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Request for Proposal

for

Selection of System Integrator/Vendor

for

Designing, Development and Operation & Maintenance (O&M) of Common EPR portal of CPCB

Volume I: Scope of Services

Central Pollution Control Board
Government of India
Parivesh Bhawan, East Arjun Nagar Delhi – 110 032

VOLUME - I

SCOPE OF SERVICES

FOR

THE SELECTION OF SYSTEM INTEGRATOR FOR DESIGN, DEVELOPMENT AND OPERATIONS & MAINTENANCE (O&M) OF COMMON EPR PORTAL

Abbreviations and Acronyms		
SN	Abbreviations	Details
1.	BWM	Battery Waste Management
2.	CIN	Corporate Identification Number
3.	CPCB	Central Pollution Control Board
4.	CO	Carbon Monoxide
5.	DIC	District Industries Centre
6.	DO	Divisional Offices
7.	DPR	Detailed Project Report
8.	EC	Environmental Compensation
9.	EMD	Earnest Money Deposit
10.	EPR	Extended Producers Responsibility
11.	FRS	Functional Requirement Specification
12.	HoWM	Hazardous Waste Management Rules
13.	MIS	Management Information System.
14.	MSA	Master Service Agreement
15.	MoEF&CC	Ministry of Environment, Forestry and Climate Change
16.	MTA	Waste Tyre Recycling Capacity
17.	MT	Metric Tonnes
18.	NO_2	Nitrogen Dioxide
19.	OTR	Off the Road
20.	O&M	Operations & Maintenance
21.	PCC	Pollution Control Committee
22.	PIBO	Producers, Importers and Brand Owners
23.	PWP	Plastic Waste Producers
24.	PWM	Plastic Waste Management
25.	QCBS	Quality and Cost Based Selection
26.	RFP	Request for Proposal
27.	RO	Regional Office
28.	RSPM	Respirable Suspended Particulate Matter
29.	SO_2	Sulphur Dioxide
30.	SI	System Integrator
31.	SPM	Suspended Particulate Matter
32.	SLA	Service Level Agreement
33.	SPCB	State Pollution Control Board
34.	SRS	Software Requirement Specification
35.	T	Tonnes
36.	Tech PMU	Technical Project Management Unit
37.	UAT	User Acceptance Testing
38.	WQM	Water Quality Monitoring

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DISCLAIMER

This Request for Proposal (RFP) is issued for the selection of a System Integrator/Vendor to Design, Development and O&M of common EPR portal for the Central Pollution Control Board.

Whilst the information in this RFP has been prepared in good faith, it is not and does not purport to be comprehensive or to have been independently verified. Neither CPCB, nor any of its officers or employees, nor any of their advisers nor consultants accept any liability or responsibility for the accuracy, reasonableness or completeness of the information contained in the RFP, or for any errors, omissions or misstatements, negligent or otherwise, relating to the proposed Project, or makes any representation or warranty, express or implied, with respect to the information contained in this RFP or on which this RFP is based or with respect to any written or oral information made or to be made available to any of the recipients or their professional advisers and, so far as permitted by law and except in the case of fraudulent misrepresentation by the party concerned, and liability therefore is hereby expressly disclaimed.

The information contained in this RFP is selective and is subject to updating, expansion, revision and amendment at the sole discretion of CPCB. It does not, and does not purport to, contain all the information that a recipient may require for the purposes for making a decision for participation in this process. Each Party must conduct its own analysis of the information contained in this RFP, to correct any inaccuracies therein and is advised to carry out its own investigation into the proposed project, the regulatory regime which applies thereto and by and all matters pertinent to the project and to seek its own professional advice on the legal, financial and regulatory consequences of entering into any agreement or arrangement relating to the Project. CPCB shall not be responsible for any direct or indirect loss or damage arising out of or for use of any content of the RFP in any manner whatsoever.

This RFP includes certain statements, estimates, projections, targets and forecasts with respect to the proposed project. Such statements, estimates, projections, targets and forecasts reflect various assumptions made by the management, officers, employees, consultants, and experts, which (the assumptions and the base information on which they are made) may or may not prove to be correct. No representation or warranty is given as to the reasonableness of forecasts or the assumptions on which they may be based and nothing in this RFP is, or should be relied on as, a promise, representation or warranty.

CPCB shall be the final authority with respect to qualifying a bidder through this RFP. The decision in selecting the System Integrator/Vendor who qualifies through this RFP shall be final and CPCB reserves the right to reject any or all the bids without assigning any reason thereof. CPCB further reserve the right to negotiate with the selected agency to enhance the value through this project and to create a more amicable environment for the smooth execution of the project.

CPCB may terminate the RFP process at any time without assigning any reason and upon such termination CPCB shall not be responsible for any direct or indirect loss or damage arising out of such a termination.

NOTICE INVITING TENDER

Central Pollution Control Board (CPCB), working under the Ministry of Environment, Forest and Climate Change, Govt. of India invites technical and financial proposals from reputed Bidder (in sealed cover), to **"Select System Integrator (SI) for Designing, Development and O&M of common EPR portal"** on behalf of Central Pollution Control Board (CPCB).

The document can be downloaded from the website https://www.cpcb.nic.in/ or can be accessed through GeM Portal, response to this tender shall be deemed to have been done after careful study and examination of this document with full understanding of its implications. This section provides general information about the Issuer, important dates and addresses and the overall eligibility criteria for the parties.

Issuer

The Member Secretary
Central Pollution Control Board (CPCB)
Parivesh Bhawan, East Arjun Nagar Delhi – 110 032
Email Id: **mscb.cpcb@nic.in**

For any queries:
Contact Number: 011-43102296

1. About this RFP

Below Section describes the structural and functional components of the RFP.

(i) RFP Volume I: Functional and Technical Specifications **(**Scope of Work)
(ii) RFP Volume II: General & Financial Specifications **and** Master Service Agreement (MSA)

The (SI)/vendor is expected to examine all instructions, terms, CPCB requirements and other information in the RFP documents. Failure to furnish all information required by the RFP documents or submission of a proposal not substantially responsive to the RFP documents in every aspect would be at the bidder's risk and may result in rejection of the proposal.

The objective of this Request for Proposal (RFP) is to select a qualified System Integrator (SI) to provide comprehensive services for the design and development of common Extended Producer Responsibility (EPR) portal for the Central Pollution Control Board's (CPCB) along with its O&M phase.

The scope of this RFP involves the Design, Development, and O&M of common EPR portal This integrated system will centralize and streamline EPR-related activities across these waste categories, reducing redundancies and improving operational efficiency. The system integrators will ensure a seamless consolidation process, enhancing technical capabilities and ensuring the portal scalability for future expansions. This initiative aims to improve the effectiveness of India's EPR framework by providing a centralized, efficient, and scalable platform for waste management.

1.1 Key objective

The Central Pollution Control Board (CPCB), under the Ministry of Environment, Forest, and Climate Change, aims to enhance the enforcement of environmental regulations related to water and air pollution through the effective management of Extended Producer Responsibility (EPR) frameworks. These frameworks assign waste management responsibilities to producers, promoting sustainability and reducing environmental impact. CPCB has established five EPR portals for various waste types, with additional portals in development. However, issues with functionality, security, and usability have limited their effectiveness. To address these challenges, CPCB is seeks to onboard a System Integrator (SI) for design, development and operation & maintenance of a common EPR portal. The key objectives are as follows:

A. **Designing of Common EPR Portal:** Conduct a comprehensive analysis of existing portals and develop other necessary technical documentation for a common EPR portal.
B. **Development of Common EPR Portal:** Development of common EPR as per the defined functional requirement and maintaining system integrity through regular enhancements and updates.
C. **Operation & Maintenance of Common EPR Portal:** The operation & maintenance of the developed common EPR portal for the next five years with regular enhancements and support in updates.

1.2 Requirement of System Integrator (SI)

The Central Pollution Control Board (CPCB), operating under India's Ministry of Environment, Forest and Climate Change (MoEFCC), plays a pivotal role in enforcing environmental regulations related to water and air pollution. As part of its mandate, CPCB manages Extended Producer Responsibility (EPR) frameworks, which are designed to transfer the responsibility of waste management from the government to the producers of goods. This approach not only promotes sustainable waste management practices but also helps mitigate the environmental impact associated with waste disposal.

To support this objective, CPCB has established multiple EPR portals dedicated to managing different types of waste, including Plastic Packaging Waste, Waste Batteries, Waste Tyres, Used Oil, and E-Waste. However, these individual portals are currently facing several challenges from the users' point of view. and Issues have been identified.

To address these challenges and enhance the effectiveness of these portals, CPCB is seeking to onboard a service provider (System Integrator) to design, develop common EPR portal along with its operation & maintenance. This common portal aims to provide a single-window platform for stakeholders, streamlining the management of various waste types and improving user experience. The selected System Integrator will play a crucial role in transforming CPCB's EPR management system, making it more efficient, secure, and user-friendly.

2. About CPCB

2.1 Introduction

The Central Pollution Control Board (CPCB), established in September 1974 under the Water (Prevention and Control of Pollution) Act, 1974, and subsequently given additional powers under the Air (Prevention and Control of Pollution) Act, 1981, is a statutory organization responsible for enforcing environmental regulations in India. CPCB provides technical services to the Ministry of Environment, Forests, and Climate Change and is mandated to promote the cleanliness of water bodies and improve air quality by preventing and controlling pollution. CPCB also coordinating with State Pollution Control Boards (SPCBs) to implement environmental legislation.

2.2 Key Stakeholders

The success of the project is likely to be measured by the synergistic involvement of these stakeholders at various levels of execution. For the purpose effective implementation of the system solution, the stakeholders / target audience have been categorized as follows:

A. Internal Stakeholders

a) Central Pollution Control Board (CPCB)

The CPCB (Central Pollution Control Board) is a regulatory body in India responsible for monitoring and controlling pollution levels to protect environmental quality.

b) State Pollution Control Board. (SPCB)

The SPCB (State Pollution Control Board) is a state-level regulatory authority in India responsible for managing and controlling pollution within its authority.

c) Regional Directorate (RD)

The Regional Offices of the CPCB are responsible for implementing and monitoring pollution control measures in specific geographic areas in India.

B. External Stakeholders

a) Producers, Importers and Brand Owners (PIBO)

Producers, Importers and Brand Owners (PIBOs) are entities responsible for the production, importation, and branding of products, and under EPR regulations, they are accountable for the management and disposal of post-consumer/pre-consumer waste associated with their products.

b) Plastic Waste Producers (PWP)

Plastic Waste Producers (PWP) are entities involved in the collection, processing, and recycling of plastic waste to ensure its proper disposal and reuse in compliance with environmental regulations.

c) Manufactures

Manufacturers are entities involved in producing goods from raw materials on the large scale, typically for distribution and sale.

d) Producer

Producers are entities that create or generate products or goods, and under EPR regulations, they are responsible for managing the environmental impact of their products throughout their lifecycle, including post-consumer waste.

e) Refurbishers

A refurbisher is an entity or individual that restores used or damaged products to a like-new condition, often for resale or reuse, extending the products lifecycle and reducing waste.

f) Recycler

A recycler is an entity or individual that processes used materials or products to convert them into reusable raw materials/new products, thereby reducing waste and promoting sustainability.

g) Retreaders

Retreaders are companies that refurbish used tires to extend their lifecycle, contributing to waste reduction and recycling efforts under Extended Producer Responsibility systems.

h) Importer

The importers are entities that bring materials into a country and are responsible for ensuring its proper collection, recycling, or disposal in compliance with environmental regulations.

i) **Collection Agents**

Collection agents are entities responsible for collecting used oil from generators or designated points and ensuring its proper recycling or disposal according to regulatory guidelines.

j) **System Integrator/Vendor**

The System integrators will work on the development of the common EPR portal. This common EPR portal brings all the existing EPR portals of CPCB into a single platform which will result in streamlining the operations, reduce redundancy, and significantly improve the overall efficiency of the EPR framework.

3. Overview of current EPR portals

The Central Pollution Control Board (CPCB) of India has developed several Extended Producer Responsibility (EPR) portals to ensure the effective monitoring and compliance of waste management rules. These portals are vital in enforcing EPR obligations for producers, importers, and brand owners (PIBOs) under the Plastic Waste Management (PWM) Rules, E-Waste Management Rules, and other regulatory frameworks. The portals serve as an interface for stakeholders to register, file returns, and monitor compliance in line with the prescribed guidelines.

CPCB currently operates five EPR portals, each requiring an evaluation of their functionalities to ensure effective waste management reporting and compliance tracking. This process also includes analyzing user experience to identify usability issues and technical challenges, such as system performance, security measures, and data management.

3.1 EPR portal for Plastic Packaging Waste Management (PWM)

The Ministry of Environment, Forest and Climate Change, Government of India, in its fourth amendment to the Plastic Waste Management Rules, dated February 16, 2022, introduced the ‘Guidelines on Extended Producer Responsibility for Plastic Packaging’ in Schedule II of the Rules. In line with these guidelines, the Central Pollution Control Board (CPCB) has developed a Centralized EPR Portal for plastic packaging.

The EPR Portal for Plastic Packaging is designed to facilitate the registration and compliance of Producers, Importers and Brand Owners (PIBOs), and Plastic Waste Processors (PWPs)

in line with the Extended Producer Responsibility (EPR) Guidelines. The portal is structured into seven key modules, each addressing a specific aspect of the EPR process:

A. **Module 1:** Registration of PIBOs - Enables Producers, Importers, and Brand Owners to register on the portal in compliance with the EPR Guidelines.
B. **Module 2:** Registration of PWPs - Allows Plastic Waste Processors to complete their registration.
C. **Module 1(A):** Combined Registration for PIBOs and PWPs - Offers a unified registration process for both PIBOs and PWPs and Dynamic EPR targets for PIBOs.
D. **Module 3:** Generation of Certificates - Facilitates the generation of certificates necessary for compliance under the EPR framework.
E. **Module 4:** Filing of Annual Returns - Provides a platform for the submission of annual returns, ensuring that registered entities meet their reporting obligations.
F. **Module 5:** Levy of Environmental Compensation (EC) - Addresses the calculation and imposition of environmental compensation for non-compliance.
G. **Module 6:** Audit - Supports the audit process to ensure transparency and adherence to EPR Guidelines.
H. **Module 7:** Capacity Building - Focuses on enhancing the knowledge and skills of stakeholders through training and capacity-building initiatives. The capacity building and relevant trainings has to be organized by vendor (as per the requirement of CPCB)

This comprehensive structure ensures that all aspects of the EPR process are systematically managed, promoting effective compliance and environmental stewardship.

Note: Refer Annexure I for Functional & Technical details

I. Users of Plastic Waste Management

Internal User	External User
▪ CPCB Members ▪ SPCB Members ▪ Regional Office Members	▪ Producer Importer and Brand Owner (PIBO) ▪ Plastic Waste Processor (PWP)

3.2 EPR portal for E-Waste Management

The E-Waste (Management) Rules, 2022 apply to all entities involved in the manufacture, sale, transfer, refurbishing, dismantling, recycling, and processing of e-waste, including manufacturers, producers, refurbishers, dismantlers, and recyclers. These rules cover electrical and electronic equipment, along with their components, consumables, parts, and spares. The aim is to regulate the entire lifecycle of electronic products to minimize their environmental impact, particularly at the end-of-life stage.

A key aspect of these rules is the concept of Extended Producer Responsibility (EPR), which requires producers to take responsibility for their products even after they have been sold. The EPR obligations are determined based on the product's lifespan and information provided by producers through an online portal. Producers must meet their EPR targets, as outlined in the E-Waste (Management) Rules, by purchasing EPR certificates from registered recyclers and submitting quarterly returns online.

To streamline this process, CPCB has developed an Online E-Waste Management System, known as the EPR Portal. This portal allows producers to apply for Registration Certificates and Recycling Targets/EPR obligations. All stakeholders, including producers, recyclers, refurbishers, and manufacturers, must register on this portal. The system ensures that CPCB can efficiently generate EPR Registration Certificates for producers, based on the information submitted, and allows producers to fulfil their responsibilities by purchasing certificates from registered recyclers and submitting the necessary returns through the portal.

User for E-Waste Management EPR Portal	
Internal User	**External User**
▪ CPCB Members ▪ SPCB Members ▪ Regional Office Members	▪ Producer ▪ Recycler ▪ Manufacturer ▪ Refurbisher

Note: Refer Annexure II for Functional & Technical details

3.3 EPR portal for Waste Batteries Management

The Ministry of Environment, Forest, and Climate Change issued the Battery Waste Management (BWM) Rules on August 22, 2022. According to these rules, every producer and any individual or entity involved in the manufacturing of batteries must register with the Central Pollution Control Board (CPCB). This registration process is facilitated through an online centralized portal developed by CPCB.

Under Rule 4 (1), producers are obligated to fulfil their Extended Producer Responsibility (EPR) for the batteries they introduce into the market. This responsibility includes ensuring that recycling or refurbishing obligations are met. To comply with these requirements, producers must ensure that waste batteries are recycled by certified waste battery recyclers, thereby achieving their assigned EPR targets. They are also required to obtain EPR certificates from recyclers based on the quantity of waste batteries recycled, which can be used to meet their EPR obligations.

User for Battery Waste Management EPR Portal	
Internal User	**External User**
▪ CPCB Members ▪ SPCB Members ▪ Regional Office Members	▪ Producer ▪ Recycler ▪ Refurbisher

Note: Refer Annexure III for Functional & Technical details

3.4 EPR portal for Waste Tyres Management

The Ministry of Environment, Forest and Climate Change (MoEF&CC) has introduced amendments to the Hazardous Waste Rules through the notification of "The Hazardous and Other Wastes (Management and Transboundary Movement) Amendment Rules, 2022." These amendments specifically address the utilization and management of waste tyres, incorporating the principles of Extended Producer Responsibility (EPR).

Under the EPR framework, producers of new tyres are entrusted with the responsibility of ensuring the environmentally sound management of waste tyres, as outlined in Schedule-IX of the amended rules. The management and utilization of waste tyres will be governed by EPR principles, where tyre producers, as defined in Para 1(e) of the Schedule, are assigned specific EPR obligations based on the quantity of tyres they manufacture, sell, or import.

Additionally, recyclers and retreaders are required to generate and issue EPR Certificates corresponding to the amount of waste tyres they recycle or retread. To fulfil their EPR obligations, producers must purchase these EPR Certificates from registered recyclers. The quantity of EPR Certificates purchased will be applied against the producer's EPR obligations. Moreover, producers have the option to buy retreading certificates to defer their EPR obligations; however, the obligations will only be considered fulfilled once the necessary recycling certificates are acquired.

The entire process, including stakeholder registration, EPR certificate generation, trading and issuance of certificates, and filing of EPR obligations, must be carried out through a centralized EPR portal developed by the Central Pollution Control Board (CPCB). According to Paras 2 and 3 of Schedule IX, producers, waste tyre recyclers, and retreaders are mandated to register themselves on this EPR Portal.

User for Waste Tyre Management EPR Portal	
Internal User	**External User**
▪ CPCB Members ▪ SPCB Members ▪ Regional Office Members	▪ Producer ▪ Recycler ▪ Retreader

Note: Refer Annexure IV for Functional & Technical details

3.5 EPR portal for Used Oil Management

The Ministry of Environment, Forest and Climate Change has amended the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 through notification G.S.R 677(E) dated September 18, 2023. This amendment is titled "The Hazardous and Other Wastes (Management and Transboundary Movement) Second Amendment Rules, 2023" and introduces the Extended Producer Responsibility (EPR) instrument for managing Used Oil in the country.

Under these rules, Producers of Base Oil or Lubrication Oil and Importers of Used Oil are required to fulfil EPR obligations based on the quantity of Base Oil or Lubrication Oil they place in the market and the quantity of Used Oil they import. Producers can meet their EPR requirements by acquiring Extended Producer Responsibility Certificates from registered recyclers. According to para 26 of the rules, Producers, Collection Agents, Recyclers, and Used Oil Importers must register on the EPR portal developed by the CPCB.

According to the rules, a Producer is defined as any person or entity, regardless of the selling method used (such as dealer, retailer, or e-retailer), who: (i) Manufactures and sells base oil or lubrication oil domestically under their own brand; (ii) Sells lubrication oil domestically under their own brand using base oil manufactured by others; or (iii) Sells imported base oil or lubrication oil domestically.

User for Used Oil Management EPR Portal	
Internal User	**External User**
▪ CPCB Members ▪ SPCB Members ▪ Regional Office Members ▪ Custom	▪ Producer ▪ Recycler ▪ Collection Agent ▪ Importer

Note: Refer Annexure V for Functional & Technical details

4. About Common EPR Portal

The Central Pollution Control Board (CPCB) is planning to develop a Common Extended Producer Responsibility (EPR) Portal to streamline the monitoring and compliance of waste management rules. This portal is designed to enforce EPR obligations for producers, importers, and brand owners (PIBOs) under various regulatory frameworks, including the Plastic Waste Management (PWM) Rules, E-Waste Management Rules, Tyre Waste Management Rules, Battery Waste Management Rules, and Used Oil Waste Management Rules along with the forthcoming EPR portals. The Common EPR Portal serves as a unified interface for stakeholders to register, file returns, and monitor compliance in line with the prescribed guidelines.

The Common EPR Portal will include the following features:

4.1 Centralized Registration

a) The portal provides a centralized platform for the registration of Producers, Importers, Brand Owners (PIBOs), and other stakeholders involved in all categories of waste management.
b) It supports combined registration for PIBOs and Plastic Waste Processors (PWPs), ensuring a streamlined process.

4.2 Enhance Compliance Tracking

a) Enhanced Compliance and Regulatory Oversight: By consolidating all compliance-related processes under a single platform, regulatory bodies like the Central Pollution Control Board (CPCB)/SPCG/RDs can efficiently monitor adherence to EPR guidelines, track stakeholder performance, and enforce regulations. This ensures a more structured and accountable waste management ecosystem.
b) It includes modules for filing annual returns, generating certificates, and auditing compliance.

4.3 Standardized and Streamlined Processes

a) The portal introduces uniform procedures for critical operations such as registration, certificate issuance, compliance reporting, and fee payments. This reduces administrative bottlenecks, enhances efficiency, and ensures a seamless experience for all stakeholders.

4.4 Environmental Compensation

a) The portal addresses the calculation and imposition of environmental compensation for non- compliance with EPR guidelines.
b) It ensures that stakeholders are held accountable for their environmental impact.

4.5 User-Friendly Interface

a) The portal will be designed with a user-friendly interface to ensure ease of use for all stakeholders.
b) It includes features such as dynamic EPR targets, certificate generation, and real-time compliance tracking.

4.6 Improved Data Accuracy and Consistency

a) Standardized data formats and uniform reporting structures enhance the integrity and reliability of information submitted through the portal. This minimizes errors, discrepancies, and redundancies, ensuring that regulatory bodies and stakeholders can access accurate and up-to-date records.

4.7 Enhanced Security Measures

a) The portal incorporates robust security measures to protect user data and ensure the integrity of the system.
b) It includes features such as secure login, data encryption, and regular security audits.
c) A centralized, well-secured digital framework minimizes exposure to cyber threats, unauthorized access, and data breaches. By consolidating security protocols into a single system, the portal provides enhanced protection compared to multiple fragmented platforms.

4.8 Integration with Existing Systems

a) The portal is designed to integrate seamlessly with existing waste management systems and regulatory frameworks.
b) It ensures that data is accurately captured and reported in line with regulatory requirements.

4.9 Cost-Effective Operations

a) The integration of infrastructure, software development, technical support, and maintenance into a single portal significantly lowers operational costs. By eliminating

redundancies associated with multiple standalone systems, the portal optimizes resource utilization and reduces financial overheads.

4.10 Operation and Maintenance

a) The designed and developed common EPR portal will enhance transparency by providing detailed tracking reports. The system will facilitate error free filling of applications through cross validations and in compliance with EPR guidelines through regular operation & maintenance of the portal in the next five years.
b) The portal will undergo regular updates and upgrades to incorporate new regulatory requirements, technological advancements, and user feedback during the maintenance phase of five years. This ensures that the system remains up-to-date and continues to meet the evolving needs of its users.

5. Scope of Work

The **System Integrator (SI) / Vendor** shall be responsible for the **design, development, implementation, and maintenance** of the **Common EPR Portal**, ensuring seamless stakeholder integration, regulatory compliance, and operational efficiency. The project will be executed in **two phases**. In **Phase I**, the SI/Vendor shall integrate all existing EPR portals into a unified **Common EPR Portal** through a **Single Sign-On (SSO) mechanism**, providing users with an **integrated common dashboard** for all EPR-related activities. This integration will streamline access, eliminate redundancy, and improve user experience across various EPR frameworks.

In **Phase II**, the SI/Vendor shall undertake the **comprehensive development and long-term maintenance** of the Common EPR Portal to support all existing EPR frameworks. The portal shall serve as a **single-window platform** for **Producers, Importers, Brand Owners (PIBOs), Plastic Waste Processors (PWPs), Waste Recyclers, Manufacturers, Retreaders, and Refurbishers**, facilitating **registration, compliance tracking, and financial transactions** through a **common payment and audit module** to ensure transparency and regulatory oversight and ensure that the portal is **scalable, secure, and interoperable** with other government platforms while incorporating **best practices in data management, cybersecurity, and user experience** to enhance system reliability and compliance management. Additionally, the vendor shall provide Helpdesk and Video Conferencing support through the Phase II of the project.

5.1 Key Scope Areas

a) Perform a thorough analysis of existing portals and create the required technical documentation for a unified Common EPR portal.
b) The SI/Vendor shall integrate all existing EPR portals into a Common EPR Portal using a Single Sign-On (SSO) mechanism, enabling users to access a centralized dashboard for all EPR-related activities.
c) It shall be the responsibility of the Vendor/SI to design, develop, operate the Common EPR Portal.
d) Design and develop the portal based on defined functional requirements, ensuring system reliability through regular updates and enhancements.
e) Develop a common EPR portal for Plastic Packaging Waste, Waste Batteries, Waste Tyres, Used Oil, and E-Waste and upcoming EPR portals for CPCB.
f) Implement blockchain technology to ensures transparency, data security, and automation in waste management by providing tamper-proof records, real-time tracking, and efficient credit management.
g) Migrate and validate legacy data during the implementation phase.
h) CPCB will provide production server however bidder have to provide UAT and staging server for the portal development.
i) Provide change management support, including user training for effective system utilization.
j) Integration of the Common EPR portal with other platforms through API
k) Operate and manage the implemented solution throughout the project's duration after the Go-Live date.
l) Facility to connect through Video Conferencing and Helpdesk support throughout the operation and maintenance phase
m) Upgrade and maintain the existing Helpdesk and Ticketing module.
n) Offer exit management support starting six months before the completion of the five-year O&M period.
o) Implement AI/ML to analyze large datasets from the EPR portal to predict trends, optimize waste management processes, and identify potential non-compliance.
p) Develop an AI-powered system to categorize user grievances, implement chatbots for initial support, and create a ticketing system to prioritize and route issues to the right staff.
q) The Bidder shall submit an inception report and detailed project plan along with the timeline within two months of commencement of work.

5.2 Detailed Scope of Work

Since the success of the project depends on the performance of the IT systems, it is mandated that a proven approach and methodology be adopted and implemented for this project. The indicative list of activities to be performed is explained below:

I. **System Requirements Study, System Development & Implementation**

a) The selected System Integrator (SI) shall prepare an Integrated Project Plan for the entire project that covers detailed tasks which are intended to be performed, as part of the project.

b) The roles and responsibilities for the project team along with support arrangements that are expected from the CPCB need to be jointly arrived at and should be signed off between the SI and CPCB.

c) The SI/Vendor needs to prepare and submit an Inception Report, which will serve as the foundation document for all activities related to the project. Additionally, the Inception Report must cover the risks the SI anticipates and the plans they propose towards risk mitigation.

d) The acceptance of the Inception Report by CPCB is necessary before proceeding to the next stage of the project.

r) The SI/Vendor shall submit an inception report and detailed project plan along with timeline within two months (T+2) of commencement of work.

e) Based on the report submitted on T+2 by the SI/Vendor, the CPCB will verify the work done and on satisfactory performance and work completed as per the submitted timeline, then payment will be processed on quarterly basis.

II. Integration of existing EPR portals into Common EPR portal through Single Sign-On (SSO) mechanism

a) Develop & Implement SSO Authentication: Configure and integrate a Single Sign-On (SSO) mechanism to enable seamless user authentication across all EPR modules, ensuring a unified login experience based on assigned roles.

b) Set Up Centralized User & Role Management: Establish a centralized user database with unique email-based authentication, enforce Role-Based Access Control (RBAC), and manage dynamic module access permissions.

c) Enhance UI/UX for Seamless Navigation: Redesign the login/signup interface, develop an integrated dashboard, and enable smooth module-switching without requiring multiple logins.

d) Ensure Security, Compliance & User Migration: Implement secure authentication mechanisms, maintain user activity logs for auditing, and execute a structured migration plan to transition existing users to the new SSO-based system.

III. Requirements Gathering and Analysis

e) A high-level analysis of processes has already been performed and the functional requirements have been identified. The high-level Functional Requirements as envisaged for this project are included in this document in section 8.

f) The SI needs to go through the document, and may consult with the CPCB whenever necessary, to obtain more details on the requirements of the project. The SI shall conduct an actual requirement gathering and prepare a detailed SRS document.

g) The SI shall conduct a comprehensive discussion with the CPCB (or its representatives) and subsequent analysis to ensure that all requirements, including but not limited to, the Functional Requirements of this document are covered in the requirements analysis they conduct and are later captured in the system.

h) The SI must map the Functional Requirements to the proposed solution and analyse the existing gaps between the Functional Requirements and the functionalities provided by the solution.

i) Activities conducted as part of this task will result in the project deliverable “Software Requirements Specifications” (SRS) document, which shall detail the requirements of the complete solution up to the last detail. SRS document shall comply with the latest and most relevant IEEE standards.

IV. Definition & Design

a) Having conducted a comprehensive analysis of the requirements for the project, the SI will need to prepare elaborate system architecture and design documents for the same.

b) The Architecture document should detail the complete architecture of the proposed systems. The corresponding architecture(s) may be identified for the development including for the solution applications, if any. For the complete solution, the following documents, including, but not limited to, the following shall be submitted for sign-off.

i. Application Architecture with all relevant design patterns identified.
ii. All Database structures, schema and detailed description of tables and fields.
iii. Naming conventions followed for the tables and fields.
iv. Data Flow Diagrams (DFD) & Entity-Relationship (ER) diagrams.
v. Details of validation rules and constraints like Integrity Checks etc. to be applied.

vi. Format of all input screens including data entry requirements.

vii. Format of all reports that would be generated by the project.

viii. Business logic used for all reports and functions.

ix. Access control mechanisms, data security and audit trails to ensure that databases are not tampered with or modified by unauthorized users. The following guidelines need to be observed for security.

- Build a complete audit trail of all transactions (add, update and delete) using transaction log reports, so that errors in data, intentional or otherwise, can be traced and reversed.
- The most appropriate level of security commensurate with the value to that function for which it is deployed, must be chosen.
- Access Controls must be provided to ensure that the databases are not tampered or modified by the system operators.
- Implement data security to allow for changes in technology and business needs.

x. Object Oriented Design including design of web services using Service Oriented Architecture (SOA) shall be used for designing the solution components. All UML models including identification of actors, use cases, class diagrams, collaboration diagrams and sequence diagrams used for development / integration shall be part of the System Analysis and Design (SAD) document.

xi. Based on the requirements analysis conducted above, the SI must develop a comprehensive solution.

V. Design and Implementation of the System Architecture:

a) The system design must be such that the developed solution is technology neutral and can be deployed from any of the readily available & cost-effective options from data centres like NIC DC/cloud that the Purchaser wishes to deploy it on.

b) The design must be such as to require the minimal installation, if at all, at the user's end, besides the Internet Browser. The system should be able to support all common desktop & mobile browsers (like Internet explorer, Mozilla, Chrome etc.).

c) SI shall ensure users' involvement in this stage when they are finalizing all design components including the user interfaces, the mode of data entry, storage and retrieval, MIS reports, queries and the application design as a whole.

d) SI shall upgrade and maintain the existing mobile app (iOS/Android) for all the users.

e) Plans for User Acceptance Tests and System Integration Tests including Stress Tests and plans for necessary changes to the product / packaged solution configuration to optimize performance etc.

f) The SI would be responsible for making sure that all the above pre-requisites are adequately met.

Activities conducted as part of this task will result in the project deliverable "Software Design Document or High-Level Design Document" (SDD/ HLD), which shall include all aspects of the architecture and design including Application architecture, deployment architecture, UML diagrams, UI, database schema and all other standard practices followed in the industry.

VI. Development, integration, testing and implementation of common EPR portal and other modules of the System.

a) Once the SDD is completed and signed-off, the SI shall develop the solution to implement the functional and design requirements as defined in the initial phase.

b) **The SI shall deploy their experienced team along with the key experts (stated in section 6) proposed for the project at the Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi, Govt. of India, until the Go-Live of the solution.**

c) The SI should deploy a dedicated team experienced in development, integration, configuring, testing and deployment of the developed solution.

d) Conceptualizing & development of the solution as per the functional requirements specified in this Bid Document.

e) The SI shall develop all five existing EPR portals i, e., Plastic Packaging Waste, Waste Batteries, Waste Tyres, Used Oil, and E-Waste along with any upcoming EPR portals into a unified Common EPR Portal. The work on EPR Plastic Portal shall begin as soon as the work is awarded and shall be in parallel with Phase I.

f) Preferably, minimal changes should be made to the modules. This is important to ensure that future upgrades, enhancements and bug fixes are not impacted. Every custom development must be documented in detail and the code / script should be properly annotated with comments etc.

g) The SI must deploy a software development methodology that ensures rapid deployment of the applications in such a way that (a) the users are continually involved in the development process, and (b) minimum iterations are required before the final Go-live of the solution.

h) From the integration perspective, the SI must take into account necessary interfacing requirements (both at the application and data level). Should an interfacing need to be done with a new EPR portals that is scheduled for integration in next phase, appropriate interfaces must be provided so as to affect this integration as smoothly as possible. Such interfaces shall follow industry standards such as web services. If such a need arises, the SI shall be responsible for creating such required web service or API etc. for the same. The SI must design & implement the system keeping provisions for data sharing to & from the common EPR portal with any other department's/divisions online system through industry standard approaches (e.g. web service & APIs) in a secured & authenticated manner as and when required.

i) At every stage of the development process, the different components of the must get thoroughly tested to ensure that it is bug-free.

j) SI must supply the application, database and all related software, integration tools, along with the source code and describing the process to be followed for installing and operating the same.

k) SI should create all necessary master files for the system.

l) The necessary Hardware, IT infrastructure, Licenses like the servers and system software for **application development & testing** including User Acceptance Testing and User Training on developed solution shall be responsibility of SI/Vendor.

VII. Adherence to Standards in Development, Implementation & Maintenance of Common EPR portal

a) The SI should ensure that the system complies 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 development, security, installation, and testing. The suggested architecture must be scalable and flexible for modular expansion. It should ensure ease of integration with software / applications developed using common industry standards since the solution may be linked and connected to other sources (websites, contents, portals, systems of other user departments/divisions etc.) as well as there may be loose/tight integration with backend system of other divisions depending on individual service processes. The solution architecture should thus have provision to cater to the evolving requirements of the CPCB.

VIII. Implementation of AI/ML and Blockchain technology

a) Implement a blockchain-based system to ensure transparent, secured, tamper-proof recording of waste management transactions and real-time tracking of waste from production to recycling.

b) Utilize blockchain's immutable nature to secure sensitive data (e.g., recycling certifications), and deploy smart contracts to automate the verification of recycling credits and compliance, reducing manual intervention.

c) Streamline EPR credit and certificate management with secure, transparent tracking, and enable easy auditability for compliance monitoring, enhancing regulatory oversight.

d) Develop an AI-powered system to categorize user grievances, implement chatbots for initial support, and create a ticketing system to prioritize and route issues to the right staff.

***Note**: The System Integrator/Vendor can implement AI/ML technology in the Common EPR portal at a later stage or after its development, depending on CPCB's requirements.*

IX. Pilot Rollout & Full scale roll out.

a) The newly developed common EPR portal shall be rolled out with Pilot roll with considering the Plastic waste EPR portal of CPCB.

b) Upon successful completion of pilot testing and closure of bugs & deficiencies observed during the Pilot roll out, the solution (common EPR portal) shall be full scale roll out with all the EPR portals.

X. Helpdesk (Ticketing System + Telephonic System) and Video Conferencing Support System

a) The SI/Vendor shall establish a helpdesk support channel, staffed by a dedicated team, for the entire project cycle.

b) The helpdesk team shall resolve issues through a ticketing system as well as telephonically within a specified timeframe and update the daily status on the CPCB dashboard

c) The SI/Vendor shall ensure the secure storage and backup of all VC recordings and Record of Discussions for the entire duration of the operation and maintenance phase.

d) The SI/Vendor shall provide training sessions for stakeholders on how to use the VC platform and helpdesk support system effectively for the issue related to Common EPR Portal.

e) The SI/Vendor shall provide a detailed escalation matrix for unresolved issues, ensuring timely resolution and communication with CPCB officials.

f) The SI/Vendor shall offer bilingual (English and Hindi) support through the helpdesk to cater to diverse stakeholder needs.

g) The System Integrator (SI)/Vendor shall manage and facilitate daily video conferencing (VC) links for stakeholders to connect with the CPCB helpdesk. This VC service shall be operational form the sixth month (T+6)

h) The SI/Vendor shall create and share the VC link with stakeholders, ensuring its validity for the pre-specified times and working business days of CPCB.

i) The SI/Vendor shall provide daily Records of the Meeting (RoD), highlighting key issues, to CPCB officials by the end of each business day.

XI. Data Digitization: Data porting, data entry, scanning, validation and migration of legacy data and case files

a) Data migration from the legacy system through validation with the CPCB and data porting to the new system shall be the responsibility of the SI. Collection & Mapping of all relevant data/records including Certificate records of existing approvals.

i. Identification of the data gaps.
ii. Providing templates/approach for collection of data/ records
iii. Extraction and loading of the data/records.
iv. Listing of errors during the data migration & correction of data
v. Final porting of the data/records into the solution database/storage

XII. **Change Management and Training of users for effectively using the system.**

a) The SI shall support Tech PMU to impart training to the CPCB staff and other key stakeholders on the usage and maintenance of the solution.

b) SI with the help of Tech PMU shall propose different training modules for relevant user profiles at the appropriate timelines in the project.

c) SI will support Tech PMU to provide such additional training as they deem necessary in order to ensure that the training imparted is comprehensive and complete.

d) The SI in consultation with the Tech PMU shall propose an appropriate training model in their proposal and must propose detailed methodology on how the training would be conducted.

e) SI shall assist Tech PMU to prepare Computer Based Training Modules to enable the users for self-learning.

XIII. Security Audit of the Application:

a) The SI shall assist CPCB for getting application audited by CERT-In Empanelled application security auditors before Go-Live complete system. The cost of the same and any consequent re-audit to validate closure of deficiencies detected in previous audit, if need be, to achieve successful completion of Application Security Audit will be borne by the CPCB.

b) Should any inspected or tested software fail to conform to the specifications, the CPCB may reject the software, and the SI shall either replace/redevelop the rejected software or make alterations necessary to meet specification requirements free of cost.

c) The auditor must submit the test results to the CPCB, and any deficiency found during the security audit shall be required to be removed by SI to accept the implementation to be complete & as a prerequisite to start of Go-Live & subsequent Operations & Maintenance period.

d) The SI shall be required to remove the bugs & deficiencies observed in such audit free of cost. The report/certificate resulting out of such audit shall be directly submitted by the auditor to CPCB and the payments shall be made to the auditor by the CPCB directly.

e) During the O&M Phase, the SI shall assist CPCB in getting security certification of the system from a CERT-IN empanelled auditor every 6 months. The cost of the same is to be borne by the CPCB. The SI shall be required to remove the bugs & deficiencies observed in such audit free of cost. The report/certificate resulting out of such audit shall be directly submitted by the auditor to CPCB and the payments shall be made to the auditor by CPCB directly.

f) The SI shall carry out commensurate changes / updates to project &/or design documents & users/operations manuals, if any changes are implemented in the common EPR portal responding to the deficiencies detected during the Security Audit. The SI shall incorporate such updates of project/design documentation & operations/user's manual. After removal of deficiencies & update of the documentations/manual wherever required, the system shall be subject to re-audit to validate removal of deficiencies & to secure certificate of successful security audit from the Application Security Auditor.

g) The CPCB has the right to inspect, test and, where necessary, reject the software / deliverable after the software deployment at Project Site shall in no way be limited or waived by reason of the software previously been inspected, tested and passed by the CPCB or its representative prior to the software deployment.

h) No clause in the Bid document releases the SI from any warranty or other obligations under this Contract.

i) The SI shall facilitate security audits by Auditors such auditors appointed by the CPCB. The SI shall be required to close deficiencies identified by such audit free of cost and update the project documentation & assist Tech PMU to update manuals accordingly.

XIV. Operation and maintenance of the entire solution, including but not limited to the IT application, for the entire duration of the project from the Go-Live date.

a) On successful completion of above tasks and with the complete system going live, the SI must extend Post Implementation Support till the end of the contractual period which is 5 years**.**

b) The SI must ensure that all necessary measures are taken for the smooth implementation of the system.

c) The System Integrator (SI) must ensure that all necessary support is handed over to the new support team appointed by CPCB for a smooth transition at the end of the Operations and Maintenance (O&M) period. The SI should submit performance metrics for this transition as part of the exit management plan, which must be agreed upon by both the SI and the CPCB. The exit management and guidance should take place during the final six months of the O&M phase, in collaboration with the new SI chosen by the purchaser.

XV. Integration Common EPR portal with another platform

The Common EPR Portal will seamlessly integrate with several key platforms, including the EPR Trading Platform, Common Consent Management Platform, Common Audit Portal, National Single Window System (NSWS), and any other portal requested by CPCB through the use of Application Programming Interfaces (APIs). This integration aims to streamline the regulatory and compliance management processes, ensuring a smooth and efficient exchange of information across these platforms. By facilitating data synchronization, the integration will enhance the overall functionality of the EPR system, making it easier for stakeholders to manage and comply with environmental regulations.

XVI. Documentation of the Project

a) The SI must ensure that complete documentation is provided in adherence to standard methodologies in software development as per ISO standard and/or CMM models. The

documentation requirement from the SI for each phase of this project shall include, but not limit to, the following:

i. Communications Plan listing all stakeholders in the project, defining their roles and responsibilities.
ii. All Architecture documents, Design documents and coding, testing and deployment manuals etc.
iii. Quality Assurance Plan documenting the planned and systematic pattern of all actions necessary to assure confidence that the software developed will conform to the functional and technical requirements of project.
iv. Interface Control Document, documenting the interface characteristics of one or more systems and documents & agreements between interface owners.
v. Test Plan Containing information on the software test environment to be used for independent testing, the test cases to be performed, and the overall testing schedule. This includes methodology, schedule, resources, tools, procedures, environment definition, test cases, and software test results.
vi. Systems Manual Detailing the data structure, table, forms and report structures.
vii. Operations Manual providing instructions for installing the application, troubleshooting, interpreting message logs, and FAQs (Frequently Asked Questions).
viii. User Manual (online) providing detailed instructions on how to use the software. In addition, it shall describe how to access, submit inputs to, and interpret outputs from the application.
ix. A data dictionary listing out all the data elements included shall be prepared.

6. Key resource profile and their responsibilities

To address the challenges with the EPR portals, it is essential to engage an experienced agency for the necessary support and expertise as a system Integrator/Vendor.

For timely planning & implementation of the common EPR Portal, it is crucial to define the necessary technical profiles. These profiles ensure that the right expertise is available to tackle various aspects of the project, from planning to execution and delivery. Below sections the structure & profiles details that is proposed in the scope.

6.1 Proposed Team Profile

a) Dedicated Resources for Design & Development Common EPR Portal:

S. N	Resource Profile	Unit	Duration in month	Experience and Educational Qualification
1.	Program Manager	1	15	BE/B.Tech/MCA/M.Tech/MBA **Experience**: 15+ years in IT project management, stakeholder coordination, budgeting, risk assessment, and Agile methodologies. **Certifications**: PMP/PRINCE2/Certified Scrum Master (CSM) Must have project management experience of 5 IT implementation projects of State-Central Government of India /PSU/PSBs/ Private Sectors
2.	Database Administrator	1	15	BE/B.Tech/MCA/M.Tech **Experience**:10 years in database design, optimization, backup strategies, security, and administration of databases like MySQL, PostgreSQL, Oracle, or MS SQL Server. **Certifications**: Relevant certification
3.	Business Analyst	5	15	BE/B.Tech/MCA/MBA **Experience**: 5+ years in business process modelling, requirement gathering, stakeholder communication, and Agile/Scrum methodologies.
4.	Solution Architect	1	15	BE/B.Tech/MCA/M.Tech Consultant with minimum 10+ years' experience in IT architecture, system design, enterprise solutions, cloud computing, and microservices architecture. Must have knowledge of PHP and backend technology along with existing EPR portals and technology stack such as Java, Python, Angular etc. Experience in any 3 projects in Central/ State Govt./ PSU or Govt. associated Organizations. Certifications: TOGAF Certification
5.	Tech Lead	1	15	BE/B.Tech/MCA/M.Tech **Experience**: 10+ years in software development, technical decision-making, team management, and code quality assurance. Proficiency in multiple programming languages and frameworks with relevant certification.

S. N	Resource Profile	Unit	Duration in month	Experience and Educational Qualification
				Must have experience in any 3 projects in Central/ State Govt./ PSU or Govt. associated Organizations.
6	QA Specialist	5	15	BE/B.Tech/MCA/M.Tech/Any Graduate **Experience**: 5+ years in software testing, automation (Selenium, JUnit, TestNG), performance testing, and test strategy development.
7	UI/UX Designer	2	15	BE/B.Tech/MCA/M.Tech **Experience**: 5+ years in user experience design, wireframing, prototyping (Figma, Adobe XD), and front-end usability testing.
8	Lead Developer	5	15	BE/B.Tech/MCA/M.Tech **Experience**: 10+ years in full-stack development, team leadership, software architecture, and high-performance application development with relevant certification. Must have experience in any 2 projects in Central/ State Govt./ PSU or Govt. associated Organizations.
9	Developer	15	15	BE/B.Tech/MCA/M.Tech **Experience**: 5+ years in coding, debugging, and feature development using modern programming languages and frameworks.
10	DevOps	1	15	BE/B.Tech/MCA/M.Tech **Experience**: 10+ years in CI/CD pipelines, automation, cloud infrastructure (AWS, Azure, GCP), containerization (Docker, Kubernetes), security. Experience in working with NIC environment/Government project.
Total		**37**		

Note:

- *The resources listed for the development of common EPR portal are designated as onsite personnel. These individuals are required to be physically present at the Central Pollution Control Board (CPCB) office or any other CPCB-designated location for the duration of their engagement. CPCB may increase the resources as per the same rates quoted by the bidder as and when required.*
- *The vendor shall be responsible for providing all necessary project management tools and any other relevant software required by the proposed resources for project execution. Additionally, the vendor must supply laptops along with all essential accessories to ensure seamless workflow and productivity.*

b) Dedicated Resources for Operation & Maintenance of Common EPR Portal:

S. N	Resource Profile	Unit	Duration in month	Experience and Educational Qualification
1.	Program Manager	1	45	BE/B.Tech/MCA/M.Tech/MBA **Experience**: 15+ years in IT project management, stakeholder coordination, budgeting, risk assessment, and Agile methodologies. **Certifications**: PMP/PRINCE2/Certified Scrum Master (CSM) Must have project management experience of 5 IT implementation projects of State-Central Government of India /PSU/PSBs/ Private Sectors
2.	Database Administrator	1	45	BE/B.Tech/MCA/M.Tech **Experience**:10 years in database design, optimization, backup strategies, security, and administration of databases like MySQL, PostgreSQL, Oracle, or MS SQL Server. **Certifications**: Relevant certification
3.	Business Analyst	2	45	BE/B.Tech/MCA/MBA **Experience**: 5+ years in business process modelling, requirement gathering, stakeholder communication, and Agile/Scrum methodologies.
4.	Tech Lead	1	45	BE/B.Tech/MCA/M.Tech **Experience**: 10+ years in software development, technical decision-making, team management, and code quality assurance. Proficiency in multiple programming languages and frameworks with relevant certification. Must have experience in any 2 projects in Central/ State Govt./ PSU or Govt. associated Organizations.
6	QA Specialist	2	45	BE/B.Tech/MCA/M.Tech/Any Graduate **Experience**: 5+ years in software testing, automation (Selenium, JUnit, TestNG), performance testing, and test strategy development.
7	UI/UX Designer	1	45	BE/B.Tech/MCA/M.Tech **Experience**: 5+ years in user experience design, wireframing, prototyping (Figma, Adobe XD), and front-end usability testing.
8	Lead Developer	5	45	BE/B.Tech/MCA/M.Tech

S. N	Resource Profile	Unit	Duration in month	Experience and Educational Qualification
				Experience: 10+ years in full-stack development, team leadership, software architecture, and high-performance application development with relevant certification. Must have experience in any 2 projects in Central/ State Govt./ PSU or Govt. associated Organizations.
9	Developer	10	45	BE/B.Tech/MCA/M.Tech **Experience**: 5+ years in coding, debugging, and feature development using modern programming languages and frameworks.
10	DevOps	1	45	BE/B.Tech/MCA/M.Tech **Experience**: 10+ years in CI/CD pipelines, automation, cloud infrastructure (AWS, Azure, GCP), containerization (Docker, Kubernetes), security. Experience in working with NIC environment/Government project.
11	Grievance Redressal Team	4	45	Graduate in any stream from recognized university. **Experience**: Strong verbal and written communication and Familiarity with the steps involved in grievance redressal, including reporting, investigation, mediation, and resolution.
Total		**28**		

6.2 Roles and Responsibilities

S. N	Resource Profile	Roles and Responsibility
1.	Project Manager	a) Define the project scope, goals, and deliverables. b) Develop detailed project plans, including timelines, resource allocation, and risk management strategies. c) Assemble and lead the development team. d) Assign tasks based on team members' skills and experience. e) Foster collaboration and resolve conflicts within the team. f) Develop and manage the project budget. g) Monitor expenditures and ensure the project stays within financial constraints. h) Identify potential risks and develop mitigation plans. i) Monitor risks throughout the project lifecycle and adjust plans as necessary. j) Maintain open and transparent communication with stakeholders.

S. N	Resource Profile	Roles and Responsibility
		k) Provide regular updates on project progress and address any concerns. l) Ensure that project deliverables meet quality standards. m) Oversee testing, ensure high-quality standards, and manage a smooth go-live process for the portal. n) Oversee the execution of project tasks. o) Monitor project progress and make adjustments to keep the project on track. p) Act as the main communication bridge between stakeholders and teams, ensuring alignment and regular updates.
2.	Database Administrator	a) Help implement the database schema and ensure it aligns with performance and scalability goals. b) Assist in query optimization, indexing, and caching to enhance database performance. c) Aid in configuring access controls, encryption, and backup/recovery systems. d) Support in moving data from legacy systems and integrating with third-party services. e) Help monitor database health, perform routine maintenance, and support scaling efforts as the portal grows.
3.	Business Analysts	a) Collaborate with stakeholders to understand and document business needs and requirements. b) Conduct interviews, workshops, and surveys to gather detailed requirements. c) Create process flow diagrams and models to visualize the current and future state of business processes. d) Identify gaps and propose improvements to enhance efficiency. e) Work with the development team to design solutions that meet business requirements. f) Validate the proposed solutions through user acceptance testing (UAT) and feedback sessions. g) Prepare detailed functional specifications, user stories, and use cases. h) Maintain comprehensive documentation for future reference and compliance. i) Act as a liaison between CPCB and the technical team. j) Ensure clear and consistent communication to align project goals and expectations. k) Identify potential risks and develop mitigation strategies. l) Monitor and report on project risks throughout the development lifecycle.

S. N	Resource Profile	Roles and Responsibility
4.	Solution Architect	a) Define the technical vision and strategy for the common EPR portal. b) Ensure alignment with CPCB goals and objectives. c) Design comprehensive solutions that address business requirements. d) Create architectural diagrams and technical documentation. e) Evaluate and select appropriate technologies, tools, and frameworks. f) Ensure the chosen technology stack supports scalability, security, and performance. g) Plan the integration of the new portal with existing systems. h) Ensure seamless data flow and interoperability. i) Work closely with CPCB stakeholders, project managers, and development teams. j) Communicate technical concepts to non-technical stakeholders. k) Identify potential technical risks and develop mitigation strategies. l) Monitor and address risks throughout the development lifecycle.
5.	Tech Lead	a) Contribute to the technical design and architecture of the system, ensuring that it aligns with business requirements and follows best practices for scalability, performance, and maintainability. b) Lead the development of key components and features of the portal, ensuring high-quality, efficient, and reusable code. c) Work closely with business analysts, UI/UX designers, and other stakeholders to ensure that the system meets functional and non-functional requirements. d) Conduct code reviews to ensure code quality, adherence to best practices, and maintainability. Mentor junior developers, providing guidance on coding standards and problem-solving techniques. e) Work on integrating various system components (e.g., databases, APIs, third-party services) and ensure thorough unit testing, integration testing, and performance validation. f) Focus on building efficient and optimized code, identifying performance bottlenecks early, and ensuring the system can handle expected user loads. g) Must have knowledge to implement advance technologies in project like AI/ML, blockchain etc.
6.	UI/UX Designer	a) Review and test the newly developed common EPR portal to ensure functionality and quality.

S. N	Resource Profile	Roles and Responsibility
		b) Implement process improvements to enhance efficiency and effectiveness. c) Ensure strict adherence to compliance requirements throughout the project. d) Maintain thorough documentation and provide detailed reports on progress and outcomes.
7.	Lead Developer	a) Developing Portal: Writing clean, efficient, and maintainable code to create functional software applications based on the requirements. b) Fixing Bugs: Troubleshooting and resolving issues or bugs in the portal to ensure smooth operation. c) Code Reviews: Participating in or conducting peer code reviews to maintain code quality and share knowledge. d) Writing Unit Tests: Developing and running tests to ensure that the portal functions as expected and meets quality standards. e) Debugging: Identifying issues or bugs in the portal and using debugging tools and techniques to fix them. f) Quality Assurance: Ensuring the portal is free from defects and meets the required standards by testing the code and collaborating with QA teams. g) Developing Portal: Writing clean, efficient, and maintainable code to create functional software applications based on the requirements. h) Fixing Bugs: Troubleshooting and resolving issues or bugs in the portal to ensure smooth operation. i) Code Reviews: Participating in or conducting peer code reviews to maintain code quality and share knowledge.
8.	Developer	a) Developing Portal: Writing clean, efficient, and maintainable code to create functional software applications based on the requirements. b) Fixing Bugs: Troubleshooting and resolving issues or bugs in the portal to ensure smooth operation. c) Code Reviews: Participating in or conducting peer code reviews to maintain code quality and share knowledge. d) Must have knowledge to implement advance technologies in project like AI/ML, blockchain etc.
9.	QA Specialist	a) Ensure that functional and technical requirements are clear, feasible, and testable. b) Create detailed test plans and test cases to cover all aspects of the portal's functionality.

S. N	Resource Profile	Roles and Responsibility
		c) Perform testing on individual components and their interactions to verify correctness. d) Identify defects, document them, and work with the development team to resolve issues. e) Test portal performance (speed, load times) and user experience to ensure the portal meets performance standards and is user-friendly.
10	DevOps	a) Ensure seamless deployment, scaling, and monitoring of the Common EPR Portal through automation. b) Implement security measures, access controls, and compliance with CPCB regulations. c) Monitor system performance, optimize resources, and ensure high availability. d) Identify and resolve technical issues quickly to minimize downtime. e) Collaborate with teams to enhance software quality and implement improvements.
11	Helpdesk Support and Grievance Redressal Expert	a) Ensure that grievance redressal policies and procedures are effectively implemented and adhered to, maintaining compliance with legal and regulatory requirements. b) Maintain clear and transparent communication with all parties involved in the grievance process, providing updates and feedback throughout the resolution process c) Receive, document, and investigate grievances from stakeholders and resolve within timeline. d) Manage daily issues escalated through calls and video conference session.

7. Project Timelines

Sr. No.	Activities	Timeline
Phase I- Integration of existing EPR portals through Single Sign On (SSO)		
1.	Submission & subsequent acceptance of Inception Report	T0
2.	Study of existing 5 EPR portals (plastics packaging waste, waste tyres, waste batteries, e-waste, and used oil)	T + 1 Months
3.	Submission of technical documentations (SRS, SDD, HLD, Test Plans etc.) and Detailed Project Plan (Till T+15) for integrating of	T + 2 Months

	existing EPR portals into common EPR portal and the development of Common EPR portal* **Note:** Based on the report submitted on T+2 by the Bidder, the Tech PMU will verify the work done by them if satisfactory and then payment will be processed on quarterly basis.	
4.	Integration of all the 5 EPR portals (plastics packaging waste, waste tyres, waste batteries, e-waste, and used oil) into a common EPR portal through Single Sign On (SSO) login process	T + 4 Months
5.	Go-Live of Phase I implementation	T + 4 Months
6.	Maintenance support of Phase I integration	Ongoing activity till full system Go-Live
Phase II - Development of Common EPR portal by SI/Vendor		
7.	Development and Successful Sign Off of Pilot Rollout (with EPR Plastic Portal) Note: The development of EPR Plastic Portal will begin as soon as the work is awarded and shall be done in parallel with Phase I.	T + 6 Months
8.	Development and Go-Live of all the other existing 4 EPR portal into Common EPR portal and trouble-free operation for 30 days resulting in Operational Acceptance of the System as a complete, integrated system**	T + 15 Months (Including 1 months of trouble-free operations)
9.	Development of all the forthcoming EPR portals into Common EPR portal**	Ongoing Activity
10.	Operations & maintenance activities along with the integration of Common EPR portal with EPR trading platform, Common Consent Management Platform & NSWS and any other task as assigned by the CPCB **Note**: The integration of Common EPR portal with EPR trading platform, Common Consent Management Platform & NSWS etc shall be an ongoing activity as per integration schedule provided by CPCB.	T + 16 to T + 60 Months

Note:

**The preparation of the SRS and other technical documents for integrating all existing EPR portals into a Common EPR portal via SSO, along with the development of the Common EPR portal, will be carried out simultaneously.*

*** Development of all the remaining EPR portal into a Common EPR portal along with the forthcoming EPR portals will be carried out simultaneously*

8. Technical and Functional Requirements

Below are the indicative Technical and Functional Requirements, the SI/Vendor may propose an updated version to enhance the system's robustness:

a) System Integration and Architecture

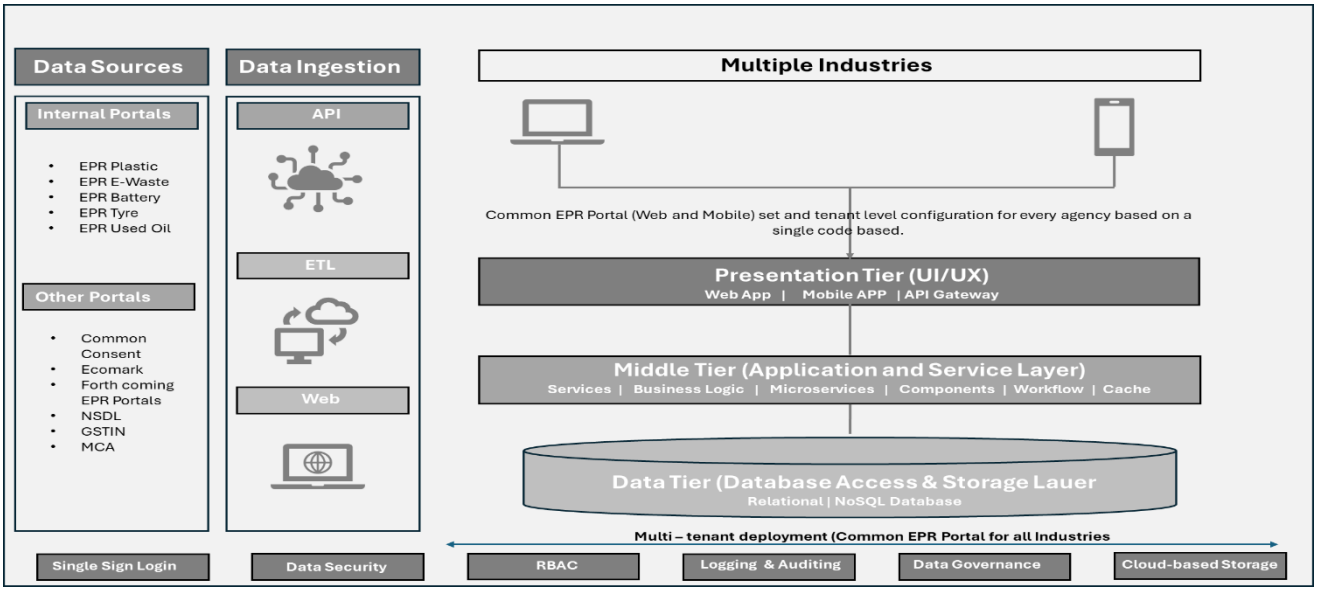
I. **Modular Architecture**: Design a modular and scalable architecture to integrate different portals and modules into a single platform.

II. **API Integration**: Develop APIs to ensure seamless data exchange and interoperability between existing systems and the new unified portal.

III. **Data Migration**: Plan and execute data migration strategies to transfer existing data from various portals to the new system without data loss or corruption.

IV. **Single Sign-On (SSO)**: Implement Single Sign-On functionality for users to access all integrated portals with one set of credentials.

V. **Microservices-based Architecture**: Design microservices to ensure flexibility, scalability, and ease of updates.



High Level Functional Architecture of Common EPR Portal

b) Software Development & Collaboration

I. The proposed system should be built in an open-source platform.

II. The Application should be built flexibility to implements desired Modules / Functionality and should have Multiple User Access modes like GUI, Web, Portal etc.

III. Standard Development methodologies (Agile, Scrum, DevOps)

IV. The system should be equipped with code testing & version control provisions.

V. The agency shall develop a modular microservices-based system on open source ensuring scalable, secure, and independent service management. The system shall support the layers of India Stack, bringing useful and applicable features as and when required for seamless grievance management.

c) User Interface (UI) and User Experience (UX)

I. **Responsive Design**: Ensure that the portal is responsive and works well across various devices, including desktops, tablets, and mobile devices.

II. **User-Friendly Navigation**: Provide intuitive navigation and clear workflows for users to easily access the various modules integrated into the portal.

III. **Role-Based Access Control (RBAC)**: Implement role-based access control to ensure the right users have access to appropriate modules and data.

IV. **Customizable Dashboards**: Allow users to customize their dashboards to display relevant information and tools.

d) Security and Compliance

I. **Data Encryption**: Use robust encryption mechanisms (SSL/TLS, AES) for data in transit and at rest.

II. **Authentication and Authorization**: Implement strong authentication mechanisms such as multi-factor authentication (MFA), along with proper authorization levels for users.

III. **Audit Logs**: Enable detailed audit logs to track user activities and system changes for transparency and security.

IV. **Compliance**: Ensure the portal complies with relevant legal, regulatory, and industry standards (e.g., data privacy laws like GDPR, etc.).

V. **Security Standards:** The proposed system should adhere Authentication and authorization, Data encryption, Secure coding practices (OWASP guidelines), Role-based access control (RBAC) and Compliance with industry standards (ISO, GDPR, HIPAA) provisions.

e) Workflow and Process Automation

I. **Workflow Engine**: Implement a configurable workflow engine to manage and automate approval processes, document submissions, dynamic EPR target calculation based on different EPR schemes and other business processes.

II. **Task Management**: Enable task assignment, tracking, and management within the portal for streamlined operations.

III. **Notifications and Alerts**: Set up automated notifications and alerts for users and administrators on key actions or events, such as approvals, rejections, or task deadlines.

f) Data Handling and Reporting

I. **Data Aggregation**: Integrate data from different portals, enabling the platform to aggregate and present it in a unified format.

II. **Advanced Reporting and Analytics**: Provide tools for generating customized reports, data visualizations, and analytics to aid decision-making.

III. **Data Export/Import Capabilities**: Enable the export/import of data in multiple formats such as CSV, Excel, and PDF for external use.

IV. **Standards**: The agency must ensure that all data processing in the proposed system complies with applicable data protection laws and regulations, including but not limited to Digital Personal Data Protection Act (DPDPA) and government-specific regulations. The environment must be audited and certified to comply with these standards, and all data processing must be conducted in accordance with the highest privacy standards.

g) Scalability and Performance

I. **Load Balancing**: Implement load balancing to distribute traffic evenly across servers, ensuring consistent performance during high demand periods.

II. **High Availability**: Ensure high availability of the portal with failover mechanisms and backup solutions in place.

III. **Performance Optimization**: Regular optimization of the system to handle increasing user load, data processing needs, and complex workflows.

h) Collaboration and Communication Tools

I. **Internal Messaging System**: Implement a messaging or chat system within the portal to allow communication between users and stakeholders.

II. **Document Management**: Integrate document management capabilities for users to upload, download, and share documents securely.

III. **Version Control**: Implement version control for documents and content to manage changes and track document history.

i) Support and Maintenance

I. **Helpdesk Integration**: Provide integrated support systems to helpdesk to assist users with technical issues or inquiries.

II. **Regular Maintenance**: Support in ensuring regular system updates, security patches, and performance optimizations.

III. **User Training and Documentation**: Offer training resources and documentation to onboard users and stakeholders effectively.

j) Deployment and Configuration

I. **Cloud/On-Premises Deployment**: Decide whether the portal will be deployed on the cloud or on-premises, considering factors like security, scalability, and costs.

II. **Continuous Integration/Continuous Deployment (CI/CD)**: Implement CI/CD pipelines for automated testing, integration, and deployment of new features and updates.

III. The system should define Frequency of backups (daily, weekly, real-time)

IV. The proposed system should ensure Disaster Recovery Provision ensuring adequate RTO & RPO as specified in the Service levels.

V. The Proposed system should have failover strategies and redundancy provisions.

k) Customization and Extensibility

I. **Custom Module Support**: Provide the capability to develop and integrate custom modules or third-party applications into the unified portal.

II. **Configurable Rules and Templates**: Allow administrators to configure business rules, templates, and workflows to meet evolving requirements.

8.1 Design Principles and Guidelines

Design principles are set of general rules and guidelines for facilitating reference architecture to support in establishing indicative drivers to define the functional and technological requirements of Common EPR Portal software solution components. The principles identified for Common EPR Portal system have been discussed below:

Principle	Description
Achieve the minimum viable product	The SI/Vendor shall ensure the current functionalities of existing Common EPR system efficiently working after migrating the application to the cloud on Lift and Shift basis and then further enhancements to Common EPR Portal while maintaining the business continuity.
Service oriented architecture	Given the continuously evolving and changing functional landscape of Common EPR Portal system, wherein updates and rollouts would be very frequent. Hence, SI/Vendor shall implement a service-oriented architecture for enhancements in Common EPR and bring in the desired aspects of availability, scalability, and agility
Leverage the existing technology stack	System to be enhanced using existing technology stack to the extent possible
High Availability, Performance and Security	The system should have high availability with scalability, performance and secure with storage data encryption
Open standards-based solution	The solution shall be based on open standards to maximize the interoperability between software components, data, and document formats. This principle shall ensure the following fundamentals: Software components to interoperate through open protocols.

Principle	Description
	Data exchange to occur between various software components and data stores through open protocols/ standards
Virtualization	It is envisaged that the solution should implement virtualization for compute, storage, and network. The virtualization solution should have capabilities to manage, monitor and maintain the health of the virtualized nodes.

Adherence to guidelines and standards:

Open Standards - Common EPR Portal system must be designed open standards, to the extent feasible and in line with overall system requirements set out in this RFP, in order to provide for good interoperability with multiple platforms and avoid any technology or technology provider lock-in.

Industry standards - The proposed solution/ components must be based on and compliant with latest industry standards (wherever applicable). This will apply to all the aspects of solution including but not limited to design, development, security, installation, and testing. There are many standards that are indicated throughout this volume as well as summarized below. However, the list below is just for reference and is not to be treated as exhaustive.

Solution Component/ application/ System	Standards
Accessibility	Accessibility - Web Content Accessibility Guidelines (WCAG) 2.0
HTML	HTML5.0 CSS 3.0
Mobile	W3C
Web portal	GIGW W3C JSR
Email	Multipurpose Internet Mail Extension (MIME)
Business processes Management	BPEL BPMN 2.0
Data exchange and interoperability	SOAP WSDL 2.0 ebXML

Solution Component/ application/ System	Standards
	XSLT 2.0 SAML SSL 3.0
Data modelling and management	UML, XML, JSON

- The Solution/Product proposed by the selected bidder should be integrated solution covering all the modules and features mentioned in scope or as finalized by CPCB.
- Application should be IPV6 Compliant.
- Application should be responsive.
- Capacity to work in distributed environment and auto data sharing facility in timely manner, which to be available for monitoring purpose.
- Compatible to operate in any location and provide real time transactional data on mineral dispatch and transportation.
- The user presentation layer of the solution should be very simple to operate at the end user level.
- The system should have compatible for further customization.
- The system should be scalable, so that addition of upcoming locations and users should not be a constraint.
- The system should have provision for seamless integration.
- System should provide a dashboard for department heads and senior officials.
- All the proposed solutions components must be seamless integrated real-time on the same platform to allow interoperability.

Guidelines - The selected bidder should adhere to relevant guidelines issued by MeitY, CERT-IN and Government of India including but not limited to:

i. Information Technology Act 2000 (revised 2008) (http://www.meity.gov.in/content/information-technology-act)

ii. CERT-In security guidelines for Indian Government websites (http://www.cert-in.org.in/)

iii. E-SAFE Guidelines for Information Security (http://egovstandards.gov.in/)

iv. e-Governance Standards for Preservation Information Documentation of e-Records (http://egovstandards.gov.in/)

v. Guidelines for Indian Government Websites (http://egovstandards.gov.in/)

vi. Guidelines for architecture (https://negd.gov.in/india-enterprise-architecture)

vii. Any other standards deemed necessary.

8.2 Security Principles

Provide and Implement additional Security Elements at the Database and access levels such as:

a) Support for centralized identity and access control and policies that will be managed and monitored by CPCB to prevent ad-hoc access to the production data by-passing the application.

b) Audit trials to provide comprehensive auditing for inserts/ deletes / updates / selects. The solution should provide for alerts and/or customizable reports to quickly spot and respond to security breaches.

c) The proposed solution should include design and implementation of a comprehensive security policy in line with ISO 27001 standards to comply with the security requirements mentioned in this section. All the necessary procedures / infrastructure / technology required to ensure compliance with security policy should be established by the selected bidder and should be approved by the CPCB before they are implemented. The Policy shall include all aspects such as physical and environmental security, human resources security, backup and recovery, access control, incident management, business continuity management etc.

d) The proposed solution should ensure proper logical access security of all the information Assets.

e) The proposed solution should be able to classify information assets according to criticality of the information asset.

f) The proposed solution should provide security including identification, authentication, authorization, access control, administration and audit and support for industry standard protocols.

g) The proposed solution should have a security architecture which adheres to the security standards and guidelines such as

- ISO 27001

- Information security standards framework and guidelines standards under e-Governance standards (http://egovstandards.gov.in)
- Information security guidelines as published by Data Security Council of India (DSCI)
- Guidelines for Web Server Security, Security IIS 6.00 Webserver, Auditing and Logging as recommended by CERT-In (www.cert-in.org.in)
- System shall comply with IT (Amendment) Acts.
- Any other standards deemed necessary.

h) The proposed solution should support the below Integration security standards:

- Authentication
- Authorization
- Encryption
- Secure Conversation
- Non-repudiation
- SOAP/ XML Firewalls
- Security standards support.
- WS-Security 1.0
- WS-Trust 1.2
- WS-Secure Conversations 1.2
- WS-Basic Security Profile

i) The proposed solution should a multi-layered detailed security system covering the overall solution needs having the following features:

- Layers of firewall
- Network IPs
- Enterprise-wide Antivirus solution
- Information and incident management solution for complete CPCB landscape
- Two factor authentications for all administrators i.e. system administrators, network administrators, database administrators.

j) Audit Log Analysis

k) Selected Bidder must ensure that the security solution provided must integrate with the overall system architecture proposed.

l) The proposed solution should be monitored by periodic information security audits /assessments performed by or on behalf of the CPCB. The scope of these audits / assessments may include, but are not limited to, a review of access and authorization procedures, physical security controls, backup and recovery procedures, and program change controls.

m) To the extent that the CPCB deems it necessary to carry out a program of inspection and audit / assessment to safeguard against threats and hazards to the confidentiality, integrity, and availability of data, the selected bidder shall provide the CPCB's representatives access to its facilities, installations, technical resources, operations, documentation, records, databases and personnel. The selected bidder must provide CPCB access to various monitoring and performance measurement systems (both manual and automated). CPCB has the right to get the monitoring and performance measurement systems (both manual and automated) audited / assessed without prior approval / notice to the selected bidder.

n) The proposed solution should facilitate system audit for all the information assets to establish detective controls. The selected bidder is required to facilitate this by producing and maintaining system audit logs for a period agreed to with CPCB.

o) The proposed solution should provide database security mechanism at core level of the database, so that the options and additions to the database confirm the security policy of the CPCB without changing the application code.

p) The proposed solution should support native optional database level encryption on the table columns, table spaces or backups.

q) The database of the proposed solution should provide option for secured data storage for historic data changes for compliance and tracking the changes.

r) The proposed solution should be able to ensure the integrity of the system from accidental or malicious damage to data.

s) The proposed solution should be able to check the authenticity of the data entering the system.

t) Retention periods, archival policies and read-only restrictions must be strictly enforceable on all logs maintained in the system.

u) The proposed solution should provide ability to monitor, proactively identify and shutdown the following types of incidents through different modes of communication (email, SMS, phone call, dashboard etc.):

- Pharming
- Trojan
- Domains (old/new), CPCB

The proposed solution should be able to monitor security and intrusions into the system and take necessary preventive and corrective actions.

v) The proposed solution should have the option to be configured to generate audit- trails in and detailed auditing reports.

w) The proposed solution should be designed to provide for a well-designed security of physical and digital assets, data and network security, backup and recovery and disaster recovery system.

x) The proposed solution should have tamper proof data storage to prevent unauthorized data tampering.

y) The proposed solution should be able to automatically check the passwords with the Govt. of India IT password policy, which can be customized by CPCB.

z) The proposed solution should enforce changing of the default password set by the system (at the time of creation of user ID) when the user first logs on to the system. The proposed solution should enforce all password policies as defined at the time of first change and thereafter.

aa) The proposed solution should store passwords in an encrypted format.

bb) Passwords must be encrypted using a hash algorithm or equivalent (selected bidder must provide details).

cc) The proposed solution should be capable of encrypting the password / other sensitive data during data transmission.

The proposed solution should ensure that the user web access shall be through SSL (https) only for all level of communication for providing higher level of security.

9. Service Level Agreements

Following section outlines the key service level requirements for the CPCB system, which needs to be ensured by the SI during the implementation and operations & maintenance phase. The SLA monitoring shall be performed/reviewed on a quarterly basis by the Tech PMU. 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, based on mutual consent of both the parties i.e. CPCB and the SI.

a) Service Level Objectives

The following Service Level Objectives have been identified for governing the SLAs in this Project.

- System should be available to the users at almost all times.
- System should be easy to use.
- System should be responsive enough for the user to work without time delays/ interruptions.
- Users should be able to easily store and retrieve the data from the system.
- Users should always get the right support as and when it is required to perform their business.

b) SLA Definition & Measurement

The SLA specifies the expected levels of service to be provided by the SI to the various stakeholders of the project. The following points clarify the manner in which the SLA metrics operate:

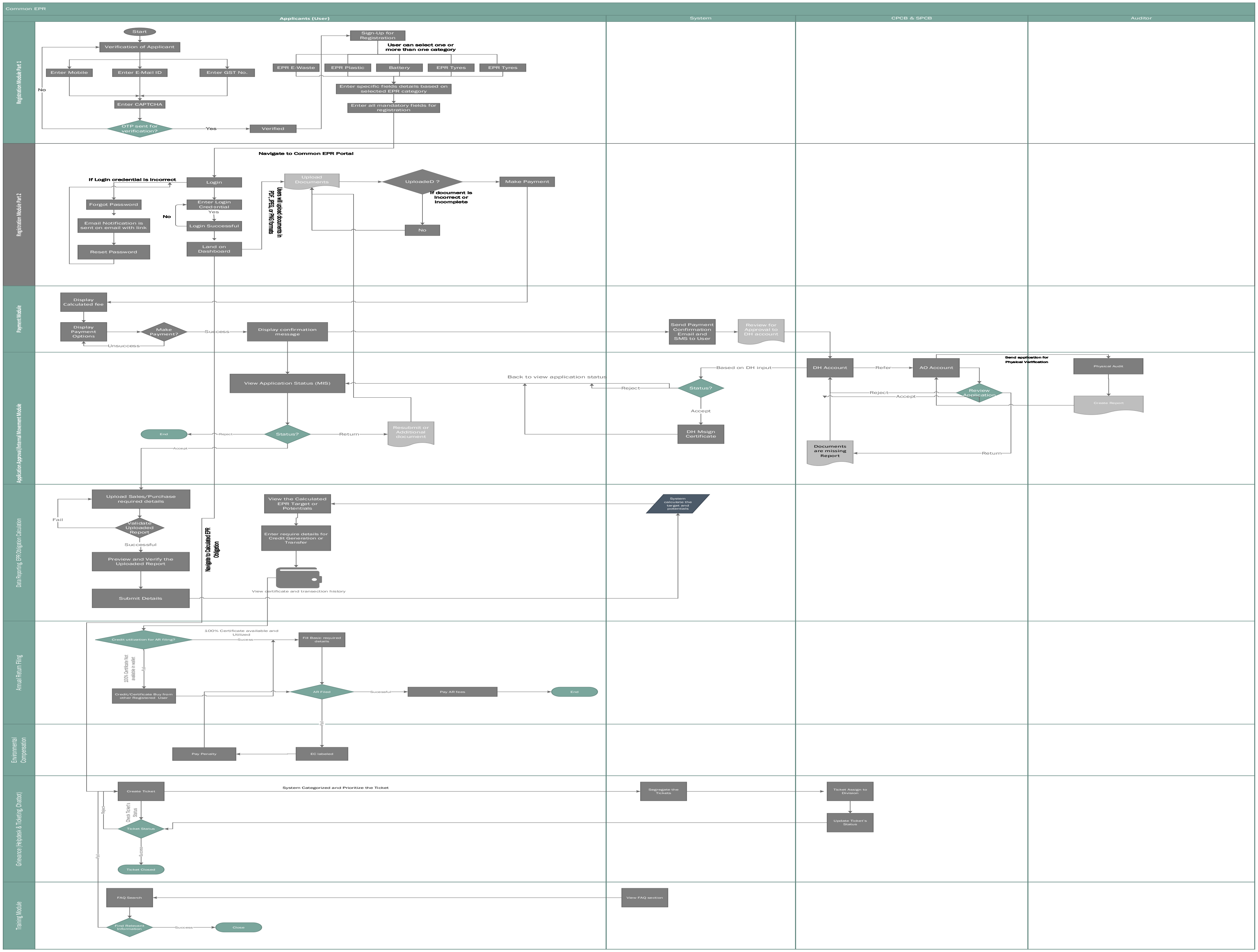
- A set of parameters have been identified to ensure the desired performance level.
- The table lists out the performance level, method of measurement and how penalties shall be levied.
- All payments to SI shall be made after deduction of penalties as per the SLA metrics.
- The following table presents the required service level management framework for the IT application to be proposed by the SI. The SI shall consider the following metrics while architecting the systems.

S. N	Metric	Expected performance standard	Measurement frequency	Penalty

1.	Availability of IT application	Each module of the application should be available 99.7% of the time (at the primary site)	Monthly & Quarterly	• Slab1: Application availability - 99.00 % to 99.70% • Slab 2: Application availability – 97.00% to 99.00% • Slab 3: Application availability below 97.00% **Penalty**: • Slab 1: 1% of the EQI • Slab 2: 3% of the EQI • Slab 3: 5% of the EQI Note: In case of failure due to infrastructure then the responsibility will lie with NIC, System Integrator/Vendor will not be penalised in that case.
2.	Page load time	The IT application should maintain a response time threshold of 5 seconds for loading of application pages.	Monthly & Quarterly	• Slab 1: Average Response Time between 5 seconds and 10 seconds for portal home page, forms and user query. • Slab 2: Average Response Time between 10 seconds and 15 seconds for portal home page, forms and user query • Slab 3: Average Response Time above 15 seconds Penalty: • Slab 1: 1% of the EQI • Slab 2: 3% of EQI • Slab 3: 5% of the EQI

10. User Flow and Functionalities

10.1 Indicative Workflow



Common EPR
Applicants (User)
System
CPCB & SPCB
Auditor
Registration Module Part 1
Start
Verification of Applicant
Enter Mobile
Enter E-Mail ID
Enter GST No.
Enter CAPTCHA
OTP sent for verification?
No
Yes
Verified
Sign-Up for Registration
User can select one or more than one category
EPR E-Waste
EPR Plastic
Battery
EPR Tyres
EPR Tyres
Enter specific fields details based on selected EPR category
Enter all mandatory fields for registration
Registration Module Part 2
Navigate to Common EPR Portal
If Login credential is incorrect
Login
Forgot Password
Email Notification is sent on email with link
Reset Password
Enter Login Credential
Yes
No
Login Successful
Land on Dashboard
Users will upload documents in PDF, JPEG, or PNG formats
Upload Documents
UploadeD ?
If document is incorrect or incomplete
No
Make Payment
Payment Module
Display Calculated fee
Display Payment Options
Make Payment?
Success
Unsuccess
Display confirmation message
Send Payment Confirmation Email and SMS to User
Review for Approval to DH account
Application Approval/Internal Movement Module
View Application Status (MIS)
Back to view application status
Reject
Status?
Based on DH input
Accept
DH Msign Certificate
DH Account
Refer
AO Account
Send application for Physical Verification
Physical Audit
Create Report
Review Application
Reject
Accept
Return
Documents are missing Report
End
Reject
Status?
Return
Resubmit or Additional document
Accept
Data Reporting, EPR Obligation Calculation
Upload Sales/Purchase required details
Fail
Validate Uploaded Report
Successful
Preview and Verify the Uploaded Report
Submit Details
Navigate to Calculated EPR Obligation
View the Calculated EPR Target or Potentials
Enter require details for Credit Generation or Transfer
View certificate and transection history
System calculate the target and potentials
Annual Return Filing
Credit utilisation for AR filing?
100% Certificate available and Utilized
Sucess
Fill Basic required details
100% Certificate Not available in wallet
Credit/Certificate Buy from other Registered User
AR Filed
Sucessful
Pay AR fees
End
Environmental Compensation
Pay Penalty
EC labeled
Grievance (Helpdesk & Ticketing, Chatbot)
Create Ticket
System Categorized and Prioritize the Ticket
Segregate the Tickets
Ticket Assign to Division
Check Ticket's Status
Ticket Status
Update Ticket's Status
Ticket Closed
Training Module
FAQ Search
View FAQ section
Find Relevant Information
Success
Close

1.1 High level (Indicative) Functionalities Common EPR portals

Phase I – Integration of existing EPR portal into Common EPR portal through Single Sign On (SSO)

Introduction: To implement the single email ID login across all modules while ensuring users retain their roles in each module, the following steps and considerations should be followed:

User Role	Activity	Functionality
Applicants (User)	**Single Sign On**	**1. <u>Implement Single Sign-On (SSO) Authentication</u>** • Integrate SSO (Single Sign-On) across all five existing EPRs, allowing users to sign-up once and access all assigned modules (multiple EPR regime) with their respective roles. • Enable Authentication using existing identity providers for a seamless sign-up process. • During sign-up, the user can select their module and role for accessing the EPR Portal, along with their previously registered module-wise email ID. • After successfully signing up, the user will follow the login process and land on the home page, where they can access their assigned modules and features based on their roles. **2. <u>Centralized User Management System</u>** • Maintain a centralized user database where each user is identified by a unique email ID. • Store the user's assigned roles and module access permissions in the database. Implement a Role-Based Access Control (RBAC) system to manage user permissions efficiently and dynamically. **3. <u>Role & Module Assignment Mechanism</u>** • During login, the system will retrieve the user's assigned roles and modules from the database. • User will only see the modules they have permission to access after logging in. • A token will be generated on the Common EPR Portal and stored in the database table. • When the user clicks on an assigned module, they will be automatically redirected with the token and user id to that module. • In that assigned module the system/developer will verify the token and User ID from the database table, if valid, the user will be granted access to the module.

User Role	Activity	Functionality
		its hit on the correct module and allow to access the assigned module. **4. <u>UI & UX Enhancements</u>** • Redesign the login/Signup page to support single email authentication. • Implement a dashboard where users can view and access all their assigned modules in one place. • Enable an easy module-switching feature so user don't need to login multiple times. **5. <u>Security & Compliance Considerations</u>** • Log all user activities for auditing and compliance with EPR regulations. **6. <u>Migration Plan for Existing Users</u>** • Notify the users about the new login process and provide updated user guides accordingly.

Phase II - Development of Common EPR portal by SI/Vendor

Phase II involves the development of a common EPR portal by the selected System Integrator (SI)/ vendor. This phase focuses on creating a unified platform for EPR registration, compliance monitoring, and certificate management. The portal will enhance transparency, streamline processes, and ensure regulatory adherence.

User Role	Module	Activity	Functionality
Applicants		**Verification of User**	• The system should allow the user to fill **Mobile number**, **Official Email Id** and **GST No.** along with the Captcha to initiate the verification process for Online Registration: o User shall enter the OTP received on mobile and click on the link received on given official email id to complete the verification process.

User Role	Module	Activity	Functionality

Applicants	**Registration Module**	**Sign-Up & Registration**	• The system should provide a registration form accessible via a "**Sign-up**" button on the homepage.
			• EPR Category Selection **(Plastic Packaging Waste, Waste Batteries, Waste Tyres, Used Oil, and E-Waste)**
			• The system should allow users to select one or more EPR categories.
			• The system should display specific fields based on the selected EPR category:
			  ○ For EPR Plastic packaging waste: Type of plastic, Quantity produced, Recycling method.
			  ○ For EPR Used Oil: Type of oil, Quantity produced, Disposal method.
			  ○ For EPR Waste Tyre: Type of tyre, Quantity produced, Recycling method.
			  ○ For EPR E-Waste: Type of e-waste, Quantity produced, Disposal method.
			  ○ For EPR Waste Batteries: Type of battery, Quantity produced, Recycling method.
			• The system should allow user to fill Required fields (All Mandatory Fields) include:
			  ○ Name of the Company
			  ○ Legal Name
			  ○ Establishment Year
			  ○ Type of Business
			  ○ State/UT
			  ○ Registered Address
			  ○ District
			  ○ Pin Code
			  ○ PAN
			  ○ CIN
			  ○ Authorized person details: Name, Designation, Mobile, PAN, and Aadhar

User Role	Module	Activity	Functionality

Applicants	**Registration**	**Login**	• **User Interface:** The system should provide a login form accessible via a "**Login**" button on the homepage.
			  ○ The login form shall include the following fields:
			  ▪ Email Address
			  ▪ Password
			• The system should provide a "**Forgot Password**" link.
			  ○ The system should allow users to reset their password via email verification.
			  ○ The system should redirect users to their dashboard upon successful login.
			  ○ The dashboard shall display user-specific information and application status.

Applicants		**Document Upload**	• The system should allow the user to upload the document as a proof along with specific application details with respect to EPR Plastic, EPR Used Oil, EPR Tyre, EPR E-Waste, and EPR Battery and redirect to payment details. • The document format should be PDF, word, Text etc.

Applicants	**Payment Module**	**Payment**	• The system should allow the authorized user to make online payment to complete the application process:
			  ○ Upon successful registration and document upload, the system should redirect users to the payment details page.
			  ○ The payment details page shall display the total amount due based on the selected EPR categories.
			• **Payment Options:** The system should be integrated with an authorised bank for online payment.
			  ○ The system should display the calculated fee amount of the application.
			  ○ Applicant shall be able to process the fee via multiple payment options (Card, Net Banking, UPI)
			  ○ The system should maintain logs of payment transactions.
			  ○ The system shall ensure secure payment processing and send confirmation via email.
			• **Confirmation Page:**
			  ○ The system should display a confirmation message upon successful payment.
			  ○ The system should send a payment receipt to the user's registered email address.

CPCB and SPCB		**Approval**	• The system shall automatically route the approval request to the appropriate authority based on the selected EPR category. ○ The system shall maintain a list of authorities responsible for each EPR category.

User Role	Module	Activity	Functionality

	Application Approval Modul		• **Review Process:**
			  ○ **Approval:**
			  ▪ Authorities shall have access to an interface to review submitted approval requests, which should include the following details.
			  ▪ Document Review
			  ▪ Information Review
			  ▪ The system should provide an “Approval” button to mark as approved.
			  ○ **Reject:**
			  ▪ The review interface shall display all submitted information and uploaded documents.
			  ▪ The system should allow the authorities to reject the submitted request, if any discrepancies are found in the documents or information.
			  ▪ The system should allow the user to enter the reason for rejection.
			  ○ **Return/Request (in case of any shortcomings):**
			  ▪ The system should allow the authorities to submit a request, if any information or documents are missing.
			  ▪ The system should allow the user to enter a reason for request.
			• **Notifications:**
			  ○ The system shall send email notifications to users regarding the status of their approval request (submitted, under review, approved, rejected, additional information required).
			  ○ The system shall also display status updates on the user's dashboard.
			  ○ **Approval Status:**
			  ▪ The system shall provide an insight information of the approval status in real-time applicants' dashboard.
			  ▪ Approved requests shall be marked as "Approved" and the user shall receive a confirmation email.
			  ○ **Rejected Status:**
			  ▪ Rejected requests shall be marked as "Rejected" with reasons provided, and the user shall receive a notification.
			  ○ **Pending Status:**
			  ▪ Requests requiring additional information shall be marked as "Pending Additional Information" and the user shall be prompted to provide the necessary details.

User Role	Module	Activity	Functionality
Applicants (User)	**Data Reporting Module**	**Data Reporting**	• The user shall be able to report their sales and purchase data with invoice upload feature. The system shall provide a data reporting interface for users to submit periodic reports. • **The reporting form shall include fields for:** o Reporting Period o EPR Category o Quantity of Material Produced/Recycled/Disposed o Supporting Documents (Invoices, Recycling Certificates, etc.) • **Validation:** o The system shall validate all mandatory fields. o The uploaded invoice shall be validated against the GST database. o Sales and purchase record shall be validated to identify whether the vendor is registered or unregistered. o The system shall ensure the accuracy of the reported data through validation. • **Submission and Review:** o The system shall allow users to submit sales and purchase GST Invoice. o The system shall allow the user to preview and verify the uploaded documents' details before submission.
Applicants (User)		**EPR obligation Calculation**	• The system should be able to assign the EPR obligations based on sales data and auto calculate the target on the user. • The system should provide an interface to users to view their calculated EPR obligations. • **The calculation form shall include fields for:** o EPR Category o Quantity of Material Produced o Financial Year • **Calculation Logic:** o The system should calculate the EPR obligation based on the predefined logic on the basis of provided data and time. o The system should display the calculated obligation to the user. • **Reporting:** o The system should generate a detailed report of the EPR obligation. o The system should allow users to download the report.

User Role	Module	Activity	Functionality

Applicants (User)	**EPR obligation Calculation Module**	**Credit Generation and Transfer**	• The user shall be able to generate the certificate based on the potential (auto calculated by the system) derived from procurement data.
			• **User Interface:**
			  ○ The system should provide an interface for users to generate and transfer EPR credits.
			  ○ The credit generation form shall include fields for:
			  ▪ EPR Category
			  ▪ Quantity of Material Recycled
			  ▪ Generated Potential
			• **Credit Transfer:**
			  ○ The system should allow users to transfer credits to other registered users.
			  ○ The system should provide a transaction history of credit transfers.
			  ○ The System should facilitate the user to park and hold the EPR certificates (EPR wallet).

Applicants (User)	**Annual Return Filing Module**	**Annual Return Filing**	• The system should provide a platform for the submission of annual returns, ensuring that registered entities meet their obligations.
			• **The annual return form shall include fields for:**
			  ○ Reporting Period
			  ○ EPR Category
			  ○ Quantity of Material Produced/Recycled/Disposed
			  ○ Supporting Documents
			  ○ EPR Credit availability
			• **Submission and Review:**
			  ○ The system should allow users to submit their annual returns.
			  ○ The system should notify users of the review status.

User Role	Module	Activity	Functionality

Applicants (User)	**Environmental Compensation Module**	**Environmental Compensation Module**	• The system should be able to calculate and generate the environmental compensation imposed for non-compliance users.
			• The system should provide an interface for users to pay environmental compensation.
			• **The compensation calculation form shall include fields for:**
			  ○ EPR Category
			  ○ Quantity of Material Produced
			  ○ EC levied.
			• **Calculation Logic:**
			  ○ The system should calculate the environmental compensation based on the provided data and predefined charges.
			  ○ The system should display the calculated compensation to the user.
			• **Payment:**
			  ○ The system should provide multiple payment options (Credit/Debit Card, Net Banking, UPI).
			  ○ The system should ensure secure payment processing.
			  ○ The system should send a payment receipt to the user's registered email address.

User Role	Module	Activity	Functionality
CPCB, SPCB and Auditors	**Audit Module**	**Audit Module**	• The system should allow SPCB to allocate the Audit process to ensure transparency and Adherence to EPR guidelines. • The system should provide a dedicated interface for authorities to conduct audits. • The interface shall be accessible from the main dashboard and clearly labelled as "Audit Module." • **Audit Form:** The form shall include the following fields: ○ **Audit Period:** ▪ Date range selector to specify the period under audit. ○ **EPR Category:** ▪ Dropdown menu to select the EPR category (Plastic Packaging Waste, Waste Batteries, Waste Tyres, Used Oil, and E-Waste) ○ **User Information:** ▪ Fields to enter or select user details (Name, Contact Information, Organization). ○ **Audit Findings:** ▪ Text area to document audit findings and observations. ▪ Option to upload supporting documents (GPS, PDF, JPEG, PNG formats). ○ **Scheduling Audits:** ▪ The system should allow authorities to schedule audits for specific users or organizations. ▪ Authorities should be able to set audit dates and notify auditor of upcoming audits via email and dashboard notifications. ○ **Conducting Audits:** ▪ The system should provide tools for authorities to review user submissions and supporting documents. ▪ Authorities should have access to all relevant data, including previous reports, compliance documents, and transaction histories. ▪ The system should allow authorities to record their findings directly in the audit interface. ○ **Review Tools:** ▪ The system should provide tools for authorities to filter and search through user submissions. ▪ Authorities should be able to view and download supporting documents for detailed review. ▪ The system should allow authorities to add comments and annotations to user submissions. ○ **Audit Reports:** ▪ The system should generate comprehensive audit reports based on the findings recorded by authorities.

User Role	Module	Activity	Functionality
			▪ Reports shall include details such as audit period, EPR category, user information, and audit findings. ▪ The system should allow authorities to download and print audit reports. ○ **Notifications:** ▪ The system should notify users of the audit results via email and dashboard notifications. ▪ Users should be able to view the audit report and any required actions or recommendations.

User Role	Module	Activity	Functionality

Applicants (User)	**Grievance (Helpdesk & Ticketing) Module**	**Chatbot**	• The chatbot should be accessible from the main page of common EPR portal.
			• The chatbot interface should be user-friendly with clear prompts and responses.
			• The chatbot should be able to answer FAQs related to EPR guidelines, registration processes, and compliance requirements.
			• The chatbot should provide the links to relevant sections of the EPR portal for detailed information.
			• The chatbot should offer step-by-step guidance for tasks such as registration, document submission, and compliance reporting.
			• The chatbot should be store user interactions and feedback securely in compliance with CPCB's data policies.
			• The system should allow users to create tickets through the following methods:
			  ○ Emails
			  ○ Phone Calls,
			  ○ Web Portal
			  ▪ The ticket assignment will be based on priority, agent availability, and defined SLAs.
			  ▪ The system should track the compliance with defined resolution times.
			  ▪ The helpdesk should be accessible from the main page of each EPR portal and provide a user-friendly interface with clear prompts and responses.
			  ▪ Users should be able to submit support requests through a web via grievance support.
			  ▪ The grievance shall capture necessary details such as user information, issue description, and priority level.
			  ▪ The system should categorize and prioritize tickets based on predefined criteria.
			  ▪ The system should allow support-agents to assign, track, and update the status of tickets.
			  ▪ The system should authenticate the user based on their login credentials for the EPR portal.
			  ▪ The system should facilitate the communication between teams.

User Role	Module	Activity	Functionality
Applicants (User)	**Application Renewal Module**	**Application Renewal**	• The system should redirect to renewal window which will be enabled when expiry of certification is less than or equal to 30 days due. • System should allow the users to review the entire renewal application form (including pre-filled and manually entered data, documents uploaded, and payment details). • System should generate and send an acknowledgment receipt after the renewal application is submitted, which includes a receipt ID. • A final step confirming the submission of the renewal request and update to the users about the application status. • System should automatically calculate the renewal fee based on the type of permit, the scale of operations, and other predefined factors. • System should ensure that the renewal process is optimized for both web and mobile platforms so users can apply for renewal process. • System should send automated renewal reminders at various intervals via email/SMS.

Applicants (User)	**Training Module**	**Training Module**	• The system should provide a comprehensive training medium:
			  ○ Video Demonstration
			  ○ FAQs Section
			  ○ Guidelines & Policies
			  ▪ The system should allow users to enhance readability (Font size and colour contrast)
			  ▪ The system should allow the user to share the feedback on the training module.
			  ▪ The system should allow the user to choose the training topics based on their needs.
			  ▪ The system should allow the user to download the training materials (PDF document or video tutorial) to use in offline mode.

User Role	Module	Activity	Functionality
CPCB, SPCB, Applicant		**MIS/Dashboard**	• The system should allow to display live insight information including the number of open tickets, resolved tickets, in-progress tickets, closed tickets and pending actions. • The system should display graphical representation of ticket volume over a specific period (e.g., daily, weekly, monthly), categorized by type. • The system should display a summary of critical incidents by severity levels (e.g., high, medium, low) to identify priority actions. • The system should highlight the number of issues for pending resolution. • The system should track and display service level agreements (SLAs) for each ticket, including visual alerts for tickets approaching SLA deadlines and the percentage of tickets meeting SLA timelines. • The system should categorize and display the average time taken to resolve tickets. • The system should display the department or team performance in handling the tickets, including average resolution time and workload distribution. • The system should display the status of ongoing compliance tasks related to relevant regulations. • The system should display detailed performance metrics of helpdesk agents and teams, including the number of tickets handled, average resolution time, and customer satisfaction scores.
Division Head	**Internal Movement Module**	**Application processing Module**	• The system should provide a real time dashboard to Division Head (DH) where DH have access to view the assigned application and number of total applications. • The system should allow DH to check and mark the application to Assisting Officer for the applications received through online process. • The system should allow DH to check and mark the application to Regional Officer for the applications received through offline process. • The system should allow DH to close the application in three ways either DH shall be authorized to Approve, Reject and Revert. • The system should allow DH to e-sign the approved application via login through E-Mudra USB Token.
Assisting Officers		**Internal Movement Module**	• The system should provide a real time dashboard to Assisting Officer (AO) where AO have an excess to view the assigned application through DH and number of total applications processed (Action taken from AO end). • The system should allow AO to provide an access to review and submit the report to respective DH with his comments and also allow AO to refer the application to another AOs (In case received application is not from his/her Jurisdiction). • The system should allow AO to highlight the application to DH (in case physical verification is required for any received application).
User Interface			• S/he can download certificate after e-sign the certificate by DH.

User Role	Module	Activity	Functionality
Regional Officers	**Internal Movement Module**		• The system should provide a real time dashboard (Web and Mobile App) to Regional Officers (RO) where RO have an excess to view the assigned application through DH and number of total applications processed (Action taken from RO end). • The system should allow RO to provide an access to view the assigned applications from DH for physical verification with the checklist. • The system should allow RO to upload the inspection report and images after the physical verification through given checklist.
Regional Directors			• The system should provide a dashboard to Regional Directors (RDs) where RDs have an excess to view rights for all the applications.
Applicants (User)	**Mobile APP**	**Mobile APP**	• Mobile app should be compatible on both platform (Android and IOS) • Mobile app should allow to view the application status i.e. Application initiated, payment completed, Application submitted, Application In-process, Registration Issued, Physical verification approved and, Approved application for certificate generation. • Mobile application should allow to data reporting functionalities direct upload or scan GST invoice QR code.
Auditors	**Mobile APP**	**Mobile APP**	• Mobile app shall provide functionalities for audit for auditors. • Mobile app should contain the check list when auditor conduct the audit.
	Non-Functional Requirements:		• The system should ensure data security and privacy. • The system should provide a user-friendly interface. • The system should be accessible on multiple devices (desktop, tablet, mobile). • The system should ensure high availability and reliability.

Note: In the aforementioned indicative functionality, the SI/Vendor may propose an updated version to enhance the system's robustness.

1.2 Indicative Implementation Strategy

The Common EPR portal shall be developed for integrating multiple EPR regimes in the future with minimal development efforts. It should be implemented via form builder application platform to create dynamic forms for different EPR regimes and their respective modules. The system should be developed to create customized workflow (e.g. annual returns, Environmental Compensation module, Application Processing, Physical Verification etc.) interlinked with dynamic application process. The common modules like (Registration, Payment, Approval, Annual Return Filling, Certifications) shall be implemented through the form builder and workflow builder. For any additional flow which cannot be implemented via workflow builder or form builder process, the same should be developed via custom development process.

1.3 Non-Functional Requirements (Indicative)

The non-functional requirements relating to performance, availability, deployment, implementation, operations, and others are listed in the subsequent subsection. Based on the assessment of the requirements listed below:

SN	Parameter	Requirement
1	Performance	As Common EPR Portal is an enhancement of existing application, all enhancements should comply with defined SLAs.
2	Scalability	System should be able to handle the increase load as the user base is expected to increase. The system provides for horizontal scalability in such a manner that a new server can be added (or removed) dynamically, as and when required in future, without disturbing the normal functioning of production system
3	Availability	The system shall provide 24 X 7 availability and comply with SLA
4	Reliability	Common EPR Portal must be a reliable system with consistent behaviour in terms of quality, availability, scalability, and performance. System should be able to handle the unavailability of any service. If the service is “core” to the use case an outage message can be displayed. If the service is “non-core” then the transaction should be able to be completed. Exception handling needs to be built into all components so that all exceptions and errors are

SN	Parameter	Requirement
		trapped and handled properly. Error information should include enough details to accurately describe and debug the problem. All data that is accepted from the end-user or sent in via HTTPS request will be validated on the server before it is used in processing to ensure that the data type and ranges are appropriate.
5	Manageability	Common EPR Portal is required to cater to stakeholders across the state accessing it from multiple points and through multiple channels. Hence the manageability of this system is essential to ensure effective monitoring and timely resolution of any issues surrounding performance, availability and security.
6	Usability	The application and user interface should be user friendly and any new user who is not tech-savvy must be able to easily use functionalities offered by the system. Error messages or pop ups must be helpful to an extent that user can take next action and does not experience too much of discomfort. User interface must be simple yet user-friendly, and the workflow should be intuitive so that user can complete their work with least time and effort.
7	Acceptance Testing, Audit & Certification	The primary goal of acceptance testing, audit and certification is to ensure that the common EPR system meets requirements, standards, and specifications as set out in this document and as needed to achieve desired outcomes. This assessment shall be done by STQC, and CPCB will bear the third-party auditing charges.
8	Technical Solution Architecture Requirements	Common EPR Portal solution needs to be architected using robust and proven software and technology. Minimum requirement for Common EPR portal software is Microservices Architecture and open industry standards. The solution architecture should be built on sound architectural principles enabling fault-tolerance, high performance, and scalability both on the software and infrastructure levels.
9	Software Architecture Requirements	Software architecture must support web services standards including XML, SOAP, UDDI and WSDL Software architecture must support appropriate load balancing for scalability and performance.

SN	Parameter	Requirement
		Software architecture must support flexibility in adding functionalities or applications. Software architecture components should utilize the high availability, clustering, and load balancing features available in the proposed infrastructure architecture to increase system performance and scalability features. Software architecture must support trace logging, error notification, issue resolution and exception handling.
10	Infrastructure Architecture Requirements	Infrastructure architecture at cloud must provide high availability redundancy and high availability capabilities as well as disaster recovery at the hardware level. All servers and systems must be configured with no single point of failure. Hardware architecture should be capable of consolidating several applications / workloads in a number of servers as required. Servers must be placed within proper security infrastructure for the Solution. The technical solution architecture for Common EPR should be sound and complete with high performance, redundancy, and scalability.
11	Development, Testing, Staging, and Production Requirements	Appropriate development, test, and staging environments should be provided and explained how they are related to production environment. This must be supported by explanations on how the development, test, and staging environment support the implementation activities of Common EPR. Development and test environment should include configuration management capabilities and tools for system configuration, versioning scheme, documentation, change control processes and procedures to manage deployment of solution deployment. The test, development, and staging environment should include required workstations, desktops/laptops, and tools appropriate to support development, testing, and staging, and deployment tasks. The development, test, and staging hardware environments must include similar operating systems,

SN	Parameter	Requirement
		software components, products, and tools to those of production environment. The development, test, and staging environments should be independent logically and physically from the production environment and of each other. The development environment should be used for development and should be configured to allow access for developer's workstations. The staging environment should be used for functional and user acceptance testing, stress testing, and performance benchmarking. The test environment should be used as a testing environment of Common EPR Portal. The test environment should be a scaled-down configuration of the production environment.
12	Security	A secure solution should be provided at the hardware infrastructure level, software level, and access level. Authentication, Authorization & Access Control (User ID & Password and Digital Signature at all user level) security mechanisms should be implemented to enable secure login and authorized access to portal information and services. Confidentiality of sensitive information and data of users and portal information should be ensured. Appropriate mechanisms, protocols, and algorithms necessary to protect sensitive and confirmation data and information both during communication and storage should be implemented. SI is responsible for SSL certificate.
13	Monitoring and Management Requirements	The Common EPR solution should provide monitoring and management of the entire Solution including all software components and application. The monitoring and management should monitor health of software and hardware infrastructure running the Common EPR solution covering operating system, database, software components, applications, servers, and other related software and hardware components. It should provide proactive monitoring, alerting and reporting.
14	Performance and Scalability Requirements	The design of the Common EPR solution should be scalable to handle increasing number of users.

SN	Parameter	Requirement
		The solution should provide measurable and acceptable performance requirements for users, for different connectivity bandwidths. The solution should provide optimal and high-performance Portal Solution satisfying response time for slow Internet connections and different browsers.
15	Implementation Requirements	The selected bidder will be required to deploy manpower and other project resources as per the terms & conditions of the Contract. The selected bidder will be required to work closely with the CPCB and perform detailed functional requirements and analysis of Common EPR Portal solution to confirm and document functional / system requirement specifications for the portal and its applications to fulfil its objectives. The selected bidder will be expected to carry the complete implementation and deployment of the common EPR Portal within the timelines specified in the RFP. The selected bidder is expected to develop, test, stage, and deploy all functional modules of the common EPR software and any hardware components of technical & functional requirements.
16	Operations Requirements	The selected bidder is expected to provide the following in support of common EPR operations: Selected bidder shall provide procedure documentation for all operations procedures, and SLA‟s (based on ITIL best practices) for all the hardware and applications provided including backup procedures, system update procedures, security procedures, failure recovery procedures, upgrade procedures, remote access procedures, user manual, SOP‟s, etc. All such procedures and documents must be submitted for review and approval by CPCB prior to adoption. Such documentation shall be updated by the during the project term by the bidder as and when required along with the necessary approval. Selected bidder will be required to provide CPCB with weekly statistics reports on the various services provided to users a mechanism as well as track and log all related statistical reports on the various delivery channels and access patterns.

SN	Parameter	Requirement
		The bidder will also establish video conferencing and Helpdesk support system to resolve the stakeholders issues with respect to common EPR portal. Selected bidder will be required to provide CPCB with weekly portal performance reports showing health of system operations. Selected bidder will be required to provide CPCB with Helpdesk for recording all day-to-day problems and other technical incidents occur during the O&M phase. This shall also record the resolution of such incidents & problems. Selected bidder will be required to commit to Service Level Agreements (SLAs) that show, among other metrics, appropriate escalation procedures and guarantee corrective actions within a pre-determined time. Selected bidder is required to respond to required levels of accuracy, quality, completeness, timeliness, responsiveness, cost-effectiveness, productivity and user satisfaction that are equal to or higher than the SLA system requirements.
17	Quality Assurance & Acceptance Requirements	Selected bidder is required to develop and implement quality assurance processes and procedures to ensure that the Common EPR Portal development and operations are performed to meet the quality standards that are relevant to each area in all project phases. Selected bidder is required to use various tools and techniques that can make tests run easily and the results are automatically measured. In this way, testing tools provide a more cost- effective and efficient solution than their manual counterparts. Plus, they minimize the risk of human error during testing. In order to ensure that such a QA mechanism is effective and acceptance of Common EPR Portal, the following tests are required for acceptance: Unit Testing: Basic validation of developed components by developers. Functional / Internal Integration Testing: Validation of developed components against functional requirements and design specifications. System Testing: Validation of both functional and technical requirements for the integrated Solution. This could include external integration if required or it can be separated into testing phases. UAT: User Acceptance Testing (UAT) validation of the Portal

SN	Parameter	Requirement
		Solution and assurance that it meets both functional and technical requirements Stress and Performance Testing: Load testing enabling understanding of performance and behaviour of Portal Solution under large number of users and high-load conditions. Selected bidder is required to describe their QA and testing approaches and procedures as well as testing tools for conducting various tests in support of the acceptance of the Portal Solution. Selected bidder is expected to follow CMMi level 3 or above processes. Selected bidder is required to describe their QA and testing approaches and procedures as well as testing tools for conducting various tests in support of the acceptance of the Portal Solution.
18	Mobile Application Platform Capability	Common EPR Portal applications and services including all appropriate channels and development of corresponding mobile applications to the Common EPR Portal applications and services leveraging the Mobile Service Delivery Gateway (MSDG) and Mobile App Store. Application platform should support the following smart phone mobile OS (Android & iOS) Support the target packaging components like (Mobile Website, Native App, Web App and Application Development, Eclipse tooling platforms) Support the ability to write code once and deploy on multiple mobile operating systems. - Support integration with native device API. - Support utilization of all native device features - Support development of applications in a common programming language - Support integration with mobile vendor SDKs for app. - development and testing - Support HTML5, CSS3, JS features for smartphone devices. - Support common protocol adapters for connection to back-office systems (i.e. HTTP, HTTPS, SOAP, XML for format) - Support JSON to XML or provide XHTML message transformations.

SN	Parameter	Requirement
		- Support multi-lingual and language internalization. - Support encrypted messaging between server and client components
19	General Requirements	<u>Modularity</u> The system should be modular in design. New application components can be integrated with the system to accommodate a phased implementation and take advantage of new technological advances. Once implemented, the system must be able to easily expand to include new capabilities without negatively impacting previously implemented functionality. Proposed software should not disturb the customization done specifically for Department during upgrade to higher release or implementation of additional packs. <u>Administration</u> Includes administrative feature to monitor utilization, trace database access chains, optimize schema and sub-schema definitions, and optimize file placement and layout. Permits system audits to determine who has used the system recently and what changes have been made. Keeps a daily transaction journal for recovery purposes should that become necessary. Statistics should be available on database access rates (both update and query) by program, terminal, ID, and by time of day etc. <u>Documentation</u> Specific elements of documentation that must be available with the system including User Manuals/ handouts (both soft and hard copy) <u>User Interface</u> Application should have consistent look and feel across family of software applications. Consistent and logical navigation flow and tool-tip information wherever relevant Uses standard GUI features (e.g., drop-down menus, dialog boxes, toolbar buttons) Data formats are consistent throughout application windows. Controls on page must respond properly to Tab order.

SN	Parameter	Requirement
		Interface recovers gracefully from anticipated user errors (e.g., invalid input) Information and error messages are useful, accurate, and correctly spelled. Unnecessary warnings do not appear. <u>Reporting</u> All modules of the solution comprise of comprehensive reporting facilities with standard. Reports that confirm to the best practices and benchmarks of related functional area Dynamic and interactive reporting using prompts to allow end users to select filter conditions to be used at run-time. Able to run the reports in a browser-based environment. Able to seamlessly export data into Microsoft Excel or MS word for further analysis and extended reporting. Able carry out multiple sorting and apply extensive selection criteria. Able to provide details/summarized reports and cross analysis of each module and sub module of the solution. Each report offers category totals and grand total figure wherever applicable/specified. Reporting software shall include the ability to generate graphs and charts based on criteria and format defined by CPCB. System shall allow users to capture and export the current display through electronic reports and in different printer-friendly formats, including, at a minimum, MS-Excel, PDF, and Web formats.

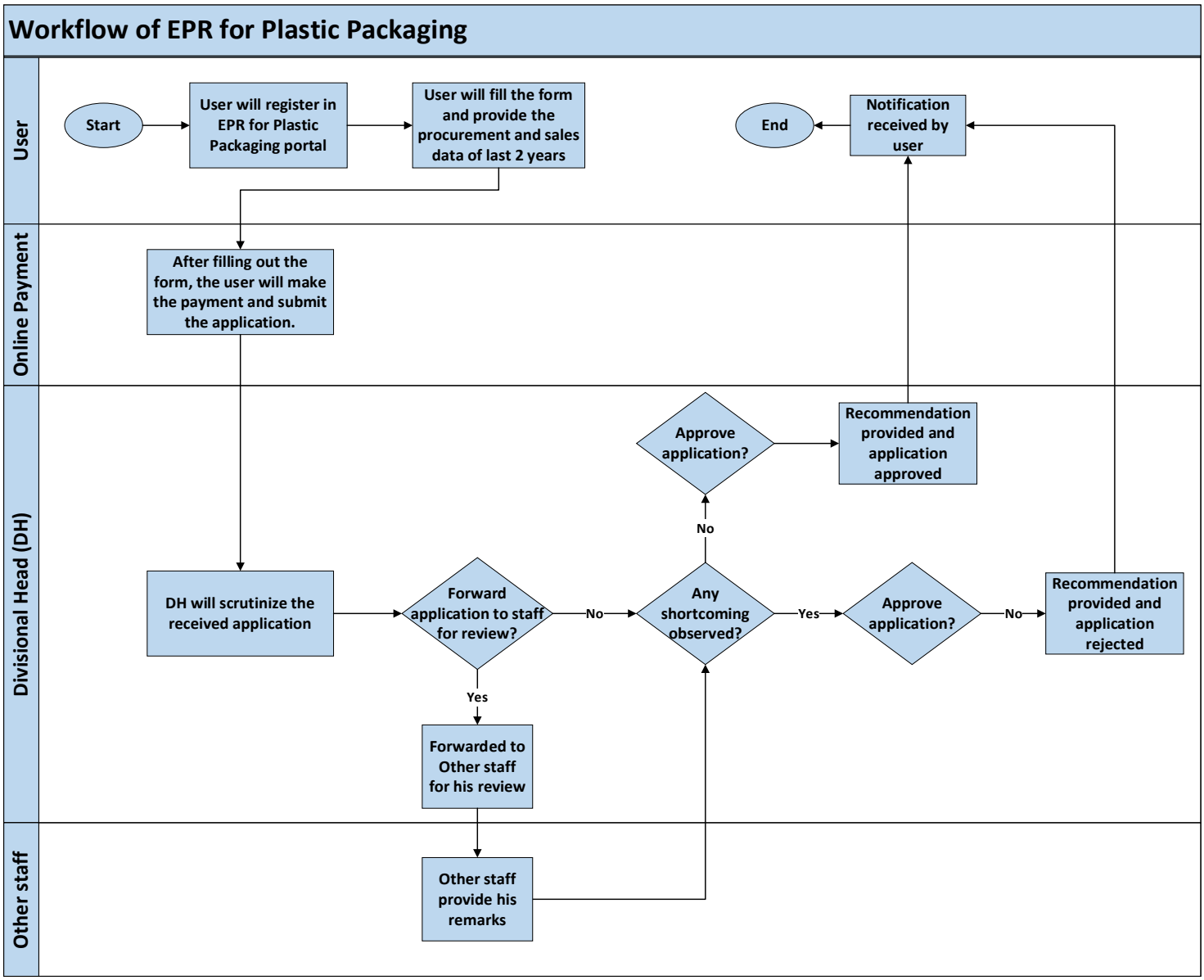
<u>Note: In the aforementioned indicative non-functionality requirement, the SI/Vendor may propose an updated version to enhance the system's robustness.</u>

2. Annexures

Annexure I

a) Functional Details of Plastic Waste Management EPR Portal

A. Registration Workflow of EPR for Plastic Packaging:



B. Workflow Description

a) Producer Importer and Brand Owner (PIBO):

The user can go to sign up on the EPR Portal, the user should navigate to the "PIBO" section and click on "Register" from the homepage. During the sign-up process, the user will need to provide the following details:

I. Applicant Type: Specify whether they are a Brand Owner, Producer, Importer, or Plastic Waste Processor.

II. Company Details:
   a. Legal Name: As registered under GST.
   b. Trade Name: As per GST records.
   c. Type of Business: Specify whether the business is a Private, Public, Proprietorship, Cooperative, etc.
   d. Type of Company: Indicate whether the company is Micro, Small, Medium, or Large, along with the necessary supporting documents.
   e. Registered Address: The official address of the company.
   f. Company PAN Card Number: This will be validated on the portal.
   g. Company CIN Number: Mandatory for companies registered under the Companies Act and will be validated on the portal.

III. Authorized Person Details:
   a. Name and Designation: Provide the name and role of the authorized person.
   b. Mobile Number: Contact number of the authorized person.
   c. PAN Details: PAN information of the authorized person.

IV. Login Details:
   a. Email ID: The authorized person's email address.
   b. Password: Create a password and click on ‘Register’.

V. Documents Required for Sign-Up:
   a. Supporting Documents for Industry Category: Proof of whether the industry falls under Small, Micro, Medium, or Large.
   b. Exemption for Micro & Small Brand-Owners: Brand-owners in these categories are exempt from EPR registration.
   c. Online Platforms and Marketplaces: Online platforms, marketplaces, and supermarket/retail chains are included in EPR registration.

VI. Logging into the Portal:
   a. After registration, the user can log in by entering their email address and password and clicking "Sign in" on the homepage. An OTP will be sent to the registered mobile number and email ID. The user will need to enter this OTP to access the application form.

b. Once logged in, the PIBO dashboard will open, where the user must complete the application form by providing information in the following sections:
   i. *General Information*
   ii. *Details on Liquid Effluent & Gaseous Emissions*
   iii. *Waste Management: Including procurement details related to plastic packaging.*
   iv. *EPR Action Plan: The user's plan for implementing Extended Producer Responsibility (EPR) for Plastic Waste Management (PWM).*
   v. *Checklist: Ensure all required items are complete.*
   vi. *Payment of Application Fees: Complete the payment process to finalize the application.*

b) Plastic Waste Processor (PWP):

The registration process for Plastic Waste Processors (PWPs) is similar to that of Producers, Importers, and Brand Owners (PIBOs). After completing the registration, the user will need to provide the following information in the relevant sections:

a. Company Details
b. GPS Location
c. Authorized Person Details
d. Industry Details
e. Consents & Authorization
f. Picture/Video of the Facility
g. Plant Machinery Details
h. Waste Management & Other Information

c) Generation & Transfer of Certificates by Plastic Waste Processors

The process of generating and transferring certificates by Plastic Waste Processors (PWPs) is divided into two sections:

I. <u>Section 1: Physical Verification of PWPs by SPCBs/PCCs</u>

This involves the State Pollution Control Boards (SPCBs) or Pollution Control Committees (PCCs) conducting a physical verification of the Plastic Waste Processors.

II. <u>Section 2: Generation & Transfer of Certificates by PWPs</u>

After the physical verification, PWPs generate and transfer the required certificates.

d) Physical Verification of PWPs by SPCBs/PCCs:

Physical verification of PWPs is to be done by SPCBs/PCCs after Registration of the PWP on the EPR Portal. PWP will be able to generate certificates only after approval of physical verification by the respective SPCB/PCC. The feature will remain disabled till the PWP facility gets physically verified. SPCB/PCC (Designated officer) will get verification request on their login page as soon as they grant registration to a PWP. SPCB/PCC (DO) has to assign the PWP to concern SPCB/PCC (RO) for field verification. SPCB/PCC (RO) to conduct physical verification of PWP premises and verify facility as per a checklist and send the recommendations to SPCB/PCC (DO). SPCB/PCC (DO) can approve or reject verification of PWPs based on RO's recommendations.

The certificate generation feature will get enabled for PWP upon approval of physical verification. If SPCB/PCC rejects the physical verification report, then the certificate generation feature will not be enabled. PWP will then be required to update the report at their end. Once the PWP is ready for verification, they can resubmit request for the verification process through the portal. PWP will get the status of the verification process through SMS and email notifications.

e) Generation & Transfer of EPR Certificates by PWPs:

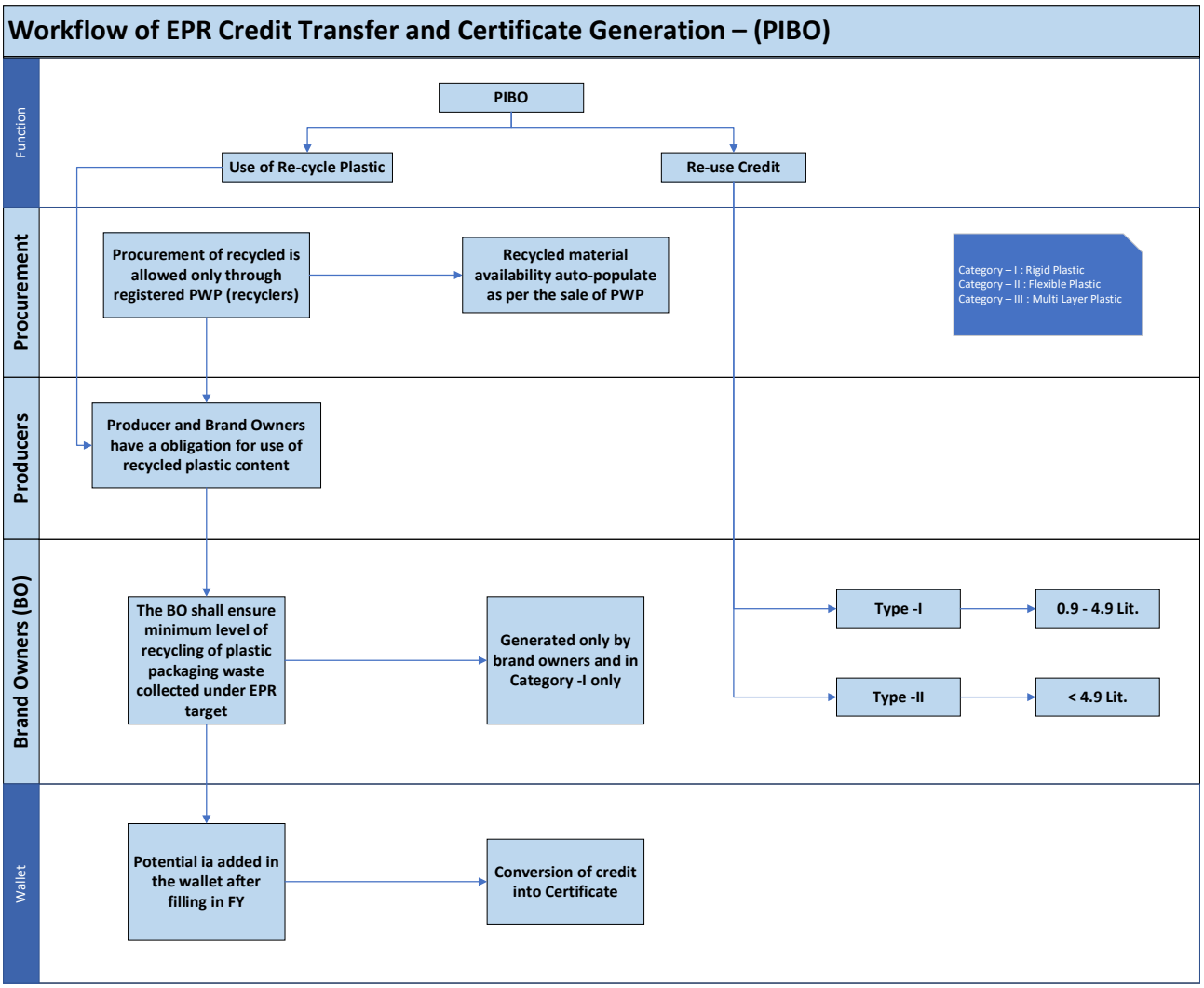
This section is divided into several key segments:

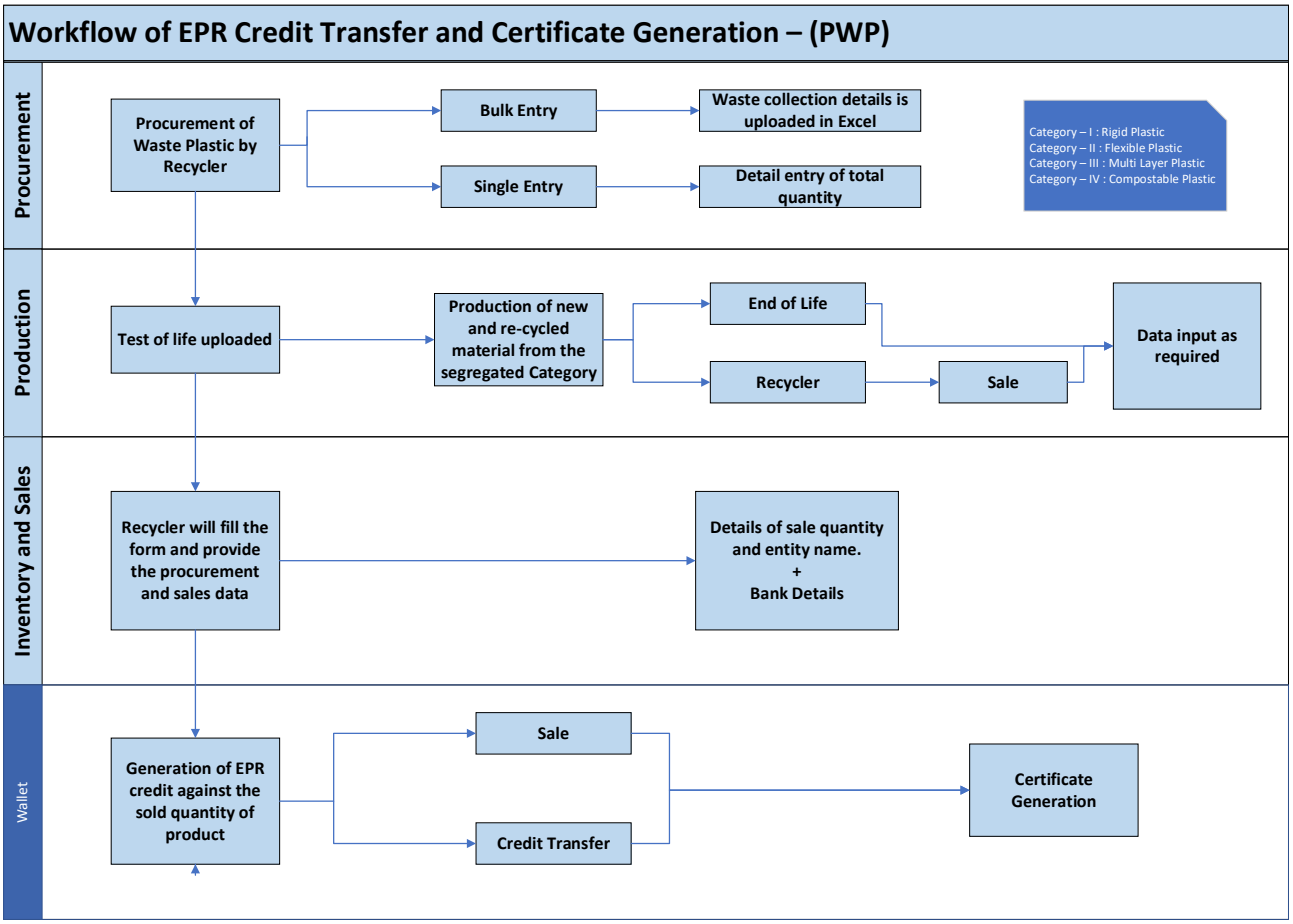
a) Plastic Waste Procurement
b) Production
c) Inventory & Sales
d) Wallet: Certificate Potential, Certificate Generation & Transfer

In these segments, the Plastic Waste Processor (PWP) is required to provide detailed information in the Procurement and Production sections. Based on the input provided, an inventory of items will be generated. Sales items can be selected from this inventory, and the potential for certificate generation will be calculated using a conversion factor that was confirmed during the physical verification process. This potential will be reflected in the PWP's wallet.

The PWP can generate certificates in various denominations—1, 10, 50, 100, 500, and 1000 tonnes (T)—based on their requirements. These certificates can then be transferred to Producers, Importers, and Brand Owners (PIBOs) in the Certificate Generation & Transfer section.

C. Workflow & Description of Credit Transfer and Certificate generation of PIBO and PWP





Description of workflow:

Definition

a) "Brand Owner" means a person or company who sells any commodity under a registered brand label or trademark.

b) "End of Life disposal" means using plastic waste for generation of energy and includes co-processing (e.g. in cement kilns) or waste to oil or for road construction as per Indian Road Congress guidelines, etc.

c) "Extended Producer Responsibility" (EPR) means the responsibility of a producer for the environmentally sound management of the product until the end of its life.

d) "Importer" means a person who imports plastic packaging product or products with plastic packaging or carry bags or multilayered packaging or plastic sheets or like

e) "Plastic" means material which contains as an essential ingredient a high polymer such as polyethylene terephthalate, high density polyethylene, Vinyl, low density polyethylene, polypropylene, polystyrene resins, multi-materials like acrylonitrile butadiene styrene, polyphenylene oxide, polycarbonate, polybutylene terephthalate.

f) "Plastic Waste Processors" means recyclers and entities engaged in using plastic waste for energy (waste to energy) and converting it to oil (waste to oil), industrial composting.

g) “Producer” means person engaged in manufacture or import of carry bags or multilayered packaging or plastic sheets or like and includes industries or individuals using plastic sheets or like or covers made of plastic sheets or multilayered packaging for packaging or wrapping the commodity.
h) “Recyclers” are entities who are engaged in the process of recycling of plastic waste.
i) “Waste Management” means the collection, storage, transportation reduction, re-use, recovery, recycling, composting or disposal of plastic waste in an environmentally sound manner.

Role of Producers, Importers and Brand -Owners in process flow:

- The Producers, Importers & Brand-Owners shall have to register through the online centralized portal developed by Central Pollution Control Board. The certificate of registration shall be issued using the portal.
- Producers, Importers & Brand-Owners shall provide Action Plan containing information on the Extended Producer Responsibility Target, category-wise, where applicable, through the online centralized portal developed by Central Pollution Control Board, along with application for registration or renewal of registration under Plastic Waste Management Rules, 2016.
- Brand Owner covered under shall provide details of plastic packaging purchased from Producers and/or Importers separately. The quantities attributed to each Producer and Importer obligated upon Brand Owner shall be deducted from the obligation of Producers and Importers. The record of such purchase including category-wise quantity purchased, shall be maintained separately by Brand Owner.

The process flow and steps involved in credit transfer and certificate generation -

a) Procurement → Production → Inventory and Sales → Wallet → Certificate Generation → Certificate Transfer
b) Procurement and waste segregation process
c) Categorization of waste plastic after segregation
d) Production of new and recycled material from different category of plastic
e) Maintaining procurement and sales details under Inventory and sales management system
f) Generation of EPR credit against the sold quantity of product
g) The recycler can make entries in EPR credit generation at the certificate generation step.
h) The last process involves the transfer of certificate by recycler.

Vendor Name: CIPL

b) Technical Details of Plastic Waste Management EPR Portal

1. General System Information

i. Architecture

- The system employs a microservices architecture, which divides the application into smaller and independent services.

ii. Development Languages and Frameworks

- **Frontend:** The user interface is built using Angular, a JavaScript-based framework is used for creating dynamic and interactive web applications.

iii. Version Control

- Git is used for version control, allowing developers to track changes, collaborate effectively, and manage the codebase across different branches.

iv. Project Management Methodology

- The system follows the Agile methodology, emphasizing iterative development, frequent feedback, and adaptability to changes.

2. Technology Stack

- **Backend**
  - The server-side logic is developed by Python.
  - FastAPI is a modern, high-performance web framework specifically designed for building APIs.
- **Frontend**
  - The user interface is developed by using Angular, a JavaScript framework that enables the creation of dynamic web applications.
- **Databases**
  - The system uses Redis & relational databases, specifically MySQL and PostgreSQL, for managing structured data.
  - These databases follow a normalized schema, ensuring efficient data organization, minimizing redundancy, and improving query performance.
- **Third-party Integrations**
  The system integrates with several external services to streamline operations:
  - **PAN CIN Certificate:** Validation of Permanent Account Numbers and Company Identification Numbers.
  - **Payment Gateway:** Secure processing of financial transactions.
  - **GST:** Seamless integration with Goods and Services Tax systems for compliance and reporting.
  - Consent APIs

3. Infrastructure and Deployment

- **Setup**
    - The system operates on a cloud-based infrastructure, leveraging the resources of NIC (National Informatics Centre).
    - Being cloud-based, the system benefits from scalability, flexibility, and easier management of resources compared to traditional on-premises setups.
    - NIC provides robust hosting solutions tailored to government needs, ensuring high availability and compliance with national IT standards.
- **Web Server**
    - The application uses Nginx as its web server, and it is high-performance server.
    - Nginx is optimized for handling multiple connections simultaneously, making it ideal for modern web applications that require speed and efficiency.
    - It also supports reverse proxying and load balancing, ensuring smooth delivery of content to users while managing traffic efficiently.

4. Networking and Security

- **Networking Protocols:**
    - The system uses HTTP/HTTPS for data communication.
    - HTTPS (Hypertext Transfer Protocol Secure) ensures that all communication between the client (user) and server is encrypted and secure, preventing data interception during transmission.
- **Security Practices**
    - **Firewalls:** Protect the network by filtering incoming and outgoing traffic based on predefined security rules.
    - **VPN (Virtual Private Network):** Ensures secure and encrypted connections over the internet, adding an additional layer of protection for remote access.
    - **TLS/SSL (Transport Layer Security/Secure Sockets Layer):** Encrypts communication over the network to secure sensitive information, such as login credentials and personal data.
- **Security Framework**
    - **OAuth2:** It is authorization framework that securely manages user authentication and access delegation, ensuring that only authorized users access the system.
    - **OTP-based Multi-Factor Authentication (MFA):** Adds an extra layer of security by requiring a one-time password (OTP) during login, minimizing the risk of unauthorized access.
- **Data Encryption:**
    - **In Transit:** All sensitive data transmitted over the network is encrypted in transit, ensuring that it cannot be intercepted or tampered with during communication. Encryption protocols like TLS/SSL are typically used for this purpose.

5. Monitoring and Maintenance

i. Testing

- In the Manual Testing, human testers to perform manually to verifying the functionality, usability, and performance of the system to identify and resolve issues before deployment.

ii. Backup Strategy

- Automated backups are conducted by the National Informatics Centre (NIC). This ensures critical data is regularly and securely stored, minimizing the risk of data loss in case of failures or unforeseen events.

iii. System Updates

- Updates and patches to the system are managed manually. It requires to avoid downtime or disruptions during update implementations.

4. Scalability and Performance

i. Scaling

- The system uses vertical scaling to manage growth and involves upgrading the hardware resources (e.g., CPU, RAM) of the existing servers to handle increased traffic or workload.

ii. Performance Optimization

To enhance system performance:

- Query log cleanup is implemented to ensure databases operate efficiently by removing outdated or unnecessary logs and bundle optimization minimizes the size of web application assets, such as JavaScript and CSS files, improving load times and overall responsiveness.

iii. Caching

- Redis, an in-memory data structure store, is used for caching.

iv. Monitoring

- System performance is monitored through log analysis and the logs provide insights of the system behaviour.

5. User Management and Access Control

i. Authentication/Authorization:

- User authentication relies on **OAuth2** and **JWT** for secure authentication tokens or session handling.

ii. RBAC:

- **RBAC** implemented to control access based on user roles.

iii. Data Protection: Compliant with NIC standards.

- The system should be complied with **NIC standards** to ensure data is protected according to NIC regulatory guidelines.

6. Data and Backup

i. Storage: Cloud and on-premises servers

- The storage should support both **cloud storage** (for scalability, flexibility, and cost-efficiency) and **on-premises servers** (for greater control and security).

ii. Data Integrity: Validated with EPR certificates.

- Data must be protected and verified for accuracy and consistency with **EPR certificates** serving as evidence of this protection and ensuring compliance with regulatory data integrity standards.

7. **Compliance and Regulatory**

   i. **Audit Logging:** User activity logs maintained.

   - The system must maintain **user activity logs**, recording all actions performed by users within the system to ensure traceability, security, and accountability.

8. **Development and Integration**

   i. **Integration:** REST APIs for internal and external systems.

   - The system should support **REST APIs** for connecting both **internal** and **external** systems. This can integrate easily with various applications and services (within the organization or from third-party vendors).

   ii. **Code Maintenance:** Managed via Git.

   - **Code Maintenance**: The code should be **managed via Git**, like version control practices will be employed to handle changes, collaboration, and the maintenance of the codebase.

9. **Support and Documentation**

   i. **Documentation:** Architecture diagrams

Manpower: 8 resources

Project Manager	1
Developers	3
Helpdesk	4

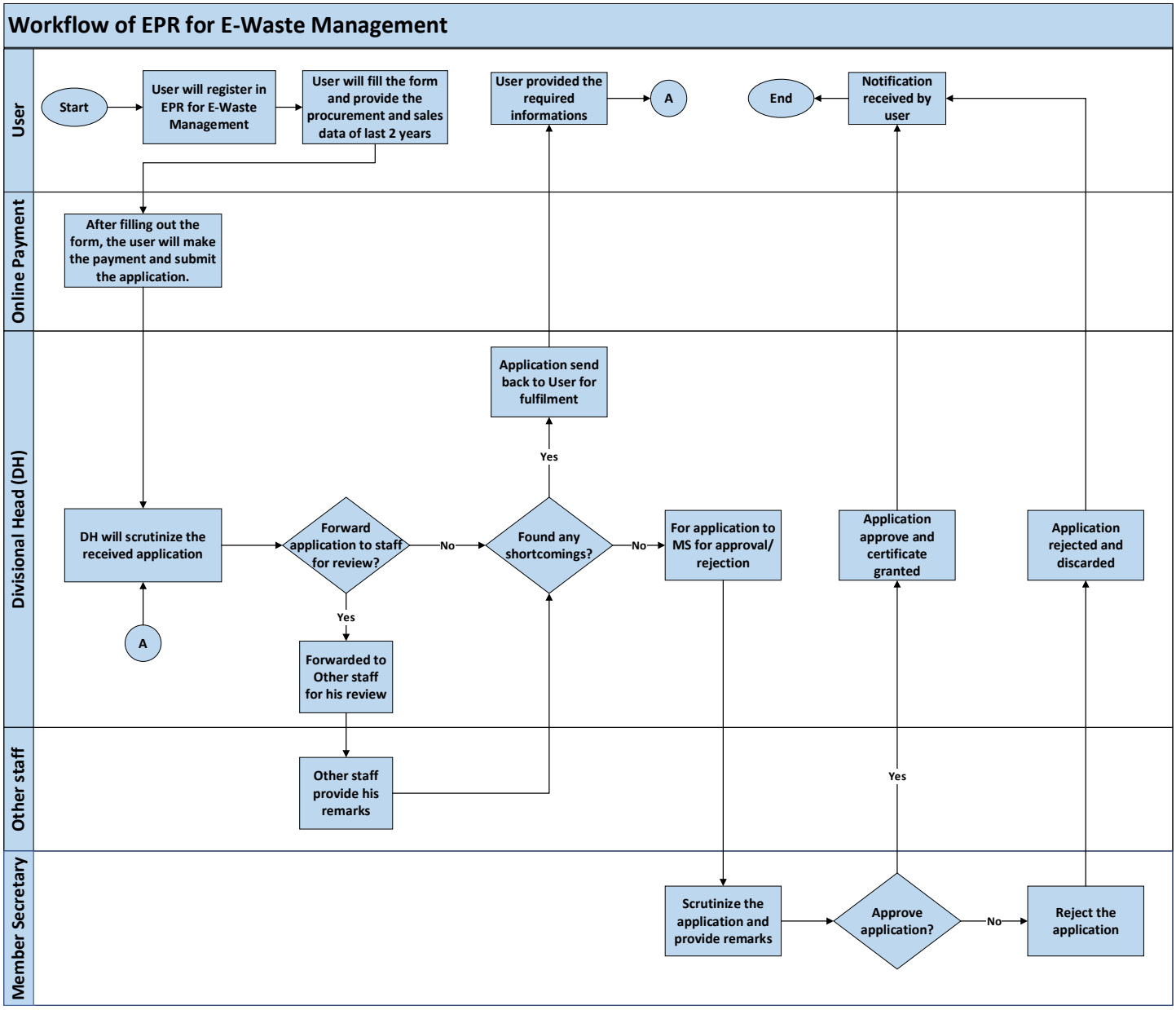
***Note**: The aforementioned resources represent a provisional list provided by the vendor for deployment on this EPR portal, as per the stipulated requirements. For detailed study and requirement kindly refer below URL.*

URL of the portal: **https://eprplastic.cpcb.gov.in/#/plastic/home**

Annexure II

a) Functional Details of E-Waste Management EPR Portal

A. Registration Workflow of EPR for E-Waste Management



B. Workflow Description

- User must register on the portal by submitting their application along with the required information data, and documents.
- Physical applications (hard copies) will not be accepted; all registration applications must be submitted online through the designated portal at https://eprewastecpcb.in.
- Registration is valid for five years from the date of issue of the EPR Registration Certificate
- User must apply for renewal of the Registration Certificate on the portal 120 days before the expiration of their current registration.
- The application will be reviewed on the portal by CPCB officials, and after verifying all required information, the application will be processed and submitted to the Competent Authority, CPCB, for approval.
- Once approved, the Registration Certificate, including the Registration Number and list of EEE with EPR obligations, will be issued to the user through the portal.
- In case of an incomplete application, any shortcomings will be communicated to the user through the portal within 25 working days. The Producer must respond within 7 working days, after which the application will be reprocessed as per the previous steps.

Basic information required from "Producers" for registration:

- Trade Name / Company Name
- Legal Name.
- Mobile Number
- Official e-mail id
- Land line Number (if available)
- CIN / Incorporation Certificate (if available)
- GST
- IEC (if available),
- PAN of company, (if available)
- PAN of Authorized Person
- Postal Address (The address should be the place from where sale in entire country is being managed – Corporate Office address. Do note that address given by the applicant in its supporting documents i.e. Self- Declaration, IEC Certificate, GST Certificate, should be same as the address given in sign up form)
- Name of the Authorized Person and Address, Company E-mail id and Telephone Numbers
- List of EEE from the list of notified EEE along with their codes for which Registration is required**:**

Basic information required from "Recyclers" for registration:

- Name of the company
- Details of the recycling facility
    - Address

  - Geo coordinates
  - Email id
  - Contact number: (Mobile & landline)
  - Year of establishment
  - CTE under air and water act (number and date of issue)
  - CTO under air and water act (number and date of issue)
  - Authorization under Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 (number and date of issue)
  - PAN Number
  - GST Number
  - CIN Number (optional)
- Details of authorized person
  - Name, Designation, Email & Mobile Number of authorized persons.
  - Aadhar number of authorized persons

Basic information required from "Manufacturers" for registration:

- Name of the company
- Details of the manufacturing facility
  - Address
  - Geo coordinates
  - Email id
  - Contact number: (Mobile & landline)
  - Year of establishment
  - CTE under air and water act (number and date of issue)
  - CTO under air and water act (number and date of issue)
  - Authorization under Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 (number and date of issue) (Optional)
  - IEC
  - PAN Number
  - GST Number
  - CIN Number (optional)
- Details of authorized person:
  - Name, Designation, Email & Mobile Number of authorized persons.

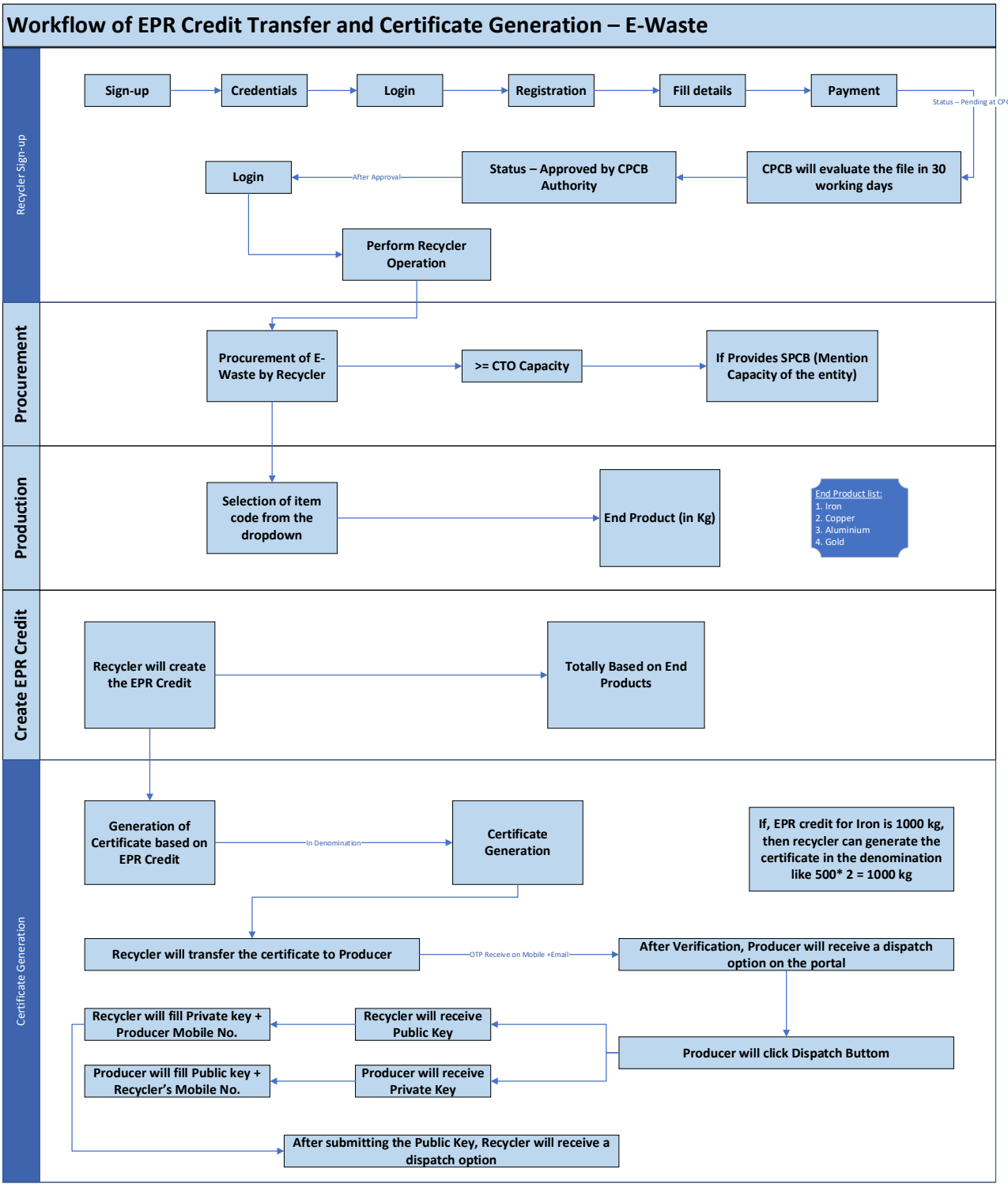
Basic information required from "Refurbisher" for registration:

- Name of the company
- Details of the recycling facility
  - Address

- Geo coordinates
- Email id
- Contact number: (Mobile & landline)
- Year of establishment
- CTE under air and water act (number and date of issue)
- CTO under air and water act (number and date of issue)
- Authorization under Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 (number and date of issue) (Optional)
- PAN Number
- GST Number
- CIN Number (optional)

- Details of authorized person
  - Name, Designation, Email & Mobile Number of authorized person b. Aadhar number of authorized persons.

C. Workflow and Description Credit transfer and Certificate generation



Description:

The process flow and steps involved in credit transfer and certificate generation –

a) Recycler Sign-up → Procurement → Production → Create EPR Credit → Certificate Generation and Transfer
b) Recycler will sign-up to register and fill the required details.
c) CPCB will evaluate the file within the 30 days.
d) CPCB authority will provide approval to recycler to start operation.
e) Recycler will be able to procure the waste as per the max. of CTO capacity.
f) Production limit is in end-product like Copper, Aluminium, Iron, and Gold only and it will be measure in kilograms.
g) EPR credit is totally based on end products.
h) Certificate generation is in available denomination as per the EPR credit.
i) Recycler will transfer the certificate to producer via OTP and verify the OTP (received on mobile + email)
j) Producer will receive a dispatch option on the portal.
k) Producer will fill and submit public key and recycler's mobile no.
l) Then recycler will receive a dispatch option

Vendor Name: Zibal Technologies

b) Functional & Technical Details of E-Waste Management EPR Portal

1. General System Information

i. Architecture

- The system is designed using a **monolithic architecture**, providing all components (e.g., frontend, business logic, data management) are integrated into a single and unified application.

ii. Development Languages and Frameworks

- Frontend: The user interface is built using AngularJS, a JavaScript-based framework is used for creating dynamic and interactive web applications.

iii. Version Control

- Git is used for version control, allowing developers to track changes, collaborate effectively, and manage the codebase across different branches.

iv. Project Management Methodology

- The system follows the Agile methodology approach, emphasizing iterative development, frequent feedback, and adaptability to changes.

2. Technology Stack

i. Backend

- The system uses **Java** for the backend development with the **Spring Framework** for building web applications.

ii. Frontend

- **Angular** is used for building the user interface, paired with **Material UI** and **Tailwind CSS** for UI components and styling.

iii. **Databases**

- The system uses a **SQL relational** database, specifically **PostgreSQL**, with a **denormalized schema**.

iv. **Third-party Integrations**

- **CTO Verification APIs**: Used for verifying the identity of users.
- **SMS APIs**: Integrated to send automated SMS notifications for order confirmations, shipment updates, and alerts.

3. **Infrastructure and Deployment**

i. **System/Application Deployed**

- Manually: The system is deployed **manually**.

ii. **Web Server**

- **Nginx** and **Tomcat** is one of the most widely used web servers. It is responsible for handling HTTP requests from clients and delivering the appropriate content from system application.

4. **Monitoring and Maintenance**

i. **Testing**

- In the Automated Testing, system to perform automated testing to verifying the functionality, usability, and performance of the system to identify and resolve issues before deployment.

ii. **Backup Strategy**

- Automated backups are performed to ensures critical data is regularly and securely stored, minimizing the risk of data loss in case of failures or unforeseen events.

iii. **System Updates**

- Updates and patches to the system are managed manually. It requires to avoid downtime or disruptions during update implementations.

5. **Networking and Security**

i. **Networking Protocols:**

- **HTTPS:** The system uses HTTPS for data communication and ensures that all communication between the client (user) and server is encrypted and secure, preventing data interception during transmission.
- **Token based Authentication:** It is used to manage user access.

ii. **Security**

- **OTP-based Authentication (MFA):** Adds an extra layer of security by requiring a one-time password (OTP) during login, minimizing the risk of unauthorized access.

6. **Scalability and Performance**

i. **System Scalability:**

- The system currently uses **vertical scaling** (increasing the size of servers) rather than horizontal scaling (adding more servers).

7. **User Management and Access Control**

i. **User Authentication:**

- **Token-based authentication** is used to manage user logins and access.

ii. **RBAC:**

- **RBAC**: **Role-Based Access Control (RBAC)** is used to manage user permissions and roles within the system.

8. **Data and backup:**
   i. **Data Storage and approach:**
      - The system stores data using **on-premises services**.

   ii. **Data Integrity:** Validated with EPR certificates.
      - Data must be protected and verified for accuracy and consistency with **EPR certificates** serving as evidence of this protection and ensuring compliance with regulatory data integrity standards.

9. **Compliance and Regulatory**
   i. **Audit Logging:** User activity logs maintained.
      - The system must maintain **user activity logs**, recording all actions performed by users within the system to ensure traceability, security, and accountability.

10. **Development and Integration**
   i. **Integration:**
      - The system should support REST APIs for connecting both internal and external systems. This can integrate easily with various applications and services (within the organization or from third-party vendors).
   ii. **Code Maintenance:** Managed via Bitbucket.

- **Code Maintenance**: The code should be **managed via Git**, like version control practices will be employed to handle changes, collaboration, and the maintenance of the codebase.

Manpower: 16 resources

BAs	2
Developers	11
Testers	3

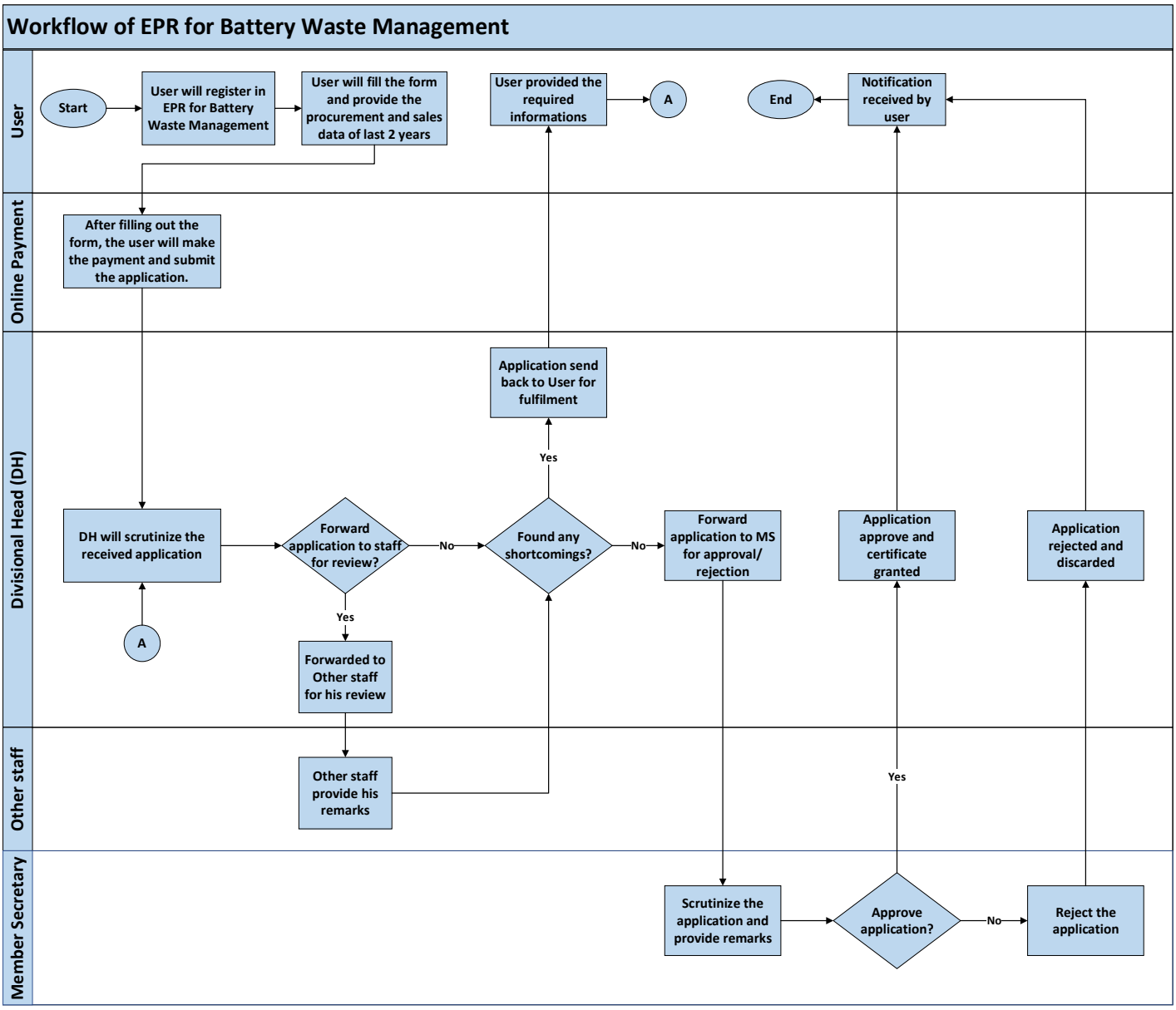
***Note**: The aforementioned resources represent a provisional list provided by the vendor for deployment on this EPR portal, as per the stipulated requirements. For detailed study and requirement kindly refer below URL.*

URL of the portal: **https://eprewastecpcb.in/#/**

Annexure III

a) Functional Details of Battery Waste Management EPR Portal

A. Registration Workflow for Battery Waste Management by Producers in the EPR System



A. Workflow description

- CPCB will process the application for registration.
- The application will be reviewed and processed within 15 working days, with registration either granted or rejected within this period.

- If any documents are missing or information is incomplete, the applicant will be notified through the portal.
- Applications will be rejected if false or irrelevant information or documents are submitted, and the application fee will be forfeited. In such cases, a fresh application with the required fees must be submitted for registration.
- A portal-generated registration certificate, signed by the Competent Authority, will be uploaded to the portal.
- The portal includes an internal processing system within CPCB, where the Member Secretary, CPCB, serves as the approving authority for issuing the certificate.
- A new registration will be valid for five years from the date it is granted.

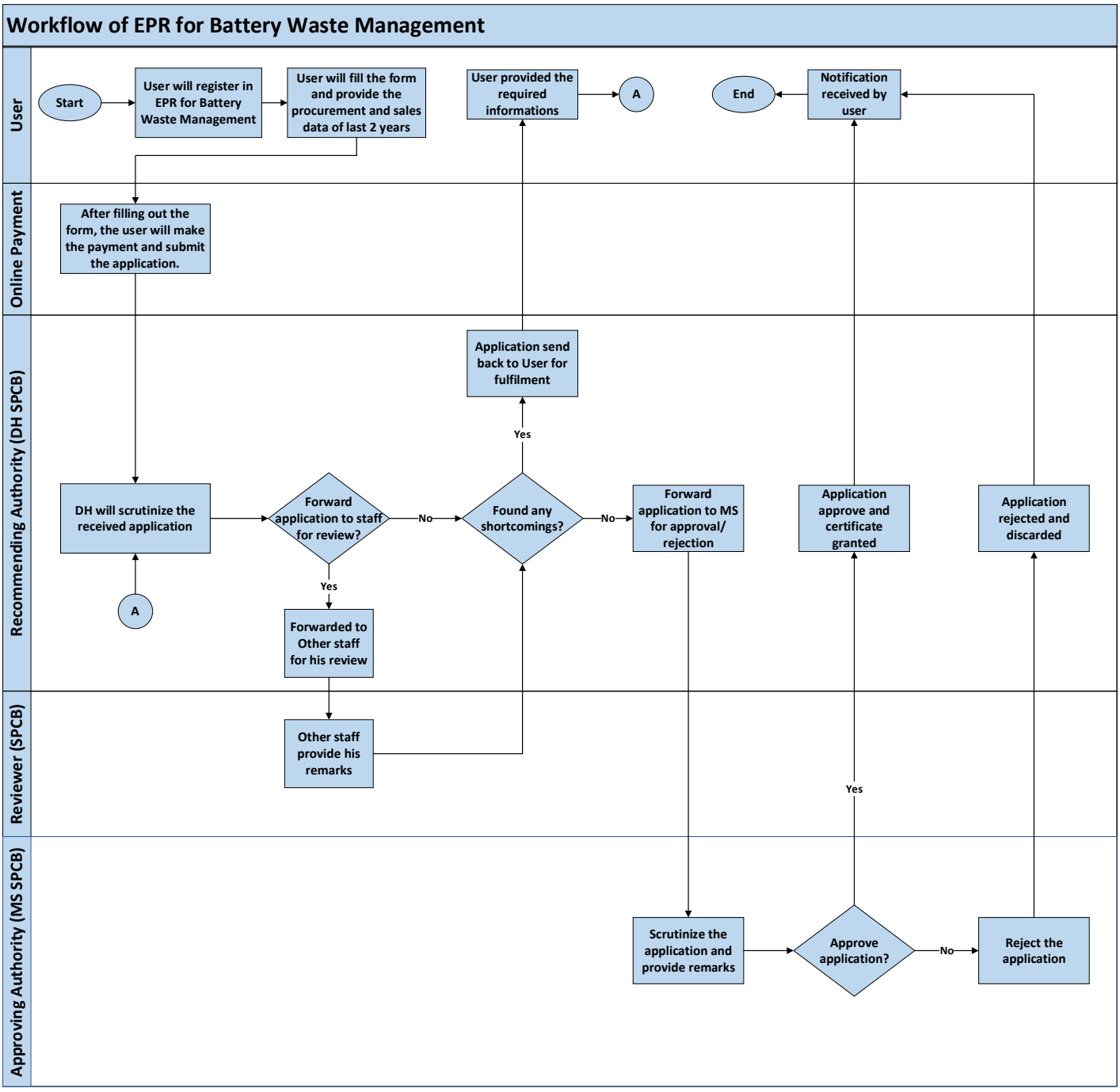
Document required for application submission.

- After creating an account, the applicant must log in to start the registration process.
- Before completing the application form, the applicant should ensure that the following documents are available in PDF format:

    - Company GST Certificate
    - PAN Card
    - Corporate Identification Number (CIN)
    - SPCBs/PCCs Consent and Authorization
    - Import Export Certificate
    - District Industries Centre (DIC) Registration

B. Registration Workflow for Battery Waste Management by Recycler in the EPR System

Recycler: The application submitted on SPCB



C. Workflow description

- The application will be reviewed and processed by the SPCB/PCC within 15 working days, with registration either granted or rejected during this period.
- If the application is incomplete due to missing documents or information, the applicant will be notified through the portal to provide the necessary details.

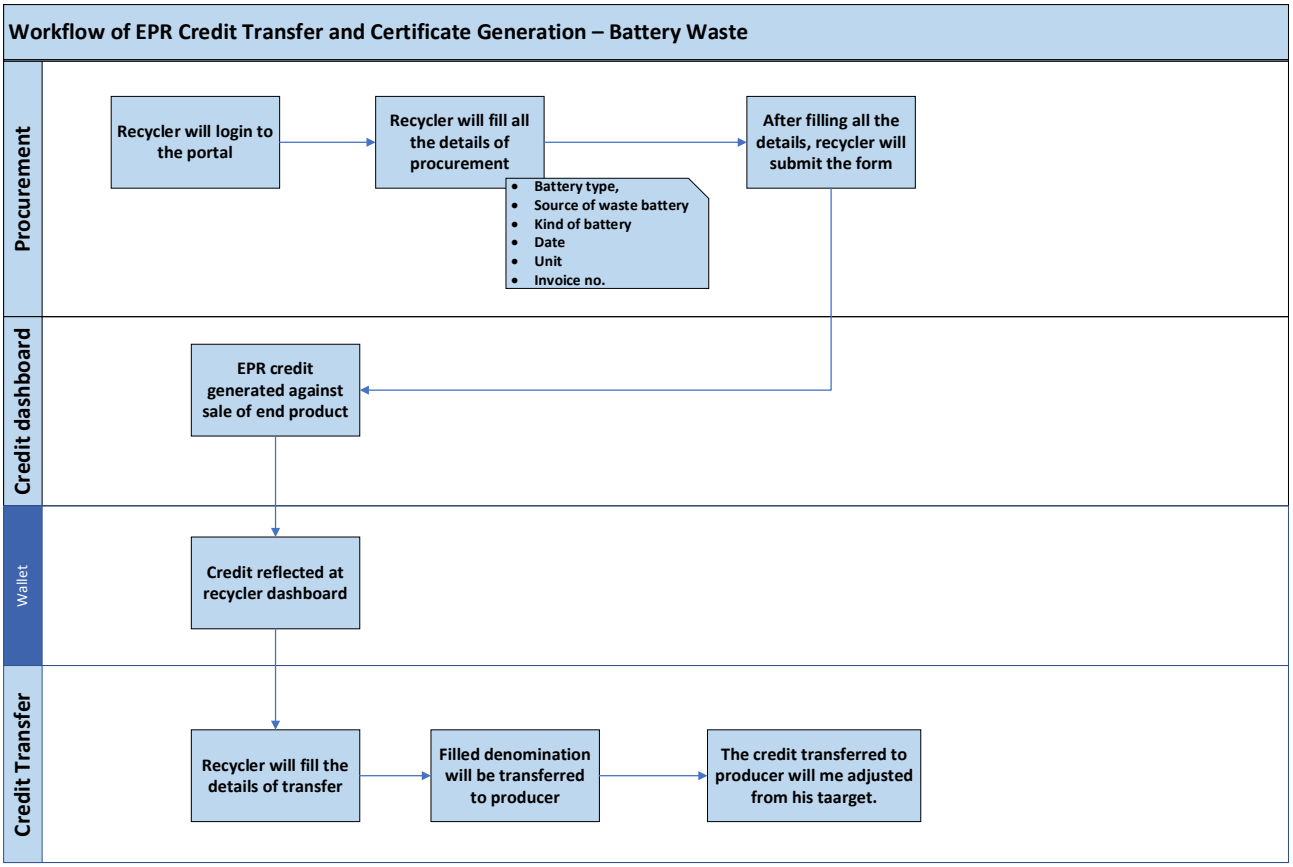
- Applications will be rejected if false or irrelevant information or documents are found, and the application fee will be forfeited. A new application with the required fees must be submitted for registration.
- A portal-generated registration certificate, signed by the Competent Authority, will be uploaded to the portal once approved.
- The portal allows internal processing within SPCBs/PCCs, with the Member Secretary of SPCB/PCC acting as the approving authority for issuing the certificate.
- A new registration will be valid for five years from the date of issuance.

Document required for application submission.

After creating an account, the applicant should log in to start the registration process. Before completing the application form, ensure that the following mandatory documents are available in PDF format:

- Company GST Certificate
- PAN Card of the company
- Process Flow Diagram of the recycling process.
- Consent issued by SPCBs/PCCs under the Air/Water Act and authorization under the Hazardous & Other Waste (Management & Transboundary Movement) Rules, 2016
- District Industries Centre (DIC) Certificate

D. Workflow & Description of Credit Transfer and Certificate generation of Battery Waste



Description:

a) The battery waste recycler will log into the portal using their credentials.
b) Upon successful login, they will need to provide the necessary details related to the procurement of waste batteries. Key information to be entered includes:
   - Type of battery
   - Source from where the waste battery was obtained.
   - Battery category or classification
   - Date of procurement
   - Measurement unit
   - Invoice number associated with the transaction.
c) After filling in and submitting these details, an EPR (Extended Producer Responsibility) credit is generated and displayed on the portal. This credit reflects the quantity of the end product sold.
d) The generated credit will also appear in the recycler's wallet within the portal for tracking purposes.
e) If the recycler wishes to transfer this credit to a producer, they must input the relevant transfer details and submit the request.
f) Upon submission, the credit will be successfully transferred to the producer. This credit will then be applied toward the producer’s EPR compliance target and documented in their annual return report.

Vendor Name: Successive Digital

b) Technical Details of Battery Waste Management EPR Portal

Technology Stack

1. General System Information

i. Architecture

- The system is designed using a **monolithic architecture**, providing all components (e.g., frontend, business logic, data management) are integrated into a single and unified application.

ii. Development Languages and Frameworks

- Frontend: PHP is used as the primary programming language for the backend of the application and the Laravel is a PHP-based framework that provides a clean and elegant syntax for developing web applications.

iii. Version Control

- Git is used for version control, allowing developers to track changes, collaborate effectively, and manage the codebase across different branches.

iv. Project Management Methodology

- The system follows the Agile methodology approach, emphasizing iterative development, frequent feedback, and adaptability to changes.

2. Technology Stack

i. Backend

- The server-side logic is developed by PHP and It is a primary programming language.
- Laravel is a PHP-based framework that provides a clean and elegant syntax for developing web applications.

ii. **Frontend**

- **HTML (HyperText Markup Language)** is the standard language used for creating and structuring the content of web pages.
- **CSS (Cascading Style Sheets)** is used for styling the web pages and providing a responsive design for better user experience.
- **JS (JavaScript):** A JavaScript that enables the creation of dynamic web applications.

iii. UI libraries and components:

- Materialize CSS and Bootstrap are two popular front-end frameworks that provide pre-designed components and a responsive grid system, which helps to build modern and consistent user interfaces.

iv. Databases

- **RDBMS (Relational Database Management System)** is used to store and manage data in a structured format using tables and relationships between data entities.
- **MySQL** is an open-source relational database management system (RDBMS) that is widely used for web applications and integrates seamlessly with PHP and Laravel.
- **Database Schema** will design in **hybrid,** and it combines both **normalized** and **denormalized** approaches to optimize performance and data integrity.

v. Third-party Integrations

  - The system integrates with several external API services to streamline operations.

3. Infrastructure and Deployment

i. System/Application Deployed

- FTP (File Transfer Protocol): It is used for manually or automatically transferring files from a local machine to the server where the application is hosted.

ii. Web Server

- **Apache HTTP Server (Apache)** is one of the most widely used web servers. It is responsible for handling HTTP requests from clients and delivering the appropriate content from system application.

4. **Networking and Security**
    i. **Networking Protocols:**
        - **HTTPS:** The system uses HTTPS for data communication and ensures that all communication between the client (user) and server is encrypted and secure, preventing data interception during transmission.
        - **VPN** is used for secure network communications, preventing unauthorized access and ensuring encrypted data transmission.

    ii. **Data Encryption:**
        - **AES** is used to protect sensitive data both at storage and in transit.

    iii. **Security**
        - **OTP-based Authentication (MFA):** Adds an extra layer of security by requiring a one-time password (OTP) during login, minimizing the risk of unauthorized access.

5. **Scalability and Performance**

    i. **Caching**
        - Redis, an in-memory data structure store, is used for caching.

6. **User Management and Access Control**

    i. **User Authentication:**

    - User authentication via a define and manage roles inside the system. This ensure that security policies and prevent unauthorised access.

    ii. **RBAC:**

    - **RBAC** implemented to control access based on user roles.

7. **Compliance and Regulatory**

    i. **Audit Logging:** User activity logs maintained.

        - The system must maintain **user activity logs**, recording all actions performed by users within the system to ensure traceability, security, and accountability.

8. **Development and Integration**

    i. **Integration:**

        - The system should support **APIs** for connecting both **internal** and **external** systems. This can integrate easily with various applications and services (within the organization or from third-party vendors).

    ii. **Code Maintenance:** Managed via Bitbucket.

- **Code Maintenance**: The code should be **managed via Bitbucket**, like version control practices will be employed to handle changes, collaboration, and the maintenance of the codebase.

Manpower: 17 resources

Project Manager	1
BA	1
Web Developers	8
Mobile Developer	2
Functional Tester	3
Security Tester	2

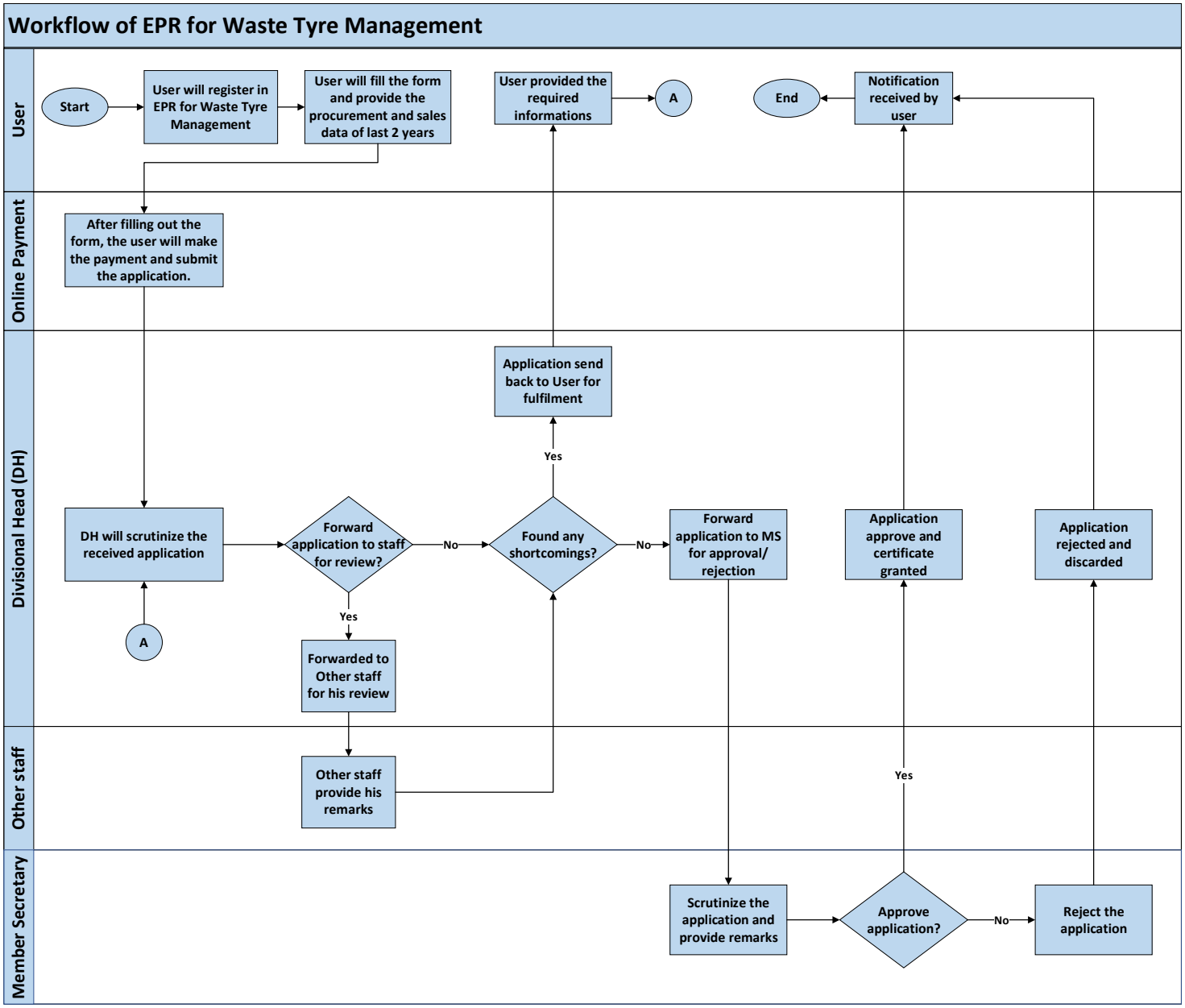
***Note**: The aforementioned resources represent a provisional list provided by the vendor for deployment on this EPR portal, as per the stipulated requirements. For detailed study and requirement kindly refer below URL.*

URL of the portal: **https://www.eprbatterycpcb.in/**

Annexure IV

a) Functional Details of Waste Tyre Management EPR Portal

A. Registration Workflow of EPR for Waste Tyre Management



B. Workflow description

- Producers, Recyclers, and Retreaders must register on the EPR portal at https://www.eprtyres.cpcb.in; only online applications are accepted.
- Registration is granted after submitting the required documents and data on the portal, following the instructions provided.
- Applicants must first sign up on the portal with basic information to receive login credentials.
- Logging into the portal requires an OTP sent to the registered mobile number.
- A detailed registration application, including company information, KYC documents, a request letter, self-declaration, and activity data, must be submitted.
- A registration fee is required at the time of application submission.
- The portal will acknowledge receipt of the registration application via email and generate a unique application number.
- CPCB will process the application and issue a Registration Certificate within 30 working days if the application is complete.
- If there are deficiencies, the application will be returned for correction, and the applicant will be notified via SMS to resubmit the required information.
- Applicants must respond to CPCB queries within 15 days, with penalties for providing false or incomplete information.
- Annual EPR obligations for Producers are calculated based on domestic sales or imported waste tyres, considering a 20% wear-and-tear factor.
- Recyclers must provide various documents, including consent letters, geotagged pictures, and videos of their facilities, for registration.
- Recyclers and Retreaders' facilities will be inspected within 3 months of registration to verify compliance before generating certificates.
- Non-compliance discovered during inspection may lead to registration suspension, with an opportunity for a hearing before actions are taken.
- After registration, Producers, Recyclers, and Retreaders must regularly upload sales and procurement data, submit periodic reports, and pay annual processing fees through the portal.

Registration Requirements for Producers, Recyclers, and Retreaders

A. Producers

- **Basic Information**
    - Company Name
    - Address of the corporate office
    - Email ID
    - Contact Number (Mobile)
    - PAN Number

- GST Number
- IEC Number
- CIN Number (optional)
- Year of Establishment
- Producer Category
- Name, Designation, Email, and Mobile of the authorized person.
- Aadhar number of the authorized person

- **Quantity of New Tyres Manufactured/Imported**

  - Financial year-wise data on manufacturing and imports (Metric Tonnes) for radial and bias ply (Nylon) tyres since FY 2019-20
  - Quantity of tyres in categories such as Motorcycle, Scooter, Passenger Car, Truck, Bus, LCV, Tractor Rear, Off the Road (OTR), and Others
  - Self-declaration supporting the quantity of tyres manufactured or imported since FY 2019-20

- **Quantity of New Tyres Sold Domestically/Imported**
  - Financial year-wise information on quantity of new tyres sold domestically and imported, including weight (Metric Tonnes) for radial and bias ply (Nylon) tyres since FY 2019-20
  - Quantity of sales and imports in categories such as Motorcycle, Scooter, Passenger Car, Truck, Bus, LCV, Tractor Rear, Off the Road (OTR), and Others
  - Self-declaration supporting past sales data since FY 2019-20

B. Recyclers

- **Basic Information**

  - Company Name
  - Details of the recycling facility including Address, Geo coordinates, Email ID, and Contact Numbers (Mobile & Landline)
  - Year of Establishment
  - CTE under Air and Water Act (number and date of issue)
  - CTO under Air and Water Act (number and date of issue)
  - Authorization under HoWM Rules (number and date of issue)
  - GST Number
  - PAN Number
  - CIN Number (optional)
  - Details of the authorized person including Name, Designation, Email, Mobile Number, and Aadhar number

- **Details of Recycling**

  - Waste tyre recycling capacity (MTA)

- Product type and recycling capacity
- Documents including:
  - Recycling capacity in MTA
  - Details of product type and its capacity
  - Geotagged video and pictures of the unit
  - Self-declaration on data authenticity and safety measures

C. Retreaders

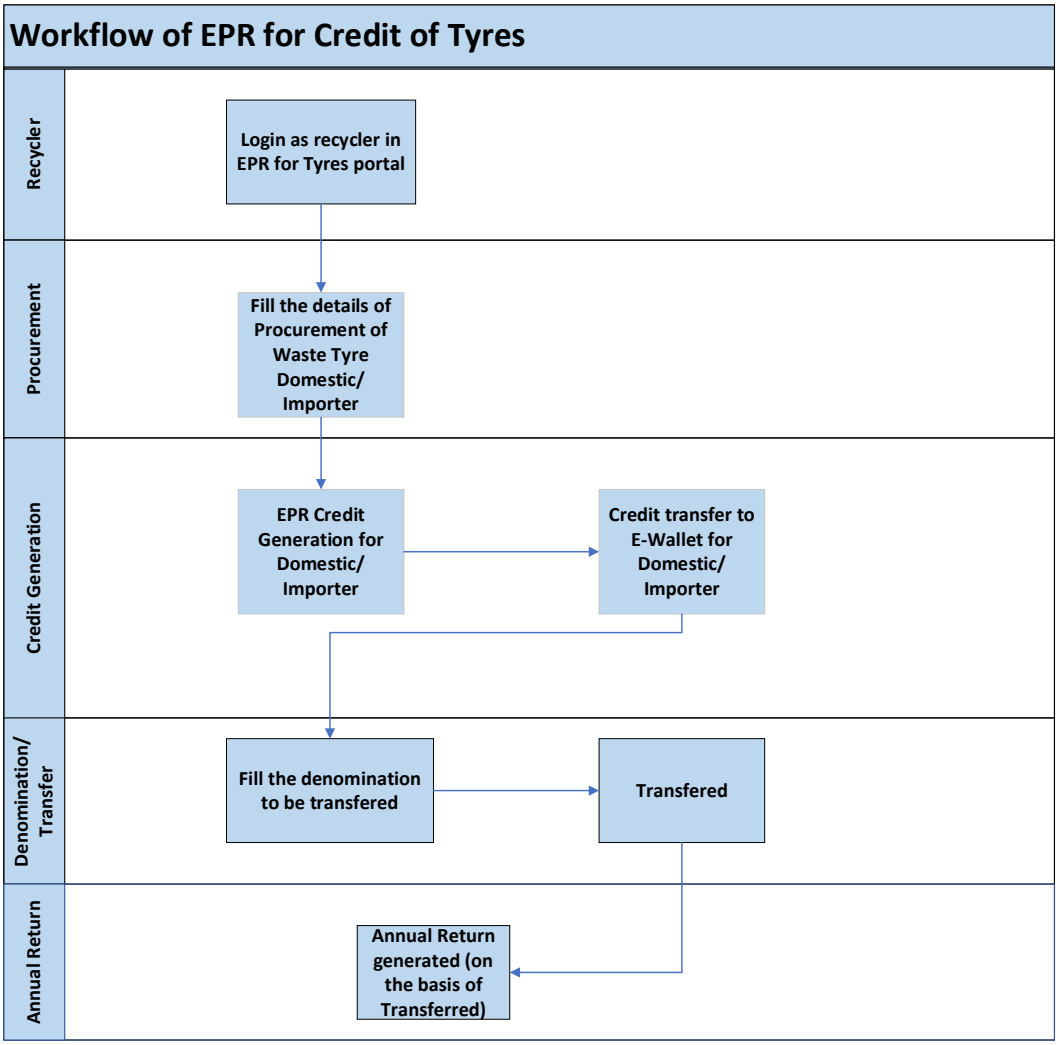
- **Basic Information**

  - Company Name
  - Details of the retreading facility including Address, Geo coordinates, Email ID, and Contact Numbers (Mobile & Landline)
  - Year of Establishment
  - CTE under Air and Water Act (number and date of issue)
  - CTO under Air and Water Act (number and date of issue)
  - Authorization under HoWM Rules (number and date of issue)
  - PAN Number
  - GST Number
  - CIN Number (optional)
  - Details of the authorized person including Name, Designation, Email, Mobile Number, and Aadhar number

- **Details of Retreading Facility**

  - Retreading capacity for both raw material and product
  - Geotagged video and pictures of the retreading facility
  - Self-declaration on data authenticity and safety measures

C. Workflow & Description of Credit Transfer and Certificate generation of Waste Tyre



Description:

The process flow and steps involved in credit transfer and certificate generation -

a) Procurement → Credit Generation→ Wallet → Certificate Generation → Certificate Transfer
b) Procurement of waste tyres
c) Generation of EPR credit against the sold quantity of product
d) The recycler can make entries in EPR credit generation at the certificate generation step.
e) The last process involves the transfer of certificate by recycler.

<u>Tyre Process Flow:</u>

The process flow and steps involved in credit transfer and certificate generation –

a) Recycler Sign-up → Procurement → Create EPR Credit → Certificate Generation and Transfer
b) Recycler will sign-up to register and fill the required details.

c) Recycler will be able to procure the waste as per the max. of CTO capacity.

d) EPR credit is totally based on end products.

e) Certificate generation is in available denomination as per the EPR credit.

f) Recycler will transfer the certificate to Domestic/Importer

Vendor Name: Successive Digital

b) Technical Details of Waste Tyre Management EPR Portal

1. General System Information

i. Architecture

- The system is designed using a **monolithic architecture**, providing all components (e.g., frontend, business logic, data management) are integrated into a single and unified application.

ii. Development Languages and Frameworks

- Frontend: PHP is used as the primary programming language for the backend of the application and the Laravel is a PHP-based framework that provides a clean and elegant syntax for developing web applications.

iii. Version Control

- Git is used for version control, allowing developers to track changes, collaborate effectively, and manage the codebase across different branches.

iv. Project Management Methodology

- The system follows the Agile methodology approach, emphasizing iterative development, frequent feedback, and adaptability to changes.

2. Technology Stack

i. Backend

- The server-side logic is developed by PHP and It is a primary programming language.
- Laravel is a PHP-based framework that provides a clean and elegant syntax for developing web applications.

ii. Frontend

- **HTML (HyperText Markup Language)** is the standard language used for creating and structuring the content of web pages.
- **CSS (Cascading Style Sheets)** is used for styling the web pages and providing a responsive design for better user experience.

iii. UI libraries and components:

- Materialize CSS and Bootstrap are two popular front-end frameworks that provide pre-designed components and a responsive grid system, which helps to build modern and consistent user interfaces.

iv. Databases

- **RDBMS (Relational Database Management System)** is used to store and manage data in a structured format using tables and relationships between data entities.
- **MySQL** is an open-source relational database management system (RDBMS) that is widely used for web applications and integrates seamlessly with PHP and Laravel.
- **Database Schema** will design in **hybrid,** and it combines both **normalized** and **denormalized** approaches to optimize performance and data integrity.

v. Third-party Integrations

The system integrates with several external services to streamline operations:

- GST API: This API is used to integrate with Goods and Services Tax (GST) calculations, invoicing, and reporting, ensuring compliance with tax regulations.
- SMS API: Integration with Aadhaar services for user identification. Integrated to send automated SMS notifications for order confirmations, shipment updates, and alerts.
- Emsigner Gateway: Validation of Permanent Account Numbers and Company Identification Numbers.
- Payment Gateway (Payu Money): Secure processing of financial transactions.
- GST API: Seamless integration with Goods and Services Tax systems for compliance and reporting.
- Google Maps: Integrated to provide location services, like geolocation tracking, route mapping, and location-based services within the system.
- Consent API: Used to manage user consent for data processing and ensure compliance with regulations such as GDPR.

3. Infrastructure and Deployment

I. System/Application Deployed

- FTP (File Transfer Protocol): It is used for manually or automatically transferring files from a local machine to the server where the application is hosted.

II. Web Server

- **Apache HTTP Server (Apache)** is one of the most widely used web servers. It is responsible for handling HTTP requests from clients and delivering the appropriate content from system application.

4. Networking and Security

i. Networking Protocols:

- **HTTPS:** The system uses HTTPS for data communication and ensures that all communication between the client (user) and server is encrypted and secure, preventing data interception during transmission.
- **AES (Advanced Encryption Standard):** It is one of the most secure encryption algorithms used for encrypting sensitive data.

ii. Security

- **OTP-based Multi-Factor Authentication (MFA):** Adds an extra layer of security by requiring a one-time password (OTP) during login, minimizing the risk of unauthorized access.

5. **Scalability and Performance**

   i. **Caching**
   - Redis, an in-memory data structure store, is used for caching.

6. **User Management and Access Control**

   i. **User Authentication:**

   - User authentication via a define and manage roles inside the system. This ensure that security policies and prevent unauthorised access.

   ii. **RBAC:**

   - **RBAC** implemented to control access based on user roles.

7. **Compliance and Regulatory**

   i. **Audit Logging:** User activity logs maintained.

   - The system must maintain **user activity logs**, recording all actions performed by users within the system to ensure traceability, security, and accountability.

8. **Development and Integration**

   i. **Integration:**

   - The system should support **APIs** for connecting both **internal** and **external** systems. This can integrate easily with various applications and services (within the organization or from third-party vendors).

   ii. **Code Maintenance:** Managed via Bitbucket.

   - **Code Maintenance**: The code should be **managed via Bitbucket**, like version control practices will be employed to handle changes, collaboration, and the maintenance of the codebase.

Manpower: 16 resources

BAs	2
Developers	11
Testers	3

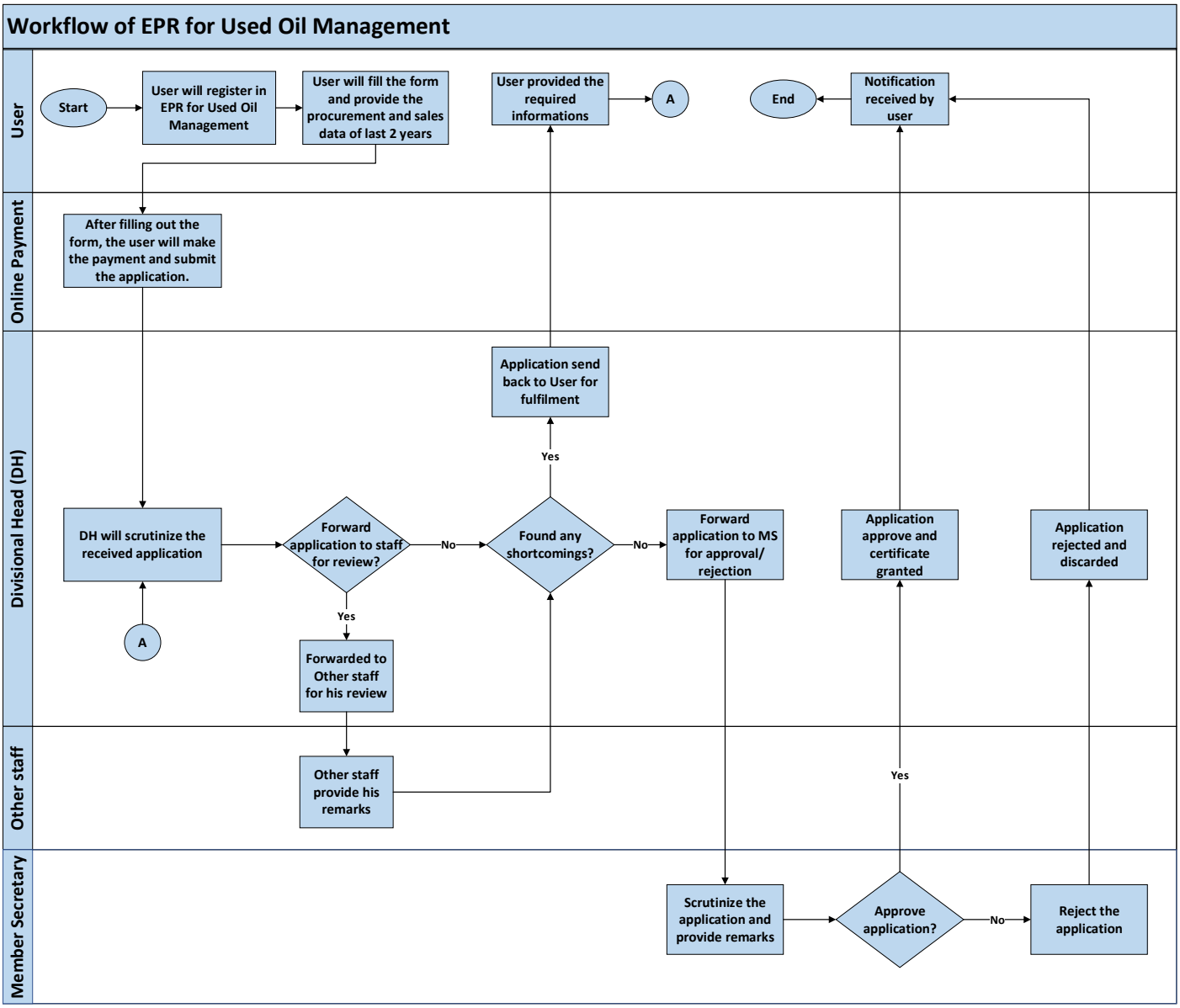
***Note**: The aforementioned resources represent a provisional list provided by the vendor for deployment on this EPR portal, as per the stipulated requirements. For detailed study and requirement kindly refer below URL.*

URL of the portal: **https://www.eprtyrescpcb.in/**

Annexure V

a) Functional Details of Used Oil Management EPR Portal

A. Registration Workflow of EPR for Used Oil Management



Application Submission

- After logging in, the user should select the type of entity (if multiple entities were selected during sign-up) and start the registration process.
- The user must ensure that the following documents are available in PDF format for completing the registration form:
    - Company GST certificate
    - PAN card of the company

- IEC certificate
- CIN document
- TIN document
- PAN card of the authorized person

B. Workflow description

- CPCB will process the application within 21 working days and decide whether to grant or reject the registration within this timeframe.
- If the application is incomplete or missing documents, CPCB will notify the applicant through the portal. The applicant will then need to provide the required information for the application to continue processing.
- If false or irrelevant information or documents are submitted, the application will be rejected, and the application fees will be forfeited. A new application, along with the appropriate fee, will need to be submitted for registration.
- A digitally signed Registration Certificate will be issued through the portal once the application is processed and approved.
- The portal allows for internal processing of applications within CPCB. The Member Secretary of CPCB will be responsible for approving and issuing the Registration Certificate.

Vendor Name: Velocis

b) Technical Details of Used Oil Management EPR Portal

1. General System Information

i. Architecture

- The system employs two instances, which consisting of 1 application and 1 database.
- Each service will be designed to perform specific functions and communicates via lightweight protocols, ensuring scalability, maintainability, and modular updates.

ii. Development Languages and Frameworks

- Frontend: Frontend: PHP is used as the primary programming language for the backend of the application and the Laravel is a PHP-based framework that provides a clean and elegant syntax for developing web applications.

iii. Version Control

- SVN is used for version control, allowing developers to track changes, collaborate effectively, and manage the codebase across different branches.

iv. Project Management Methodology

- The system follows the Agile methodology, emphasizing iterative development, frequent feedback, and adaptability to changes.

2. Technology Stack

i. Backend

- The server-side logic is developed by PHP and It is a primary programming language.
- Laravel is a PHP-based framework that provides a clean and elegant syntax for developing web applications.

ii. Frontend

- **HTML (Hypertext Markup Language)** is the standard language used for creating and structuring the content of web pages.
- **CSS (Cascading Style Sheets)** is used for styling the web pages and providing a responsive design for better user experience.
- **JS (JavaScript):** A JavaScript that enables the creation of dynamic web applications.

iii. UI libraries and components:

- Materialize CSS and Bootstrap are two popular front-end frameworks that provide pre-designed components and a responsive grid system, which helps to build modern and consistent user interfaces.

iv. Databases

- The system uses relational databases, specifically PostgreSQL for managing structured data.
- These databases follow a normalized schema, ensuring efficient data organization, minimizing redundancy, and improving query performance.

v. Third-party Integrations

The system integrates with several external services to streamline operations:

- Bill Desk: Integration with Bill Desk services for payment processing.
- GST: Seamless integration with Goods and Services Tax systems for compliance and reporting.
- SMS APIs: Integrated to send automated SMS notifications for order confirmations, shipment updates, and alerts.

3. Infrastructure and Deployment

i. Setup

- The system operates on a cloud-based infrastructure, leveraging the resources of NIC (National Informatics Centre).
- Being cloud-based, the system benefits from scalability, flexibility, and easier management of resources compared to traditional on-premises setups.
- NIC provides robust hosting solutions tailored to government needs, ensuring high availability and compliance with national IT standards.
- The system is deployed manually, with **VM deployment**.

ii. Web Server

- The application uses **Apache/2.4.57** as its web server and it is high-performance server.
- The system uses a **fixed VM** setup, provided by NIC, and lacks horizontal or vertical scaling mechanisms.

4. Networking and Security

- **Networking Protocols:**
- The system uses HTTP/HTTPS for data communication.
- HTTPS (Hypertext Transfer Protocol Secure) ensures that all communication between the client (user) and server is encrypted and secure, preventing data interception during transmission.
- **Security Practices**
- **Firewalls:** Protect the network by filtering incoming and outgoing traffic based on predefined security rules.
- **VPN (Virtual Private Network):** Ensures secure and encrypted connections over the internet, adding an additional layer of protection for remote access.
- **TLS/SSL (Transport Layer Security/Secure Sockets Layer):** Encrypts communication over the network to secure sensitive information, such as login credentials and personal data.
- **Security Framework**
- **OWASP guidelines:** It is focus on improving the security of software.
- **OTP-based Multi-Factor Authentication (MFA):** Adds an extra layer of security by requiring a one-time password (OTP) during login, minimizing the risk of unauthorized access.
- **Data Encryption:**
- Sensitive data is encrypted **at rest**.

5. Monitoring and Maintenance

i. Testing

- In the Unit Testing, human testers to perform manually to verifying the functionality, usability, and performance of the system to identify and resolve issues before deployment.

ii. Backup Strategy

- Automated backups are conducted on daily basis. This ensures critical data is regularly and securely stored, minimizing the risk of data loss in case of failures or unforeseen events.

iii. System Updates

- Updates and patches to the system are managed manually. It requires to avoid downtime or disruptions during update implementations.

3. **Scalability and Performance**
    i. **Scaling**
        - The system operates on a fixed server and does not support horizontal scaling or vertical scaling.

    ii. **Performance Optimization To enhance system performance:**
        - The system's performance optimization techniques are used as route caching, autoload optimization, and query optimization.

    iii. **Caching**
        - Redis, an in-memory data structure store, is used for caching.

    iv. **Monitoring**
        - System performance and response times are monitored through log analysis and other sever level.

4. **User Management and Access Control**

    i. **User Authentication:**

    - User management relies on **manual authentication** setup and includes **two-factor authentication (2FA)**.

    ii. **RBAC:**

    - **RBAC** implemented to control access based on user roles.

    iii. **Data Protection: Compliant with NIC standards.**

    - User data is protected using input validation, encryption, decryption, and hashing techniques to ensure privacy and security.

8. Data and Backup

i. **Storage:** Cloud

- The storage should support on **cloud storage** (for scalability, flexibility, and cost-efficiency).

ii. **Regular Backup:** Validated with EPR certificates.

- Regular backups are ensured to data recovery in case of failure.

iii. **Data integrity: Integrity Check**

- Data integrity is implemented to verify consistency and accuracy.

9. Compliance and Regulatory

i. **Regulatory Compliance:** No industry-specific regulations. The system complies with **GDPR** (General Data Protection Regulation).

- The system does need to comply with GDPR (General Data Protection Regulation).

ii. Audit Logging:

- The **Audit trails** are implemented to track system activities.

10. Development and Integration

i. Integration: REST APIs for internal and external systems.

- The system should support for connecting both **internal** and **external** systems manually as required.

ii. Code Maintenance: Managed via SVN.

- **Code Maintenance**: The code should be **managed via SVN**, like version control practices will be employed to handle changes, collaboration, and the maintenance of the codebase.

11. Support and Documentation

i. Documentation: Architecture diagrams

- **Documentation**: **SRS** document will be created for the common EPR System, and another document (Technical Design Document) will be created upon request.

ii. Support:

- **Support**: Support will be provided by Velocis entities:

12. Future Considerations

i. **Planned Upgrades**: Database enhancements.

- The system will undergo **database enhancements** to improve performance, scalability, security, and overall functionality.

ii. **Scalability Improvements:**

- The areas for future optimization are includes **server scaling** and **codebase cleanup**.

Manpower: 11 resources

Team Lead	1
BA	1
Designer	1
Fulltime Developer	5
Partial Tester	2
Database	1

***Note**: The aforementioned resources represent a provisional list provided by the vendor for deployment on this EPR portal, as per the stipulated requirements.*

URL of the portal: **https://eprusedoil.cpcb.gov.in/**

Note: *The development of workflow for Credit transfer and Certificate generation for Used Oil is under progress. For detailed study and requirement kindly refer below URL.*