Request for Proposal (RFP)
for
"*Selection of a System Integrator ('SI') for providing Software for Transformation Plan of WDRA*"

VOLUME 2
Scope of Work (SoW) for
Bidder

Date: 31 January, 2017

Bid Reference # WDRA/2016/5-20/A&F

Warehousing Development & Regulatory Authority

ABBREVIATIONS

Sr. No.	Abbreviation	Description
1	API	Application Programming Interface
2	BCP	Business Continuity Plan
3	BPD	Business Process Diagram
4	BPMN	Business Process Modelling Notation
5	BPMS	Business Process Management System
6	CHAP	Challenge Handshake Authentication Protocol
7	COBIT	Control Objectives for Information and Related Technology
8	COTS	Commercial Of The Shelf
9	CPU	Central Processing Unit
10	CRL	Certificate Revocation List
11	CM	Clearing Member
12	DARPG	The Department of Administrative Reforms and Public Grievances
13	DAT	Digital Audio Tape
14	DB	Database
15	DC	Data Center
16	DDoS	Distributed Denial of Service
17	DLT	Digital Linear Tape
18	DNS	Domain Name Server
19	DoS	Denial of Service
20	DR	Disaster Recovery
21	EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortization
22	EMS	Enterprise Management Solution
23	eNWR	Electronic Negotiable Warehouse receipt
24	ERP	Enterprise Resource Planning
25	ESB	Enterprise Service Bus
26	EY	Ernst & Young LLP
27	FC	Fiber Channel
28	FI	Financial Institute
29	FIPS	Federal Information Processing Standards
30	FTP	File Transfer Protocol
31	FTTP	Fiber-To-The-Premises
32	GRC	Governance Risk and Compliance
33	HA	High Availability
34	HBA	Host Bus Adaptors
35	HIPS	Host based Intrusion Prevention
36	HRMS	Human Resource Management System
37	HTTP	Hypertext Transfer Protocol
38	I/O	Input/output
39	ILS	Internet Locator Service

Sr. No.	Abbreviation	Description
40	IPSEC	Internet Protocol Security
41	IT	Information Technology
42	ITIL	Information Technology Infrastructure Library
43	KPI	Key Performance Indicators
44	KYC	Know Your Customer
45	KYD	Know Your Depositor
46	LDAP	Lightweight Directory Access Protocol
47	LTO	Linear Tape Open
48	MoM	Minutes of Meeting
49	MoP	Manual of Office Procedure
50	NAS	Network Attached Storage
51	NAT	Network Address Translation
52	OCR	Optical Character Recognition
53	ODBC	Open Database Connectivity
54	P2P	Peer to Peer
55	PAP	Password Authentication Protocol
56	PMO	Project Management Office
57	QCBS	Quality Cost Based Selection
58	RADIUS	Remote Authentication Dial-In User Service
59	RAID	Redundant Array of Independent Disks
60	RBI	Reserve Bank of India
61	RFP	Request For Proposal
62	RP	Repository Participant
63	RPO	Recovery Point Objective
64	RTI	Request To Information
65	RTO	Recovery Time Objective
66	RTSP	Real Time Streaming Protocol
67	SAN	Storage Area Network
68	SEBI	Security and Exchange Board of India
69	SI	System Integrator
70	SLA	Service Level Agreement
71	SLM	Straight Line Method
72	SMP	Symmetrical Multiprocessing
73	SMS	Short Message Service
74	SMTP	Simple Mail Transfer Protocol
75	SNMP	Simple Network Management Protocol
76	SOP	Standard Operating Procedure
77	SCEP	Simple Certificate Enrolment Protocol
78	SRS	Software Requirement Specifications
79	SSH	Secure Shell Protocol

Sr. No.	Abbreviation	Description
80	SSL	Secure Socket Layer
81	STQC	Standardised Testing and Quality Certification
82	TACACS	Terminal Access Controller Access-Control System
83	TCO	Total Cost Of Ownership
84	TCP/IP	Transmission Control Protocol/ Internet Protocol
85	TPM-C	transactions per minute
86	UAT	User Acceptance Testing
87	UI	User Interface
88	UPS	Uninterruptible Power Supply
89	URL	Uniform Resource Locator
90	VPN	Virtual Private Network
91	WDRA	Warehouse Development and Regulatory Authority
92	WDV	Written Down value
93	WSP	Warehousing Service Provider
94	XML	Extensible Mark-up Language

Contents

1. About the project

WDRA has embarked upon a journey to achieve its strategic vision of developing an ecosystem that enables issuance of and transactions in Negotiable Warehouse Receipts ('NWR') to:
- ► strengthen the market for commodities,
- ► encourage establishment of well managed warehouses across the country,
- ► help farmers and traders to access a larger market and to have better access to finance against the underlying assets,

The scope of WDRA transformation includes:
1. Creating an ecosystem of electronic negotiable warehouse receipts (e-NWRs) through licensed repositories;
2. Integrated IT system deployed in the Cloud for:
   - ► Automation of internal business processes & office processes with the goal of a less paper office;
   - ► Monitoring & Surveillance systems for effective supervision of regulated entities and ensuring credibility of the e-NWR ecosystem;
   - ► Online portal that enables regulated entities and other stakeholders to interact with WDRA in a seamless & transparent way;
   - ► Development of Warehouses by providing software for basic Warehouse Operations related to tracking of commodities for e-NWRs;
3. Changes in Strategy, Organization structure, including the Human Resources framework, and internal business processes to handle the transformation;
4. Key stakeholders in the transformation include warehouses & repositories.
5. The scope of work for the System Integrator (SI) includes development & deployment of the integrated IT system including integration with custom applications and Operations & Maintenance (O&M), post-stabilization after go-live.

1.1 Key Objectives

WDRA envisages the following objectives from implementing an end to end Information Communications & Technology (ICT) system:
- ► Development of the e-NWR market by providing services to farmers and warehouses to easily participate in the e-NWR ecosystem;
- ► Regulation of the e-NWR market through effective monitoring & supervision of regulated entities;
- ► Seamless interaction with regulated entities and other stakeholders;
- ► Logging & redressal of grievances of farmers and other stakeholders;
- ► Automation of internal business processes through incorporating leading industry practices;
- ► Automation of internal office processes through incorporating leading industry practices;

2. WDRA IT Systems

2.1 Overview

Proposed WDRA IT system shall include different modules, for Internal Automation, Portal, Monitoring & Surveillance and Warehouse Quality Reporting, integrated into a single IT solution with a unified application interface with centralized user management functionality. The key functions and scope for each of these modules is described below.

2.2 IT System Components

2.2.1 Internal Automation

Internal automation includes automation of internal business processes ("Business Process Automation") & office processes ("Office Automation").

Scope of Business Process Automation includes:

► End-to-end automation of all processes for Financials (including Ledger, Receivables, Payables), Procurement, HR, Payroll, etc. with integrated workflow;
► Segregation of duties and provision for generating report on violation of conflicts in segregation of duties;
► MIS reporting.

Key functions & workflows for Internal Automation include:

► Create Ledger;
► Closing of Ledger;
► Human Resources management for employees including contract employees, staff on deputation;
► Payroll management including managing compensation & benefits and corresponding accounting;
► Accounting of Revenues, Grants, Expenses;
► Bank Reconciliation;
► Leave Management;
► Procurement;
► Management of Grievance/ Queries from employees.

Scope of Office Automation includes:

► Electronic file management system for office files;
► Collaboration & Messaging;
► Travel Management & Expense reimbursements;
► Migration of digitized paper-based files & documents;
► Central document repository;
► Integrated workflow for all office processes;
► MIS reporting;

Key functions & workflows for Office Automation include:
► Electronic Filing of DO notes, Office Memorandum (OM), green sheets;
► Travel Management;
► Expense Reimbursement Management;
► Workflow Delegation;
► Segregation of duties & GRC compliance;
► Centralized directory authentication & access control;

2.2.2 WDRA Portal

Portal will provide the unified interface for seamless interaction with stakeholders and regulated entities. Portal will host static content in English & Hindi and provide online application functions for regulated entities and stakeholders.

Key functions & workflows for the Portal include:

► Static content in English & Hindi including information about WDRA, warehouse registration criteria and process, etc.;
► Public functions such as querying for warehouse space availability within a specified area;
► Translation of Portal Content & Web Content Management;
► Warehouse Registration Lifecycle;
► Unified application interface for all internal & external application functions with central directory for user management;
► Warehouse Inspection Lifecycle;
► Submission of Report of Internal & External Monitoring, Review and Evaluation of Repository Systems and Controls;
► Regulatory Data Reporting by Repository;
► Integration with external Payment Gateway & SMS Gateway;
► Complaints & Disputes lifecycle;
► User Account Creation & Maintenance;
► Multiple Channel Support, i.e. Web & Mobile;
► Management of e-learning;

2.2.3 Monitoring & Surveillance

Monitoring & Surveillance will monitor and analyse information from regulated entities and help WDRA in its regulatory functions. Scope of Monitoring & Surveillance includes:

► Monitor & Supervise regulated entities such as registered warehouses, repositories;
► Monitor & flag suspicious transactions in e-NWR and generate reports for analysis and audit or inspection;
► Enable analysis of complaints and petitions against regulated entities;
► Monitor compliance with processes and time limits by inspection & audit agencies;
► Enable sharing of information and coordination with other regulators & State Governments;
► Enable analytics and decision making through embedded knowledge management;
► Web-enabled system for tracking all artefacts related to Monitoring & Surveillance;

Key functions include:

► MIS reports, Exception Reports, and Alerts that will form the output of Monitoring and Surveillance;
► Underlying metadata catalogue that will facilitate knowledge management by correlating metadata and assimilating and sharing knowledge across the organization for shared learning and development;
► Facilitate decision making through integrated workflow that enables functions such as triggering Inspection or Suspension of warehouse or collaboration with other regulators or State Governments.

The output of monitoring and surveillance will be in the form of following reports (Listed in Annexure - 3):

► MIS Reports.
► Exception Reports
► Executive Dashboard Reports

The reports listed in Annexure - 3 are required from the day of Go-Live of Monitoring and Surveillance System and the number of reports will increase as required by WDRA. As an indicator, the number of MIS reports that can be increased is +25% of the reports mentioned in Annexure - 3

2.2.4 Warehouse Management System

Warehouse Management System provides basic functionality for Warehouse Operations related to inbound & outbound flow of commodities for e-NWRs and storage quality reporting. Warehouse Management System will provide the following functionality

- ► Tracking inward movement of commodities for e-NWRs;
- ► Generating e-NWRs for commodities and submission of e-NWR information to repositories in real-time;
- ► Recording & Submission of Inspection & Sampling Quality Control data including categorization & classification of commodities;
- ► Warehouse space availability information for farmers and depositors;
- ► Basic warehouse operations functionality such as stack-wise space availability, stack register, etc.;
- ► Tracking outward movement of commodities based on deliveries against e-NWRs;

2.3 Proposed Approach

The proposed approach for development of the IT solution is:

Module	Proposed Approach
Internal Automation	
Business Process Automation	Commercial off-the-shelf (COTS)[1]/Custom developed
Office Automation	NIC e-office
Portal	Custom developed
Monitoring & Surveillance	Custom developed
Warehouse Management System (WMS)	Custom developed

2.4 Integration Scenarios

2.4.1 Internal Automation

Integration between Business Process Automation & Office Automation will use:

- ► Central directory for synchronization of user access controls e.g. if employee joins or is terminated, user management information will be updated in central directory from which authentication & access controls, for either module, will be verified;

- ► Data transfer from Office Automation system to Business Process Automation system, using standard APIs and data formats.

2.4.2 WDRA Portal

- ► Integration with WDRA Internal Automation System for accounting of fees paid for Warehouse Registration and Repository Licenses;

- ► Integration with Repository – Repository will transfer regulatory reporting data using a standard data exchange format through a secure protocol;

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[1] **Definition of COTS**

- ► Are available from established OEMs / Forums /Community.
- ► the product(s) have been implemented in similar domains across various industries / customer ,
- ► It should carry a defined roadmap ,
- ► Supported by the OEM for patches and upgrades
- ► Product should been tested and certified against various performance benchmarks in a controlled environment by reputed certifying authorities.
- ► The product should have good number (minimum: 4) of independent implementation & support partners that are independent entities or firms.
- ► OEM/Community should have defined clear learning path to develop & certify skills on the product.
- ► Product available with detailed documentation about installation and configuration manuals, help guides, OEM / Community supported forums to understand, discuss and report any bug or issue.

- ► Integration with Payment Gateway using APIs;
- ► Integration with SMS Gateway using APIs;
- ► Integration with Name/Biometric AADHAR authentication;
- ► Integration with Digital Signature Certificate issuers;
- ► Application Integration with other modules to consolidate all application functions into a unified interface.

2.5 Migration & Cutover

2.5.1 Internal Automation

- ► Ledger
- ► Employees & Payroll
- ► Fixed Asset Register (FAR)
- ► Vendor Master Data
- ► Customer Master Data
- ► Asset Master Data
- ► Purchase Orders
- ► Other Masters e.g. Bank Master, Customer Master, Tax Master, Asset Category Master, etc.
- ► Digitized office files

2.5.2 Portal

- ► All content in the current WDRA website at wdra.nic.in will be migrated;
- ► Digitized data for last 3 years related to Registration of Warehouse, Renewal of Registration of Warehouse, Cancellation of Registration will be migrated;
- ► Digitized data for last 1 year for Inspection Report of Warehouses will be migrated.

3. Solution Details

The following section provides an architecture principles for WDRA for the solution envisaged, consisting of various components expected within the solution. Each of these components has been described subsequently. Bidder is expected to go through the same and make an independent assessment. Detailed process flows of the processes will be shared with the successful bidder at the time of selection.

3.1 Architecture & Design principles

Following architectural & design principles should be considered for designing the IT system:

Sr. No.	Principle	Description
1	Open Source Technology stack and Open Standards	API, open standards and open source technology components shall be considered for designing the system. The system integrator design principle.
2	Reusability	System should be designed using modular components that are extensible and reusable.
3	Scalability	It should be possible to scale up the system through addition of new functionality (vertical scalability) and incremental deployment of infrastructure (horizontal scalability).
4	Security	System should be designed with robust application security.
5	Application Principles	Application should be usable with runtime customization & configuration capabilities and support offline usage with asynchronous updates. Application should also support access through multiple channels such as web, mobile.
6	Lights-out Operations	System should be designed to support lights-out operations.

3.2 Solution Architecture

The overall indicative solution architecture of IT systems at the WDRA is as shown in the figure below:
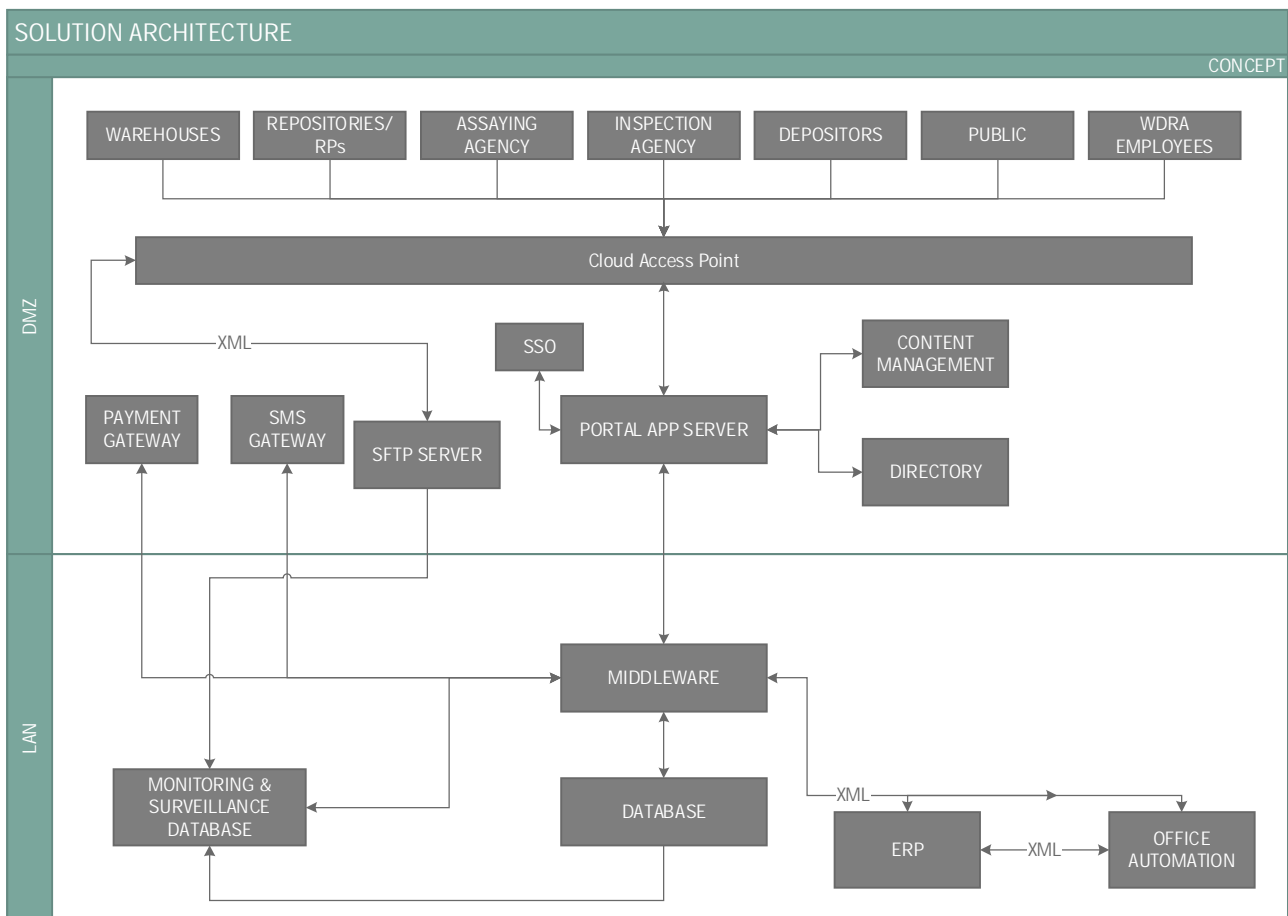
3.3 Solution Components
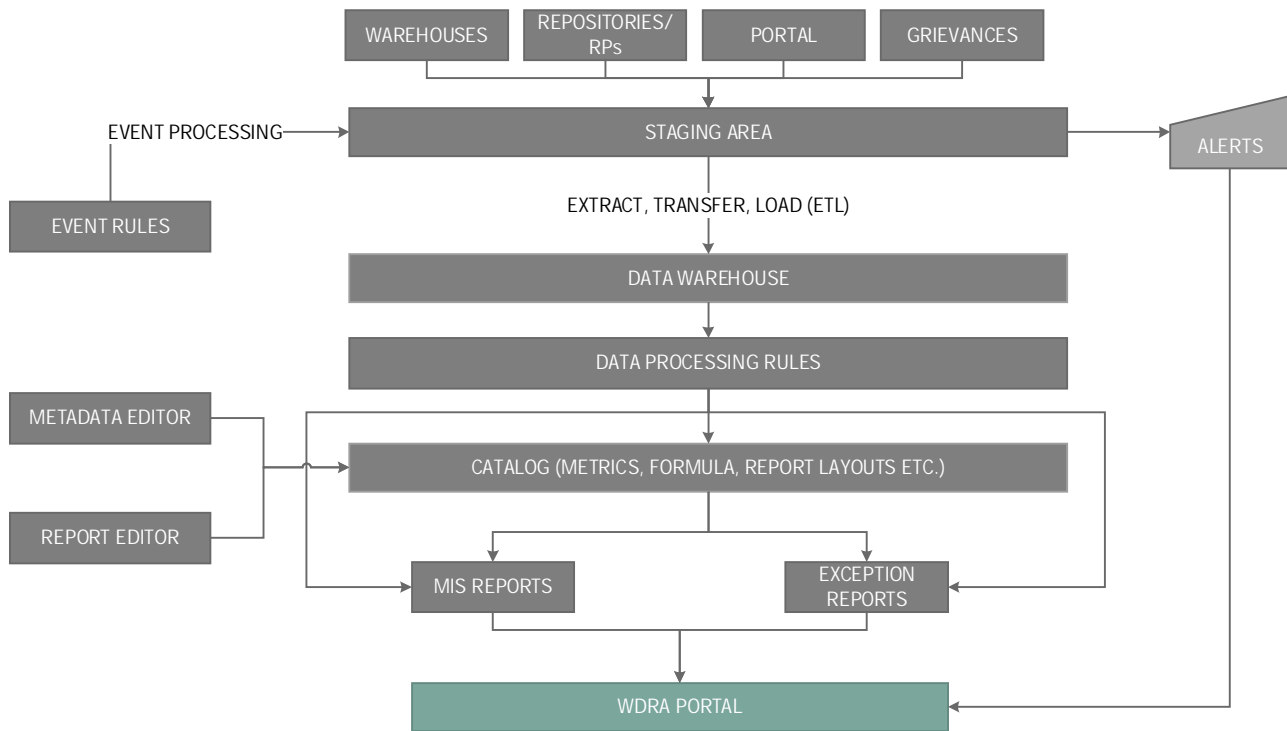
The major software solution components are detailed below:

► **WDRA Portal:** The portal will be used to display public content (such as information about the repository) and also provide access to the application functions. The portal should provide a URL which can be used to view the public content on the portal. The user interfaces (UIs) for the application can be accessed on logging into the portal. The WDRA portal will include applications such as Warehouse Registration, Inspection of warehouses, Complaints & Grievances, etc.

► **Directory Service:** The directory service will be a standard directory like LDAP (lightweight directory access protocol) and contain information for different users and used for user authentication and access control.

► **Content Management Framework:** The portal should be integrated with a Content Management framework so that the layout and content on the portal can be changed dynamically and utilities such as search can be provided.

► **Middleware:** The middleware will serve as the runtime for the application and APIs. It should support dynamic instantiation of runtimes based on user load.

► **Database:** The database is WDRA Transactional Database. The database should support the

ACID (Atomicity, Consistency, Isolation, and Durability) properties and provide access using open standards (JDBC, ODBC).

► **Cache:** Application cache can be configured for storing data, for frequently used queries, for faster response times.

► **ERP:** Contains functions for Finance, Procurement, Receivables, Payables and Payroll etc.

► **Office Automation:** Contains function for e-filing, Collaboration & Messaging, Travel Management and Expense Reimbursements etc. ERP system & Office Automation system will have an interoperable data exchange mechanism using standards such as XML.

► **Payment Gateway:** WDRA portal should be integrated with Payment Gateway so that WDRA can receive the payments (application fee, security deposit etc.) from applicant during Registration of Warehouse, Renewal of Registration of Warehouse etc.

► **SMS Gateway:** WDRA portal should be integrated with SMS Gateway so that system can send notification via SMS to user post initiation of any workflow.

► **SFTP Server:** Staging area for repositories & warehouses to upload regulatory reporting data.

► **Monitoring and Surveillance Database:** The data warehouse database is a relational data structure that is optimized for reporting & analysis. Data Integration tools collect and integrate sets of data from different data sources that have been validated in the data staging area, and store them in the data warehouse. The latter then becomes the one source of the truth for all reporting & analysis data.

3.4 Technical Architecture for Monitoring & Surveillance

The proposed system design for Monitoring and Surveillance at WDRA will include the components as shown in the figure below:

```
WAREHOUSES   REPOSITORIES/   PORTAL   GRIEVANCES
                 RPs

EVENT PROCESSING ──────►  STAGING AREA  ──────►  ALERTS

EVENT RULES

                EXTRACT, TRANSFER, LOAD (ETL)

                DATA WAREHOUSE

                DATA PROCESSING RULES

METADATA EDITOR

                CATALOG (METRICS, FORMULA, REPORT LAYOUTS ETC.)

REPORT EDITOR

        MIS REPORTS              EXCEPTION
                                 REPORTS

                WDRA PORTAL
```

3.5 Technical Architecture (Monitoring & Surveillance) Components

The major software components are detailed below:

► **Data Sources:** Includes external data sources such as registered warehouses & repositories and internal data sources such as warehouse registration data, complaints & petitions filed; external data sources will provide data in a standard XML format.

► **Staging Area:** Staging area is the entry point for the data warehouse where data from different sources is collected and stored. Validation rules & quality checks are applied to this data to filter out invalid and duplicate data. Data is then processed by Data Integration tools that take the data, transform it and load into the data warehouse tables for analysis.

► **Event Rules:** Event rules check for specific conditions in the data and generate alerts if these conditions are met e.g. flag all e-NWRs issued for "Toor dal" with quantity greater than 1 ton. Event Rules can be defined using standard languages like CQL (Complex Query Language) and is applied to the valid data in the staging area before it is loaded into the data warehouse. Alerts will be generated with content based on parameterized templates.

► **Database:** Monitoring & Surveillance database will be a data structure that is optimized for reporting & analysis. Data Integration tools collect and integrate sets of data from different data sources that have been validated in the data staging area, and store them in the data warehouse. Key functionalities of data warehouse include facilitating reporting & dimensional analysis using different reporting & analytical tools.

► **Catalogue:** Catalogue is a central repository for all metadata artefacts and maintains correlations between different metadata artefacts. Catalogue enables analysis & decision making by linking all related artefact.

► **Report Editor:** Report editor allows for defining & customising reports using metadata from the Catalogue. Report editor will support functionalities such as different types of visualizations for graphs, charts, and histograms; slicing and dicing features facilitating ad-hoc management reporting on the fly; user friendly GUI to allow easy generation of reports with analytic capabilities.

4 Functional & Performance Requirements

4.1 Functional Requirements

Detailed list of Functional Requirements has been provided in the Annexure 1 - FRS.

4.2 Security

► All web applications should be secure from the Open Web Applications Security Project vulnerabilities;
► All web applications should be configured to only use SSL/TLS to ensure secure communication;
► System should have strong role based access control logic built in it. Access control mechanism should be at multiple levels;
► System must maintain detailed audit trail logs.

4.3 Sizing

System must be sized so that utilization at average load is no more than 40% of the capacity and utilization at peak load is no more than 60% of the capacity. SI is required to size the IT solution based on the following projections for user load and configure the deployed infrastructure to meet the performance & uptime requirements.

Parameter	Year 1	Year 2	Year 3
Number of registered warehouses	1600	2000	4000
% of warehouses using WMS	10	15	20
Number of licensed repositories	2	2	2
Number of e-NWR transactions	2,10,000	4,50,000	24,00,000
Number of Warehouse Quality Reporting transactions	500,000	12,00,000	36,00,000
Number of WDRA internal users	10	15	20
Number of farmers	5000	10000	50000
Number of retail investors	125	500	3750
Number of Complaints & Disputes	670	1250	5775
Number of Concurrent Users	300	500	1200
Average transactions per hour	2000	3000	8000
Average transaction size (KB)	50	60	100

4.4 Performance

4.4.1 Internal Automation

For all online transactions & queries, the average response time should be less than 2 seconds. All batch processes should be configured to run during off-business hours.

4.4.2 Portal

Response times for different functions is shown below:

Sr. No.	Function	Average End-to-End response times[2]
1	Login & Authentication	<=2 seconds
2	Rendering of portal pages	<=2 seconds
3	All online transactions (without document upload)	<= 3 seconds
4	All online transactions (with document upload)	<= 30 seconds
5	All online queries	<= 3 seconds
6	All downloads (documents, e-learning content)	<= 30 seconds

4.4.3 Monitoring & Surveillance

Sr. No.	Measurement	Average End-to-End response times (as defined above)
1	Login & Authentication	<= 2 seconds
2	Rendering of other application pages	<= 2 seconds
3	Queries	<= 3 seconds
4	Rendering of MIS report	<= 10 seconds
5	Rendering of Exception report	<= 10 seconds
6	Rendering of Executive dashboard	<= 30 seconds

4.4.4 Warehouse Management System

Response times for different functions is shown below:

Sr. No.	Measurement	Average End-to-End response times (as defined above)
1	All online transactions	<= 3 seconds
2	All online queries	<= 5 seconds

4.4.5 Scalability

Following are the Scalability Requirements:

► System must be scalable to handle an additional 25% increase in the load (no. of concurrent users or no. of transactions per hour), with the existing configuration, and without any appreciable change in performance;

► System must provide an option for adding additional functional modules without any appreciable change in performance;

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[2]End-to-end response time is the response time for an end-user for getting a valid response after submitting a transaction or query with an assumed minimum bandwidth of 1Mbpsper user

► System must provide an option for adding new service delivery channel.

4.4.6 Reliability

Following are the Reliability Requirements:

► System must provide 99% uptime for users for applications with no unplanned downtime greater than 2 hours; this allows unplanned downtime of up to 4 days per year. System must provide high availability, with configuration between DC & DR sites as per the high-availability configuration, with no single point of failure for the complete system;

► Portal should be configured in high-availability mode and other systems like Business Process Automation & Office Automation should not be configured in high-availability mode;

► SI should coordinate with the Cloud Service Provider (CSP) to ensure data security & integrity due to communication channel failures, software & hardware operability failures;

► SI should coordinate with CSP to ensure error recovery and elimination of possible after failure consequences of communication channels, software & hardware.

5 Terms of Reference

5.1 Overview

This section sets out the scope of work for the SI during the Development & Deployment and Operations & Maintenance (O&M) phases.

5.2 Scope of Work

5.2.1 Development & Deployment

► Develop integrated software for:
   ► Automation of external regulatory functions, with integrated workflow, for warehouse registration, assignment of inspection agencies to warehouses, submission of inspection reports by inspection agencies, Complaints & Disputes, monitoring of repository SLAs & warehouse performance, etc.;
   ► Warehouse Management System for managing basic warehouse operations, for commodities for e-NWR, such as inward & outward movement and storage of commodities;
   ► Automation of internal business processes for Finance, HR, Payroll, Procurement & office functions with integrated workflow;
   ► Monitoring & Surveillance systems for effective supervision of regulated entities and ensuring credibility of the e-NWR ecosystem;
   ► WDRA portal providing a unified interface for all application functions with content management framework, user management and central authentication directory;
   ► Implementing inter-system data exchange protocol based on use-cases defined;
   ► Implementing protocol for submission of regulatory data by repositories & warehouses based on specifications defined;
   ► Migration of legacy data & content;

- ► Integrate with custom applications for e-office;

► Provide Technology Platform & tools for:
  - ► Above mentioned software;
  - ► E-learning;
  - ► Automated monitoring & management; SLA management;

► Security Audit of the software through CERT-IN empanelled IT Auditor. Scope of security audit should include web applications security testing for all application functions;

► Deploy Software in the Cloud through a Cloud Service Provider designated by WDRA;

► Provide installable for Warehouse Management System for on premise installation by warehouses. Documentation & Specifications for installation of WMS also needs to be provided;

► Development & Testing platform will be on either of the following:
  - · Cloud through the Cloud Service Provider designated by WDRA;
  - · On-premise hardware;

► Software should be developed on Open Source technology stack;

► Operate & Maintain software for a period of 3 years with:
  - ► Comprehensive 9 x 5 support (9 hours/day, 5 days/week) on all business days;
  - ► Automated Monitoring & Management;
  - ► SLAs for uptime & availability, performance;

5.2.2 Operations & Maintenance (O&M)

Key activities in the O&M phase include the following and is elaborated below:
- ► Software Maintenance – for all application and system software;
- ► Automated tools – for maintenance of Software;
- ► Change Management – managing changes to Software as per defined process;
- ► BCP/DR – for unforeseen disasters and system crashes;
- ► Sizing and Capacity Management;
- ► Performance Checking;
- ► Helpdesk – centralized helpdesk for end-user support;
- ► SLA Management;
- ► Source Code Maintenance;
- ► Security of Software;
- ► Software Audits – Periodic application software audits to assess technical & functional gaps;
- ► IT Service Management processes – developing and operationalizing service management processes for optimal service delivery related to the deployed software;

5.2.2.1 Software Maintenance

SI will be responsible for the following:
- ► Fixing of Software Defects;
- ► Enhancements to existing software;
- ► Maintenance & Enhancements to published Message Formats for inter-repository transactions;
- ► Application Uptime Maintenance;
- ► Performance Tuning;
- ► Software Upgrades;
- ► Patch Management;
- ► Compliance with Statutory Requirements;
- ► Annual Technical Support for all OEM software.

5.2.2.2 Automated Tools

SI will be required to provision tools for the following:

► Monitoring & Administration – for monitoring the health of the Software;

► Source Code Control – for versioning of the source code;

► Release Management – for creating & deploying executables across the IT infrastructure;

► Performance Management – for monitoring performance based on predefined thresholds for different application functions;

► Capacity management by monitoring system utilization based on different user loads to provision additional capacity as and when required with due approval from WDRA well in advance;

► SLA Management – for defining, measuring and monitoring SLAs including financial penalties that may be applicable.

5.2.2.3 Change Management

SI will be required to perform Change Management, as per the defined processes, including the following activities:

► Impact Analysis – perform impact analysis for the requested changes and provide effort estimate;

► Changes to Capacity – estimate the impact of the requested change on the available capacity;

► Change Rollout – follow the required process for approval of a change, performing the change and rolling out the change as per the defined process;

5.2.2.4 BCP/DR

SI will be required to work with the designated Cloud Provider to ensure:

► Periodic backup of application & data, to ensure enhanced service levels and RPO and RTO objectives as decided by WDRA, and subsequent archival conforming to Data Retention policies;

► Switching to Disaster Recovery Setup in the event of non-availability of DC setup and recovery of applications and database in the event of system crash.

5.2.2.5 Sizing and Capacity Management

The SI will be expected to perform sizing and capacity management as per the following indicative list of activities:

► Initial sizing, based on projected user load and number of transactions, for deployment of the Software; this includes sizing for computing capacity (CPU, memory) and storage;

► Capacity management by monitoring system utilization based on different user loads to provision additional capacity as and when required with due approval from WDRA well in advance;

5.2.2.6 Helpdesk

SI will be responsible for the following:

► Provisioning Software for logging, categorization and tracking of all Software related issues by all stakeholders including warehouses, repositories, depositors and internal users;

► Setting up Helpdesk support team for providing the 1st level of support for issues related to logging

in, account unlocking, password reset, etc.

► Maintain Audit trail for all issues logged in the helpdesk;

► Enforce Access control that allows designated users to log issues and update status and other users to view the information available.

5.2.2.7 SLA Management

Provision an SLA management module that allows definition, monitoring & measurement of SLAs including applicable financial penalties. List of activities includes:

► Provision independent SLA management module with separate database and middleware that may be required;

► Access controls should be defined so that WDRA alone has access to define, monitor & measure SLAs using this module;

► Define & implement a mechanism to post data, including data from helpdesk, using an asynchronous and secure event-based mechanism for any performance or uptime event;
► Process SLA data and update the metrics on a regular basis.

5.2.2.8 Source Code Maintenance

SI shall maintain all source code, developed for WDRA, in an independent source code control software with appropriate versioning and full access to WDRA. Additionally, source code for all OEM software used should be made available to WDRA on request either directly or through an Escrow agreement.

5.2.2.9 Security

SI will be responsible for the following:
► Taking adequate security measures to ensure confidentiality, integrity and availability of the information including working with the designated Cloud Provider to monitor & prevent unauthorized intrusions;

► Periodic information security audits /assessments to be performed by system integrator through an external security audit firm;

► The selected system integrator shall provide the WDRA representatives access to its facilities, installations, technical resources, operations, documentation, records, databases and personnel;

► The selected system integrator must provide WDRA access to various monitoring and performance measurement systems.

5.2.2.10 IT Service Management for Software

SI will be responsible for the following:
► Implementing IT service management processes for Incident & Defect Management, Change Management, Performance Management, Release Management, and SLA Management.

► Above includes appropriate formats for incident & defect logging, change requests, etc. which should be approved by WDRA.

► Implemented IT service management processes should be regularly monitored and fine-tuned to ensure optimal IT service delivery.

5.3 SLA & Performance Penalties

SLAs for Application Software Maintenance are defined below:

Category	Criteria	Penalty for non-compliance as % of value of Maintenance Contract per Quarter	Ceiling on Penalty as % of value of Maintenance Contract per quarter
Fixing of Software Defects	Software defect resolution patches to ensure continuous business operations	0.025% per issue per day of delay if issue is not resolved in the Production environment as per SLA resolution time for High, Medium & Low priority issues and subject to the ceiling as defined Here in. All issues unresolved as of the end of the period shall be considered for the penalty calculation irrespective of whether they were reported in the current or previous periods.	
Performance	Meeting performance criteria as defined. Will be measured once per quarter by enabling application logging	0.5% per function where response time is greater than the expected response time.	10%
System Uptime Maintenance	Minimum uptime of 99% per quarter to be maintained for the application However, system should not have outage at a stretch of more than 4 hours.	>= 99% - no penalty; >= 98% and < 99% -3%; >= 97% and < 98% -7.5%; For the above criteria, if outages are greater than 4 hours, additional penalty of 0.5% for every such outage will be deducted; < 97% - condition of default to be reported to WDRA steering committee	

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Response and resolution time to be maintained for fixing of Software defects are defined below:

Priority	Definition	Max Response Time	Max Resolution Time
High	All or part of the application is unavailable or very slow to access for a large number of users resulting in serious consequences for normal business transactions for all applicable groups of users e.g. complete system or a module or site unavailability tested at site of Production setup, data replication to DR site not functioning etc.	1 working hour	6 working hours

Priority	Definition	Max Response Time	Max Resolution Time
Medium	Full or Partial loss of any business-critical software feature for any number of users or slow to access for one or more users e.g. users in WDRA are not able to run a particular Monitoring & Surveillance report either because the feature is defective or very slow to access, a particular user is unable to create an invoice, etc.	4 working hours	1.5 working days
Low	A low impact problem that affects the efficiency of users but has a simple workaround; minor errors or documentation issues fall into this severity.	1 working day	2 working weeks

5.4 Development Change Support Classification

After post stabilization period, there may be requirement of development changes in any of the software for ERP/eOffice, portal and monitoring and surveillance systems. SI should build in costs for up to 50 changes per year, with each change costing 2 man days which WDRA shall be free to use for any types of changes. Additionally, SI should provide estimate for unit rate per function point, with appropriate escalation in costs built-in from year 1 to year 3, which can be used by WDRA to provision other changes that may be required. Additionally, the following caveats apply for all development change requests:

► Scope of work for development change support has to be out of scope of usual onsite and offsite managed support activities. This should be agreed by WDRA IT/ERP Team.

► Development work would include change request, customization, and new report development over and above the customized reports mentioned in the RFP document (which will be published by WDRA). This would also include any future integration efforts due to future implementation of repository (ies), any other related application, etc.

► The procedure for approval will have to mandatorily go through the change management cycle and approved by the Change Advisory Board headed by a WDRA representative.

5.5 Duration of Service Level Agreement

The service level agreement would be valid for the entire period of contract. SLA's will be applicable after the post go-live stabilization period.

6 Annexure

► Consolidated FRS for Internal Office Automation, WDRA Online Portal, and Monitoring and Surveillance systems. (Annexure 1)
► E-learning (Annexure 2)
► MIS and Exception Reports (Annexure 3)
► Application Security Audit (Annexure 4)