
Software Requirements Specification

for

Nucleus to Breeder Seed Production System

Version 1.0

Prepared for

Seed Division

07-08-2022

Table of Contents

| | |
|---|-----------|
| Table of Contents | ii |
| Revision History | ii |
| 1. Introduction..... | 1 |
| 1.1 Background..... | 1 |
| 1.2 Purpose | 2 |
| 1.3 Product Scope | 2 |
| 2. Overall Description | 2 |
| 2.1 Product Perspective | 2 |
| 2.2 Product Functions..... | 2 |
| 2.3 User Classes and Characteristics | 5 |
| 2.4 Operating Environment | 6 |
| 2.5 Design and Implementation Constraints..... | 6 |
| 2.6 User Documentation | 6 |
| 2.7 Assumptions and Dependencies | 6 |
| 3. External Interface Requirements | 6 |
| 3.1 User Interfaces | 6 |
| 3.2 Hardware Interfaces..... | 6 |
| 3.3 Software Interfaces | 6 |
| 3.4 Communications Interfaces | 7 |
| 4. System Features | 7 |
| 4.1 Proposed Use Case Flows..... | 7 |
| 4.2 Security..... | 23 |
| 4.3 SSL Certificate Integration..... | 24 |
| 5. Other Nonfunctional Requirements..... | 24 |
| 5.1 Performance Requirements..... | 24 |
| 5.2 Safety Requirements..... | 24 |
| 5.3 Security Requirements..... | 24 |
| 6. Other Requirements | 24 |
| Appendix C: To Be Determined List..... | 24 |

Revision History

| Name | Date | Reason For Changes | Version |
|------|------|--------------------|---------|
| | | | |
| | | | |

1. Introduction

1.1 Background

About 74% of the total population of India lives in villages and are engaged in agriculture. Increase in agricultural production not only makes the country self-reliant on agriculture produce but uplifts the poor status of our farmers also. It is generally accepted that genetically good quality seed alone can increase the production up to 20%. Farmers need quality seeds of improved high yielding varieties to grow in their fields. In the absence of high-quality seeds, farmers continue to use their own seeds i.e., crops produce on their farms. Ideally, this retained produce cannot be substituted for high quality seeds because it lacks genetic vigor and has poor germination. Also, its resistance to disease and pests decreases in the subsequent generation. Thus, availability of certified seeds of right varieties has become crucial.

Timely availability of seeds requires proper advance planning. Certified seeds need in (n)th year implies that in (n-1) th year we require the adequate amount of foundation seed which intern implies that sufficient amount of breeder seed is required in (n-2) th year. Thus, in order to supply adequate amount of quality seed to farmers, one needs to take care of foundation and breeder seeds also. It is quite difficult to estimate the demand of seeds in particular season because the demand changes with marginal changes in weather during sowing season for which any crop variety is too short to manage supply.

The importance of high-quality seeds was recognized by Government of India since long. During fifties, the State Governments were encouraged to set up large sized farms for augmenting the seed production. Research stations were set up under the Indian Council of Agricultural Research (ICAR), and State Agriculture Universities (SAU's) have taken up breeding programme for all the major crops grown in their respective areas. During sixties, attention was paid for the creation of infrastructure facilities for the production and distribution of improved seed. In 1961, seed testing laboratories were setup to strengthen the quality control measures. India is a member of the International Seed Testing Association.

In 1963, National Seeds Corporation (NSC) was setup with the responsibility of promoting the development of healthy seed industry in the country. Apart from production and distribution, the NSC was also entrusted with the responsibility of establishing a network of seed processing, storage facilities, quality control arrangements and seed certification. After the establishment of State Seed Corporations (SSCs), NSC is engaged in interstate production and distribution of seeds i.e., Supplementing the efforts of SSCs. The primary objective of NSC now is to look after the requirement of the seed deficit states. Seed Act was legislated in 1966 to maintain the purity of seeds and further enhancing the quality control measures. In 1969, the Central Variety Release Committee and Central Seed Committee were constituted to work in coordination with the NSC. In 1974-75, two National Seeds Projects (NSP-I and NSP-II) were launched, and production of seeds was decentralized. State Seeds Corporations were setup primarily for multiplication and distribution of certified seeds. The main emphasis of the NSP's was on creating a national institutional framework for support and coordination of all facets of production, storage, marketing, and quality control of certified seeds.

1.2 Purpose

The document is intended for, project stakeholders, project managers, developers, users, testers and other who plan to use the system. This outlines the main scope of the project which revolves around nucleus to breeder seed production.

1.3 Product Scope

The product scope revolves around the following major functions:

- Dashboard Development for stakeholders
- Seed Division Management
- Indentors Management
- ICAR Management
- Breeder Management
- Breeder Production Centre Management
- Reports

2. Overall Description

2.1 Product Perspective

This application is planned to monitor the seed requirement based on nucleus seed.

2.2 Product Functions

2.2.1 Add Crop

This form is for master table of crop, filled by seed division to enter new crop details.

2.2.2 Add Crop Variety

This form is for master table of notified crop variety, filled by seed division to enter details of new notified crop variety.

2.2.3 Add Crop Variety (Non – Notified Varieties)

This form is for master table of non-notified crop variety, filled by seed division to enter details of non-notified crop variety.

2.2.4 Edit Crop Variety Characteristics

This form is filled by seed division. This form is used to edit or add new morphological features of crop variety. Details like reaction to stress, major diseases, pest etc. related to crop variety are updated in this form.

2.2.5 Add Indentor

This form will be filled by Seed division. SD will have details with them, and they will enter the details. Seed division will have a manual conversation with them through mail SMS, call.

2.2.6 Add Breeder

This form will be filled by Seed division. SD will have details with them, and they will enter the details. Seed division will have a manual conversation with them through mail SMS, call.

2.2.7 Add Breeder Seed Production Centre

Breeder will add Production centres within that breeder.

2.2.8 Nucleus Seed Availability by Breeder

Production centre will enter the Nucleus seed available with them

2.2.9 Submission of Indents

- There will be timeline decided when indentors will place indent. Not anytime indent can be placed.
- Indentors will fill indent. There will be an option to Submit/Edit/Freeze Indent. If indentor have freezed Indent once, indentor will have to request seed division to provide permission to edit Indent.
- After Indent will be shared by seed division to Nodal agency, Indent cannot be edited.

2.2.10 Allocation of Breeder Seed Production to Breeder by Nodal Agency

- Seed division will direct give login credentials to Nodal Agency, no add Nodal Agency form is there.
- Nodal agency will allocate Breeder for production of Indenting Quantity.

2.2.11 BSP-1 Allocation of Breeder Seed Production by Breeder

Breeder will allocate the production quantity to its different Production Centres

2.2.12 BSP-2 Production Schedule and Availability of breeder Seed

Production centres will fill availability of seed and area sown etc details.

2.2.13 BSP-3 Inspection Report of the Monitoring Team

- The members data will be entered and then there will a Add button and it will come in rows, like these multiple members can be added.
- After filling form, it will be downloaded or be able to Print, then members will sign the form and then only able to upload.
- All BSP forms should be able to download and print.

2.2.14 BSP-4 Breeder Seed Actually Produced

Breeder Production centres will fill details of actual seeds produced.

2.2.15 Maximum LOT Size

Seed Division will fill this form to enter the LOT size.

2.2.16 Creation of LOT Number

Breeder Production centre will this form to generate LOT number for crops.

2.2.17 Add Seed Testing Laboratory

Seed Division will add seed testing laboratory.

2.2.18 Seed Testing Laboratory Form

Breeder Production centre will fill this form to fill report of seed testing.

2.2.19 Creation of Label Number for Breeder Seeds

Breeder Production centre will fill this form to create label number for breeder seeds.

2.2.20 BSP -5a Grow out Test Report

Breeder Production centre will fill this form. After this form will be filled seed division will fill Allocation for Lifting of Breeder Seed form after this 5b form will be filled by Breeder Production centre. Genetic purity of seed can be known through this form.

2.2.21 Allocation for Lifting of Breeder Seed

Seed division will fill this form. Seed division will allocate breeder seeds to the indentors for lifting.

2.2.22 BSP-5b Lifting of Breeder Seed

Breeder Production centre will this form and enter the lifting information. Seeds unlifted/ balance, reasons for excess or short supply can be known through this form.

2.2.23 BSP-6 - Utilization of Breeder Seed

Breeder Production centre will use this form to enter details of indenting agency to whom breeder seed supplied.

2.2.24 Dashboard

2.2.24.1 Seed Division Dashboard

2.2.24.2 ICAR Dashboard

2.2.24.3 Indentor Dashboard

2.2.24.4 Breeder Production Centre Dashboard

2.2.24.5 Breeder Dashboard

2.2.25 Seed Division Management

2.2.26 Indentor Management

2.2.27 ICAR Management

2.2.28 Breeder Management

2.2.29 Breeder Production Centres Management

2.2.30 Reports

2.2.30.1 Standard Reports

2.2.30.2 Ad-hoc Reports

2.3 User Classes and Characteristics

The application is planned to be used by seed division. The various stake holders of the seed division can be classified as follows:

- a) ICAR
- b) Indentor
- c) Breeder production center
- d) Breeders

2.4 Operating Environment

The application planned to be available for users to access over web browsers. The application is planned to be hosted on Linux based operating system. The core of the application would be hosted on tomcat webserver. The application is planned to be working on API integration with the frontend application. The latest Angular / PHP will be used for front end for managing the schemes that are run as part of the Seed project. The database planned to be running over Postgres SQL server.

2.5 Design and Implementation Constraints

These are the API integration that would be required to perform the integration at various stages of the application modules, unavailability of the same would increase the timely completion of the modules.

2.6 User Documentation

The user manual shall be delivered for the proposed development.

2.7 Assumptions and Dependencies

- EMAIL Integration (NIC Gateway)
- SMS – Integration (NIC Gateway) – charges as per actuals

3. External Interface Requirements

3.1 User Interfaces

The design screen UI shall be developed based on the finalization of SRS document and then shared as another UI document.

3.2 Hardware Interfaces

As the proposed solution is a web portal, hence no external hardware interfaces are planned under the current scope of the project.

3.3 Software Interfaces

The application is proposed to be developed with API framework and all interactions with database would be API based connectivity. It is proposed that application to be developed using microservice based architecture.

The software components included as part of the portal development are as follows:

- a) Web based application for nucleus to breeder seed production

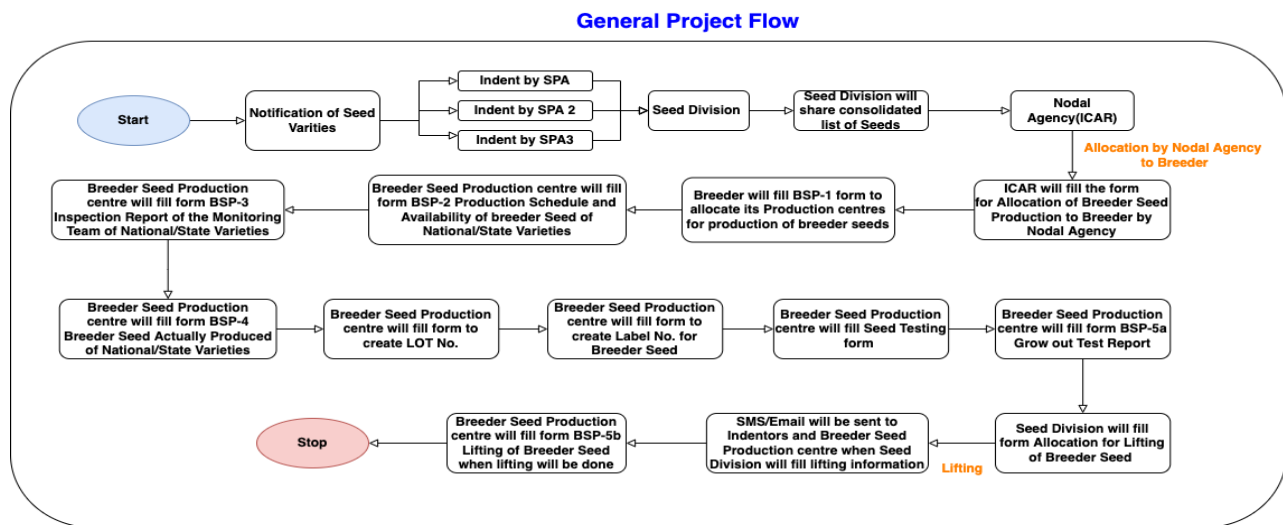
3.4 Communications Interfaces

Other integration planned to be finalized at a later date based on user requirements. All the points finalized shall be part of change management system of the project and need to evaluate based on later date.

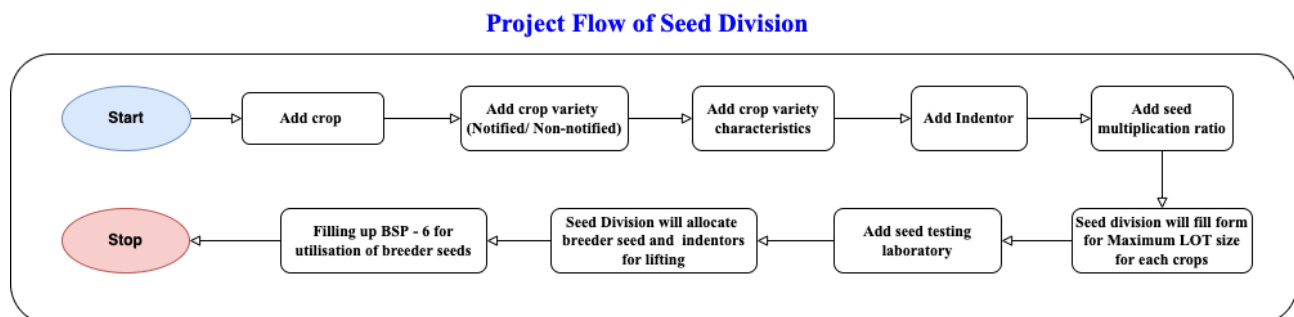
4. System Features

4.1 Proposed Use Case Flows

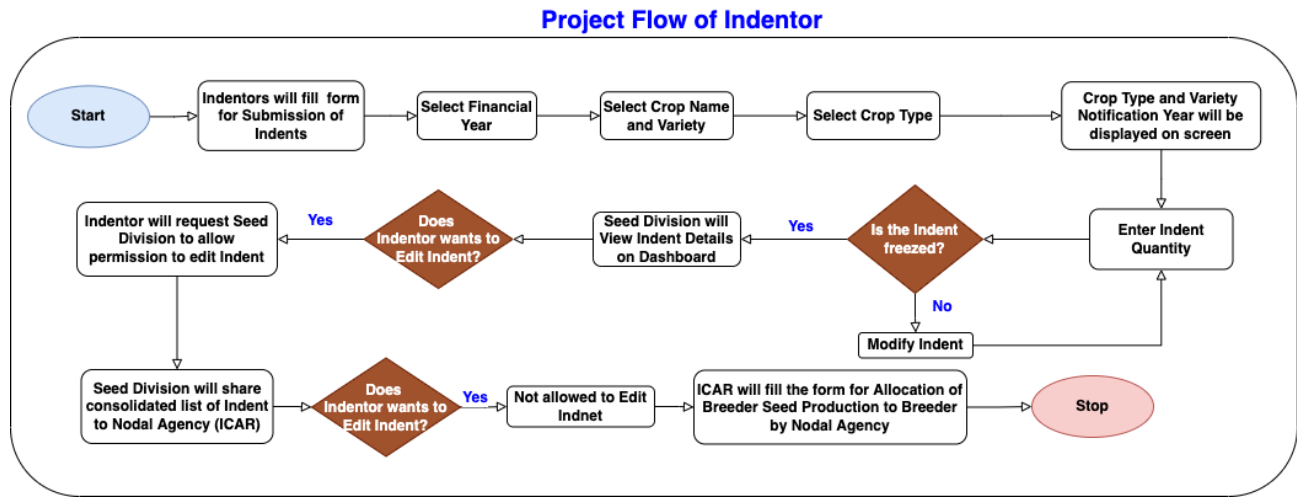
4.1.1 General Project Flow



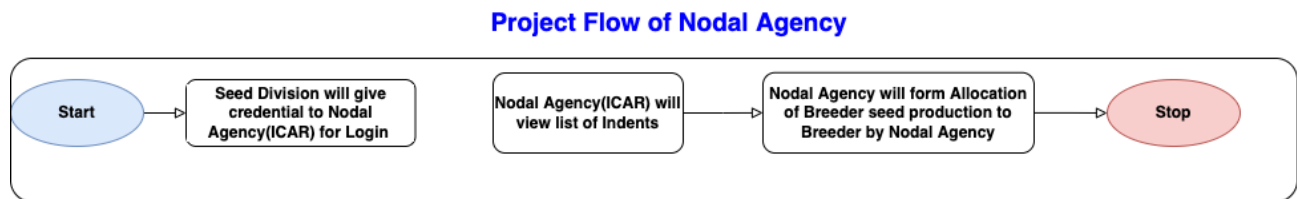
4.1.2 Project Flow of Seed Division



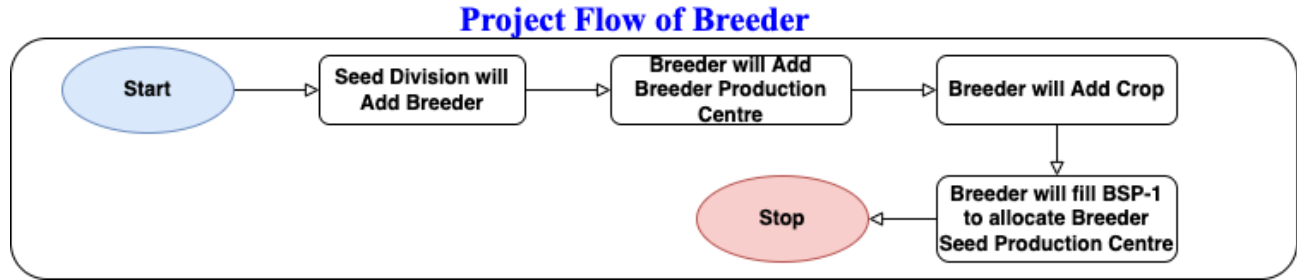
4.1.3 Project Flow of Indentor



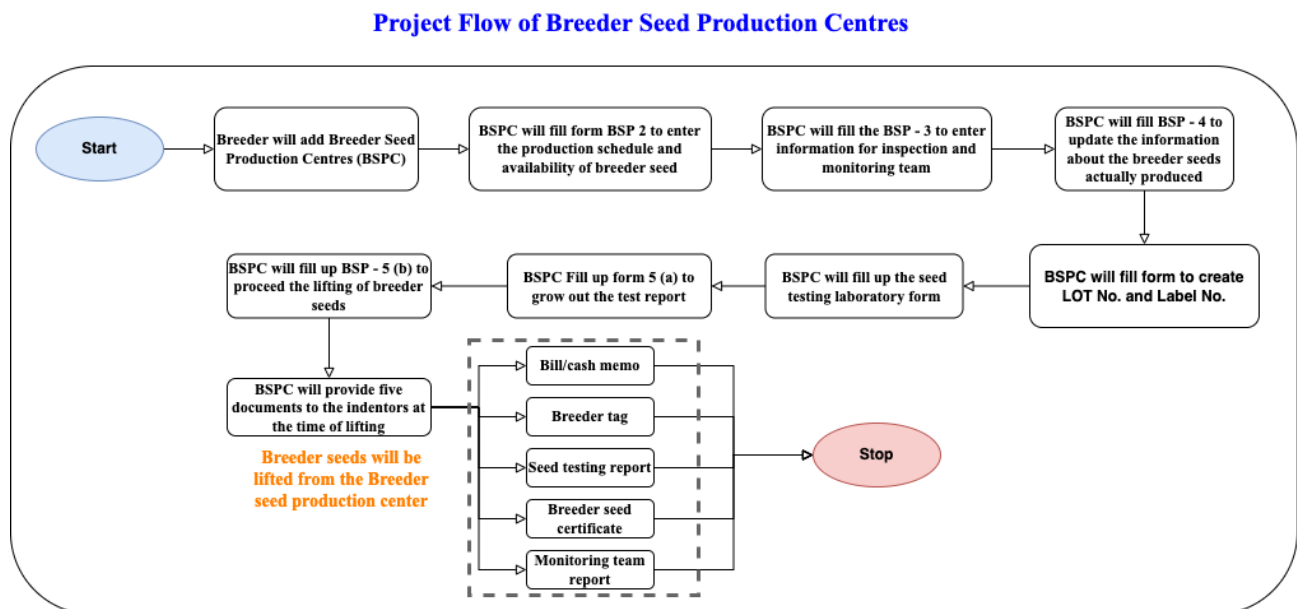
4.1.4 Project Flow of Nodal Agency



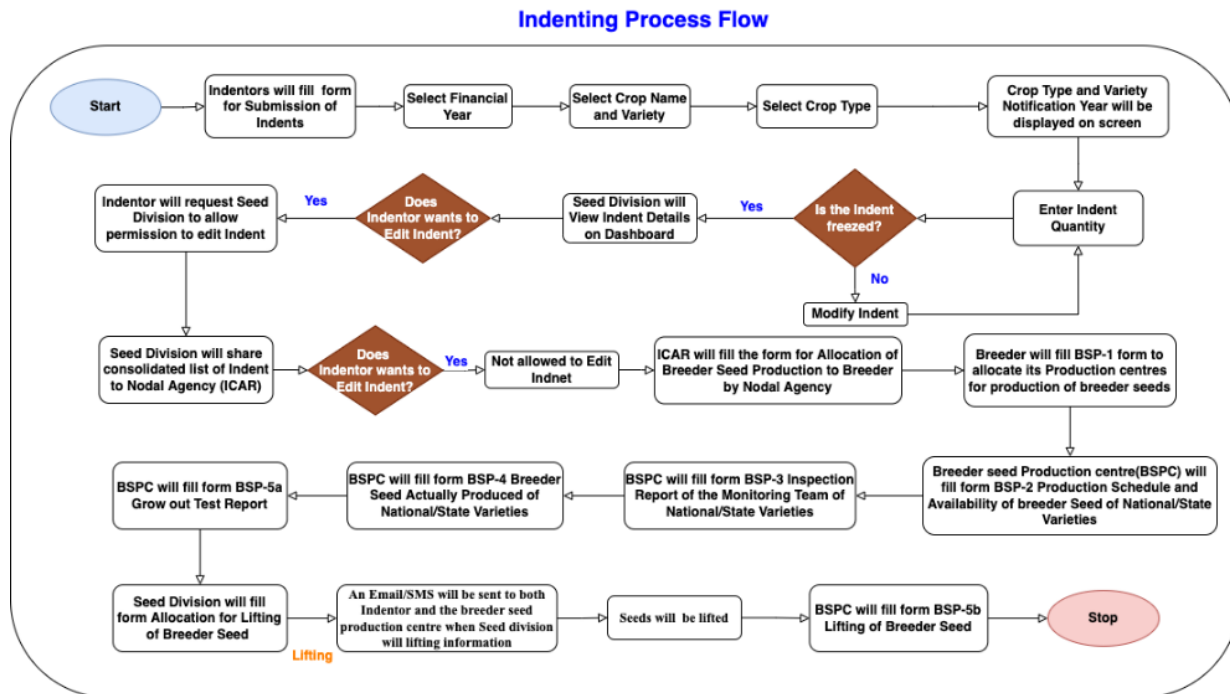
4.1.5 Project Flow of Breeder



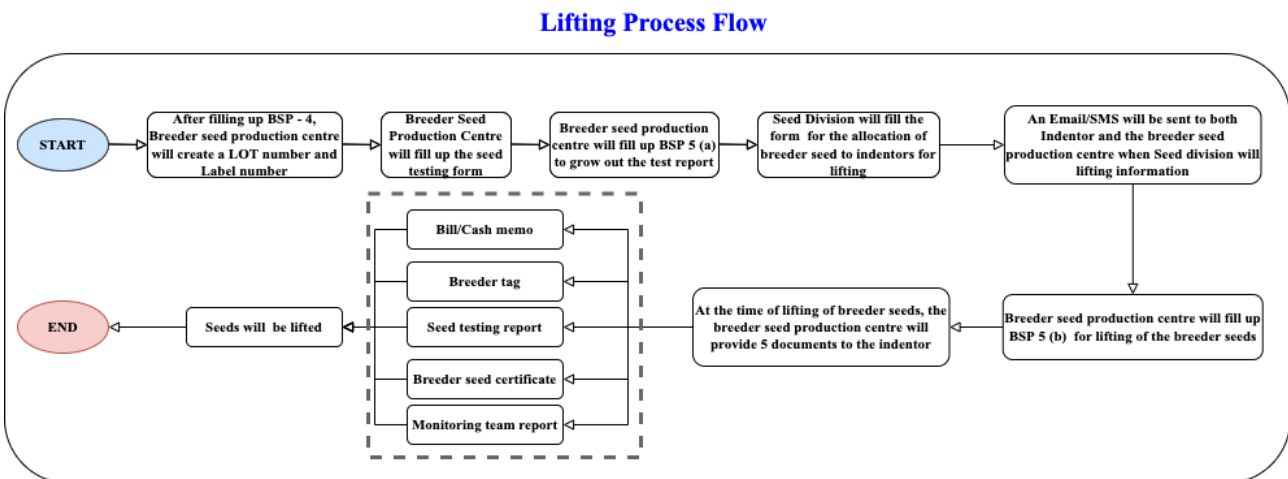
4.1.6 Project Flow of Breeder Seed Production Centres



4.1.7 Indenting Process Flow



4.1.8 Lifting Process Flow



4.1.9 Proposed Database Schema

4.1.10 Add Crop

| Form Name | Fields | Field Type | Field Mandatory |
|-----------|------------------------|------------|-----------------|
| Add Crop | Crop group | Dropdown | Yes |
| | Season | Dropdown | Yes |
| | Crop name | Enter | Yes |
| | Botanical Name | Enter | Yes |
| | Seed Replacement Ratio | Enter | Yes |

4.1.11 Add Crop Variety

| Form Name | Fields | Field Type | Field Mandatory |
|------------------|--|---------------|-----------------|
| Add Crop Variety | Crop Group | Dropdown | Yes |
| | Crop Name | Dropdown | Yes |
| | Variety Code | Autogenerated | Yes |
| | Variety Name | Enter | Yes |
| | Notification Date | Enter | Yes |
| | Notification Number | Enter | Yes |
| | Meeting Number | Enter | Yes |
| | Crop Type (Hybrid/Variety) | Dropdown | Yes |
| | Developed By:(Public Sector/Private Sector) | Dropdown | Yes |

4.1.12 Add Crop Variety (non-notified variety)

| Form Name | Fields | Field Type | Field Mandatory |
|--|--|---------------|-----------------|
| Add Crop Variety (For Non- Notified Varieties) | Crop Group | Dropdown | Yes |
| | Crop Name | Dropdown | Yes |
| | Variety Code | Autogenerated | Yes |
| | Variety Name | Enter | Yes |
| | Crop Type (Hybrid/Variety) | Dropdown | Yes |
| | Developed By:(Public Sector/Private Sector) | Dropdown | Yes |

4.1.13 Edit Crop Variety Characteristics

| Form Name | Fields | Field Type | Field Mandatory |
|-----------|------------|------------|-----------------|
| | Crop group | Dropdown | Yes |

| Form Name | Fields | Field Type | Field Mandatory |
|-----------------------------------|--|------------|-----------------|
| Edit Crop Variety Characteristics | Crop Name | Dropdown | Yes |
| | Variety | Dropdown | Yes |
| | Crop Type (Hybrid/Variety) | Prefilled | Yes |
| | View & Upload Variety Image | Upload | Yes |
| | IET Number | Enter | Yes |
| | Notification Date | Prefilled | Yes |
| | Notification Number | Prefilled | Yes |
| | Meeting Number | Prefilled | Yes |
| | Developed By (Public Sector/Private Sector) | Prefilled | Yes |
| | Central/State: Radio Button | Dropdown | Yes |
| | State of Release (List of state will appear when state will be chosen, select one state only)) | Dropdown | Yes |
| | Responsible Institution for Developing Breeder Seed | Dropdown | Yes |
| | Year of Release | Dropdown | Yes |
| | Resemblance to Variety | Enter | Yes |
| | Parentage | Enter | Yes |
| | Maturity (in days) | Enter | Yes |
| | Spacing (in cm): | Enter | Yes |
| | Generic Morphological Characteristics | Enter | Yes |
| | Specific Morphological Characteristics | Enter | Yes |
| | Seed Rate (Kg/Ha) | Enter | Yes |
| | Average Yield (kg/Ha): (x) Range of Yield: Between (x) – (x) | Enter | Yes |
| | Fertilizer Dosage (Kg/Ha) | Enter | Yes |
| | Agronomic Features | Enter | Yes |
| | Adaptation and recommended Ecology | Enter | Yes |
| | Reaction to Stress | Enter | Yes |
| | Reaction to Major Diseases | Enter | Yes |
| | Reaction to major Pests | Enter | Yes |

| Form Name | Fields | Field Type | Field Mandatory |
|-----------|---|------------|-----------------|
| | Recommended States for Cultivation (Drop down allowing multiple selections) | Dropdown | Yes |

4.1.14 Add Indentor

| Form Name | Fields | Field Type | Field Mandatory |
|--------------|----------------------------|------------|-----------------|
| Add Indentor | Agency Name | Enter | Yes |
| | Category of Agency | Dropdown | Yes |
| | State | Dropdown | Yes |
| | District | Dropdown | Yes |
| | Short Name | Enter | Yes |
| | Address | Enter | Yes |
| | Pin code | Enter | Yes |
| | Contact Person Name | Enter | Yes |
| | Contact Person Designation | Dropdown | Yes |
| | Phone | Enter | No |
| | Fax Number | Enter | No |
| | Mobile | Enter | Yes |
| | Email | Enter | Yes |
| | Latitude | Enter | Yes |
| | Longitude | Enter | Yes |

4.1.15 Add Breeder

| Form Name | Fields | Field Type | Field Mandatory |
|-------------|---------------------------|---------------|-----------------|
| Add Breeder | Breeder Code | Autogenerated | Yes |
| | Breeder Name | Enter | Yes |
| | Short Name | Enter | Yes |
| | State | Dropdown | Yes |
| | District | Dropdown | Yes |
| | Address | Enter | Yes |
| | Nodal Officer Name | Enter | Yes |
| | Nodal Officer Designation | Enter | Yes |
| | Mobile | Enter | Yes |

| Form Name | Fields | Field Type | Field Mandatory |
|-----------|-----------------------------|---------------|-----------------|
| | Phone | Enter | No |
| | Fax Number | Enter | No |
| | Email | Enter | Yes |
| | Bank Name | Dropdown | Yes |
| | Bank Branch Name | Dropdown | Yes |
| | IFSC Code | Autogenerated | Yes |
| | Bank Account Number | Enter | Yes |
| | Confirm Bank account Number | Enter | Yes |
| | Latitude | Enter | No |
| | Longitude | Enter | No |

4.1.16 Add Breeder Crop

| Form Name | Fields | Field Type | Field Mandatory |
|------------------|---------------------------|------------|-----------------|
| Add Breeder Crop | Breeder Production Centre | Dropdown | Yes |
| | Crop group | Dropdown | Yes |
| | Crop Name | Dropdown | Yes |
| | Variety Name | Dropdown | Yes |

4.1.17 Add Breeder Seed Production Centre

| Form Name | Fields | Field Type | Field Mandatory |
|------------------------------------|----------------------------|---------------|-----------------|
| Add Breeder Seed Production Centre | Breeder Code | Dropdown | Yes |
| | Production Centre Code | Autogenerated | Yes |
| | Production Centre Name | Enter | Yes |
| | State | Dropdown | Yes |
| | District | Dropdown | Yes |
| | Address | Enter | Yes |
| | Contact Person Name | Enter | Yes |
| | Contact Person Designation | Enter | Yes |
| | Contact Person Mobile | Enter | Yes |
| | Contact Person Email | Enter | Yes |
| | Latitude | Enter | Yes |
| | Longitude | Enter | Yes |

4.1.18 Add Nucleus Seed Availability by Breeder

| Form Name | Fields | Field Type | Field Mandatory |
|--------------------------------------|--|---------------|-----------------|
| Nucleus Seed Availability by Breeder | Breeder Production Centre Name | Pre-filled | Yes |
| | Name of Contact officer and address and Designation | Pre-filled | Yes |
| | Financial Year | Dropdown | Yes |
| | Crop Name | Dropdown | Yes |
| | Variety Name | Autogenerated | Yes |
| | Quantity of Nucleus Seed (kg) | Enter | Yes |
| | Reference No. of MoU/Authorization in case variety | Enter | Yes |
| | Date of Reference No. of MoU/Authorization in case variety | Calendar | Yes |
| | Enter Office order/cash memo | Enter | Yes |
| | Date of Office order/cash memo | Calendar | Yes |

4.1.19 Submission of Indents

| Form Name | Fields | Field Type | Field Mandatory |
|-----------------------|---------------------------|---------------|-----------------|
| Submission of Indents | Financial Year | Dropdown | Yes |
| | Season | Dropdown | Yes |
| | Crop Name | Dropdown | Yes |
| | Variety | Dropdown | Yes |
| | Crop Type | Autogenerated | Yes |
| | Variety Notification year | Autogenerated | Yes |
| | Indent Quantity | Enter | Yes |

4.1.20 Allocation of Breeder Seed Production to Breeder by Nodal Agency

| Form Name | Fields | Field Type | Field Mandatory |
|--|---|---------------|-----------------|
| Allocation of Breeder Seed Production to Breeder by Nodal Agency | Year of Indent | Dropdown | Yes |
| | Crop Name | Dropdown | Yes |
| | Variety | Pre-filled | Yes |
| | Indenting Agency | Dropdown | Yes |
| | Indent Quantity | Pre-filled | Yes |
| | Select Breeder Name | Dropdown | Yes |
| | Name of Nodal officer and address and Designation | Autogenerated | Yes |

| Form Name | Fields | Field Type | Field Mandatory |
|-----------|-------------------------|------------|-----------------|
| | Available Nucleus Seed | Pre-filled | Yes |
| | Breeder Seed Allocation | Enter | Yes |

4.1.21 BSP-1

| Form Name | Fields | Field Type | Field Mandatory |
|--|--|---------------|-----------------|
| BSP-1 Allocation of Breeder Seed Production by Breeder | Year of Indent | Dropdown | Yes |
| | Crop Name | Dropdown | Yes |
| | Variety | Autogenerated | Yes |
| | Year of Release | Pre-filled | Yes |
| | Indenting Agency | Pre-filled | Yes |
| | Indent Quantity | Pre-filled | Yes |
| | Production Centre Name | Dropdown | Yes |
| | Name of Contact officer and address and Designation | Autogenerated | Yes |
| | Available Nucleus Seed | Pre-filled | Yes |
| | Breeder Seed Allocation | Enter | Yes |

4.1.22 BSP-2

| Form Name | Fields | Field Type | Field Mandatory |
|--|--|-------------------|-----------------|
| BSP-2 Production Schedule and Availability of breeder Seed | Year Of Indent | Dropdown | Yes |
| | Crop Name | Dropdown | Yes |
| | Production centre Name | Dropdown | Yes |
| | Name of Nodal officer and address and Designation | Autogenerated | Yes |
| | Variety Name | Autogenerated | Yes |
| | Quality targeted (q) | Pre-filled BSP-1 | Yes |
| | Area sown (ha) | Enter | Yes |
| | Expected production | Enter | Yes |
| | Field location | Enter | Yes |
| | Date of sowing | Calendar | Yes |
| | Expected Inspection Period | From -To Calendar | Yes |
| | Expected date of harvest | From -To Calendar | Yes |
| | Expected date of availability | From -To Calendar | Yes |

| Form Name | Fields | Field Type | Field Mandatory |
|-----------|---------|------------|-----------------|
| | Remarks | Enter | Yes |

4.1.23 BSP-3

| Form Name | Fields | Field Type | Field Mandatory |
|--|---|-------------------------|-----------------|
| BSP-3 Inspection Report of the Monitoring Team | Year Of Indent | Dropdown | Yes |
| | Crop | Dropdown | Yes |
| | Production centre Name | Dropdown | Yes |
| | Variety Name | Autogenerated | Yes |
| | Quality targeted (q) | Pre-filled BSP-2 | Yes |
| | Area sown (ha) | Pre-filled BSP-2 | Yes |
| | Expected production | Pre-filled BSP-2 | Yes |
| | Field location | Pre-filled BSP-2 | Yes |
| | Date of Proforma BSP-I sent | Date when BSP-1 Freezed | Yes |
| | Date of Proforma BSP-II sent | Date when BSP-2 Freezed | Yes |
| | Report of the monitoring team specifically for isolation seed | Dropdown | Yes |
| | No of Samples to be taken for grow out test | Enter | Yes |
| | Remarks | Enter | Yes |
| | Details of Monitoring Team Name Designation Mobile Number Institute Name Address | Enter | Yes |

4.1.24 BSP-4

| Form Name | Fields | Field Type | Field Mandatory |
|--|------------------------|------------|-----------------|
| BSP-4 Breeder Seed Actually Produced | Year Of Indent | Dropdown | Yes |
| | Crop Name | Dropdown | Yes |
| | Name of Breeder | Pre-filled | Yes |
| | PD/PC Letter No. | Enter | Yes |
| | Production centre Name | Dropdown | Yes |

| Form Name | Fields | Field Type | Field Mandatory |
|-----------|---|-------------------------|-----------------|
| | Variety Name | Autogenerated | Yes |
| | Actual Allocation as per BSP-1 Target | Pre-filled BSP-1 | Yes |
| | Actual quantity of breeder seed produced(A) | Enter | Yes |
| | Carry Over Seed Amount(B) | Enter | Yes |
| | Total Availability (C) | Autogenerated | Yes |
| | Production surplus (+)/Deficit (-) over BSP-1 Target | Autogenerated | Yes |
| | Date of Proforma BSP-I sent | Date when BSP-1 Freezed | Yes |
| | Date of Proforma BSP-II sent | Date when BSP-2 Freezed | Yes |
| | Date of Proforma BSP-III sent | Date when BSP-3 Freezed | Yes |
| | No. of Samples taken for Seed testing/ Grow Out Tests | Enter | Yes |
| | Year of Production of Carryover Breeder Seed | Calendar | Yes |
| | Carry over Seed Previous Year Germination | Enter | Yes |
| | Carry over Seed Current Year Germination | Enter | Yes |

4.1.25 Maximum LOT Size

| Form Name | Fields | Field Type | Field Mandatory |
|------------------|------------------|---------------|-----------------|
| Maximum LOT Size | Crop Name | Autogenerated | Yes |
| | Maximum LOT Size | Enter | Yes |

4.1.26 Creation of LOT Number

| Form Name | Fields | Field Type | Field Mandatory |
|------------------------|--|---------------|-----------------|
| Creation of lot number | Crop name | Dropdown | Yes |
| | Year of indent | Dropdown | Yes |
| | Varieties | Autogenerated | Yes |
| | Actual quantity of breeder seed produced | Autogenerated | Yes |
| | Lot number | Autogenerated | Yes |

4.1.27 Creation of label number for breeder seeds

| Form Name | Fields | Field Type | Field Mandatory |
|--|-----------------|---------------|-----------------|
| Creation of label number for breeder seeds | LOT Number | Dropdown | Yes |
| | Crop Name | Autogenerated | Yes |
| | Variety Name | Autogenerated | Yes |
| | Pure Seed(%) | Autogenerated | Yes |
| | Label Number | Autogenerated | Yes |
| | Inert Matter | Autogenerated | Yes |
| | Germination (%) | Autogenerated | Yes |
| | Net Weight(Kg) | Enter | Yes |
| | Date of Test | Calender | Yes |
| | Valid Upto | Calender | Yes |

4.1.28 Add Seed Testing Laboratory

| Form Name | Fields | Field Type | Field Mandatory |
|-------------------------|---------------------|------------|-----------------|
| Seed Testing Laboratory | Lab Name | Enter | Yes |
| | Address | Enter | Yes |
| | State | Enter | Yes |
| | District: | Enter | Yes |
| | Short Name | Enter | Yes |
| | Contact Person Name | Enter | Yes |
| | Mobile | Enter | Yes |
| | Phone/Fax Number | Enter | Yes |
| | Email | Enter | Yes |
| | Latitude | Enter | Yes |
| | Longitude | Enter | Yes |

4.1.29 Seed Testing Laboratory Form

| Form Name | Fields | Field Type | Field Mandatory |
|------------------------------|-------------------------|---------------|-----------------|
| Seed testing laboratory form | Reference number | Enter | Yes |
| | Date | Enter | Yes |
| | Report receiving date | Enter | Yes |
| | Seed testing laboratory | Dropdown | Yes |
| | Crop name | Dropdown | Yes |
| | Variety | Autogenerated | Yes |
| | Lot number | Autogenerated | Yes |
| | Sample No. | Enter | Yes |
| | Normal | Enter | Yes |
| | Abnormal | Enter | Yes |
| | Hard | Enter | Yes |
| | Fresh Ungerminated | Enter | Yes |
| | Dead | Enter | Yes |
| | Pure Seed | Enter | Yes |
| | Other Crop Seed | Enter | Yes |
| | Weed Seed | Enter | Yes |
| | Inert Matter | Enter | Yes |
| | Moisture% | Enter | Yes |

4.1.30 BSP-5a

| Form Name | Fields | Field Type | Field Mandatory |
|------------------------------|------------------------|------------------|-----------------|
| BSP -5a Grow out Test Report | Year Of Indent | Dropdown | Yes |
| | Production centre Name | Dropdown | Yes |
| | Crop Name | Dropdown | Yes |
| | Variety Name | Autogenerated | Yes |
| | Area sown (ha) | Pre-filled BSP-3 | Yes |

| Form Name | Fields | Field Type | Field Mandatory |
|-----------|---|-------------------------|-----------------|
| | Field location | Pre-filled BSP-3 | Yes |
| | Authority under which grown - Date of BSP-I | Date when BSP-1 Freezed | Yes |
| | Authority under which grown - Date of BSP-II | Date when BSP-2 Freezed | Yes |
| | Authority under which grown - Date of BSP-III | Date when BSP-3 Freezed | Yes |
| | Authority under which grown - Date of BSP-IV | Date when BSP-4 Freezed | Yes |
| | No. of samples taken for Grow Out Test | Pre-filled BSP-4 | Yes |
| | Genetic purity (%) in GOT | Enter | Yes |

4.1.31 Allocation for Lifting of Seed

| Form Name | Fields | Field Type | Field Mandatory |
|--|---|------------------|-----------------|
| Allocation for Lifting of Breeder Seed | Year Of Indent | Dropdown | Yes |
| | Crop Name | Dropdown | Yes |
| | Variety name | Autogenerated | Yes |
| | Allocation of Breeder Seed to Indentors for Lifting | Autogenerated | |
| | Indenting Quantity | Pre-filled BSP-1 | Yes |
| | Production centre Name | Dropdown | Yes |
| | Name of Nodal officer and address and Designation | Autogenerated | Yes |
| | Actual Production on as per BSP-IV | Pre-filled BSP-4 | Yes |
| | Quantity of breeder seed allotted(q) | Enter | Yes |

4.1.32 BSP-5b

| Form Name | Fields | Field Type | Field Mandatory |
|--------------------------------|------------------------|------------------|-----------------|
| BSP-5b Lifting of Breeder Seed | Year Of Indent | Dropdown | Yes |
| | Production centre Name | Dropdown | Yes |
| | Crop Name | Dropdown | Yes |
| | Variety name | Autogenerated | Yes |
| | Indenting Quantity | Pre-filled BSP-1 | Yes |

| Form Name | Fields | Field Type | Field Mandatory |
|-----------|--|------------------|-----------------|
| | Agencies to whom the Breeder Seed Supplied | Pre-filled BSP-1 | Yes |
| | Actual Production on as per BSP-IV | Pre-filled BSP-4 | Yes |
| | Quantity of breeder seed allotted(q) | Pre-filled BSP-1 | Yes |
| | Quantity of breeder seed lifted (q) | Enter | Yes |
| | Date of Lifting | Calendar | Yes |
| | Amount Received | Enter | Yes |
| | Reasons for short/excess supply, if | Enter | Yes |
| | Quantity of breeder seed balance | Autogenerated | Yes |
| | Quantity un-lifted | Autogenerated | Yes |

4.1.33 BSP-6

| Form Name | Fields | Field Type | Field Mandatory |
|---|--|-------------------|-----------------|
| BSP-6 - Utilization of Breeder Seed | Year Of Indent | Dropdown | Yes |
| | Crop Name | Dropdown | Yes |
| | Variety name | Autogenerated | Yes |
| | Indenting Quantity | Pre-filled BSP-1 | Yes |
| | Agencies to whom the Breeder Seed Supplied | Dropdown | Yes |
| | Actual Production on as per BSP-IV | Pre-filled BSP-4 | Yes |
| | Quantity of breeder seed allotted(q) | Pre-filled BSP-1 | Yes |
| | Quantity of breeder seed lifted (q) | Pre-filled BSP-5b | Yes |
| | Quantity of breeder seed balance | Autogenerated | Yes |

4.2 Security

The admin section would be protected by username and password and salted MD5/SHA (256) encryption would be used. All forms and login page would have CAPTCHA at database level also password would be stored in encrypted format. After 5 consecutive wrong attempts the password would be reset, and new password would be sent to administrator through email. The website would be Free from OWASP Top 10 vulnerabilities

4.3 SSL Certificate Integration

Run the portal over https protocol SSL certificate will be integrated. SSL Certificate will be provided by the Seed Division.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The system will run 24x7 except for scheduled and pre-notified system maintenance downtimes. Any downtime for maintenance activities shall be notified on site.
The portal will allow the users to be concurrently logged into the system.

5.2 Safety Requirements

It is assumed that the DR environment would be provided by Seed Division to have a failover environment in a separate location where the current application would be hosted.

In order to cater to load requirement / concurrency of users, it would be required to provide hardware load balancer to manage the load on the web portal. In the scenario the hardware scenario required would be facilitated by Seed Division for deployment into the servers.

All the current development during the development phase, Seed Division should facilitate for staging server for testing the application and User Acceptance Test clearance.

5.3 Security Requirements

The application is planned to be security audited before launch of the application on servers. The audit is planned to be taken care by Seed Division and any patch updates required to be done on the application shall be facilitated by the development team.

Server hardening and Vulnerability Assessment of the server shall be ownership of Seed Division, when it is shared with development team.

6. Other Requirements

Appendix C: To Be Determined List

- Finalization of other forms that are required for completion as part of the current website.
