allocation, distribution, utilization and grievance redressal for animal vaccine doses
- c. **User Portals:** Each administrative level (Directorate, District, SDVO, Deputy Director of District Veterinary Hospitals, Block, End User) and farmers will have access to a web-based portal. The portals will offer different access levels to view, update, and request inventory.
- d. **Mobile Application:** Designed for Block and End User levels, the mobile app will enable requesting for vaccine stock, tracking distribution and managing utilization of vaccines and grievance redressal. Mobile application will also function in offline mode to enable utilization in areas with low connectivity. Barcode scanning will be enabled as an optional feature to retrieve vaccine related data. Additionally, farmers can also login to the portal and apply for availing vaccination services from the Directorate.

- e. **API Layer:** The system will include an API layer to ensure 2-way connection with external databases like the potential third-party procurement systems, GO-SUGAM portal, Krushak Odisha Database and Bharat Pashudhan portal ensuring modularity and future extensibility.

3.2.3 Proposed Application Components

Following are the details of the proposed components to be developed under the aforementioned vaccine inventory management system:

Sl. No.	Category	Major Requirement	Explanation
1	Vaccine Database	Database integration and database visibility	<p>Integration of database of all procured vaccines along with all vaccine production related data from 3rd party vendor's database to the proposed system.</p> <p>At every level, the vaccine doses available will be made visible at all levels below, categorized by:</p> <ul style="list-style-type: none"> - Location (e.g. LAC name, block name etc. depending on level) - Vaccine Batch Number - Vaccine Type - Disease Type - Animal Type - Quantity allocated - Date delivered <p>The vaccine doses available at the level immediately above can also be seen.</p> <p>This will have colour-coded indicators (e.g., green, yellow, red)</p>
2	Vaccine Allocation	Allocation of vaccine doses to districts from state level	<p>A module will be developed where the procured vaccines will be distributed across all 30 districts from DAH&VS. In the distribution process, the vaccine will be mapped to their respective districts through the vaccine's batch number for easy tracking of vaccine dose. Further, vaccines will be allotted to villages through the vaccine's batch number.</p>

Sl. No.	Category	Major Requirement	Explanation
3	Vaccine Utilization	Mobile Application and user portal at end user level to update data of utilization of vaccine doses	<p>The application will have individual logins for every end user, which is the point at which the vaccine is administered.</p> <p>This covers the Block Veterinary Officers (BVOs) and Artificial Insemination Technician (AITs). Additionally, farmers can also login to the portal and apply for availing vaccination services from the Directorate.</p> <p>The end user will enter the mobile number or aadhar number of the farmer to fetch data from Krushak Odisha database. In case, the farmer is not registered on Krushak Odisha database, the end user will enter farmer's name, phone number and Aadhaar number manually. A unique id will be generated for each farmer in the system to track their journey of utilizing services onboarded on the system from the backend. This unique id can also be used by the end user for identification. Utilization of each vaccine dose will be updated on the proposed system by the end user by adding the:</p> <ul style="list-style-type: none"> - Farmer name, phone number/ Aadhaar number - Vaccine dose's batch number (chosen from a dropdown menu) - Expiry Date - Vaccine Name (chosen from a dropdown menu) - Quantity Administered - Source of vaccine distribution (chosen from a dropdown menu) - Date administered

Sl. No.	Category	Major Requirement	Explanation
			<p>The data should be updated every 7 days. If data for the week is not updated, then reminder alerts are to be sent to the end user and it is flagged at the block and district level.</p> <p>The vaccine doses administered are automatically subtracted from the state, district, block, and end-user inventory database.</p> <p>Additionally, a module will be developed to record user charges collected and deposited to the department for the vaccines distributed.</p> <p>Further, reminders will be sent for application of additional vaccine doses/booster shots (if required). Vaccination plan/report will be visible at block and end user level to plan upcoming vaccination drives</p>
4	Vaccine Restocking	Restocking of vaccine doses in case of complete utilization	<p>The end user can place requests for restocking of vaccine doses via their mobile application and user portal.</p> <p>This can be done by going to a 'Raise Restocking Request' option, which will cover:</p> <ul style="list-style-type: none"> - Animal Type via a dropdown - Disease Type via a dropdown - Vaccine Name via a dropdown - Quantity Needed - Urgency (Request to be categorized as urgent and not urgent via dropdown)

Sl. No.	Category	Major Requirement	Explanation
			<p>The request can be forwarded to the block level from the end user once they choose to submit.</p> <p>The end user can mark 'approved' against each request via the app or can reject the request by clicking on 'reject'. The block official can also edit the request through the 'edit' option.</p> <p>The request then goes to the district level, at which point it can be edited, rejected, and approved.</p> <p>Then the district can choose to forward to the Directorate for approval. At the Directorate level, they can edit, accept, and reject. They can subsequently choose to reassign vaccine doses between districts or add to a procurement list to be sent to vendors (empaneled vendors to appear in a dropdown near submit option). Post fulfilling the restock request of the end user, the Directorate will close the request by marking it as 'Fulfilled'.</p> <p>Stock history at every level to be also made visible. A summary of stocking status—pending, approved, fulfilled—along with the average time to approval at each level, to be also shown.</p>
5	Vaccine Redistribution	Re-allocation of vaccine doses in case from a district with surplus doses to a district with deficit doses	In case a district is experiencing a deficit of vaccine doses, the Directorate may allot doses from a nearby district which has vaccine doses in surplus. Allocator has the option to enter quantity in numbers or percentages (to be converted to numbers based on inventory levels).

Sl. No.	Category	Major Requirement	Explanation
			<p>The allocator also indicates slots for pickups. Allocators can give multiple slots or one slot.</p>
6	Data Analysis Reports	Data reports and dashboard for data analysis and visualization at all levels	<p>Following data reports and dashboards will be created at state, district, block and end user level (for both web and mobile application) to provide real-time and predictive insights of vaccine procurement, usage, and inventory management:</p> <ul style="list-style-type: none"> • <u>Dose Utilization Report:</u> Summarizes the utilization of vaccine doses against their target (in number and percentages). Visualization will be shown in a heat map format with red indicating low utilization, yellow indicating adequate utilization and green indicating high utilization. This data will be available at state, district, block and end user level and can be categorized by disease name, vaccine name, animal type, date etc. • <u>Dose Restocking Need Report:</u> Summarizes the need for restocking of vaccine doses based on their utilization. Visualization will be shown in a heat map format with red indicating urgent need for restocking and gray indicating no need for restocking. This data will be available at state, district, block and end user level and can be categorized by disease name, vaccine name, animal type, date etc. • <u>Data Updation Rate:</u> Summarizes the frequency of data updation (daily, weekly, monthly etc.) at all levels.

Sl. No.	Category	Major Requirement	Explanation
			<ul style="list-style-type: none"> • User charges report: Summarizes the user charges collected and deposited to the department for the vaccine doses administered by end user • Master Report: Provides detailed vaccine wise details of dose utilization with all farmer data, demographic data, dose related data, date and time etc. <p>All reports should be downloadable in PDF, CSV, and Excel format.</p>
7	Integration with other databases	Linkage with other relevant databases	<p>Major agricultural and livestock databases—3rd party vendor’s system, Krushak Odisha (KO), Bharat Pashudhan will be linked with the proposed system:</p> <ul style="list-style-type: none"> • Krushak Odisha (KO): System will be linked to Krushak Odisha through Aadhar number or phone number as a unique identifier. For KO, an option to edit its data would be made available. Edits will have to be approved at Block and District level to reflect on the KO database. • Bharat Pashudhan: Cattle tag number, aadhar number or phone number can be used as the unique identifier for Bharat Pashudhan Portal. • 3rd party vaccine vendor’s system: The system will also be linked to a 3rd party vaccine vendor’s procurement system for fetching detailed data of all the vaccine doses procured by the state.

Sl. No.	Category	Major Requirement	Explanation
			The data for the individual farmers will be fetched from the respective databases and will be viewable from the platform/ app.
8	Grievance Redressal	Reporting of any technical and non-technical issues at all levels for efficient resolution	<p>A separate grievance redressal module will be created for all officials and farmers to cater to all technical and nontechnical queries and issues which will be resolved in 24-48 hours of receiving the query by the concerned technical team.</p> <p>The following details will be provided while reporting any grievance:</p> <ul style="list-style-type: none"> - Name - User Type (District, SDVO, Deputy Director of District Veterinary Hospitals, Block, AITs, Farmers) - Issue Type (Technical, Non-Technical) - Service Type (Semen, Vaccine, Medicine etc.) - Issue Description - Upload Geo-tagged photo, if applicable

3.3 Digitization of Medicine Procurement and Distribution

The Directorate procures medicines for the welfare of animals like cattle, goats, and sheep in the state of Odisha. The procurement is done annually at the state level, and then allocated to 3200+ LACs (Livestock Aid Centres), 500+ Veterinary Hospitals and Dispensaries, and 150+ Mobile Veterinary Units (MVUs) across the state.

The allocation is in a cascaded manner, with the Directorate allocating the medicines to the districts from a central store based in Phulnakhara, Bhubaneswar to offices of the respective Chief District Veterinary Officers (CDVOs) which subsequently allocate to the respective blocks. At the block level, the allocation is done by the BVDs (Block Veterinary Dispensaries) which then allocate to the end points which include LACs and MVUs.

3.3.1. Objective

The purpose of this exercise is to digitize the aforementioned system, in order to achieve the following goals:

- a. Have an updated list of medicine inventory statewide at all times
- b. Change medicine allocation between districts or procure additional medicines via this simplified process quickly in times of need
- c. Track medicine usage at the end user level to enable temporal analysis
- d. Efficient issue resolution for officials as well as farmers with integrated grievance redressal system

The systems will broadly cover four areas:

- a. Medicine tracking and procurement
- b. Medicine distribution
- c. Data analysis module
- d. Grievance redressal

3.3.2. System Design

The digitised medicine procurement and distribution system for the Directorate will follow a multi-tier architecture that spans several administrative levels, ensuring real-time data synchronization and efficient medicine allocation.

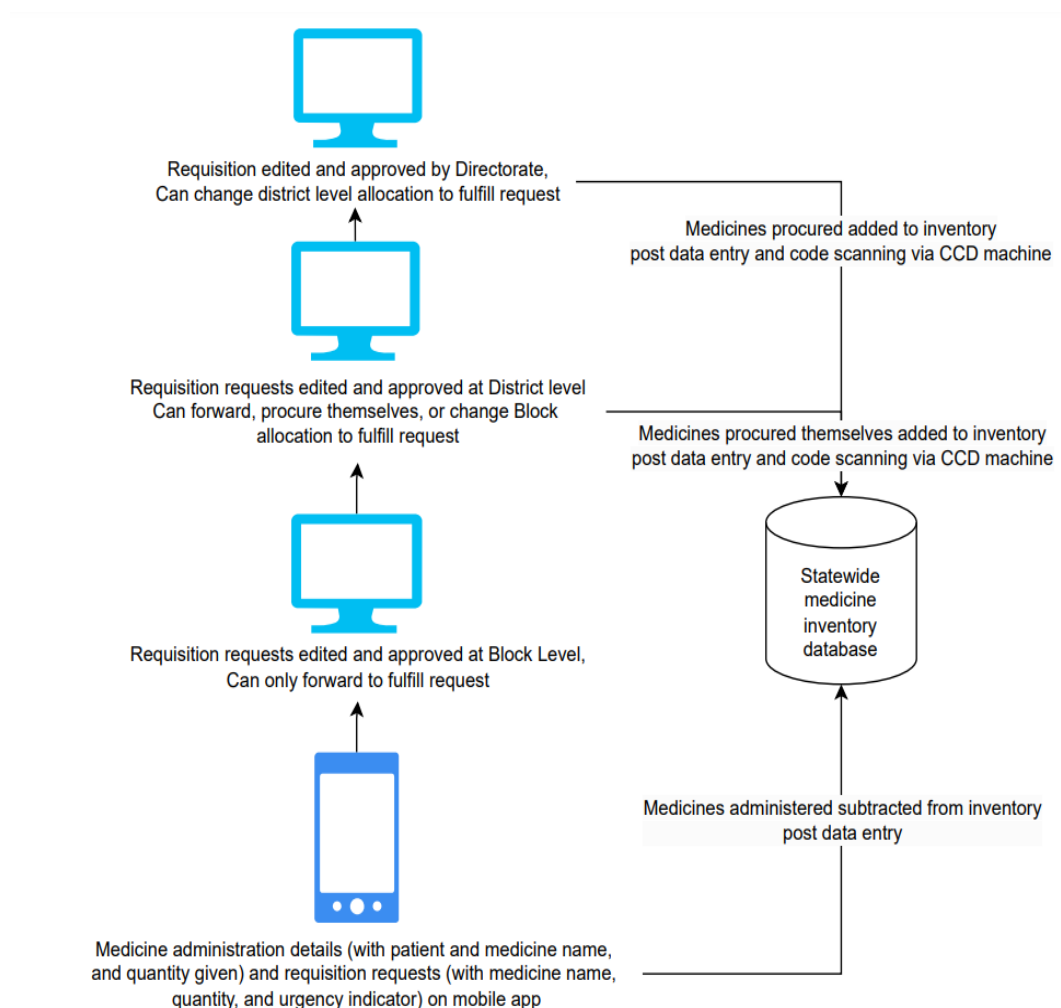
Key Components:

- a. **Central Database:** A state-wide inventory and requisition database hosted on a cloud platform accessible by all tiers. This serves as the central hub for tracking inventory, requisitions, and medicine allocation.
- b. **Modules:** Separate modules for procurement, allocation, distribution, utilization of medicines and grievance redressal.
- c. **User Portals:** Each administrative level (Directorate, District, SDVO, Deputy Director of District Veterinary Hospitals, Block, End User) and farmers will have access to a web-based portal. The portals will offer different access levels to view, update, and request inventory. Integration with CCD (Charge Coupled Device) scanning devices will enable accurate real-time stock updates.

- d. **Mobile Application:** Designed for Block and End User levels, the mobile app will facilitate medicine requisitions, track stock levels, and record administration details and for grievance redressal. Barcode scanning capabilities will allow real-time updates on medicine distribution at LACs, MVUs, and hospitals. Additionally, farmers can also login to the portal and apply for availing medicine services from the Directorate.
- e. **API Layer:** The system will include an API layer to connect with external tools like barcode scanners and other potential third-party procurement systems, ensuring modularity and future extensibility.

3.3.3. Proposed Application Components

3.3.3.1 Medicine Tracking and Procurement



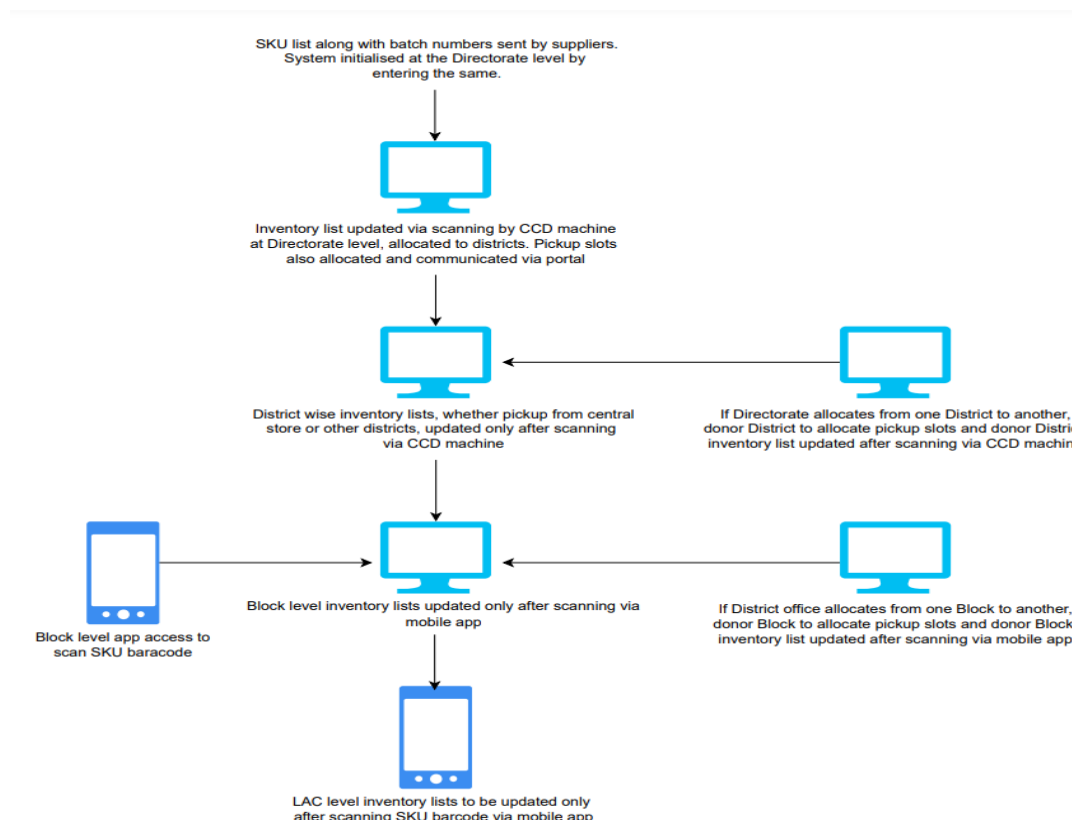
Category	Major Requirement	Explanation
<p>Medicine Administration Tracking</p>	<p>Mobile Application and user portal at end user level to enter data on administered medicines</p>	<p>The application will have individual logins for every end user, which is the point at which the medicine is administered. This covers the LACs, VDs, and MVUs. Additionally, farmers can also login to the portal and apply for availing medicine services from the Directorate.</p> <p>The end user will enter each medicine administered to the farmer by adding the:</p> <ul style="list-style-type: none"> - Farmer name - Medicine administered (chosen from a dropdown menu) - Quantity administered - Date administered <p>Provision for entering medicines administered to stray animals by medicine SKU name and animal type to also be made.</p> <p>In the L2 stage, the farmer name will not be entered manually but can be chosen from a searchable dropdown that links to the farmer profile (described below). In case there is a farmer not in the list, an option to create the farmer's profile will be present. An option to explore a farmer profile (that has the farmer's prior medicine allocations filterable via date and medicine) to also be added. The farmer profile will be updated after each entry.</p>

Category	Major Requirement	Explanation
		<p>The data should be updated every 7 days. If data for the week is not updated, then reminder alerts are to be sent to the end user and it is flagged at the block and district level.</p> <p>The medicines administered are automatically subtracted from the state, district, block, and end-user inventory database.</p>
Inventory list visibility	Database access via mobile app and portal	<p>At every level, the medicines available at all levels below, categorised by:</p> <ul style="list-style-type: none"> - Location (eg. LAC name, block name etc depending on level) - Medicine name - Quantity allocated - Quantity delivered - Date delivered <p>The medicines available at the level immediately above can also be seen.</p> <p>This will have colour-coded indicators (e.g., green, yellow, red) signal stock status (healthy, warning, critical).</p> <p>Notifications will go to the end users and the level above, via app ribbon, text message, and email, in case the stocks are at critical levels.</p>
Medicine procurement	Requisition requests	<p>The end user can place requisition requests via their mobile application and user portal. This can be done by going to a 'Raise Requisition Request' option, which will cover:</p>

Category	Major Requirement	Explanation
		<ul style="list-style-type: none"> - Medicine Name via a dropdown - Quantity Needed - Urgency (Each medicine to be categorised under P0, P1, P2, and P3 having the highest level of urgency) <p>The request can be forwarded to the block level from the end user once they choose to submit.</p> <p>The end user can mark 'fulfilled' against individual medicine SKUs once they receive the orders by scanning barcodes via the app (to be covered in detail under the distribution component), else it will keep showing as unfulfilled.</p> <p>The request can be forwarded to the block level, at which point it can be edited, rejected, and approved. As with the end user level, they can also mark as 'fulfilled' once it is fulfilled by scanning barcodes with the mobile app.</p> <p>The request then goes to the district level, at which point it can be edited, rejected, and approved.</p> <p>The district can choose to forward to the Directorate and add to another list under the header of 'medicines procured at district level'. Stock levels are updated via scanning by CCD machines (not in scope of work) integrated with the system. They can also choose to reassign medicines between blocks.</p>

Category	Major Requirement	Explanation
		<p>At the Directorate level, they can edit, accept, and reject. They can subsequently choose to reassign medicines between districts or add to a procurement list to be sent to vendors (empanelled vendors to appear in a dropdown near submit option).</p> <p>Requisition form history at every level to be also made visible, with option to transfer SKU wise or form wise requests to current requisition request.</p> <p>A summary of requisition statuses—pending, approved, fulfilled—along with the average time to approval at each level, to be also shown.</p>

3.3.3.2 Medicine distribution



Category	Major Requirement	Explanation
Database updation	Updation of inventory levels at every level post verification of outflow and receipt	<p>Inventory levels at the Directorate level to be updated via login at the Central Store. CCD machines to be used to scan medicine barcodes of inflows and allocated outflows. Post scanning one SKU, the user can enter the amount of medicines under inflow or outflow. Option enter SKU name via dropdown without scanning to also be made.</p> <p>Similarly, at the district level, inflows and outflows to be tracked by scanning via CCD machines. Option for bulk approval without scanning, but entering SKU name (from dropdown) and quantity, to also be made.</p> <p>At the block and end user levels, scanning of barcodes to be done via the mobile app that is to be developed. Both inflows and outflows at block level to be scanned, and only inflows to be scanned at the end user level. Option for bulk approval to be made here as well.</p> <p>In case of reallocation between districts or blocks, both inflow and outflow to and from the sites compulsorily will have scanning as well as the bulk upload via data entry option.</p>
Medicine allocation	Medicine allocation to the lower levels	Medicines to be allocated to the lower levels, with option for re- allocation available at the Directorate and district levels.

Category	Major Requirement	Explanation
		<p>Medicines allocated by SKU. Allocator to have the option to enter quantity in numbers or percentages (to be converted to numbers based to inventory levels).</p> <p>The allocator also indicates slots for pickups. Allocators can give multiple slots or one slot.</p> <p>Districts can also flag their medicine stocks as 'extra', to be visible at the Directorate level.</p>

3.3.3.3 Data Analysis Module

The data analysis module will be critical in offering real-time and predictive insights into medicine procurement, usage, and inventory management. Below are the specific outputs the system will generate through trend analysis and visualisation.

Category	Function	Output
Medicine Usage Trends	Analyse how often specific medicines are administered over different periods (daily, weekly, monthly).	Graphical representation showing spikes or dips in medicine usage, categorised by district, block, or end user.
Requisition Fulfillment Rates	Track the time taken to fulfill medicine requisitions across all levels (from submission to fulfillment)	A timeline plot showing average requisition fulfillment time and percentage of unfulfilled requests.
Emergency Requisition Trends	Analyse the number and frequency of emergency (PO) requisition requests.	A heatmap showing which districts are more prone to emergency requests and visualizing the rise in urgent medicine demands during specific periods.

Category	Function	Output
Medicine Allocation Efficiency	Measure the efficiency of medicine reallocation between districts or blocks, especially during emergencies or shortages.	A bar chart comparing the amount of reallocated stock versus new procurement, showing the volume of reassignments.
Stock-out Occurrence Tracking	Tracks instances where medicine stocks run out at any level.	Shows which medicines experienced stock-outs, the duration of the stock-out, and the location (district/block/end-user). This report helps identify areas with frequent shortages, enabling proactive reallocation of stock.
Medicine Usage by Category	Summarises how different categories of medicines (e.g., antibiotics, vaccines, anti-parasitic drugs) are used at various levels.	Shows which medicines are most frequently administered in each category, providing insights into health trends and potential shortages.
Predictive Analytics (part of L2)	A predictive analytics module using Auto Regressive Integrated Moving Average (ARIMA) or similar methods to forecast medicine needs, allowing the Directorate to order stock ahead of time based on predicted demand.	<ul style="list-style-type: none"> - Graph: A time series line graph displaying predicted medicine demand over the next periods (e.g., weeks, months). Each medicine category (e.g., antibiotics, vaccines) will be visualized separately. - Numerical Forecasts: Tables showing the exact predicted demand numbers for each medicine at district and block levels for upcoming periods.

3.3.3.4 Farmer-Level Database Creation and Integration

As part of the app's L2 development, a farmer-level database will be established. Each farmer will have a clickable profile that includes:

- a. Farmer Name
- b. Aadhar Number (serving as the unique identifier)

- c. Mobile Number
- d. Medicines Administered: The specific medicine(s) given and the corresponding dates filterable by medicine and date range.

Feature	Description
Linkage with other databases	<p>The farmer profiles will be linked to two major agricultural and livestock databases—Krushak Odisha (KO) and Bharat Pashudhan—using the Aadhar number as a common unique identifier across platforms. The data for the individual farmers will be fetched from the respective databases and will be viewable from the platform/ app.</p> <p>For KO, an option to edit its data would be made available. Edits will have to be approved at Block and District level to reflect on the KO database.</p>
Report Generation	<p>The system will generate custom reports at multiple administrative levels (Directorate, District, Block, End User) based on the farmer-level data. The report will contain:</p> <ul style="list-style-type: none"> - Farmer Identification Information: <ul style="list-style-type: none"> ○ Farmer Name ○ Aadhar Number - Medicine Administration Data: <ul style="list-style-type: none"> ○ Medicine Name ○ Quantity Administered ○ Date of Administration ○ End user name/ ID - Inventory Usage Analysis: <ul style="list-style-type: none"> ○ Breakdown of medicines administered per farmer, categorised by type and frequency. ○ Total quantity of each medicine administered per farmer, contributing to district/block-level inventory monitoring.

Feature	Description
	All reports should be downloadable in PDF, CSV, and Excel format.
Grievance Redressal	<p>A separate grievance redressal module will be created for all officials and farmers to cater to all technical and non-technical queries and issues which will be resolved in 24-48 hours of receiving the query by the concerned technical team. Following details will be provided while reporting any grievance:</p> <ul style="list-style-type: none"> - Name - User Type (District, SDVO, Deputy Director of District Veterinary Hospitals, Block, AITs, Farmers) - Issue Type (Technical, Non-Technical) - Service Type (Semen, Vaccine, Medicine etc) - Issue Description - Upload Geo-tagged photo, if applicable

3.4 Digitization of Disease Diagnosis & Surveillance System

The DAH&VS stands at the forefront of disease testing, identification, and surveillance to protect livestock health across Odisha. Equipped with a skilled network of veterinary professionals and field workers, the Directorate actively monitors livestock health, conducting rigorous testing and surveillance to quickly detect and address infectious diseases through District Diagnostic Labs (DDLs) & Animal Disease Research Institute (ADRI-Phulnakhara). Alongside regular vaccination drives, many proactive measures extend across rural and urban regions, safeguarding cattle, poultry, and other livestock against outbreaks that could impact both animal populations and the livelihoods of farmers. The Directorate also empowers farmers through educational programs, emphasizing the importance of timely testing, disease prevention, and comprehensive animal health management. By prioritizing early detection and preventive care, DAH&VS significantly boosts livestock productivity, minimizes economic risks, and fosters resilient, healthier communities.

3.4.1. Aim

DAH&VS aims to digitize the above mentioned process of disease surveillance in order to achieve the following goals:

Primary:

- a. Early Detection: Identify disease outbreaks or emergence of new diseases promptly.
- b. Disease Prevention: Gather data to inform prevention strategies, reducing disease transmission.
- c. Control and Containment: Monitor disease spread, enabling swift control measures.
- d. Eradication: Achieve disease-free status through sustained surveillance.
- e. Identification of zoonotic diseases
- f. Prevention of disease transmission to humans

Secondary:

- a. Risk Assessment: Evaluate disease risks, informing policy and decision-making.
- b. Monitoring Disease Trends: Track changes in disease patterns, incidence, and prevalence.
- c. Evaluating Control Measures: Assess effectiveness of disease control strategies.
- d. Improving Animal Health: Enhance overall animal health through surveillance-driven interventions.
- e. Supporting Trade and Commerce: Ensure safe trade of animals and animal products.
- f. Protecting Public Health: Identify zoonotic diseases (transmissible to humans).
- g. Enhancing Biosecurity: Identify vulnerabilities and strengthen farm biosecurity.
- h. Informing Research and Development: Provide data for research, vaccine development, and diagnostic tests.

Advantages of the System

Livestock Farmers and Producers:

- a. Protection of livestock investments
- b. Minimization of economic losses
- c. Improved animal health and productivity

Veterinarians and Animal Health Professionals:

- a. Early diagnosis and treatment
- b. Development of effective disease control strategies
- c. Staying updated on emerging diseases

Effective disease surveillance in livestock requires collaboration among stakeholders, utilization of modern technologies (e.g. data analytics, molecular diagnostics), and adherence to international standards.

Objective of Digitization in Disease Surveillance:

- a. End to end tracking and monitoring of sample deposit to final report receiving.
- b. Advice on curative & therapeutic measures directly to the beneficiaries after the test results.
- c. Integration of vaccination history from Bharat Pashudhan portal.

3.4.2. System Design

The proposed disease surveillance system will consist of the following components:

- a. **Central Database:** A state-wide surveillance database hosted on a cloud platform accessible by all tiers. This serves as the central hub for tracking disease outbreaks, trends, distribution pattern and reoccurrence possibility across the state.
- b. **User Portals:** Each administrative level (Directorate, District, SDVO, Deputy Director of District Veterinary Hospitals, Block, End User) will have access to a web-based portal. The portals will offer different access levels to view, update, and request for disease diagnosis.
- c. **Mobile Application:** Designed for District and End User levels, the mobile app will enable viewing the test report of their submitted samples, tracking of outcome report & professional advice. Mobile application will also function in offline mode to enable utilization in areas with poor internet connectivity.
- d. **API Layer:** The system will include an API layer to ensure 2-way connection with external databases like the potential third-party web/application system - Bharat Pashudhan portal ensuring modularity and future extensibility.

3.4.3. Proposed Application Components

Following are the details of the proposed components to be developed under the aforementioned disease surveillance system:

Sl. No.	Category	Major Requirement	Explanation
1	Registration of end user	To ensure authenticity & transparency	The name of the beneficiary, address, mobile no/AADHAAR no & Identification number of the livestock (if available) to be stored, so that the disease distribution

Sl. No.	Category	Major Requirement	Explanation
			pattern, reoccurrence and control measures could be predetermined.
2	Disease identification	Identification of the disease from the suspected samples	A module will be developed where the database will be kept on the diseases diagnosed from all across the 30 Districts as well as ADRI.
3	End user Report	Mobile Application and user portal at end user level to view data of the diagnosed sample submitted by the beneficiary.	The end user will enter the mobile number or AADHAAR number along with the unique registration number generated at the time of sample submission to view the reports & other advisory. Additionally, a module will be developed to record user charges collected and deposited to the department for the samples submitted.
4	Data Analysis Reports	Data reports and dashboard for data analysis and visualization district levels & state level (ADRI & DAH&VS)	Following data reports and dashboards will be created at state, district and end user level (for both web and mobile application) to provide real-time and predictive disease outbreak & distribution pattern. All reports should be downloadable in Microsoft Excel, PDF and CSV, format.
5	Integration with other databases	Linkage with other relevant databases	Bharat Pashudhan: Cattle tag number, AADHAAR number or phone number can be used as the unique identifier for Bharat Pashudhan Portal. The data for the individual farmers will be fetched from the respective databases and will be viewable from the platform/ app, which will help to ascertain the vaccination status of animals.
6	Grievance Redressal	Reporting of any technical and non-technical issues at all levels for efficient resolution	A separate grievance redressal module will be created for all officials and farmers to cater to all technical and non-technical queries and issues which will be resolved in 24-48 hours of receiving the query by the

Sl. No.	Category	Major Requirement	Explanation
			<p>concerned technical team. Following details will be provided while reporting any grievance:</p> <ul style="list-style-type: none"> - Name - User Type (District, SDVO, Block, AITs, Farmers) - Issue Type (Technical, Non-Technical) - Service Type (Semen, Vaccine, Medicine etc) - Issue Description - Upload Geo-tagged photo, if applicable

3.5 Digitization of Training Activities in ARD Sector

In line with Odisha's commitment to improving animal health and welfare, DAH&VS has introduced a series of targeted training programs for Veterinary Officers to elevate the quality of care provided to livestock and pets across the state. Organized and facilitated by the Veterinary Officers' Training Institute (VOTI), these programs are designed to enhance skills in modern veterinary practices, preventive healthcare, and advanced diagnostic techniques, ensuring officers are well-equipped to address the complex needs of diverse animal populations. Topics range from zoonotic disease management and biosecurity protocols to innovative approaches in animal nutrition and welfare standards, all of which reflect a commitment to sustainable livestock management and public health.

Additionally, DAH&VS emphasizes the importance of community outreach, empowering officers to engage with rural communities, educate farmers, and promote awareness of best practices in animal husbandry. Through these comprehensive training initiatives, DAH&VS aims to foster a highly skilled cadre of veterinary professionals capable of contributing to the state's object.

3.5.1. Objective

To develop an online platform for training programme management & database of the trainings to streamline the process.

Additional Features:

- a. Application for training (The user/ can apply online for training out of specified training programmes)

- b. Database creation (The database of the officers who have taken which trainings are to be created so that new officers could be trained)
- c. Transparency in selection of the participants for the training programme
- d. To help maintaining track record of the training records individual & batch wise

3.5.2. System Design

The proposed system will consist of the following components:

- a. **Central Database:** A state-wide database hosted on a cloud platform accessible by all tiers.
- b. **User Portals:** Each administrative level (Directorate, District, SDVO, Deputy Director of District Veterinary Hospitals, Block and end user:- Veterinary Officers) will have access to a web-based portal. The portal will offer different access levels to view, update, and request for registration for different training sessions.
- c. **Mobile Application:** Designed for District and End User levels, the mobile app will enable tracking of approval of training application & slot allotment for the training programs.

3.5.3. Proposed Application Components under Digital Training Management System

Following are the details of the proposed components to be developed under the aforementioned training activities in ARD sector:

Sl. No.	Category	Major Requirement	Explanation
1	Registration of end user	To ensure authenticity & transparency	The end user i.e. VAS/AVAS/BVO/DD/ADVO/CDV O/AD can apply online through web based application/mobile application for different training programmes. The user has register by putting the name, block/district name/ designation etc. for the trainings.
2	Approval of training	To maintain uninterrupted service delivery	To maintain uninterrupted service delivery, the maximum number of participants from same institution are to be scrutinized & approved by district/DAH&VS tier, then it will appear at the end user if the application is approved or rejected/ added to pending for approval list

Sl. No.	Category	Major Requirement	Explanation
3	Slot allocation	For smooth management of training batch wise	After approval, the batch wise slot allocation will be done at VOTI level. The list of participants can be viewed & downloaded in PDF & Excel formats as well.
4	Database creation	To maintain transparency & track record	A database will be created to maintain records about the training programmes, the participants taken the trainings etc. to avoid duplicity and maintain records of the trainings as well as exposure visits.
5	Grievance Redressal	Reporting of any technical and non-technical issues at all levels for efficient resolution	A separate grievance redressal module will be created for all officials and farmers to cater to all technical and non-technical queries and issues which will be resolved in 24-48 hours of receiving the query by the concerned technical team. Following details will be provided while reporting any grievance: <ul style="list-style-type: none"> - Name - User Type (District, SDVO, Block, AITs, Farmers) - Issue Type (Technical, Non-Technical) - Service Type (Semen, Vaccine, Medicine etc) - Issue Description - Upload Geo-tagged photo, if applicable

3.6 Mobile Veterinary Units (MVUs) Operations

The Mobile Veterinary Unit (MVU) is a pioneering initiative delivering veterinary healthcare, breeding support, and advisory services to farmers in remote villages across Odisha. Designed to reach areas where veterinary institutions are scarce, MVUs provide doorstep treatment, on-the-spot

diagnostics, and disease surveillance to protect livestock health. They play a critical role in controlling outbreaks, detecting endemic diseases, and ensuring timely vaccinations, safeguarding cattle, poultry, and other animals.

To enhance efficiency and transparency, digitizing MVU operations is essential. A digital system will enable real-time tracking of manpower deployment, ensuring veterinary professionals are effectively reaching designated locations. It will also facilitate better inventory management, preventing shortages of essential medicines and vaccines. Additionally, by monitoring the services availed by farmers and tracking progress against set targets, digitization will help optimize resource allocation and improve service delivery. Strengthening MVU operations through technology will lead to more effective disease control, improved livestock productivity, and greater support for farmers across the state.

3.6.1. Objective

DAH&VS aims to digitize the operations of the Mobile Veterinary Units (MVUs) to enhance service delivery, improve resource utilization, and ensure transparency in veterinary healthcare.

Primary Objective	Secondary Objective
<ul style="list-style-type: none"> a. Workforce Monitoring: Enable real-time tracking of MVU personnel, ensuring MVU team is operating as per guidelines and are not understaffed. b. Medicine Inventory Management: Digitally track medicine stock levels, ensuring proper disbursement, timely restocking and preventing shortages. c. Service Utilization Tracking: Monitor veterinary services provided to farmers, ensuring equitable access and identifying service gaps. d. Target Achievement Monitoring: Assess MVU performance against predefined service targets to evaluate efficiency and impact. e. Livestock Health Improvement: Enhance disease prevention, treatment effectiveness, 	<ul style="list-style-type: none"> a. Data-Driven Decision-Making: Utilizing digital records for policy formulation and resource allocation based on service demand and livestock health trends. b. Disease Surveillance & Monitoring: Enable proactive identification of emerging diseases and track treatment efficacy. c. Cost Optimization: Reduce operational inefficiencies through improved route planning and resource allocation. d. Sustainability & Scalability: Develop a robust digital framework that can be expanded to enhance veterinary services across the state.

Primary Objective	Secondary Objective
and overall livestock well-being through data-driven interventions.	

Advantages of the system:

Livestock Farmers and Producers

- a. Timely access to veterinary care at their doorstep.
- b. Minimize economic losses for farmers by reducing treatment costs.
- c. Improved productivity through preventive healthcare.

Veterinarians and Animal Health Professionals

- a. Streamlined operations with optimized scheduling and reporting.
- b. Measure to report understaffing and shortage of medicines.
- c. Reduce administrative burden for veterinarians by minimizing paperwork.

Digitizing MVU operations will drive efficiency, accountability, and improved service delivery, ensuring a healthier livestock sector in Odisha.

3.6.2. System Design

The proposed disease surveillance system will consist of the following components:

- a. **Central Database:** A cloud-hosted state-wide database accessible at all administrative levels, serving as the central hub for tracking MVU deployment, service utilization, medicine inventory, and operational efficiency across the state.
- b. **User Portals:** A web-based portal with role-based access for different administrative levels (Directorate, District, SDVO, Deputy Director of District Veterinary Hospitals, Block, and MVU personnel). The portal will allow real-time tracking of MVU operations, workforce monitoring, inventory and service updates.
- c. **Mobile Application:** A dedicated mobile application for MVU personnel to log service details, report medicine usage, track assigned cases, and receive route plans. The app will also facilitate data entry in offline mode for areas with poor connectivity.

- d. **API Layer:** A robust API layer will enable seamless integration with external systems like the Tata Fleet Edge, ensuring interoperability, modularity, and future scalability for expanded functionalities.

3.6.3. Proposed Module Components

Following are the details of the proposed components to be developed under the aforementioned MVU activities in ARD sector:

Sl. No.	Category	Major Requirement	Explanation
1	Advance Tour planning	Database to update the tour plan and approval layer from CDVOs	<p>This module will reflect the advance tour plan of MVU and ensure compliance to the plan.</p> <p>The BVOs should be able to update the three-month plan, post which the CDVO can accept/ reject/ suggest any changes.</p>
2	Medicine Inventory	A table which should keep getting updated with the medicines being utilized and the stock left	<p>At every level, the medicines available with MVU will be made visible. The BVOs should enter the medicines in stock, fields to enter should be in table format</p> <ul style="list-style-type: none"> ✓ Name of medicine ✓ Supplied by (dropdown of centrally supplied/ purchased themselves) ✓ Quantity in stock <p>This will have colour-coded indicators (e.g. green, yellow, red). Other than this, a field to flag shortage of medicines.</p>
3	Villages visited	An offline feature to upload the details then and there	Module for the MVU advance team to update the villages visited by filling the name of the village along with 2 geotagged photos both with arrival and departure time.

			<p>There should be a functionality to extract the data from geotagged photographs about location, time and date.</p> <p>Also through this, the villages should be automatically verified from planning and should be flagged in case of any difference.</p>
4	Manpower and service tracking	Website update details to the	<p>The application will have individual logins for every end user. This covers the Block Veterinary Officers (BVOs) and MVU team.</p> <p>The MVU team must complete this daily form for each village, noting attendees, staffing issues, and the number of farmers benefitted (male, female, total). It should include details of treatments, procedures, vaccinations, AI, pathological samples examined or sent, user charges collected, deworming cases, and medicines or supplements distributed. If an awareness camp was conducted, the topic must be recorded. Any challenges faced should also be mentioned.</p>
5	Integration with relevant tools	Linkage with Original Equipment manufacturer (currently Tata Fleet)	Tata Fleet Edge will be linked with the proposed system to fetch location history of vehicles, check the behavior of the driver and prevent misuse of the vehicle.
6	Data Analysis Reports	Data reports and dashboard for data analysis and visualization at all levels	Following data reports and dashboards will be created at state, district, block and end user level (for both web and mobile application) to provide real-time and predictive

			<p>insights of MVUs:</p> <p><u>i. Tour plan compliance & Coverage report:</u></p> <p>A quarterly tour plan compliance report will be automatically generated by comparing the villages visited with advance tour planning to ensure compliance. It would also include the number of villages covered as compared to the target.</p> <p><u>ii. Services by MVU:</u></p> <p>This report would summarize the treatments done, vaccines administered, awareness camps done etc. with respect to the target set centrally by respective CDVOs/BVOs.</p> <p><u>iii. Manpower:</u></p> <p>This would summarize whether the manpower in MVU was as per guidelines and highlight the MVUs that were understaffed.</p> <p><u>iv. Report by Tata Fleet Edge:</u></p> <p>Provides a report based on data extracted from Tata Fleet Edge.</p> <p>All reports should be downloadable in PDF, CSV, and Excel format.</p>
7	Grievance Redressal	Reporting of any technical and non-technical issues at all levels for efficient resolution	A separate grievance redressal module will be created for all officials and farmers to cater to all technical and non-technical queries and issues which will be resolved in 24-48 hours of receiving the query by the concerned technical team. Following

			<p>details will be provided while reporting any grievance:</p> <ul style="list-style-type: none"> ✓ Name ✓ User Type (District, SDVO, Block, AITs, Farmers) ✓ Issue Type (Technical, Non-Technical) ✓ Service Type (Semen, Vaccine, Medicine etc) ✓ Issue Description ✓ Upload Geo-tagged photo, if applicable
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3.7 Expenditure Monitoring

DAH&VS is committed to enhancing livestock healthcare and disease management through various State Plan schemes. These initiatives, including **strengthening of Disease Surveillance by ADRI, Support to Vaccine Production & Disease Control Institutions, Bio-Medical Waste Management under LHCS, and Repair/AMC of Equipment under SLSI & MO**, play a crucial role in improving veterinary services and ensuring the well-being of livestock. To ensure transparency and accountability, a systematic approach is required to track the funds allocated per district and the actual expenditure incurred under these schemes.

3.7.1. Objective

The primary objective is to establish a digital tracking system for monitoring fund allocation and expenditure under the State Plan schemes. This will help in assessing the financial utilization, ensuring optimal resource allocation, and improving decision-making for veterinary healthcare services.

3.7.2. System Design

- a. **Central Database:** A state-wide cloud-hosted database accessible at all administrative levels to track fund allocation and expenditure updates for each district under various State Plan schemes.
- b. **User Portals:** A web-based portal with role-based access (Directorate, District, SDVO, Deputy Director of District Veterinary Hospitals, and Block), enabling them to view, update, and manage fund allocations, expenditures, and requests for additional funds.

- c. **Mobile Application:** Designed for District and End User levels, the mobile app will allow real-time tracking of fund approvals, expenditure updates, and financial reporting, ensuring transparency and efficient utilization of resources.

3.7.3. Proposed Module Components

Following are the details of the proposed components to be developed under the aforementioned expenditure statements:

Sl. No.	Category	Major Requirement	Explanation
1	Fund Allocation	Centralized system to enter the funds allocated	A state-wide database will record fund allocation per district under MVU and other State Plan schemes.
2	Expenditure Statement Reporting	Monthly expenditure report	Module to enter the expenditure done for every scheme on district level. An automated monthly financial report should also be generated automatically.
3	Fund Request & Approval System	Digital portal for requesting additional funds	A web-based module where districts can raise fund requests, justify the need, and track approval status. The Directorate can review, approve, or modify fund allocations as per requirements.
4	Dashboard & Analytics	Visual representation of fund allocation and utilization	A dashboard to provide real-time insights into fund usage trends, pending approvals, and comparative expenditure across districts, supporting data-driven financial planning. Reports will be downloadable in PDF, CSV, and Excel formats.
5	Grievance Redressal	Reporting of any technical and non-technical issues at all levels for efficient resolution	A separate grievance redressal module will be created for all officials and farmers to cater to all technical and non-technical queries and issues which will be resolved in 24-48 hours of receiving the query by the concerned technical team. Following details will be provided while reporting any grievance: ✓ Name

			<ul style="list-style-type: none"> ✓ User Type (District, SDVO, Block, AITs, Farmers) ✓ Issue Type (Technical, Non-Technical) ✓ Service Type (Semen, Vaccine, Medicine etc.) ✓ Issue Description ✓ Upload Geo-tagged photo, if applicable
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3.8 Monthly Farm Reports

DAH&VS aims to enhance the monitoring and management of livestock productivity through a structured data collection process. Currently, poultry, cattle, and other farms submit monthly reports on paper. To improve efficiency, accuracy, and accessibility, a digital platform is proposed to systematically collect and analyze this data. This initiative will ensure better decision-making, resource allocation, and transparency in the sector.

3.8.1. Objective

The primary objective is to establish a digital tracking system to record and monitor farm-level data related to livestock numbers and productivity. This system will streamline data collection, improve accessibility for stakeholders, and facilitate data-driven policy-making to enhance the overall productivity of the livestock sector.

3.8.2. System Design

- a. **Central Database:** A cloud-hosted, state-wide database accessible at all administrative levels to record and track farm-level data on livestock numbers, and productivity.
- b. **User Portals:** A web-based portal with role-based access for Directorate, District, SDVO, Deputy Director of District Veterinary Hospitals and Block-level officials, as well as farm owners, enabling them to submit, update, and review data.
- c. **Mobile Application:** A mobile app for farmers and district officials to enter and monitor real-time data, ensuring efficient reporting and accurate record-keeping.

3.8.3. Proposed Module Components

Following are the details of the proposed components to be developed under the aforementioned expenditure statements:

Sl. No.	Category	Major Requirement	Explanation
1	Animal Count & Identification	Digital entry for livestock numbers & tattoo-based tracking	A centralized system to record the number of animals in each farm, categorized by species (cattle, poultry, goats, etc.). Each animal is assigned a Tattoo Number, ensuring accurate identification and tracking of livestock history, health records, and farm productivity.
2	Productivity Reporting	Monthly report on milk/egg production and sales	A module to enter and track monthly production data, ensuring accurate monitoring of livestock output at the district level. Automated reports will be generated monthly.
3	Breeding, AI & Lactation Tracking	Monitoring Artificial Insemination (AI), pregnancy, and lactation cycles	A module to record AI procedures, pregnancy confirmations, and lactation cycles for each cow. Ensures proper reproductive health management, optimizing breeding cycles and milk productivity.
4	Farm Infrastructure & Capacity	Data on farm size, livestock capacity, and infrastructure	Records farm-specific details such as farm type, total area, livestock capacity, present strength, production levels, and available infrastructure (e.g., sheds, feed godowns, vehicles, and power backup). Also includes fodder farms, ensuring data on cultivated fodder land, fodder yield, and storage facilities are documented for sustainable livestock feeding.
5	Fodder Farm Management	Tracking fodder cultivation, yield, and distribution	A dedicated system to record fodder farm areas, types of fodder grown (e.g., maize, hybrid Napier, alfalfa), production per hectare, and distribution data. This ensures optimized fodder supply for all livestock farms, reducing feed costs and enhancing productivity.
6	Staff Position & Workforce Management	Tracking sanctioned and present staff strength	Maintains real-time data on staff availability across farms. Helps in workforce planning, identifying staff shortages, and optimizing resource allocation.

Sl. No.	Category	Major Requirement	Explanation
7	Dashboard Analytics &	Real-time monitoring of farm operations and financial planning	A centralized dashboard offering visual insights into farm productivity, fund utilization, pending approvals, and workforce allocation. It supports data-driven decision-making for improving farm efficiency. Reports can be downloaded in PDF, CSV, and Excel formats
8	Grievance Redressal	Reporting of any technical and non-technical issues at all levels for efficient resolution	<p>A separate grievance redressal module will be created for all officials and farmers to cater to all technical and non-technical queries and issues which will be resolved in 24-48 hours of receiving the query by the concerned technical team. Following details will be provided while reporting any grievance:</p> <ul style="list-style-type: none"> ✓ Name ✓ User Type (District, SDVO, Block, AITs, Farmers) ✓ Issue Type (Technical, Non-Technical) ✓ Service Type (Semen, Vaccine, Medicine etc) ✓ Issue Description ✓ Upload Geo-tagged photo, if applicable

3.9 On-Call Artificial Insemination (AI) Service

To improve accessibility and responsiveness of breeding services across the state, the Directorate aims to digitize the On-Call Artificial Insemination (AI) booking and service delivery process. Currently implemented manually through field calls and verbal coordination, the system lacks traceability, service monitoring, and data-driven planning. Digitization of this system will empower farmers to self-book AI services, enable real-time allocation of field staff based on location and availability, and ensure service feedback and record maintenance.

This module will be built to integrate seamlessly with existing platforms and semen inventory systems, enabling live availability matching and monitoring of services provided.

3.9.1. Objective

The objective of the proposed system is to enable end-to-end digital tracking of AI requests raised by farmers—from booking to delivery. It will ensure timely delivery, reduce missed service opportunities, improve semen dose traceability, and feed real-time service data into central breeding performance dashboards.

3.9.2. System Design

- a. **Central Database:** A cloud-hosted platform that records booking requests, technician assignment, service completion, and feedback for each AI event. The database will sync in real-time with the semen inventory module to reflect stock availability.
- b. **User Portals:** A web portal with role-based access for district officials, CDVOs, block level administrators, and backend operations teams. The portal will allow real-time monitoring of service demand, technician workload, route planning, and grievance resolution.
- c. **API Layer:** A robust API layer will be developed for integration with existing digital systems i.e. Bharat Pashudhan, GOSUGAM etc., semen inventory management systems and other databases.
- d. **Mobile Application:** A dual-interface mobile app—for farmers (booking & status tracking) and for AI technicians (booking list, route plan, and service entry). The technician interface will work offline to support low-connectivity areas.
- e. **Analytic Dashboard:** Role-wise dashboards to visualize service demand, delivery turnaround time, semen stock status, technician performance, and booking saturation across districts. Insights will support better resource planning and performance tracking.

3.9.3. Component Description:

Following are the details of the proposed components to be developed under the aforementioned system:

Sl. No.	Category	Major Requirement	Explanation
1	Farmer Booking Interface	Self-booking via app/portal/ assisted centre/chatbot	Farmers can request AI services by entering livestock ID, breed, location, and preferred time. The system validates details via Aadhaar/tag-based linkage with existing databases.
2	Technician	Auto-allocation engine with override functionality	Based on location, availability, and previous assignment. Route

Sl. No.	Category	Major Requirement	Explanation
	Allocation & Routing		optimization to cluster requests geographically. Manual reassignment option with justification.
3	Semen Dose Sync	Real-time inventory status at block/ district levels	Ensure technician is assigned only if appropriate semen is in stock nearby. Synchronizes with Semen Inventory Management System.
4	Service Logging & Closure	OTP-verified service completion and feedback entry	Technicians will log service completion through the app, entering key details (animal ID, semen batch, time stamp, technician ID). OTP verification will ensure authenticity. Feedback can also be collected from farmers post-service.
5	Integration with External Systems	Seamless API linkages	Connected with existing systems for animal records, and for live tracking
6	Dashboards & Analytics	To be provided in the Centralized dashboard for monitoring	Reports on booking-response ratio, AI conversion rate, semen stock-out trends, turnaround time, technician efficiency, and area-wise service coverage.
7	Feedback & Grievance Module	Timely redressal and user satisfaction tracking	Farmer feedback on AI quality, technician behavior, and resolution of complaints within 48 hours by respective CDVO/BVO cells.

3.10 Centralised Dashboard

The proposed software application will feature a comprehensive, interactive dashboard that serves as a central hub for data visualization, monitoring, and real-time insights for all of the above modules detailed in section-5.1 to section-5.9. The dashboard will provide Department users with an intuitive interface to analyze trends, and generate actionable insights through dynamic charts, graphs, and reports. With customizable filters, drill-down capabilities, and real-time data synchronization, users can easily navigate complex datasets and make informed decisions efficiently. Designed for seamless accessibility across devices, the dashboard will enhance user experience by offering a visually engaging, data-driven environment tailored to the application's specific objectives.

3.11 Provision of AI features

The bidder shall incorporate suitable Artificial Intelligence (AI)–based components within the proposed work plan to enhance efficiency, automation, and decision-support capabilities. The proposed AI interventions may include, but are not limited to, predictive analytics, intelligent data processing, automated workflows, anomaly detection, and user-experience enhancement tools. Bidders are required to clearly outline the AI technologies, methodologies, and implementation approach, along with expected outcomes and measurable benefits. The AI solutions should comply with applicable standards, ensure data security and privacy, and be scalable for future upgrades.

4. Technical Requirement

4.1 Adherence to Standards

- a. The development of application should be done preferably using open-source platform. The Selected Agency is free to use the software available like application server, any third-party software etc. as per requirement of their proposed solution. For proprietary software, adequate license must be procured in the name of F&ARD Department, Govt of Odisha and cost towards the same will be borne by the Agency.
- b. The system shall ensure compliance with relevant defined industry standards (their latest versions as on date) wherever applicable. This will apply to all the aspects of solution including but not limited to its design, development, security, implementation, and testing. The proposed architecture shall be scalable & flexible for modular expansion and shall ensure ease of integration with other applications.
- c. The solution architecture should thus have provision to cater to the evolving requirements of F&ARD Department, Government of Odisha.

A reference list of the minimum industry standards which the system components should adhere to is mentioned below:

Component	Standards
Information Access / Transfer Protocols	SOAP, HTTP/HTTPS
Interoperability	Web Services, Open Standards
Portal Development	W3C Specifications
Document encryption	PKCS specification
Information Security	ISO 27001 certified System
Operation	ISO 9001 Certified
Service Management	ISO 20000 specifications or latest
Project Documentation	IEEE/ISO Specifications for documentation
Data Standards	All-important data entities should be in line with standards published by DeiTY.

4.2 Technical Architecture

The Technical Architecture of the System would be multi layered. The architecture should be scalable both vertically and horizontally with security features. The overall technology solution shall be based upon the most relevant and suitable architecture standards including standards for Service Oriented Architecture (SOA), XML services & necessary protocols for internet applications. The Selected Agency shall use only the Enterprise version of the Database software and procure the same in the name of F&ARD Department, Government of Odisha as per its quoted price.

4.3 Hosting Infrastructure

The application will be hosted at the infrastructure to be facilitated by DAH&VS/OCAC after successful completion of security audit.

5. Security, Integrity & Confidentiality

- a. ***Web Services Security:*** System shall comply with all the Web services including routing, management, publication, and discovery should be carried out in a secure manner. Those who are using the Web services should be able to utilize security services such as authentication, authorization, encryption and auditing. Encryption of data shall take place at client level itself. Application server shall provide SSL security.
- b. ***Data Integrity and Confidentiality:*** Data integrity techniques need to be deployed to ensure that information has not been altered, or modified during transmission without detection. Similarly, Data confidentiality features are also to be applied to ensure that the data is only accessible by the intended parties.

- c. ***Transactions and Communications:*** With respect to the Data Transactions and Communications, system needs to ensure that the business process are done properly and the flow of operations are executed in correct manner.
- d. ***Non Repudiation Security:*** The application shall have the Non-repudiation security services to protect a party to a transaction against false denial of the occurrence of that transaction by another party. End-to-End Integrity and Confidentiality of Messages The integrity and confidentiality of messages must be ensured even in the presence of intermediaries.
- e. ***Database Controls:*** The database controls for online transaction processing systems like access to database directly, access to database through application, access to log files, access by the remote terminals, DBA controls, backup policy and backup procedures.

6. Change Management Procedure

Any requirement beyond the scope of work mentioned above shall be treated as Change Request. Change request management shall be conducted based on request received from the Department subject to the approval of the Change Request proposal. The activities that shall be treated as changes request are mentioned below:

- Functional changes in the application
- Development of new modules/Form/Report in the developed system
- Changes in the workflow or core application framework
- Addition of new modules

The procedure for executing the change request is as follows:

Analysis: The changes suggested shall be analysed and an effort estimation including timeline shall be submitted to the Department.

Approval: Department shall provide approval on the effort and timeline suggested.

Incorporation: After receiving the approval, the changes will be incorporated in the application.

Payment: The additional cost of change requests will be borne by the Department. Payments to such assignment will be as per the man month rate provided in financial bid format and will be made as per actual man month consumed after completion of work of respective enhancement.

7. Intellectual Property Rights

The Intellectual Property Rights (IPR) of all software code, data, algorithms, documentation, manuals, digitized documents etc. generated as a part of implementation and O&M of this project shall solely vest with the Department. The Selected Agency will not have any right to share, use or disclose above mentioned components/artifacts. The source code of entire applications along

with necessary documentations developed under this RFP/ Contract should be shared with Department/OCAC after Go-live of the application.

8. Exit Plan

- a. The selected firm will provide systematic exit plan and conduct proper knowledge transfer process to handover operations to OCAC/ Department team at least three months before project closure.
- b. IT resource persons of OCAC/Department will work closely with resource persons of the Service Provider at test, staging and production environment during knowledge transfer phase.
- c. All knowledge transfer should be documented and possibly recorded.
- d. The Service Provider will ensure capacity building of the IT resource persons of OCAC/Department on maintenance of Application.

9. Project Documentation

The Service Provider will share below list of documents to OCAC/Department during the project contract period.

- a) Latest version of Source Code & Database
- b) System Requirement Study Documents
- c) High Level Design (HLD) / Low Level Design (LLD) documents including
 - Application architecture documents
 - ER diagrams and other data modelling documents
 - Database design
 - Application component design including component deployment views, control flows, etc.
 - Application flows and logic
- d) User Manual
- e) Application Installation & Configuration Manual
- f) Report of Security Audit & Safe-to-Host Certificate
- g) Any other documents defined under Timeline & Tentative Deliverables
- h) All the above documentation should be done as per IEEE/ISO/CMM Standard

10. Project Timeline

The project shall initially be for a period of 3 years from the date of go-live and Operation & Maintenance may be taken up for another two (2) years based on performance and requirement of the Department.

T- Issuance of Work Order/Purchase Order

Sl. #	Project Component	Tentative Deliverables	Timeline
1.	Requirement Study and Documentation	<ul style="list-style-type: none"> Detailed Project Plan SRS Document 	T+4 Weeks
2.	Approval by Department	<ul style="list-style-type: none"> Approval letter 	T+5 Weeks
3.	Software Development, Testing, Deployment, Configuration	<ul style="list-style-type: none"> System Design Document Hosting of Application in the staging environment Load Testing report 	T+26 Weeks
4.	User Acceptance Test	<ul style="list-style-type: none"> Test plans & Test Cases Conduct of UAT 	T+28 Weeks
5.	Security/ UIDAI compliance Audit	<ul style="list-style-type: none"> Vulnerability report Fixing of vulnerabilities Safe to Host certificate 	T+30 Weeks
6.	Training	<ul style="list-style-type: none"> Training for Stakeholders Operation manual FAQs 	T+31 Weeks
7.	Go-Live	<ul style="list-style-type: none"> Movements of application from Staging to the Production environment 	T+32 Weeks
8.	Operation Maintenance &	<ul style="list-style-type: none"> Quarterly Activity Report 	36 Months from the date of Go-Live
9.	Hand Holding support	<ul style="list-style-type: none"> 2 onsite resource to be deployed 3 Years from the date of go live 	36 months

11. Service Level & Penalty

The Selected agency shall agree to the following Service Level Agreement (SLA), if it fails to deliver as per scope of work within the corresponding Delivery Period and any extension thereof. These SLAs shall be tracked on the basis of timeline and are envisaged to have penalty and/or liquidation damage clauses on non-adherence to any of them.

- a. Maximum penalty capping is 10% of respective milestone.
- b. In case, the delay is more than 24 weeks and the cause of delay is attributable to Selected Agency, authority reserves right to increase the penalty value and/ or take appropriate action against the bidder such as cancellation of contract, increase of penalty percentage etc.
- c. Penalty will not be applicable if the delay is not attributable to the agency/ due to force majeure situation or due to OCAC's default. However, in such cases, the Selected agency has to communicate in writing the reason of delay. The decision of the Purchaser in this regard shall be final.

- d. If at any time during the Contract, the Selected agency encounters conditions impeding timely performance of service, then the agency shall promptly notify to OCAC in writing of the fact of the delay and its likely duration along its cause(s). As soon as practicable, after receipt of the agency's notice, OCAC shall evaluate the situation and may at its discretion waive the penalty on the request of the selected bidder.

The SLA parameters are divided into 2 (two) types: -

11.1. Implementation Phase

Sl.#	Major Area	Parameter	Requirements	Penalty
a)	Development & Implementation	Major milestone during development and implementation as per project timeline.	As per project timeline	Rs. 500/- per daydelay
b)	Response time for bug fixing	Time taken (after the request has been informed) to acknowledge problem	Within 24 hours from the time the bug is reported.	Rs. 100/- per hour delay
c)	Resolution Time (Only for Bug fixing)	Time taken by the Selected Agency to fix the problem	Problems with severity within 48 hours from the time of reporting.	Rs. 500/- per hour delay
e)	Deployment of Support Resource	Start of service	As per project timeline	Rs. 1,000/- per day delay

11.2. Application Availability

The Application covering all the features shall remain operational during the scheduled operation time for at least 98% of time measured on monthly basis for a 24x7x365 time period excluding the OSDC network downtimes, if any. The non-availability for application service, website measured on monthly basis and excluding the scheduled maintenance shutdown.

Measurement	Reporting Period	Target	Penalty
Daily	Monthly	>= 98%	Nil
		>= 95% but <98%	0.5% of Quarterly billed value of Application Development / Operation & Maintenance Support (As applicable)

		>= 90% but <95%	1.0% of Quarterly billed value of Application Development / Operation & Maintenance Support (As applicable)
		<90%	2.0% of Quarterly billed value of Application Development / Operation & Maintenance Support (As applicable)

- a. Performance of system refers to the proper and timely functioning of the system’s functionalities. The application should be available and performing as per functionalities
- b. The non-availability for application service is measured on monthly basis and excluding the scheduled maintenance shutdown and incidents.
 - i. Maximum penalty capping is 10% of respective milestone.
 - ii. In case, the delay is more than 24 weeks and the cause of delay is attributable to Selected Agency, authority reserves right to increase the penalty value and/ or take appropriate action against the bidder such as cancellation of contract, increase of penalty percentage etc.
 - iii. Penalty will not be applicable if the delay is not attributable to the agency/ due to force majeure situation or due to OCAC’s default. However, in such cases, the Selected agency has to communicate in writing the reason of delay. The decision of the Purchaser in this regard shall be final.
 - iv. If at any time during the Contract, the Selected agency encounters conditions impeding timely performance of service, then the agency shall promptly notify to OCAC in writing of the fact of the delay and its likely duration along its cause(s). As soon as practicable, after receipt of the agency’s notice, OCAC shall evaluate the situation and may at its discretion waive the penalty on the request of the selected bidder.

11.3. Reporting Procedures of SLA

The SI’s representative will prepare and distribute Service level performance report in a mutually agreed format by the 10th working day of the completion of each month. The reports will include “actual versus target” Service Level Performance, variance analysis and discussion of appropriate issues or significant events.

Definitions

- a. “Scheduled Maintenance Time” shall mean the time that the System is not in service due to a scheduled activity. The scheduled maintenance time would not be during Working Hour timeframe. Further, scheduled maintenance time is planned downtime with the prior permission.

- b. “Scheduled operation time” means the scheduled operating hours of the System for the month. All scheduled maintenance time on the system would be deducted from the total operation time for the month to give the scheduled operation time. The total operation time for the applications within the Primary DC, DR and critical client site infrastructure will be 12 hrs. X 7 days X 12 months.
- c. “System downtime” means accumulated time during which the System is totally inoperable within the Scheduled Operation Time.
- d. “Availability” means the time for which the services and facilities are available for conducting operations including application and associated infrastructure. Availability is defined as: $\{(Scheduled\ Operation\ Time - System\ Downtime) / (Scheduled\ Operation\ Time)\} \times 100\%$

Interpretations

- a. The SLA parameters shall be monitored on a monthly basis as per the individual SLA parameter requirements.
- b. The SI is expected to provide the required service levels. In case the service levels cannot be achieved at service levels defined in the tables below, it shall result in a breach of contract and invoke the penalty clause. Payments to the SI are linked to compliance with the SLA metrics.
- c. During the contract period, it is envisaged that there could be changes to the SLA, in terms of addition, alteration or deletion of certain parameters, which is based on mutual consent of both the parties i.e. the OCAC and SI.

12. Payment Terms

SL#	CATEGORY/ACTIVITIES	PAYMENT TERM
1.	Application Design, Development, Integration and Implementation (Web & Mobile)	<ul style="list-style-type: none"> • 20% of application development cost on approval of SRS. • 40% of application development cost on approval of UAT. • 30% of application development cost after declaration of Go-Live by OCAC/User Department. • Balance 10%, equally divided in 4 quarters (first year) after Go-live.
2.	Application Support and Software Maintenance for a period of three year.	QGR Payment. To be paid in 12 Installment on submission of quarterly status report.
3.	SSL Certificate (if supplied by selected agency)	100% of the cost shall be paid after configuration of SSL in the Live Web application
4.	Third Party Security Audit/ UIDAI Compliance Audit	100% of the cost shall be paid on submission of Safe-to-Host certificate/ UIDAI compliance report
5	Change request Cost	100% of approved cost after incorporation and certification by Department
6	Enterprise Database	100% of cost on delivery and installation
7	Handholding Support Cost for 3 Years for 2 Resources	Quarterly payment based on the submission of Invoice, attendance report and Quarterly Performance / Activity report.

N.B.

- i. Payments to the bidder/authorized partner, after successful completion of the target milestones (including specified project deliverables), after submission of an invoice along with supporting documents subject to penalties, if any.
- ii. The currency or currencies in which payments shall be made to the selected bidder under this Contract shall be Indian Rupees (INR) only.
- iii. In case of disputed items, the disputed amount shall be withheld and will be paid only after settlement of the dispute.
- iv. Any penalties/ liquidated damages, as applicable, for delay and non-performance, as mentioned in this bidding document, will be deducted from the payments for the respective milestones.
- v. Taxes, as applicable, will be deducted/ paid, as per the prevalent rules and regulations at the time of billing.