INDUS ACTION

Enabling Social Protection

Product Requirements Document *for* Building & Other Construction Workers Digital Public Goods

Change Log			
Version	Date	Author	Remarks
1.0	13/Mar/2025	Ankit Saxena, Indus Action	Prepared and published the first cut of the PRD document

Glossary

Administrative Burden: a term coined by Pamela Herd and Donald Moynihan (2019) to explain burdens experienced by citizens in citizen-state interactions. The concept categorises these burdens into learning, compliance, and psychological costs.

BoCW Board: the tripartite Building and other Construction Workers Welfare Board with representatives from workers, employers, and the government tasked with the registration of construction workers at the state level and the promotion of their welfare through an array of schemes, initiatives, or facilities.

BoCW Card: also alternatively known as the labour card, is a piece of document received by a construction worker after successfully registering with a state's BoCW Board. The BoCW card must be regularly renewed to enable access to BoCW schemes.

Cess: specialised fund generated by levying a 1% cess on the construction costs at major building sites, which employers remit to the government.

Discovery: the dual process wherein a citizen is able to discover government schemes and policies they are eligible for, and conversely, the state is able to discover the wide pool of citizens eligible for a scheme.

Interoperability: refers to the ability of different systems, devices, or software components to connect and communicate with each other seamlessly. It ensures that these entities can work together effectively without requiring significant effort from end users.

Live registered members: construction workers who possess a valid (unexpired) BoCW or labour card. Construction workers can remain live registered members by continuously renewing their labour card.

Validation: the process of verifying the identity, demographic status or occupation status of a citizen.

MVP: An MVP (Minimum Viable Product) is the most basic version of a product that includes the most essential features needed to solve a problem and gather real user feedback.

Edge case: Edge cases are rare or extreme scenarios that test the limits of a system, often involving unusual inputs, boundary values, or unexpected user behaviors that could cause errors or failures.

Module: A module is a self-contained unit of code or functionality within a larger system, designed to perform a specific task and often reusable across different parts of a program or application.

1. Introduction

India's construction sector, a pivotal contributor to the nation's GDP, boasts a vast workforce that is expected to grow substantially by 2030. Despite the sector's economic significance, its workforce faces dire socio-economic challenges, exacerbated by the informal nature of their employment. The Building and Other Construction Workers (BoCW) Act of 1996 seeks to address these issues by offering social security and welfare benefits to construction workers. However, a review of the Act's implementation reveals critical shortcomings, notably low worker registration rates and inefficient fund utilization, which hamper the delivery of its intended benefits.

Among the several key levers to overcome these shortcomings, implementing a tech solution is central to almost every state BoCW board. Such a solution aims to model all workflows and processes, enhance worker awareness and experience, reduce administrative burdens, streamline documentation, minimize inclusion and exclusion errors, improve validation protocols, and enhance backend operational efficiency.

The objective of this document is to outline the product requirements for building such a tech solution so that it can be leveraged by different state boards and stakeholders to develop or improve their systems. Furthermore, Indus Action's vision is to utilize this Product Requirement Document (PRD) to develop a Digital Public Good that different state boards can adopt, and thus enabling them to realize the intended benefits for workers, board staff, and other stakeholders.

2. Key Design Principles

The existing systems and process which Indus Action's team has reviewed and analysed struggle with below challenges -

- Accurate Worker Identification and Registration: Difficulty in capturing the transient workforce and preventing duplicate registrations.
- Cess Collection and Contribution Management: Challenges in tracking employer contributions and ensuring compliance with the BOCW Cess Act.
- Benefit Delivery and Scheme Management: Complex processes for disbursing benefits and managing various welfare schemes under the BOCW Act.
- Data Management and Reporting: Lack of comprehensive data for informed decision-making and program evaluation.

To address these challenges the theme of the PRD centers around below design principles -

- **Modularity** - developing a modular product, comprising a set of interoperable modules that address specific functionalities related to BoCW board. States can "cherry-pick" the modules they require and integrate them into their existing systems or build upon them.
- **Interoperability** - This would involve following standard best practices while exposing relevant functionality through APIs and developing protocols for interdepartmental data sharing to improve data validation for claims verification processes.
- **Simplicity & Ease of Use** - The system should follow the principles of minimalist UI by keeping the interface clean with only essential elements to avoid overwhelming the citizens. System should use intuitive icons and short, simple sentences for easy navigation. There should be wizard-style workflows for guiding users through processes, with clear progress indicators. Also, focus on language and localization should be there for all modules.
- **Foundational Scope for MVP Development -** The MVP version of the product should focus on building a robust foundation by incorporating essential core modules that address key challenges in the construction sector. These modules include Worker Identification & Registration, Cess Collection & Contribution Management, Benefit Delivery & Scheme Management, Grievance Redressal, and Data Management & Reporting. Each module should be designed to handle various edge cases, ensuring scalability, reliability, and adaptability across different states and implementation scenarios.

3. Functional Requirements

This section would elaborate on the functional requirements in the system. The requirements are elaborated in the form of modules.

3.1. Worker Identification & Registration

This module ensures accurate identification, seamless registration, and secure validation of construction workers. Since many workers are migrant, illiterate, or lack formal employment records, the system must support multiple registration pathways and prevent duplicate or fraudulent registrations.

It is important to note that all the welfare schemes are available to only those construction workers who are duly registered with the department. Further, the registration is to be duly renewed every year to become eligible for any of the welfare schemes.

Below are the use cases which are part of the this module -

3.1.1. User Personas & Roles

1. Construction Workers (End Users)
    - Need an easy, guided registration process in their preferred language.
    - Many may lack digital literacy, requiring assisted registration options.

- Should be able to track registration status and update information as needed.

2. Employers / Contractors
   - Can bulk-register workers employed on their projects.
   - Should receive notifications on pending verifications and compliance status.

3. Common Service Centers (CSCs) / Labor Officials
   - Assist workers in offline or assisted registration.
   - Verify worker documents and approve/reject registrations.

4. BoCW Board Officials
   - Manage the registration and renewals
   - Manage workforce databases and ensure compliance with state labor policies.

3.1.2. Use Cases

The Worker Registration & Identification process follows multiple user flows:

1. Self Registration (worker via web/mobile) - A construction worker wants to register independently using a smartphone or web portal.

2. Assisted Registration (via Common Service Centers or Employers) - A worker visits a CSC or is registered by an employer on-site.

3. Bulk Employer Registration - A contractor registers multiple workers employed under a project.

4. Registration Status Tracking & Updates - A worker wants to check their registration status or update details.

5. Download Labor Card - A worker needs to download their labor card for job verification or benefit claims.

6. Registration Amendment (Updating Worker Details) - A worker needs to update their profile due to changes in employment, location, life events, or personal details.

7. Registration Renewal - A worker's registration is valid for one year, and the worker wants to renew it to continue receiving benefits.

8. Registration Approval Workflow - BoCW officials want to review the registration details and approve/ reject the registration request.

9. Unique Number Generation - System generates a unique identifier for all successful registrations.

10. Notifications - System generates notifications at various stages of the registration process to keep the users updated.

11. Auditing - System maintains an audit trail of all changes made to the registration request.

12. Identity Verification & Deduplication - System leverages Aadhar for eKYC and worker authentication (biometric authentication). System leverages relevant fuzzy matching algorithms to check for duplicates.

13. Data Analytics & Reporting - BoCW officials analyze the registration, renewal trends, insights and KPIs such as (not an exhaustive list)
    - New worker registrations, renewals, and drop-off rates across different regions and time periods.
    - Worker distribution by age, gender, skill level, and location
    - Average time taken for registration approvals
    - Pending verifications and backlog cases to optimize workload management
    - Common reasons for registration rejections and areas where process improvements are needed

3.2. Cess Collection & Contribution Management

The BOCW Cess Act mandates that construction projects above a certain cost threshold contribute a cess (levy) to fund welfare schemes for workers. However, tracking employer compliance, ensuring accurate cess collection, and reconciling payments remain major challenges. This module would provide the required functionalities/ features to streamline cess calculation, payment, and compliance monitoring.

3.2.1. User Personas & Roles

1. Employers / Contractors
    - Can register their projects and declare cess liability.
    - Make cess payments online and track compliance status.

2. BoCW Board Officials
    - Track overall cess collection and employer compliance.
    - Identify defaulters and issue notices.
    - Approve cess adjustments, refunds, and exemptions.

3.2.2. Use Cases

1. Employer Registration & Project Declaration - A contractor starts a new construction project and must register it for cess compliance.

2. Cess Payment by Employers - A registered employer makes a cess payment for an ongoing project.

3. Compliance Tracking & Reminders - An employer has pending cess dues, and the system sends automated reminders.

4. Cess Reconciliation & Refunds - An employer has overpaid cess and requests a refund.

5. Cess Calculation Engine - Administrators configure cess rates per state regulations, and auto-adjustment for cess slabs & exemptions.

6. Online Payment Gateway - There is a payment gateway availability with multiple payment methods (UPI, NEFT, debit/credit cards) with instant account/ ledger updates for book keeping and transparency.

7. Data Analytics & Reporting - BoCW officials analyze cess collection trends & detect anomalies, with options such as graphical insights into cess collection trends, AI-driven fraud detection for underreported cess, etc

3.3. Benefit Delivery & Scheme Management

TheBoCW Act provides various welfare benefits for the registered construction workers. This module aims to digitize and streamline the process of managing schemes, claim application, and benefit disbursement to eligible workers.

3.3.1. User Personas & Roles

1. Construction Workers (Primary Beneficiaries)
   - Apply for various BoCW benefits and welfare schemes.
   - Track application status and receive notifications on approvals/rejections.
   - Submit required documents digitally to reduce paperwork delays.

2. BoCW Board Officials (State/Nodal Administrators)
   - Process and verify benefit applications.
   - Approve or reject applications based on eligibility criteria.
   - Monitor benefit utilization trends and identify gaps.
   - Manage scheme lifecycle, new scheme definition and business rules configuration.

3. Employers / Contractors
   - Assist workers in benefit registration.
   - Provide employment verification for worker applications.

4. Accounts Personale
   - Approve and disburse approved benefits directly to worker bank accounts / DBT (Direct Benefit Transfer).

3.3.2. Use Cases

1. Worker Benefit Application Flow - A registered worker applies for a BoCW welfare benefit (e.g., medical assistance, child education support).

2. Automated Benefit Disbursement Flow (PFMS Integration) - A worker’s approved benefits are transferred directly to their bank account.

3. New Scheme Creation & Configuration - A BoCW board official wants to create a new welfare scheme for construction workers and configure the business rules.

4. Scheme Modification & Rule Updates - The government revises eligibility criteria for a scheme, requiring the BoCW board to update its configuration.

5. Scheme Budget Allocation & Fund Tracking - BoCW board needs to allocate funds to different schemes and track their utilization.

6. Scheme Expiry & Renewal - A time-bound scheme reaches its expiry date, and the BoCW board decides whether to renew or terminate it.

3.4. Grievance Redressal

The Grievance Redressal module ensures that construction workers and stakeholders can raise complaints, track their resolution, and receive timely responses. Since many workers face challenges such as delays in benefit disbursement, incorrect registration details, or lack of access to entitlements, an efficient redressal mechanism is essential for transparency, accountability, and trust.

This module enables workers to submit grievances through multiple channels (web portal, mobile app, helpline, walk-in centers) and allows authorities to efficiently categorize, assign, track, and resolve issues through an integrated system.

3.4.1. User Personas & Roles

1. Construction Workers (End Users)
   - Need to register grievances, receive updates on status and resolution.

2. Grievance Officer
   - Updates grievances with resolutionS
   - Escalates grievance tickets whenever necessary

3.4.2. Use Cases

1. Grievance Registration - A registers a grievance for an issue he/she is facing.

2. Complaint Processing & Resolution - A BoCW officer responsible for addressing a worker's grievance updates the ticket with relevant resolution.

3. Escalation Mechanism for Unresolved Complaints - A worker’s complaint remains unresolved beyond the standard processing time, and thus triggers an escalation.

4. Feedback & Grievance Closure - A worker's grievance has been resolved, and needs to be closed.

3.5. Content Management

System should support basic content management capabilities. This will play a crucial role in ensuring that construction workers, employers, and welfare board officials have access to accurate, updated, and localized information related to registration, benefits, skill development, and grievance redressal.

3.5.1. User Personas & Roles

1. Construction Workers (End Users, often with low digital literacy)
    - Need to understand or be made aware of the registration process, benefit details, documentation requirements, important timelines, etc

2. Employer/ Contractor
    - Needs to understand guidelines on cess contributions/ compliance, legal documentation related to worker benefits, etc

3. Welfare Board Official (State-Level Admin)
    - Needs to manage & update policies, circulars, and scheme details
    - Publish compliance reports & training materials

3.5.2. Use Cases

1. Access Information and FAQs - Worker wants to access information pertaining to benefits and the rules for availing the benefits.

2. Publish a New Scheme Update - Welfare Board Officials need to either publish a new scheme or an update on an existing scheme and its rules.

3. Accessing Cess Compliance Guidelines - Employers need to access and understand the Cess compliance guidelines.

3.6. Dashboards and Reports

The Dashboard & Reports Module is essential for real-time monitoring, decision-making, and policy evaluation. It will provide actionable insights to welfare board officials, employers, and field officers, ensuring efficient program implementation and compliance tracking.

3.6.1. User Personas & Roles

1. Welfare Board Official
    - Needs to track metrics and trends for Worker Registration, Cess Collection, Benefit Disbursement, and Grievance Redressal

2. Employer / Contractor
    - Needs to track cess compliance and worker registration status

3.6.2. Use Cases

1. Reviewing Worker Registrations Metrics - BoCW board official wants to review metrics related to worker registrations, such as (not an exhaustive list) -

Module	Metric	Definition
New Worker Registration	Total Registered Workers	Number of workers successfully registered (can be filtered across date-time and region)
	New Registrations Per Month	Number of new worker registrations each month (can be filtered across region)
	Registration Completion Rate	% of users who start vs. complete registration (can be filtered across date-time and region)
	Average Time to Register	Time taken from initiation to approval (can be filtered across date-time and region)
Registration Renewals	Total Renewal Rate	% of workers renewing their registration yearly (can be filtered across date-time and region)
	Renewal Drop-Off Rate	% of workers who start but do not complete renewal (can be filtered across date-time and region)
	Average Time to Renew	Time taken from renewal request submission to approval (can be filtered across date-time and region)
	Late Renewals	% of workers renewing after the deadline (can be filtered across date-time and region)

2. Tracking Cess Payment Compliance - BoCW board official wants to review metrics related to cess collection, such as (not an exhaustive list) -

Module	Metric	Definition
Cess Collection & Contribution Management	Total Registered Employers	Number of employers successfully registered in the system.
	New Employer Registrations Per Month	Number of new employers registering each month.
	Total Cess Collected	Total cess amount collected within a specific period.
	Cess Collection Rate	% of expected cess collected from registered employers.

	Average Cess Payment Amount	The average cess amount paid per employer.
	Cess Payment Timeliness Rate	% of cess payments made before the due date.

3.7. Functional Audit

There should be a log created for any change that happens to a case. All these changes should be shown on the case as audit history. Below are the details that should be captured -

- Date and time of the change
- User - should be an actual user name or System (an example for System would be a case that gets auto escalated and thus changing a few fields)
- Fields changed - field names which were changed with old and the new value
- Remarks - system should support configuring remarks for a few scenarios such as creation of a new registration case, case status changed to in-progress, closed, escalated, etc.

3.8. Notification Rules

System should support configuring different notification rules for various events and changes. Each rule should have below fields -

- Event - single select from possible values as new registration, renewal, claim application submitted, etc
- Notification channel - multi-select from possible values as SMS, Whatsapp, Email
- Notification template - notification message with placeholders to select specific fields from the registration case.
- Receiver - multi-select from possible values as citizen, board official, etc

3.9. Role Based Access Control

Since the system is meant to serve construction workers, welfare board officials, and other stakeholders, a well-defined role-based access control (RBAC) mechanism is required to ensure the security, data integrity, and efficient workflows.

- System should support creating fine-grained permissions for different modules.
- System should support creating roles that can have specific modules and permissions mapped.
- System should support creating groups of users.
- System should support assigning roles either directly to users or to groups.
- System should also be able to differentiate between logged in users and anonymous users.

Such a role based access control could like - (not an exhaustive list)

Role	Permissions	Modules Accessible
Worker	Register/ Renew/ Amend Registration, Track Status, Download Labor Card	Worker Identification & Registration
	Apply for benefits, View Schemes	Benefit Delivery & Scheme Management
	Raise Complaint, Close Complaint	Grievance Redressal
BoCW Official	Approve/Reject registrations	Worker Identification & Registration
	Approve/Reject Claims, Manage Scheme Lifecycle	Benefit Delivery & Scheme Management
	Edit and Update Complaint Status	Grievance Redressal
Employer	Register Workers, Pay Cess, Track Compliance	Cess Collection and Contribution Management

3.10. Administration

The Administration Module is a critical part of the system, ensuring smooth operations, configuration management, user access control, and overall governance of the platform. This module will provide administrative users with the tools to manage users, configure system settings, monitor performance, and oversee compliance. System should support below use cases - (not an exhaustive list)

1. User Management & Access Control
    - Creating and managing user accounts
    - Assigning and modifying user roles and permissions
    - Tracking user activity logs and audit trails
    - Bulk onboarding of administrative users

2. System Configuration & Policy Management
    - Defining cess contribution slabs and employer payment schedules
    - Configuring eligibility criteria and business rules for welfare schemes
    - Setting up workflow automation for approvals and escalations

3.11. Skill Development and Occupational Safety

This module aims to improve the employability, productivity, and safety of construction workers by providing structured training programs, and workplace safety measures.

- System should support offering courses (masonry, plumbing, carpentry, etc.). for workers to develop their skill and also get digital certificates upon completion of the courses.

- System should support providing training on workplace safety to workers and offer digital certificates on completion of such training.

4. Non Functional Requirements

The Non-Functional Requirements (NFRs) define the system's quality attributes, ensuring that the solution for construction workers is secure, scalable, accessible, and performant. These NFRs ensure a seamless experience for all stakeholders, including workers, welfare board officials, and policymakers.

4.1. Performance & Scalability

- High Availability & Uptime – The system should have at least 99.9% uptime to ensure continuous access for workers and administrators. The application should handle at least 50000 concurrent users without degradation in performance.
- Low Latency – Response times for common user actions (e.g., form submission, grievance tracking) should be <1 second for a smooth user experience.
- Concurrent User Handling – The system should support high concurrency, allowing millions of workers to access services simultaneously, especially during peak periods (e.g., registration renewal deadlines).
- Scalability – The architecture should support high availability with active-active deployment architecture. The system should be able to scale horizontally to accommodate increased traffic.
- Efficient Caching Mechanism – Frequently accessed data (e.g., scheme details, eligibility rules) should be cached to reduce load times and database queries.

4.2. Security & Data Privacy

- Compliance with Data Protection Laws – Adhere to India’s Digital Personal Data Protection Act (DPDP) and global best practices like GDPR for secure handling of worker data.
- End-to-End Encryption – All sensitive data (personal details, bank accounts, grievances) must be encrypted at rest and in transit.
- Role-Based Access Control (RBAC) – Different user roles (worker, officer, admin) should have granular access based on their responsibilities.
- Multi-Factor Authentication (MFA) – Critical administrative actions should require MFA to prevent unauthorized access.
- Fraud Detection Mechanisms – Implement AI-powered anomaly detection to identify duplicate registrations, fake worker accounts, and fraudulent benefit claims.

4.3. Accessibility & Inclusivity

- Multilingual Support – The system should be available in multiple languages to ensure accessibility for diverse workers. There should be integration with relevant translation services to ensure quick translations and management.
- Voice-Assisted Navigation – Enable voice commands and audio-based guidance for workers with low literacy.
- Mobile-First Design – Since most workers rely on mobile devices, the UI should be optimized for low-end smartphones with limited internet connectivity.
- Offline Mode – Provide offline functionality for workers in remote areas with poor internet access, allowing data sync when connectivity is restored.
- Accessibility for Disabled Users – Follow WCAG (Web Content Accessibility Guidelines) to ensure that visually and physically impaired users can access services.

4.4. Maintainability & Extensibility

- Modular Architecture – The system should be designed in loosely coupled modules (e.g., registration, grievances, benefits) to enable independent updates, feature expansions and cherry-pick deployment approach.
- API-Driven Development – The system should provide RESTful APIs for seamless integration with Aadhaar authentication, DigiLocker, payment gateways, and external welfare databases.
- Automated Testing & CI/CD – Implement unit tests, integration tests, and automated deployments for bug-free releases.
- Developer-Friendly Documentation – Ensure comprehensive API documentation and sandbox environments for third-party integrations.

4.5. Interoperability & Integration

- Integration with Government Systems – The system must seamlessly integrate with BoCW boards, Aadhaar eKYC, DigiLocker, UMANG, and payment gateways (UPI, DBT, PFMS, etc.).
- Standardized Data Formats – Use open standards (JSON, XML, OpenAPI) for data exchange between government and third-party systems.
- The web application should support modern browsers (Chrome, Edge, Firefox, Safari).

4.6. Logging, Monitoring & Analytics

- Real-Time System Monitoring – Use ELK Stack (Elasticsearch, Logstash, Kibana) or Grafana/Prometheus (or any other similar stack) for real-time tracking of errors, API response times, and user activities.
- Automated Alerts for Critical Issues – Set up automated notifications for failures, fraud attempts, or service downtimes.