Functional Specification Document (FSD)

Project Name: Cornflow

Client: Sai-Krupa Trending Pvt Ltd

Freelance Vendor: Sainath Chikane

Date: July 09, 2025

# 1. Introduction

## 1.1 Purpose

This Functional Specification Document (FSD) outlines the functional, non-functional, technical, and operational specifications for the “Cornflow” data analytics platform. It serves as the primary reference for developers, stakeholders, and testers to understand the expected system behavior and ensure alignment with business goals.

## 1.2 Scope

Cornflow is a Business Intelligence (BI) and decision support system designed for Sai-Krupa Trending Pvt Ltd to optimize corn production planning, reduce costs, and identify new high-potential territories for expansion. This document details the data flows, system behavior, access controls, and reporting features.

# 2. Project Overview

## 2.1 Background

Sai-Krupa Trending Pvt Ltd currently manages corn production across multiple territories but lacks integrated analytics to drive strategic decisions. Fragmented data systems have resulted in inefficiencies and limited visibility into performance.

## 2.2 Objectives

- Centralize historical and current production data  
- Visualize trends across districts, states, and years  
- Identify areas for cost optimization and manpower reduction  
- Highlight high-potential expansion zones  
- Provide actionable insights to business users

# 3. Stakeholders

| Role | Name | Organization |  
|------|------|--------------|  
| Sponsor | Rameshwar Shelke | Sai-Krupa Trending Pvt Ltd |  
| Freelance Vendor | Sainath Chikane | Independent |  
| Analyst / Engineer | Sainath Chikane | Independent |  
| Users | Operations, Finance, Strategy Teams | Sai-Krupa Trending Pvt Ltd |

# 4. Functional Requirements

## 4.1 Data Integration

- Upload corn production data in Excel/CSV format  
- Validate schema and field consistency  
- Remove duplicates and handle null values  
- Auto-correct data type mismatches (e.g., strings in numeric fields)

## 4.2 Data Storage

- Structured storage using MySQL  
- Tables for production, pricing, districts, and metadata  
- Backup strategy: Daily incremental + weekly full backup

## 4.3 Dashboards & Reporting (Power BI)

- Top 10 costliest districts in Maharashtra  
- Districts with production consistently below state average  
- State-wise heatmap of production vs price  
- Year-over-year production by state/district  
- Price-performance matrix for national-level decision making

## 4.4 User Roles & Access

| Role | Permissions |  
|------|-------------|  
| Admin | Full access (data upload, delete, modify, view) |  
| Analyst | View and query dashboards; download reports |  
| Viewer | Read-only access |

## 4.5 Export Options

- Export dashboards to Excel, PDF  
- Scheduled email reports for management

# 5. Non-Functional Requirements

| Category | Requirement |  
|----------|-------------|  
| Performance | Dashboards should load within 5 seconds for up to 1 million rows |  
| Security | TLS 1.2 encryption; Role-based access; Daily access logs |  
| Availability | 99.5% uptime required |  
| Scalability | System should support integration with APIs (weather, market prices) |  
| Version Control | GitHub repository integration |  
| Mobile Access | Mobile-optimized Power BI dashboards (phase 2) |

# 6. Technical Architecture

- Frontend: Power BI (with optional Tableau compatibility)  
- Backend: MySQL (preferred), ETL scripts in Python  
- Cloud Hosting: AWS or Azure (depending on client preference)  
- Data Pipeline: Manual upload (Phase 1), API integration (Phase 2)  
- Version Control: GitHub  
- Deployment: Hybrid (on-premise with cloud dashboard access)

# 7. Assumptions & Constraints

## Assumptions

- Historical data will be made available in clean Excel or CSV format  
- Sai-Krupa will nominate authorized users and provide credentials  
- Users have basic familiarity with dashboards

## Constraints

- No real-time data feed available (manual uploads only in Phase 1)  
- IoT and forecasting modules are future enhancements

# 8. Project Timeline

| Phase | Activity | Target Date |  
|-------|----------|-------------|  
| Phase 1 | Requirements Finalization | Nov 15, 2024 |  
| Phase 2 | Data Collection & Prep | Dec 30, 2024 |  
| Phase 3 | Database Setup & ETL | Jan 31, 2025 |  
| Phase 4 | Dashboard Development | Mar 20, 2025 |  
| Phase 5 | UAT & Internal Testing | Apr 5, 2025 |  
| Phase 6 | Final Deployment | Apr 15, 2025 |  
| Phase 7 | Support & Maintenance Start | Apr 16, 2025 |

# 9. Glossary

- ETL – Extract, Transform, Load  
- BI – Business Intelligence  
- KPI – Key Performance Indicator  
- UAT – User Acceptance Testing

# 10. Approval

| Name | Role | Signature | Date |  
|------|------|-----------|------|  
| Rameshwar Shelke | Sponsor (Client) | | |  
| Sainath Chikane | Freelance Vendor | | |