Request for Proposal
for
Selection of System Integrator for Ensuring Continuity of Khanij Online (CHiMMS) Application and Design, Development, Implementation and Maintenance of Khanij Online 2.0

(Volume 1 of 3- Scope of Services)

RFP No.: 62157/CEO/CHiPS/KhanijOnline2.0/RFP/2020
dated 13th March 2020

Chhattisgarh Infotech Promotion Society
State Data Centre Building, Near Police Control Room,
Civil Lines, Raipur, Chhattisgarh–492001
Tel.: +91-771-4014158
Email: ceochips@nic.in , Website: www.chips.gov.in

DISCLAIMER

This Request for Proposal (RFP) for Selection of System Integrator for **"Ensuring Continuity of Khanij Online (CHiMMS) Application and Design, Development, Implementation and Maintenance of Khanij Online 2.0"** for the state of Chhattisgarh is issued by CHiPS on behalf of Directorate of Geology and Mining (DGM), Government of Chhattisgarh.

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

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

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

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

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

Abbreviations and Acronyms

Abbreviation	Description
ACD	Automatic Call Distributor
ACR	Annual Confidential Report
AMC	Annual Maintenance Contract
ANI	Automatic number identification
API	Application Programming Interface
ATS	Annual Technical Support
BCP	Business Continuity Planning
BG	Bank Guarantee
BOM	Bill of Materials
BoQ	Bill of Quantity
BPEL	Business Process Execution Language
BPMN	Business Process Model and Notation
CA	Chartered Accountant
CAPEX	Capital Expenses
CCA	Controller of Certifying Authorities
CCTV	Closed-circuit television
CEO	Chief Executive Officer
CG	Chhattisgarh
CGSWAN	Chhattisgarh State Wide Area Network
CGTD	Chhattisgarh Transport department
CHiMMS	Chhattisgarh Integrated Mines & Minerals Management System
CHiPS	Chhattisgarh Infotech Promotion Society
CLI	Caller Line Identity
CM	Chief Minister
CMMi	Capability Maturity Model Integration
COTS	Commercial of the Shelf
CPU	Central Processing Unit
CRM	Customer Relationship Management
CSC	Common Service Centre
CSP	Cloud Service Provider
CSS	Cascading Style Sheets
CTI	Computer Telephone Integration
CV	Curriculum Vitae
CVC	Central Vigilance Commission
DC	Data Centre
DCR	District Control Rooms
DD	Demand Draft
DGM	Directorate of Geology and Mining
DMF	District Mineral Foundation
DMO	Direct Mode Operation
DNIS	Dialled number identification sequence
DR	Disaster Recovery
DRaaS	Disaster Recovery as a Service
ebXML	Electronic Business Extensible Mark-up Language

Abbreviation	Description
EMD	Earnest Money Deposit
EPBX	Electronic Private Automatic Branch Exchange
E-TP	E-Transit Pass
FPA	Functional Point Analysis Model
FRS	Functional Requirement Specification
GIGW	Guidelines for Indian Government Websites
GIS	Geographic Information System
GST	Goods & Service Tax
H/w	Hardware
HA	High Availability
HR	Human Resource
HTML	Hypertext mark-up Language
IA	Implementation Agency
ICCC	Integrated Command Control Centre
ICT	Information and Communication Technology
IE	Internet Explorer
IIS	Internet Information Services
INR	Indian Rupees
IP	Internet Protocol
ISO	International Organization for Standardization
IT	Information Technology
ITeS	Information Technology Enabled Services
ITIL	Information Technology Infrastructure Library
ITSM	IT service management
IVR	Interactive Voice Response
JSON	JavaScript Object Notation
JSR	Java Portlet Specifications
KT	Knowledge Transfer
LDAP	Lightweight Directory Access Protocol
LED	Light Emitting Diodes
LI	Lead Implementer
LLP	Limited liability partnership
LOI	Letter of Intent
MAF	Manufacturer Authorization File
MB	Mega Byte
MCDR	Mineral Conservation and Development Rules
MeitY	Ministry of Electronics and Information Technology
MIS	Management Information System
MMP	Mission Mode Project
MMRD	Mines and Minerals Development Regulation
MoRTH	Ministry of Road Transport and Highways
MoU	Memorandum of Understanding
MRD	Mineral Resource Department
MSA	Micro Service Architecture
MVC	Model-View-Controller
NDA	Non-Disclosure Agreement

Abbreviation	Description
NeGP	National eGovernance Plan
NIT	Notice Inviting Tender
NMDC	National Mineral Development Corporation
NMET	National Mineral Exploration Trust
NOA	Notification of Award
O&M	Operation and maintenance
OEM	Original Equipment Manufacturer
OGP	Obvious Geologically Potential
OSU	Operational Support Unit
PAN	Permanent Account Number
PBG	Performance Bank Guarantee
PMU	Project Monitoring Unit
POA	Power of Attorney
PSTN	Public Switched Telephone Network
PSU	Public Sector Undertaking
QA	Quality Analysis
QR	Quick Response
QCBS	Quality Cost Based Selection
RAM	Random Access Memory
RCA	Route Cause Analysis
RFC	Retro fitment Centre
RFP	Request for Proposal
RPO	Recovery Point Objective
RTO	Recovery Time Objective
S/w	Software
SAML	Security Assertion Mark-up Language
SAN	Storage Area Network
SDA	State Designated Agency
SDC	State Data Centre
SDK	Software Development Kit
SECL	South Eastern Coalfields Limited
SI	System Integrator
SLA	Service Level Agreement
SMS	Short Message Service
SOAP	Simple Object Access Protocol
SOP	Standard Operating Procedures
SPOCs	Single Point Of Contact
SQL	Structured Query Language
SRS	Software Requirement Specifications
SSDG	State e-Governance Service Delivery Gateway
SSL	Secure Sockets Layer
STQC	Standardisation Testing and Quality Certification
SWAN	Structured Wireless-Aware Network
TCS	Tax Collected at Source
TEC	Technical Evaluation Committee
TP	Transfer Protocol

Abbreviation	Description
UAT	User Acceptance Testing
UML	Unified Modelling Language
UNFC	United Nations Framework Classification for Resources
UPS	Uninterruptible Power Supply
URL	Uniform Resource Locator
VLT	Vehicle Location Tracking
VM	Virtual Machine
VPN	Virtual Private Network
VTS	Vehicle Tracking System
WB	Weigh Bridge
WCAG	Web Content Accessibility Guidelines
Wi-Fi	Wireless Fidelity
WRR	Weighted Round Robin Functionality
WSDL	Web Service Definition Language
XML	Extensible Mark-up Language
XSLT	Extensible Stylesheet Language Transformations

Structure of the Document

The intent of this RFP is to invite bids for selection and appointment of the System Integrator for "**Ensuring Continuity of Khanij Online (CHiMMS) Application and Design, Development, Implementation and Maintenance of Khanij Online 2.0"** for Directorate of Geology and Mining (DGM), Government of Chhattisgarh.

The Request for Proposal (RFP) consists of three volumes viz.

A. **RFP Volume 1: Scope of work including Functional & Technical Specifications**

This volume of RFP broadly covers the following:

- Project Overview, Objectives and Timelines
- Scope of work
- Workstream
- Functional and Technical requirements
- Service Level Agreement (SLA)
- Project Schedule

The bidder is expected to respond to the requirements completely and in as much relevant detail as possible and focus on demonstrating bidder's suitability to become the implementation partner of DGM/CHiPS.

B. **RFP Volume 2: Instruction to Bidders**

This volume of RFP broadly covers:

- General instructions for bidding process
- Bid evaluation process including the parameters for Technical evaluation and commercial evaluation to facilitate CHiPS in determining bidder's suitability as the implementation partner
- Commercial bid and other formats

C. **RFP Volume 3: Master Service Agreement**

This volume of RFP broadly covers:

- Contractual, Non-Disclosure Agreement
- Legal Terms & Conditions applicable for the Proposed engagement
- Payment Schedule

The bidders are expected to examine all instructions, forms, terms, Project requirements and other information in the RFP documents. Failure to furnish all information required as mentioned in the RFP documents or submission of a proposal not substantially responsive to the RFP documents in every respect will be at the Bidder's risk and may result in rejection of the proposal.

Contents

1 INTRODUCTION

1.1 About Chhattisgarh

Chhattisgarh is the 10th largest state in India with an area of 135,190 sq. km. Chhattisgarh was carved out of Madhya Pradesh in 01 November 2000 with its 16 Chhattisgarhi speaking districts. It is an important hub of production of steel production and electrical power generation in India, producing about 15% of the total steel produced in India. It is surrounded by seven states namely Madhya Pradesh, Maharashtra, Andhra Pradesh, Telangana, Orissa, Jharkhand and Uttar Pradesh.

Being a mineral rich state, concerted efforts have been made to systematically explore and develop the mineral resources in the country. Mineral, being finite and non-renewable natural resources, require special attention so that these are exploited and utilized in an optimal manner. These are our 'source of treasure' and constitute the backbone of the industrial development of the nation.

Bountiful nature has bestowed Chhattisgarh with vast reserves of all-important minerals. Recognizing the pivotal role of mineral in the industrialization of the state, the government of Chhattisgarh has taken various policy decisions to eliminate procedural hindrances and to create the necessary environment, to allow entrepreneurship to grow, to develop and to thrive in this state.

1.2 About CHiPS

Chhattisgarh Infotech Promotion Society (CHiPS) is the nodal agency and prime mover for propelling IT growth & implementation of the IT & e-Governance projects in the State of Chhattisgarh. CHiPS is involved in the end-to-end implementation of the following major projects:

- State Wide Area Network - CG SWAN
- E-District (Online G2C Services)
- Common Service Centres (CSC) – Rural CHOiCE
- Khanij Online
- Geographical Information System (GIS)
- e-Procurement
- State Data Centre
- Crime and Criminal Tracking and Network System (CCTNS)
- Digital Secretariat
- 36-Inc
- BharatNet

Vision statement

“To empower the people of Chhattisgarh through universal access to information and Government services making effective use of information and communication technologies.”

1.3 About MRD & DGM

Chhattisgarh is endowed with variety of mineral wealth. Under MRD, the Directorate of Geology and Mining (DGM), Chhattisgarh is actively engaged in development of minerals and mineral based industries in the state. For the rapid and systematic investigation and

conservation of minerals, 3 Regional Offices of Directorate are operational at Raipur, Bilaspur and Jagdalpur. Presently the DGM has 28 district offices, 5 Check Posts & Weigh bridges at district level. The Directorate has sophisticated laboratories located at head office Raipur and Regional offices comprising modern equipment's, trained and experienced manpower to carry out detail analysis of rocks, minerals and ores. Remote sensing and Petrological laboratory of the DGM has a capacity to assist in mineral investigation. Recognizing the pivotal role of minerals in the industrialization of the state, the Government of Chhattisgarh has formed several policies to eliminate procedural delays and to create an amicable environment for the entrepreneurs and growth in this state.

1.3.1 Primary Duties and Responsibilities

A) Proposing and Exploration of Minerals / Ores through:

i. Remote sensing and photo-geological studies in obvious geologically potential (OGP) areas supported by ground geophysical survey, to target mineral bearing areas.
ii. Reconnaissance, geochemical, Petrological and ground geophysical survey to locate new mineralized areas to target prospecting and exploration (mapping, ground geophysical survey, drilling, pitting/trenching, sampling etc.) and estimation of the mineral resources.
iii. Petrological studies, chemical analysis and other physical tests of mineral, ore and rock samples.
iv. Exploratory mining wherever needed.
v. Undertaking the "Mineral Beneficiation Studies" for preparation of feasibility study reports.
vi. Categorization of the mineral resources as per the United Nations Framework Classification (UNFC).
vii. Guidance to the mining lessees on their request for (i) prospecting and exploration in the lease hold areas as per prevailing rules and (ii) preliminary assessment of mineral resources.

B) Regulatory & Administrative:

i. Approval and monitoring of the mining plan and scientific exploitation of mineral resources vide MMRD Act and applicable Rules.
ii. Guidance for development of infra-structural facilities in the mining area and mineral based industries.
iii. Monitoring of unauthorized excavation, removal, transportation and misuse of mineral.
iv. Monitoring and guidance for conservation of mineral resources and restoration of ecological balance.
v. Collection of returns / data on production and many other related aspects of mining

C) Collection of Mineral Revenues

i. The duties of the DGM have increased with time. The mineral concessions of major and minor minerals have risen from 1577 in the year 2000-01 to 3211 in the year 2010-11.
ii. Phenomenal increase in State's mineral revenue is observed from INR. 429.96 crores in the year 2000-01 to INR. 2461.46 crores in 2010-11. Mineral Revenue of 2018-19 is INR. 6111 crores plus.

iii. It is observed that DGM's regulatory, operational and monitoring systems, efficiency would increase considerably by application of IT (information technologies) intervention in the system
iv. On an average, approximately 1000applications / annum are received by the department for various mineral concessions.
v. The average number of transit Pass issued annually are approximately 75,00,000.
vi. The department has been collecting approximately Rs. 2500 crores of revenue from mining activities.
vii. The responsibility of the DGM has enormously increased with time.

1.3.2 Policy Related Responsibilities

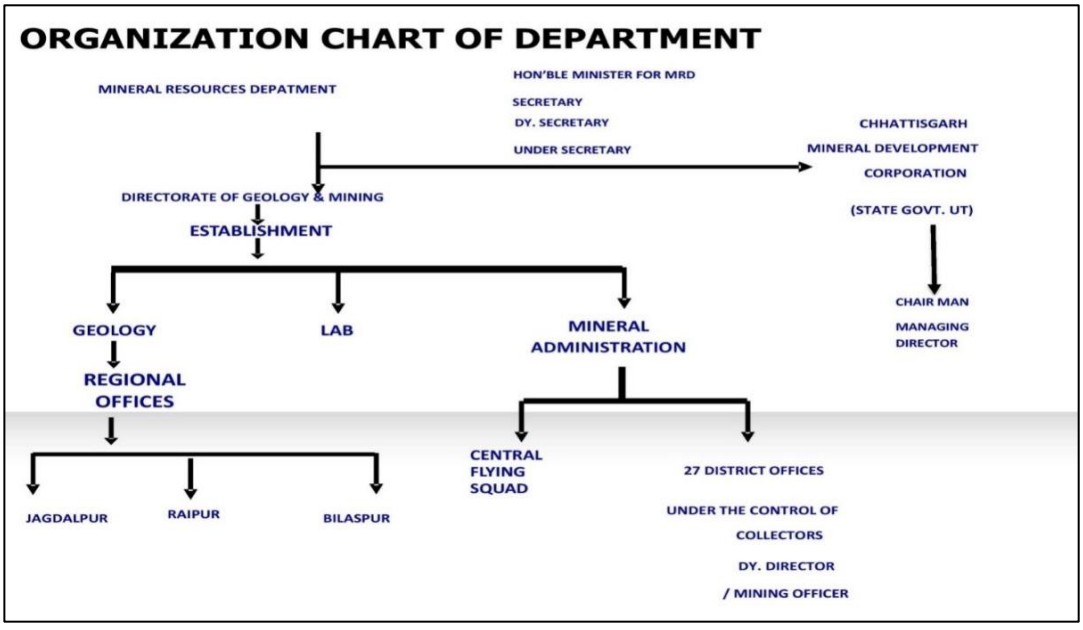
i. Investigation, prospecting and estimation of mineral resources.
ii. Auctions of Mines & Minerals.
iii. Development and Regulation of Mines and Minerals.
iv. Grant of mineral concessions and compilation of revenue.
v. Taxation of mineral revenue

1.3.3 Administration of Rules and Acts by the Department

i. Mines and Mineral (Development and Regulation) Act, 1957 (as amended).
ii. Mineral Concession Rules, 1960/2016.
iii. Mineral Conservation and Development Rules, 2017.
iv. Chhattisgarh Minor Mineral Rules, 2015.
v. Chhattisgarh Mineral (Mining, Transportation and Storage) Rules, 2009 (as amended).
vi. The Minerals (Auction) Rules 2015.
vii. The Minerals (Non-Exclusive Reconnaissance Permits) Rules 2015.
viii. The Minerals (Evidence of Mineral Contents) Rules 2015
ix. The Coal Mines (Special Provisions) Act 2015

1.3.4 Organization Structure

The organization structure of Mineral Resources Department at the administrative as well as functional (district/field) level has been outlined in the diagrams below:

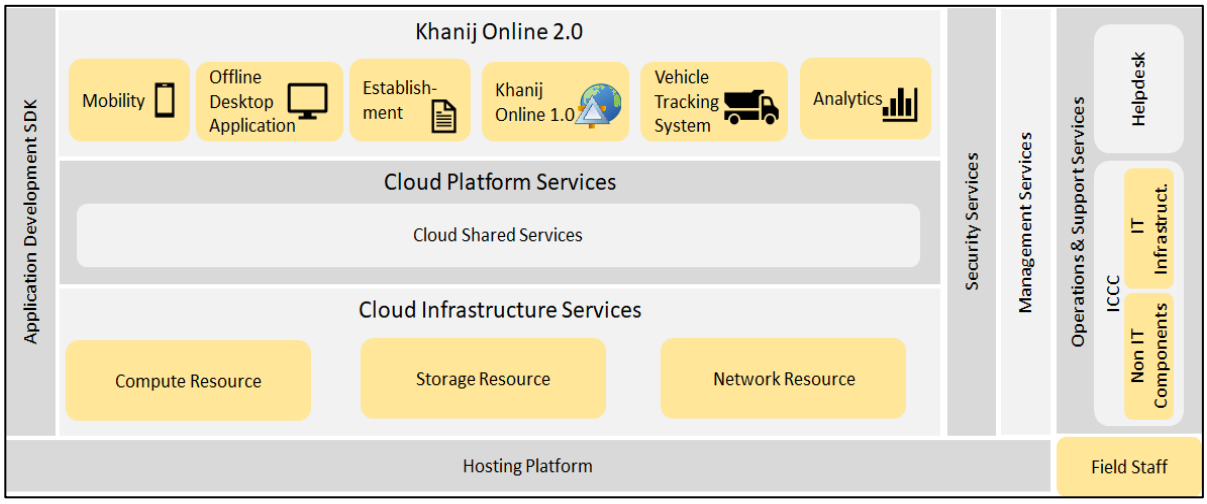


1.4 About this RFP

Khanij Online is an Integrated web-based Mines and Minerals Management System developed for Directorate of Geology and Mining for administration and regulation of mineral reserves in the state of Chhattisgarh. Existing Khanij Online went live on 1st June 2017. Currently the project is under support contract which, is valid till May 2020 and the new SI needs to take it over from the incumbent SI through transition.

The project streamlined the core processes of mining administration through automation. This project contributed significantly to e-governance in the state, thus, it was awarded with the National e-Governance Award 2019. After successful completion of this phase, emerging business needs and the vision of DGM wish to take this project to next level of e-governance, as Khanij Online 2.0. The enhance version Khanij Online 2.0 will improve the efficiency through mobility, increase the control on minor mineral through Offline Desktop Application I the areas where last mile connectivity is a challenge and vehicle tracking will enable DGM in monitoring the mineral movement within the state. DGM also wants to leverage the technology for trend analysis for various mining and related activities. Real time analytics on dashboard is needed for the stakeholders to monitor their own key performance parameters in real time. Khanij Online 2.0 intends to keep all such aspirations.

Below image depicts a conceptual model of Khanij Online 2.0 along with support units.



The conceptual model of Khanij Online 2.0 requires Khanij Online (existing)to be migrated to cloud and following modules enhanced

i. Vehicle Tracking System
ii. Mobile App
iii. Offline Desktop Application
iv. Establishment
v. Analytics (BI)

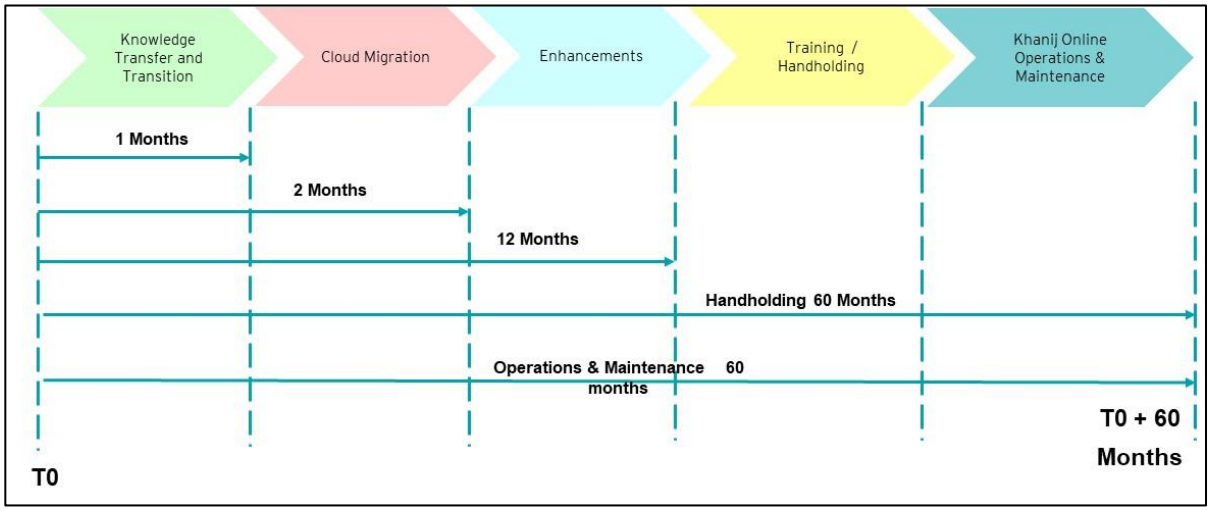
For the operational support, there will be following units working in 24x7 mode.

i. Helpdesk, for resolving the technical issues faced by users
ii. Integrated Command & Control Centre (ICCC) managed by OSU team

iii. Field Unit deployed at district level for handholding of users

Since ICCC is an integral part of this project, the SI needs to set it up with all specified ICT infrastructure as well as non-IT components.

The project needs to be completed as per following timeline.



In the proposal, the SI needs to ensure that their proposed timeline in accordance of the above.

2 OVERVIEW ON EXISTING KHANIJ ONLINE

Khanij Online is an integrated web-based Mines and Minerals Management System developed for Mineral Resources for administration and regulation of mineral reserves in the state of Chhattisgarh. Khanij Online Project has successfully completed Functional, Security, Performance and Vulnerability and Performance Testing of STQC. Project is currently in Operations & Maintenance Phase.

Existing Khanij Online project has received National e-Governance Silver Award 2019 for Excellence in Government Process Re-engineering for Digital Transformation.

Existing Khanij Online is currently catering the business requirements efficiently and need to be migrated to cloud based on lift and shift basis, followed by further enhancements.

2.1 Stakeholders

Existing Khanij Online has following stakeholders.

i. Mineral Resources Department
ii. Directorate of Geology & Mining (DGM)
iii. CHiPS
iv. Non-Government/ Private Sector organization
v. Lessees, Licensee and any other user dispatching mineral in the state of Chhattisgarh
vi. Vehicle Owners
vii. End Use Plant
viii. Banks
ix. Certifying Authority (eMudra)
x. System Integrator

2.2 Key Features

The existing application has following main modules.

i. **Master Data Module:** This module is for managing the Master Data. Currently there are around 30 Masters Data Types.

ii. **Royalty & Mineral Mapping:** This module is for mapping the royalty for each type of mineral and its grade.

iii. **User Information Module:** This module deals with the lessee / licensee related information, their profile, inspection reports and notices.

iv. **Role and Access Based Administration Module:** This module is for granting the access rights to the users as per their respective roles.

v. **Mineral Concession Application Module:** This module is registration of LOI holders.

vi. **Issuance of License:** This module is for issuing new licenses as well as renewal of licenses.

vii. **End User (Purchaser / Consignee) Module:** This module is for the registration of end users.

viii. **Transport & Individual Vehicle Owner Registration Module:** This module deals with the registration of transport vehicle owner and enables the one to add the vehicles for transportation of minerals.

ix. **e-Permit Module:** This module is for taking permission for dispatching the minerals by lessee/licensee/end use plants/other entity if any by paying the payables online.

x. **e-Transit Pass Module:** This module is for issuing different type of e-Transit Pass for various types of transportation modes. Each mode has its own type of transit pass mechanism.

xi. **Check Post Module:** This module deals with check post based mineral transport monitoring like inspection of mineral in transit, verification of e-Transit Pass etc.

xii. **Weighbridge Integration Module:** This module deals with direct data capturing from weighbridges at Department's check posts as well as private weighbridges at mines area.

xiii. **e-Return Module:** This module deals with the e-Return filed by the lessee and licensee to DGM.

xiv. **Demand/Credit Note Module:** This module is for assessing the demand/credit on any revision on the payables.

xv. **Payment Gateway Module:** This module is for collecting revenues online. Currently SBI and ICICI payment gateways were integrated.

xvi. **Mail & SMS Module:** This module is for communicating vital information to the users during the process in different modules.

xvii. **Mineral Vigilance Module:** This module is for receiving the complaints and tracking them to closure.

xviii. **Notice Module:** This module is for sending notice and the complete process till its closure.

xix. **Inspection Module:** This module is for capturing inspection details with its complete process flow.

xx. **Grievance Module:** This module enables all stakeholders to register their respective grievances and records the further actions on the grievance reported.

xxi. **Static Reports Module:** This module is for periodic reports for monitoring and analysis purpose.

xxii. **Star Rating:** This module is for awarding to the minor lease holders for their efforts and initiatives taken for implementation of the Sustainable Development Framework for development of mines and the mining area.

xxiii. **Helpdesk Support:** This module is for providing support to any stakeholder, for portal related issues.

2.3 Modules/ Enhancements in existing Khanij Online System

SN	Module Name	Application/ Service
A.	Master & Configuration	All Kinds of Master data are managed
		All Kinds of configurations are managed
		Royalty & respective other payables are mapped
		To regulate the grant and regulation of mineral concession-based Rule and on prevailing Act/ Rules/ Policy
		Rule formation based on formula and policy for the disposal of application system and regulation of mineral concession as per the formula/ rates, etc. based on rules and policy
		All rights for Transactional Changes
		User specific MIS
B.	User Information	To manage different types of user and their roles and responsibilities
		Workflow based provision for managing profiles of Lessee/ Licensee
		Provision for Managing Super User and Sub User and their roles
		User specific MIS
C.	Mineral Concession Application Module	As per the new provisions incorporated in MMDR Act, 1957 as amended, mining leases and prospecting cum mining leases are to be granted through e-auction. Hence, the details of the preferred bidder are entered in Khanij Online application and the workflow is managed till lease grant.
		Online payment of payables during the process of lease grant
		Issuance of LoI
		Online submission of statutory requirements and their verification
		User specific MIS
D.	Issuance of License	Online workflow-based submission of applications for License as applicable, their scrutiny and disposal status.
		Related user specific MIS
E.	End User Registration	Online workflow-based registration of End Users those are procuring mineral from State of Chhattisgarh
		Provision for profile editing for certain information allowed by DGM
		User specific MIS
F.	Vehicle Owner and Vehicle Registration	Provision for vehicle owners for registering themselves
		Provision for registering vehicles by the vehicle owners by online paying the payables
		Provision for monitoring vehicles for vehicle owners
		Provision for alert system for vehicle renewal
		Provision for generating registration slip for registered vehicles

SN	Module Name	Application/ Service
		User specific MIS
G.	e-Permit	Provision for Lessee/licensee/end user to generate e-Permit for dispatching mineral using DSC
		Provision for user specific online payables if any
		Provision for applying balance quantity of permits through merge permits
		Provision for applying e-Permit and payment by Super User
		Provision for managing Mining Plan/ EC Capping along with previous years arrears if any
		System driven e-TP generation
		Provision for archiving e-Permit
		Production Capping on EC/ Mining Plan
		Provision for online payment of production-based coal premium
		Adjustment of CESS within royalty for specific user
		User specific MIS
H.	e-Transit Pass	Provision for generating user specific e-TP
		Provision for managing e-Permit Specific purchaser and consignee, transportation mode, route etc.
		Workflow based e-TP cancellation
		Provision for mode wise e-TP generation
		Provision for bulk download/upload of offline e-TP Generation with basic information and their updation by source or destination later
		Provision for Trip close by Destination user
		Workflow based provision for adding stock by licensee other than e-TP
		Provision for managing favourite transporter
		Provision for managing mineral processing and recovery for licensee
		Provision for stop the e-TP generation by competent authority
		Provision for checking of e-TP using handheld device and submission of cases in case of irregularity
		Provision for storing data in handheld device
		Provision for TP Re-Print
		Upgradation of Coal grade after dispatch and payments managed accordingly
		Provision for dispatching low grade limestone by major mineral lease
		Dispatch facility for common railway Siding
		Overload rider in e-TP
		Separate e-TP generation modality for Minor minerals
		User specific MIS
I.	Daily Production Entry	Provision for entering daily production
		Provision for submitting monthly production using DSC

SN	Module Name	Application/ Service
		User specific MIS
J.	Check post and Weighbridge Module	Provision for Checking of e-TP at check post using barcode reader
		Check post and onboarded major mineral lessee weighbridges are integrated with Khanij Online to capture the integral weight
		Provision for submitting cases, in case of irregularity found during checking
		User specific MIS
K.	Vehicle Breakdown	Provision for transportation of mineral though another vehicle in case vehicle mentioned in e-TP gets breakdown
		Workflow based approval process
		Source/ Destination/ Vehicle Owner are eligible for applying for change of vehicle
		User specific MIS
L.	e-Return Module	Provision for users for filing returns based on the submission frequency and mineral wise as per rule/act using DSC
		Production data linked with e-Return
		User specific MIS
M.	Demand / Credit Note	Provision for auto generating user specific demand and credit note as on when royalty rate changed in the portal.
		Provision for auto sending demand and credit note to user through mail and their portal dashboards
		Provision for verification of generated demand and credit note by competent authority before sending the same to user using DSC
		Provision for online payment of demands by user
		Provision of head wise e-Wallet in case of there is some amount to be credited
		The amount credited in e-Wallet can be adjusted against head wise payables
		User specific MIS
N.	Integrations	Payment gateways integration for online payments
		SMS and Mail integrations for communication
		Digital Signature Certificate for major transactions
		Integration with MoRTH for vehicle authentication and validity checking
		User Specific MIS
O.	Star Rating	Provision for minor mineral lessee to fill star rating form online
		Provision for inspection and verification online
		Provision of declaring star rating result
		User Specific MIS
P.	Geology	Provision for FPO creation and approval
		Provision for update MPR against FPO and submission to regional office and approval

SN	Module Name	Application/ Service
		Provision for LAB Report generation
		User Specific MIS
Q.	Notice and Inspection	Provision for sending notice to any user from competent authority in Govt. format
		Provision for response and scrutiny off response
		Provision for disposal of notice
		Provision for submitting inspection report and verification
		Provision for submitting Field report and verification
		User Specific MIS
R.	Iron ore Tailing Dam	Provision for special user entity for disposing of Iron ore tailing dams
		Provision for e-Permit and e-TP generation
		User Specific MIS
S.	Grievance	Workflow based provision for registering complaints and their disposal
		User Specific MIS
T.	Helpdesk Support	24*7 helpdesk support system
		Workflow based provision for generating tickets for issues/support required and their disposal
		Ticket resolution SLA imposed
		User Specific MIS
U.	MIS	User Specific Dashboard
V.	Enhancements	Facility for licensee to add multiple minerals
		Separation of mode of payment of Premium from royalty with respect to captive coal mines
		Verification facility for checking e-Transit Pass in portal homepage
		Addition of New Transportation mode as Slurry Pipe
		Information of registered vehicles in Homepage
		Change in NMET fund head change
		Change in e-Permit & e-Transit Pass for adding through washery /storage/crusher/screening plant/ processing plant
		Dispatch from end use plant
		Enhancement in LTP for pulling RTP data
		MAIL & SMS by PASS in case service in not working
		Addition of WB & LAB in lessee profile
		HDS Module enhanced for sending tickets through OSU head
		Implement browser security
		Railway Siding name in RTP
		Offline e-TP updations provision for both Source & Destination
		Enhancement of demand & credit note for sending through district office
		End User Approval Process
		Minor Mineral Dispatch Process

SN	Module Name	Application/ Service
		Process Enhancement in Geology Module
		Cess Online Collection with Royalty
		Licensee onward dispatch
		Payment gateway modality enhancement
		Production Linking With e-Return

Following are the current key transactions details:

i. **108** lessees (SECL, NMDC and others) are onboard in system

ii. **159** Major Mineral licensees (Washery, beneficiation plant, crusher, storage etc) are onboard in system

iii. **2520** End Users (Cement plant, Power plant, Steel plant etc) are registered

iv. More than **22,600** vehicle owners and 51,740 vehicles are registered in the system

v. More than **Rs. 5600 Crore** Royalty, DMF, NMET & Vehicle Registration fees received through portal

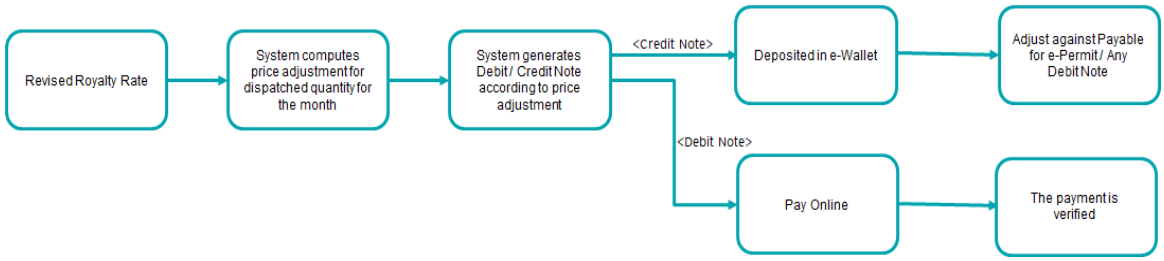
vi. More than **31 Lakh** e-Transit Passes issued through portal

vii. More than **7 Crore** Metric Tonne dispatched through various modes (Road, rail, conveyor belt etc) through portal

2.4 Key Process Areas

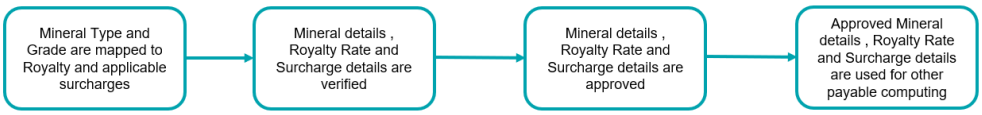
The existing application has automated the following key process areas pertaining to mining administration.

A. Royalty Assessment and Debit / Credit Note: The lessee pays the royalty to DGM for the mining. This royalty does vary as per market price variation for the mineral. This process deals with such price variation and associated financial adjustment through Debit. / Credit Note and e-Wallet.



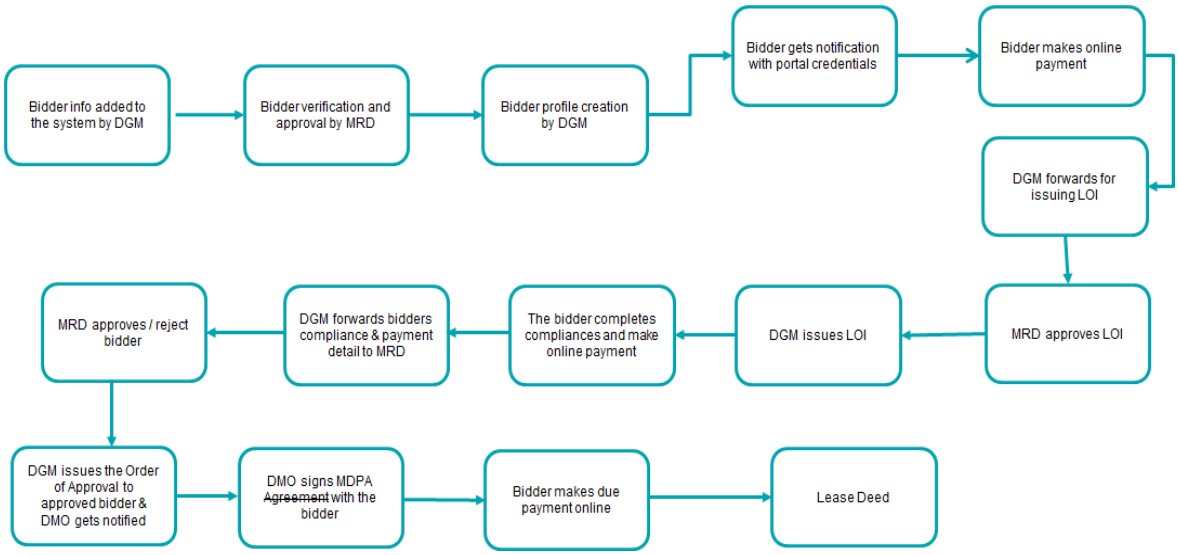
Process Map 1: Royalty assessment and Debit / Credit Note

B. Mineral-Royalty-Surcharge Mapping: The mineral type and grade requires different royalty rate and associated surcharges as applicable. This process deals with defining the royalty rate and applicable surcharges for each type of mineral and its grade.



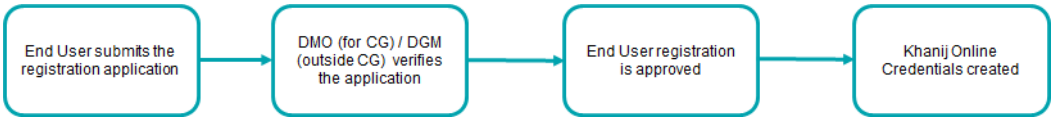
Process Map 2: Mineral, Royalty and Surcharge Mapping

C. Application Based LOI: The mining blocks are allotted as per bidding processes. The successful bidder is added in the system as lessee. Following is the process of adding the application based LOI.



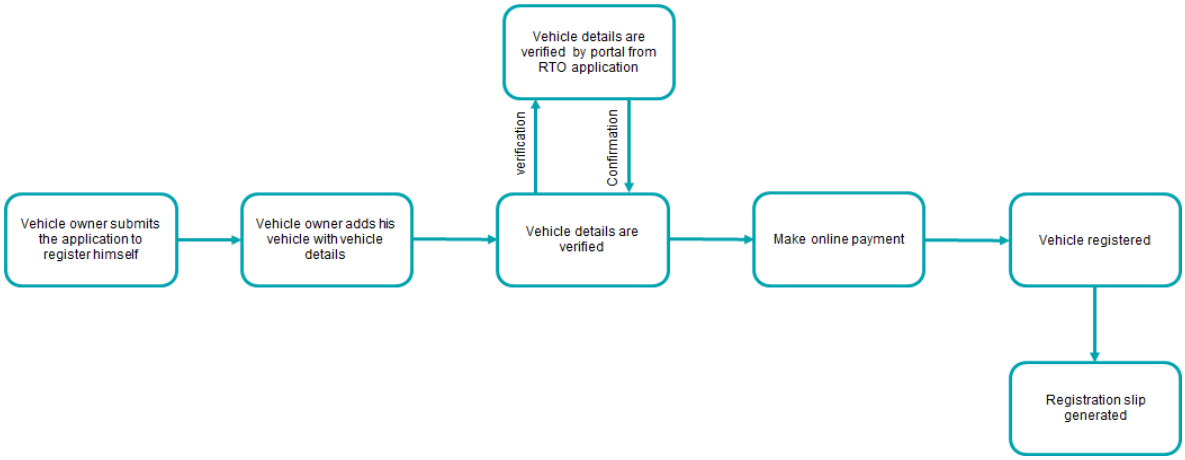
Process Map 3: Application based LOI

D. End User Registration: There are plants which consume minerals or refine it. These end users need to register with DGM and following the registration process for end users.



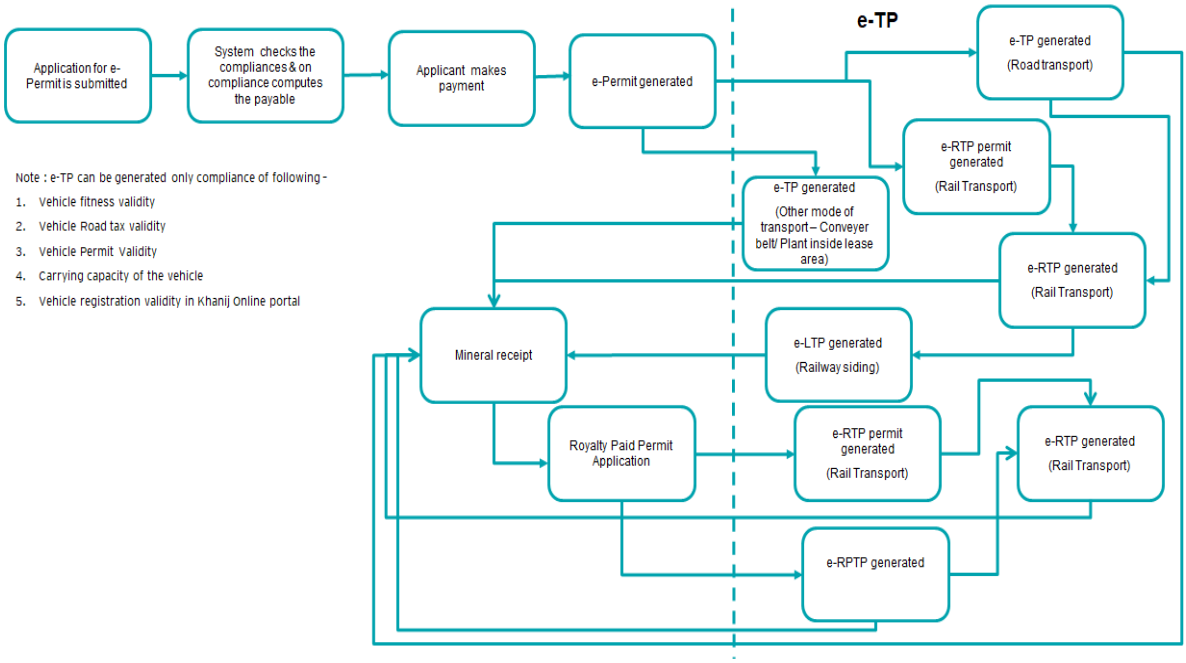
Process Map 4: End user registration process

E. Vehicle Registration: Vehicles transporting minerals must be registered with DGM. The following process deals with registration of the vehicle owner, who can add one or more vehicle owned.



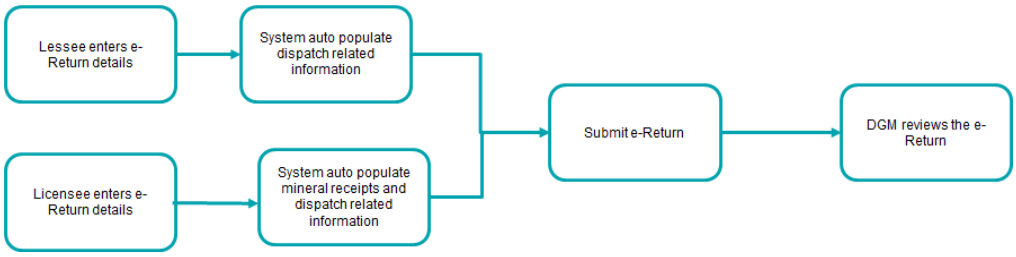
Process Map 5: Vehicle registration

F. e-Permit & e-Transit Pass (E-TP): The mining of given mineral can be done to the permitted quantity only. For that purpose, e-Permit is issued after making online payment through the system. For transport of mineral, e-Transit Pass (e-TP) is generated through the system.



Process Map 6: e-Permit and e-Transit Pass

G. E-Return: All Lessees and licensees are required to file e-Return to DGM and following is the process of filing e-Return through system.



Process Map 7: e-Return

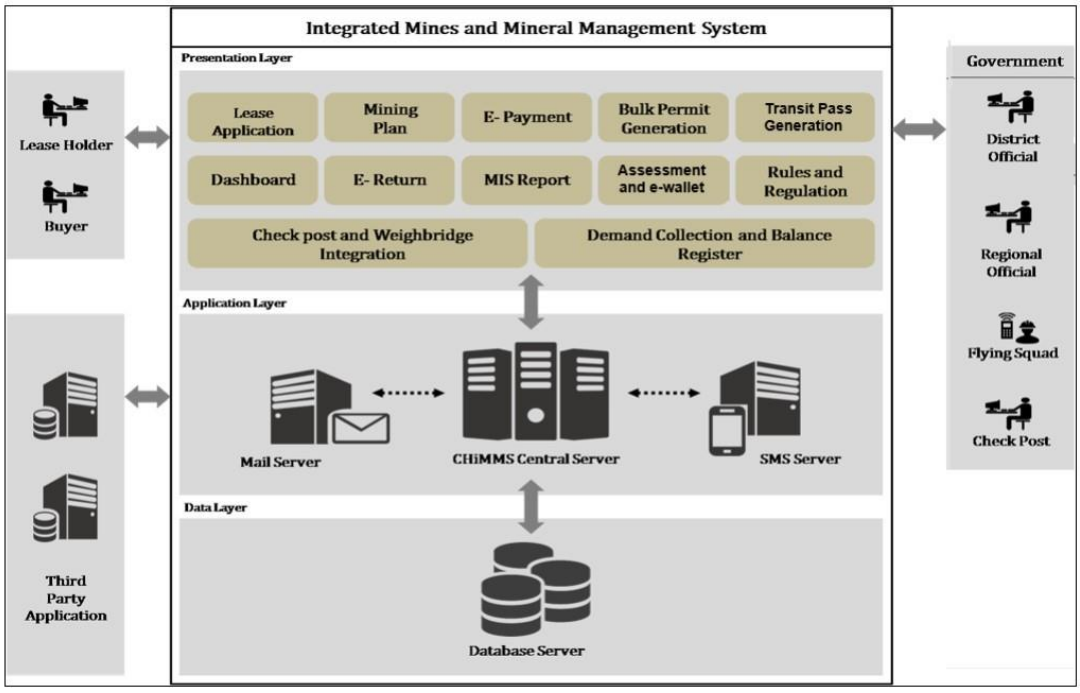
2.5 Technology Landscape

2.5.1 Existing Technology Landscape

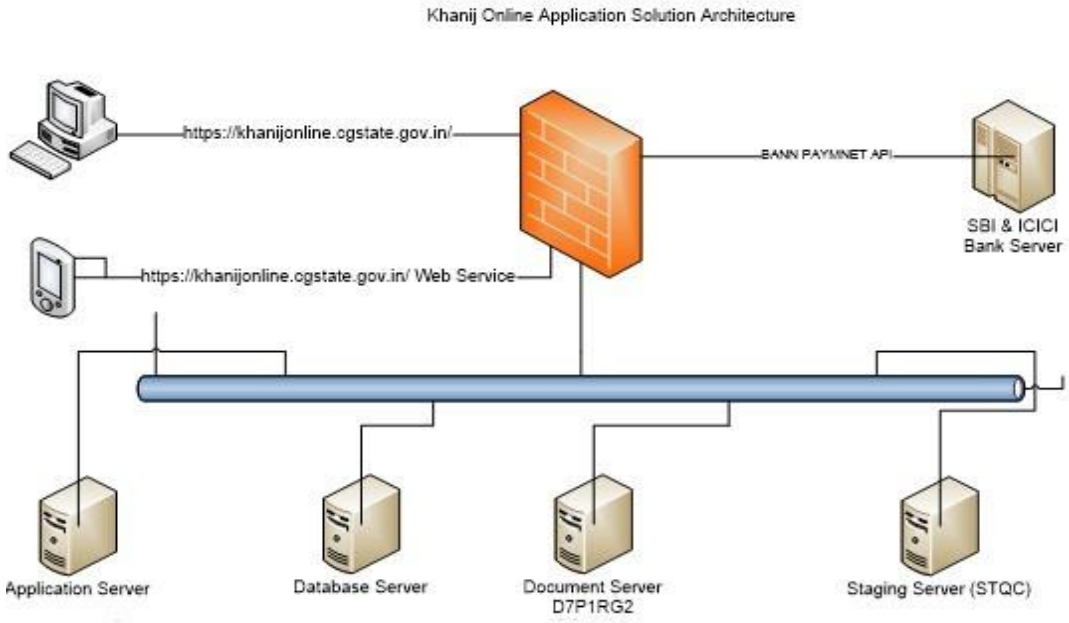
The existing application Khanij Online has the following technology stack,

Component /Base	Details
Design Pattern	MVC 4 Design Pattern, Inversion of Control
Framework	Dot Net Framework 4.5
Database	MS SQL Server Standard Edition 2016 (Per core Edition)
Operating system for App-Server and DB server	Windows Server 2016
Application Server	.Net Framework 4.5
Web Server	IIS 10.0, Apache Tomcat
IDE	Visual Studio 2012
Client Machine	Windows Family (W7 & above)
Client Side Validation	Ajax, Java Script, jQuery
Version Control & Backup	VSS
Browser	IE 6.x & above, Mozilla Firefox 3.0 & above, Chrome

2.5.2 Current Solution Architecture



2.5.3 Physical Architecture



2.5.4 Server Details

Model No.	Serial No.	Server Model	Host Name	Operating System	Capacity	Used For
Dell-PWR-Edge-R630	D7NWQG2	Dell-PWR-Edge-R630	WIN-D7NWQG2	Window server 2016	Intel Xeon E5-2620 v4 @2.10 GHz (2CPU-8Core) DDR4 16GBx12 600GB x 3 SAS Drive	Production App
Dell-PWR-Edge-R630	D7NZQG2	Dell-PWR-Edge-R630	WIN-D7NZQG2	Window server 2016	Intel Xeon E5-2620 v4 @2.10 GHz (2CPU-8Core) DDR4 16GBx12 600GB x 3 SAS Drive	Staging
Dell-PWR-Edge-R630	D7P3RG2	Dell-PWR-Edge-R630	WIN-D7P3RG2	Window and SQL Server 2016 Standard edition	Intel Xeon E5-2620 v4 @2.10 GHz (2CPU-8Core) DDR4 16GBx12 1.2TB x 6 SAS Drive	Production DB
Dell-PWR-Edge-R630	D7P1RG2	Dell-PWR-Edge-R630	WIN-D7P1RG2	Window server 2016	Intel Xeon E5-2620 v4 @2.10 GHz (2CPU-8Core) DDR4 16GBx12 1.2TB x 6 SAS Drive	Production Documents

3 OVERVIEW OF KHANIJ ONLINE 2.0

Present contract with existing System Integrator (SI) will end in May 2020. Considering the growth and efforts made to make this as Single Window for all mining Stakeholders [Mining department, Lessees, Licensees, Traders, End use plant, vehicle owners, and transporters] for effective administration and regulation of mineral resources in the state of Chhattisgarh, Khanij Online 2.0 project has been envisioned for next five years.

The scope of the selected bidder shall be responsible for ensuring and delivering all the functional, technical, operational and non-functional requirements by coordinating with DGM, CHiPS and other stakeholders. The selected bidder shall perform System Study to understand the existing Khanij Online Portal functionalities and code base as part of the scope.

The existing Khanij Online portal needs to be aligned as per the proposed Application Architecture for Khanij Online 2.0. Khanij Online and various other associated services need to be migrated to Khanij Online 2.0 (SI has the choice of technology and platform).

3.1 Key Objectives

The key objectives behind this proposed solution are as mentioned below -

i. Effective and simplify Mineral administration and regulation in the state of Chhattisgarh

ii. Compliance to Govt. rules & regulations for both major and minor mineral

iii. Centralized monitoring & Control at all mines / licensee/end use plant area/check post

iv. Surveillance of mineral dispatch through portal

v. Generation of Mineral Dispatch MIS

vi. High resolution Digital Map-based based tracking of vehicles by the control centre operators to monitor, track and control the Route Navigation of the mineral carrying vehicles, Alarm Management, Speed Management, Stoppage management, Route replays, vehicle tracking dashboard etc.

vii. Monitor actual delivery time and location using Geo-Fencing abilities

viii. Integration with other government applications or third-party application

ix. To Offer High Scalability & Reliability

x. To Provides real-time and uninterrupted access to information

3.2 Brief Scope of Work

The following outlines the broad areas of scope of work and the selected bidder will perform the following primary tasks -

i. Transition Plan and smooth knowledge transfer and handover of entire Khanij Online application from existing SI by complete takeover of application in As-is condition along with all developments, enhancements, databases, source codes, user manuals, SRS, Design Documents, integrations, infrastructure at SDC till moving application to cloud, Hardware's supplied by existing SI and all other components required to run the system effectively without any interruption.

ii. Selected bidder needs to ensure the continuity of business operations and performance enabled by existing Khanij Online. To ensure continuity of Khanij Online Portal which includes portal support, renewal of IT support and other software and hardware subscriptions and licenses, enhancements of existing Portal to support both major and minor mineral, timely solution of tickets/issues for efficient working.

iii. Setting up HA and DR for existing Khanij Online on cloud infrastructure and migration of existing Khanij Online (CHiMMS) application and data from SDC (on premise) to MeitY empanelled cloud service provider with HA and DR. This will be followed by further enhancements to make it Khanij Online 2.0.

iv. Development/ Customization of core application in proposed architecture with all new modules/ change requests and any changes in the workflow and core application framework during contract period without any additional cost.

v. Design, Development / Customization & Installation, configuration, Documentation of Software for vehicle tracking system. Conduct a pilot of identified vehicles to showcase basic functionality of the VTS and Accuracy of data for the different GPS devices.

vi. Design, Development of Mobile App for all stakeholders in both Android and iOS platform. Mobile application needs to work in online and offline mode both.

vii. Design, Develop An offline desktop/laptop/Tablet based application for the stakeholders to continue the dispatch process for the users having fluctuating or no internet at their dispatch point.

viii. Design and Develop an establishment module with workflow for leave and ACR management for DGM users, Change Request Management.

ix. Site Preparation, Procurement and establishment of IT infrastructure at Integrated Command Control Centre (ICCC) connected with district offices and development of geolocation specific monitoring module for seamless monitoring/incident – response management, collaboration and geo-spatial display.

x. Design, Development of centralised management /user specific dashboards for easy visualization of data showing key performance indicators.

xi. Design & Execution of Training/ Capacity Building for successful implementation and operation and follow up training to the stakeholders involved in Khanij Online for the changes/enhancements on regular intervals or as planned by DGM/CHiPS.

xii. Maintaining all hardware's/infrastructure related to project during the contract period.

xiii. Operations & Maintenance of entire system from exit of the previous SI and after “Go Live” of new components till completion of the contract. The O&M shall include complete operational support for Application/ System Software/ other Infrastructure related to this project as per SLA for the contract period.

xiv. DGM/ CHiPS won't pay any extra cost for development during Operations and Maintenance of Khanij Online 1.0 and after Go-Live of Khanij Online 2.0. Any additional development in application software will be done by Operations and Maintenance team.

xv. Bugs / Issues fixing in the Application Software as well as operational problems. Tuning and code changes for optimal performance. Enhancement/modification in modules as change in business rules. Data Validation/correction. Ticket resolution as per SLA

xvi. Application of analytics on transaction data to provide insightful analysis such as trend or pattern analysis, early warning, forecasting. The Service Provider shall generate additional reports and modify existing reports as per requirement of DGM / CHiPS

xvii. Other API based integration such as Digital Payment, Digital Signatures, Weighbridge / conveyor integration or any other external application (government or private), as per emerging business requirement. Application services Integration with any third-party application/utility as per the DGM/CHiPS requirement. This will be implemented at no extra cost to DGM/CHiPS.

xviii. Deployment of Personnel as required for the contract period.

xix. 24*7 Helpdesk will be setup at the location arranged by DGM. The helpdesk will also have IVRS support to handle standard queries.

xx. STQC Certification (The STQC audit is part of the selected bidder scope for closing the non-compliances as reported by STQC. The payment to be paid to STQC for quality certification will be borne by selected bidder only).

xxi. Any other work assigned by DGM / CHiPS related to the project

The scope of Khanij Online 2.0 will cover following aspects:

A) Ensure the continuity of existing Khanij Online application

The primary objective is to ensure the continuity of Khanij Online Portal which includes renewal of IT support and other software, hardware subscriptions, licenses, enhancements in existing Portal to support both major and minor mineral as per act & policy and subsequent amendments, timely solution of tickets for efficient working and system enhancements for effective mineral administration and monitoring. SI will be responsible for smooth transitioning of the entire application, infrastructure, and services from the incumbent SI ensuring business continuity and performance. As part of the transition, the Service Provider is also responsible for provision the necessary compute & storage infrastructure on the cloud/premise including the underlying software licenses/certificates to host the Application.

B) Design and development, implementation and maintenance of Khanij Online 2.0 application with Service Oriented Architecture (SOA)

i. Mines and Management System in Khanij Online 2.0 with Establishment Module, Change Request Module, Integration with other departments, Banks, weighing meters and other associated application - The SI shall carry out a detailed systems study to prepare/refine the Functional Requirements Specifications and formulate the System and Software Requirements Specifications documents incorporating the functional specifications and standards provided by the CHiPS/DGM. The SI shall Design and Develop the Service Oriented Architecture for Khanij Online 2.0.

ii. **Mobile App:** Now days Mobile App has become a standard means for ease of delivery of information and services to perform day to day activities. Considering the requirement, Android/iOS based mobile application is required for Khanij Online 2.0. The SI shall Design and Develop the hybrid mobile application to achieve project objectives for all stakeholders (Lessee, Licensee, End user, Vehicle Owner and Departmental Officials). App will also contain feature of QR code based soft TP in addition to paper-based TP.

iii. **Desktop based application:** An offline desktop/laptop/Tablet based application need to be developed for all stakeholders where internet is not available or is fluctuating.

iv. **Mineral Vehicle Tracking System:** Vehicle Tracking System (VTS) for Monitoring and Surveillance of Mineral Transport would have the following objectives -

a) Live tracking of the movement of registered (in KO portal) vehicles transporting minerals in the State of Chhattisgarh from source to destination as per transit pass

b) Tracking of mineral transporting vehicles to prevent activities like route deviation, illegal mining by tracking real time as well as historic vehicle location data

c) Ensuring that the mineral is offloaded / delivered at the designated purchaser's location and as per the destination given in transit pass

d) Increased transparency in mining and its logistics activities

e) Ease of investigation in matters illegal utilization of vehicles, dumping of mineral at non-designated locations, tracking of route, root cause analysis in case of delay etc.

C) Application hosting on cloud

DGM desires to host the existing Khanij Online and Khanij Online 2.0 on Cloud Service Provider (CSP) for a period of 5 years which can be further extended based on the requirement and mutual agreement.

System Integrator shall be responsible for hosting the existing Khanij Online application and all ancillary in-scope applications on Virtual Private Cloud (VPC) or Government Community Cloud (GCC) from MeitY empaneled Cloud Service Providers (CSPs) only, which are empaneled as on the last date of bid submission. In no case, System Integrator shall host the application on Cloud of any company which is not empaneled with MeitY and has a history of data loss and security breaches. During the Contract period, if the chosen CSP is no longer empaneled with MeitY, SI shall choose another MeitY empaneled CSP and switch the Hosting services at no additional cost to DGM / CHiPS.

The SI shall be responsible for installation of all the software and licenses required for the successful hosting of the existing Khanij Online and Khanij Online 2.0 application and all ancillary in-scope software. The Cloud, where the newly developed system will be hosted should comply with the all requirements as per RFP.

System Integrator shall perform the detailed assessment of the existing hosting infrastructure and propose a cloud-based solution for existing Khanij Online and Khanij Online 2.0. Proposed solution shall be with MeitY empaneled CSP.

Existing Khanij Online system shall be migrated from the CG SDC to the cloud, but its architecture may have to be reworked to make it compatible with the new cloud e.g. Virtual machine configuration, Database options, High Availability DC and DR (for both application and database) and cloud resource monitoring and management tools in redundancy. The SI shall also ensure that the application shall be portable to another CSP (lift and shift) without any changes to application code.

The CSP / Cloud Infrastructure shall have below high-level features, but not limited to:

i. There shall be availability >= 99.75% for Khanij Online portal

ii. There shall be availability >= 99.75% for CSP's Cloud resource Monitoring and Management Portal

iii. Cloud Service Providers shall be STQC Audit Compliant

iv. Cloud Service Providers shall be ISO 27001, ISO 20000, SOC 2(Type-1 &Type 2) and ISO/IEC 27017:2015 certified

v. The time to provision for new virtual machines shall be maximum in 5 minutes

vi. The usage details for all the Cloud Service should be available within 15 mins of actual usage

vii. Vulnerability Reporting should be within 30 minutes of identification to DGM / CHiPS

viii. Timely resolution of identified vulnerability should be as per the approved plan from DGM / CHiPS

ix. There should not be any security breach including Data Theft / Loss / Corruption

x. There shall be backup of all data including VM, Application, database with no loss

xi. Provisioning of Firewall and load balancer

xii. Provisioning of bandwidth considering the overall load and traffic coming to Existing Khanij Online and Khanij Online 2.0 application without compromising the overall performance of the system.

xiii. Auto up gradation of all license

xiv. Cloud Infrastructure will be managed by SI during contract duration

xv. Procuring and Installation of Software licenses

xvi. Self Service provisioning Portal with API for automated provisioning

xvii. RTO, RPO and uptime for DC and DR shall be as per SLA as specified in volume-1 of this RFP.

xviii. Provisioning of application and cloud security logs for min. 6 months for review and audit.

xix. MIS and Reporting Services

The Cloud, where the existing Khanij Online and Khanij Online 2.0 will be hosted shall comply with the SLA requirements as provided in Section 5 of this RFP.

In no case, SI shall host the application on Cloud of any CSP that is not empaneled with MeitY. During the Contract period, if the chosen CSP is no longer empaneled with MeitY, SI shall choose another MeitY empaneled CSP and switch the Hosting services at no additional cost to DGM. The SI shall be responsible for installation of all the software required for the successful hosting of existing Khanij Online application and all ancillary in-scope software. The Cloud, where existing Khanij Online will be hosted shall comply with the SLA requirements as provided in RFP Volume - I, shall have following broad level capabilities but not limited to:

a) Cloud Setup and Migration:

The SI shall use cloud Infrastructure which is scalable, secure and extendable. Doing so the SI shall ensure that it would avoid using such services, which would restrict the application from moving from one CSP to another CSP. SI shall be responsible for

i. Design and provisioning of required IT set up & services

ii. Providing required compute infrastructure (server/virtual machines) and storage infrastructure on the cloud including the underlying software licenses to host the application suite.

iii. Provisioning of required bandwidth link for migration of the data to the new cloud setup by the SI

iv. Providing required support during migration of the solution on the Cloud infrastructure.

v. Develop migration roadmap, identifying the constraints and inhibitors to cloud migration

vi. Submit migration plan and related documentation

vii. Detailed risk management and exit plan for cloud.

viii. Provision for Development / Test environment on Cloud

ix. Support in Migration of all data from existing infrastructure in secured manner

x. The SI shall be required to provide support for updates, upgrades, security patches etc. for software licenses. The SI would be required to provide enterprise level support or equivalent for software licenses, covering updates, security patches, issue resolution at software level, bug fixing etc.

xi. SI shall inform DGM for any updates/upgrades in the software licenses before making any upgrades on IT infrastructure provisioned on Cloud. These updates/upgrades would be tested by the application development teams on the existing application before applying and release of same in production. The SI shall be responsible for provisioning of Internet Bandwidth at both DC & DR and replication bandwidth between DC & DR.

xii. SI shall ensure zero downtime except planned downtime.

xiii. The SI shall be responsible for ensuring security of overall solution and infrastructure from any threats and vulnerabilities. The SI shall address ongoing needs of security management including, but not limited to, monitoring of various devices / tools such as firewall, intrusion prevention/ detection, content filtering and blocking, virus protection, event logging & correlation and vulnerability protection through implementation of proper patches and rules.

xiv. Sharing Root Cause Analysis report for any downtime or unavailability of the cloud infrastructure

xv. The SI shall also be required to provide the following as services under the project:

    a. Routing, Web Application Firewall, Firewalls, Load Balancer, Bandwidth, Backup, Operations Management and Data Management

xvi. Security & Data Privacy (Data & Network Security including Anti-Virus, Virtual Firewall, VPN, SSL, Log Analyzer, IPS, DDOS Protection)

xvii. Reports on security breach and security related incidents along with co-relation with events

xviii. The SI needs to provide a solution to automatically provision the infrastructure via Self Service Provisioning tool, provide metering and billing to provide service assurance for maintenance & operations activities. Detailed user level or user group level auditing, monitoring, metering, accounting etc.

xix. The Cloud infrastructure and data must be maintained only at the location of the identified Cloud hosting site. Data can only be moved to other site in case of any emergency with prior approval of the DGM.

xx. The SI shall also allow application access of the Development, UAT and Production environment to the respective teams at DGM.

xxi. SI is to provide VPN services for application access for enhancement, operations and maintenance.

b) Disaster Recovery:

i. The SI shall ensure availability of DR site within India

ii. The exact address of the Primary Site (DC) and Disaster Recovery Site (DR) shall be shared by the SI.

iii. The DC & DR shall operate on Active-Passive mode. DR shall be exact replica of DC ad shall operate at 100% compute as DC during outages.

iv. In case of failure of DC, the DR should be activated based on the SLA parameters mentioned in the RFP.

v. SI shall provide DR as a Service (DRaaS) from a data centre located in a different office from the main DC.

c) Operational Acceptance of Cloud:

i. Operational Acceptance shall commence once the cloud services are commissioned and migration is completed.

ii. Operational Acceptance shall only be provided after cloud resources have been provisioned and switchover testing (as applicable) has been completed. Switchover testing would include:

- Switch over of application from DC to DR as per defined RTO and RPO
- Switch over applications from DR to DC as predefined RTO and RPO
- Complete Data Replication and Reverse Data Replication as per RPO
- Fully functional application while DR site is operational, taking into consideration the end user experience

d) Operations, Maintenance & Support for Cloud Services:

The SI shall be responsible for providing 24*7*365 days support for Khanij Online. 2.0. The maintenance and support shall include following activities –

i. Ensuring Uptime and utilization of the cloud resources as per SLAs.

ii. In the event of a disaster at DC site, activation of services from the DR site is the responsibility of SI.

iii. The SI shall be responsible for providing support for all system software at the Cloud Site (DC and DR) for the entire contract period.

iv. On expiration / termination of the contract, SI to handover complete data in the desired format to the DGM which can be easily accessible and retrievable. SI shall also provide support for transitioning to another SI.

v. SI shall provide provision for viewing live Dashboards for Daily report, utilization etc. through the monitoring tool/self-provisioning tool.

vi. SI to provide list of key contact persons with contact details with escalation hierarchy for resolution of issues and problems. This shall be via an Incident Management system.

vii. MIS Reports - SI shall submit the reports on a regular basis in a mutually decided format. The SI shall workout the formats for the MIS reports and get these approved by the DGM.

e) Provisioning Cloud Services for Additional Quantities:

New SI shall undertake its own sizing basis current transactions rate is 18 Lakh / year, projected growth is to 75 Lakh transactions / year after all lessee and licensee are onboarded to Khanij Online 2.0, desired SLAs and shall configure additional quantities as & when required. SI shall also study the existing application for mobility to cloud.

The SI shall be responsible for provisioning required compute infrastructure (server/virtual machines), storage and services for hosting the existing Khanij Online and Khanij Online 2.0 application.

f) Cloud Services Checklist:

The SI must ensure that the proposed CSP meets the MeitY requirements as per following checklist as well.

SN	Description of Cloud Service
1	Disaster Recovery as a Service (DRaaS), with the DR site located in a different center.
2	Dev/Test Environment as a Service
3	Managed services: Backup services
4	Managed services: Disaster Recovery and Business Continuity Services

D) Integrated Command & Control Centre

The vision of integrated Command Control Centre (ICCC) is to have an integrated view of all the field level equipment's and mineral movement and monitor their operations remotely. ICCC would serve as the focal point to serve as a decision support engine for administrators in day to day operations as well as during exigency situations.

ICCC shall be a fully integrated, web-based solution that provides seamless incident – response management, collaboration and geo-spatial display.

4 DETAILED SCOPE OF WORK

Below sections depict the various Work streams during the entire project tenure. The detailed Scope for each work stream has been elaborated.

4.1 Work Stream 1: Takeover of existing application and Hardware

New SI will perform all the functions and services necessary to accomplish the Transition of the entire knowledgebase, application (Web, Handheld device, other utility and integrations etc.), infrastructure, and services under existing Khanij Online from the current SI on or before the specified completion dates. New SI will be responsible for the overall management of the transition in accordance with the transition plan and will work to ensure the transition is completed on schedule and to identify and resolve any problems encountered. New SI will demonstrate its understanding of existing Khanij Online and ability to support to reasonable satisfaction of DGM/CHiPS, prior to the completion of Transition Phase, proving that it is ready to takeover independently, the O&M of existing Khanij Online.

A. Responsibilities of the SI during the Knowledge Transfer Phase shall include the following (including but not limited to):

i. The new SI will be required to submit a detailed Knowledge Transfer plan at the start of the KT phase, listing all the activities from their end, including the expectations from existing SI and DGM/CHiPS. A checklist (as part of knowledge transfer plan) needs to be prepared by the new SI for ensuring proper knowledge transfer. This shall be reviewed and subject to approval by DGM/CHiPS.

ii. The existing SI shall provide all knowledge transfer of the system to the incoming SI to the satisfaction of DGM as per the specified timelines.

iii. The knowledge transfer shall include initial and ongoing training on existing Khanij Online, training materials, operations manuals, procedure manuals, source code control and deployment/ installation guide.

iv. The existing SI shall conduct detailed Knowledge Transfer sessions for the new SI (such sessions should be recorded by the new SI for future playback) and shall concentrate on the following:

a) Study of the functional specification documents including the SRS, enhancements log, user manual documentation of business processes, presentations to DGM to confirm understanding

b) Identification and deep dive into all available documents (like SRS, enhancement log, design documents, User Manual etc.)

c) Details of integration with other systems

d) Details and access to the codes, scripts, jobs, etc. for study and assist in understanding the documentation of existing Khanij Online and its various components, understanding of development, support processes, configuration management processes, etc.

e) Understanding of various environments (development, UAT, Production etc.), and obtain training on all the existing tools used, processes followed, and activities performed

f) Understanding of existing client end infrastructure and network management, including the role of SPOCs and other stakeholder's profiles

g) Walkthrough of the helpdesk setup and solution.

h) Understand the applicable IT policies and their respective status

i) Understanding of all existing issues in DGM's IT landscape and their impact; the issues faced by the existing SI while implementing and managing the existing solutions and the resolutions for the same; and also, of any special behavior (if any) exhibited by the overall solution or the integrated applications.

B. It is clarified that new SI is required to deploy technically competent resources, in the specific solution areas of existing Khanij Online, during the KT phase and Transition phase. The existing SI shall not be responsible for imparting any basic technical skillset to the resources of the new SI, which would be deemed as a pre-requisite.

C. The new SI is required to utilize this time in the most efficient and effective manner, to ensure so as to take-over the operations of existing Khanij Online. The new SI should deploy its project management, domain as well as technical manpower to absorb the KT sessions. They should conduct site visits to get an understanding of the requirements at each of the locations.

D. The new SI will be required to submit a weekly status report on the progress of KT activities

E. During this phase, the new SI shall be required to submit a report on the detailed understanding of existing Khanij Online system and operations, which will be reviewed by DGM/CHiPS and this will form the basis of start of the next phase, i.e. Transition Phase.

F. Incumbent SI will assist new SI with the complete audit of the system including licenses and physical assets.

G. The major responsibilities of the Si during transition phase are:

i. During the Transition the new SI will be given a hands-on exposure to existing Khanij Online system, by the incumbent SI. During the15 days, the new SI will shadow the entire team of the incumbent SI, at all the client locations. During the next15 days, the new SI shall be managing the entire responsibilities of existing Khanij Online, however the existing SI shall deploy its team as a shadow support and will be responsible for supervising and reviewing all the activities of the new SI.

ii. The new SI shall detail the transition plan and transition risk management plan (submitted at the proposal stage), at the start of this. These plans shall build on the already submitted plans (submitted at the bidding stage) and should not entail any deviation from the principles laid down in the proposal made. DGM team will finalize the scope of the activities that will be taken over by the new SI from the incumbent SI.

iii. Incumbent SI will take the lead in this phase and continue with the usual operations of maintaining and managing the existing Khanij Online system

iv. New SI will shadow the incumbent SI with the purpose of understanding the existing system and preparing for takeover in the next phase

v. The new SI would need to create a separate team to align with the resources deployed by incumbent SI during the transition phase. Each team member observes the activities done by the incumbent SI. Process and application knowledge are built, and hands-on application and infrastructure know-how is acquired. This knowledge will be documented for future use by the new SI.

vi. Study of Existing System and Operations (As-Is Architecture): The new SI shall study and document the current operations of existing Khanij Online system. And conceptualize the transition phase accordingly.

vii. Change request: Any change requests by DGM/CHiPS during this phase will be implemented by the incumbent SI

viii. Old SLAs of existing Khanij Online will be applicable to the incumbent SI during this phase

ix. Success criteria for the transition will be defined in this phase by DGM/CHiPS, and only upon meeting the success criteria, the project will move in next phase, where the new SI will be in lead for managing existing Khanij Online independently.

x. Transfer and handover of all IT assets from old to new SI and everything that is a part of existing Khanij Online project to the new SI

xi. AMC and ATS: The incumbent SI shall handover all AMC/ATS support related documents, credentials etc. for all OEM products supplied / maintained in the system. It will also handover MoUs signed for taking services taken from any of the sub-contracted agencies.

xii. The new SI shall examine and document or cause it to be documented by the existing SI any process, code, software which is not either documented or is operated in an ad-hoc manner in consultation with the existing SI to avoid any surprises once the new SI takes over operations.

H. The detailed processes incurred during Transition phase are:

i. The new SI will take the lead in this phase, in managing existing Khanij Online system and the incumbent SI will provide shadow support to the new SI but exit of incumbent SI will subject to the approval of DGM/CHiPS.

ii. The new SI will carry out the activities with support of the incumbent SI

iii. The new SI shall continue the business on existing Khanij Online system and deliver the services to the stakeholders. The new SI shall also manage the existing operations including the applications, facility management, etc.

iv. Any change requests generated on existing Khanij Online hereafter will be implemented by the new SI as per the Change Control procedures defined for existing Khanij Online (and any amendments thereafter).

v. As part of the transition process, the new SI will perform the following activities (including but not limited to) to continue to meet DGM business requirements without any disruption to DGM’s services.

vi. Validate the inventory of all project related assets (H/w & S/w) as submitted by the existing SI

vii. Facilitate the effective and smooth transfer of assets from the existing SI

viii. Assume operational ownership (including commercials, if any) of the software licenses to the SI and renewal of Third-Party Contracts. However, DNS Domain ownership shall remain to be of DGM.

ix. Setting up High Availability (HA) and Disaster Recovery (CR) with security requirements

x. Implement the required governance model

xi. Develop and implement the required plans, as well as the operational change management processes required to implement the transition plan

xii. Prepare the functional, system, technical and process documentation of the existing applications and processes necessary for continued operation and maintenance of the services

xiii. Provide the program and project management services associated with the above activities.

At the end of transition phase, SI shall be required to submit acceptance and compliance report to DGM/CHiPS.

4.2 Work Stream 2: Ensure continuity of existing Khanij Online

The primary objective is to ensure the continuity of Khanij Online which Includes IT support and other software and hardware subscriptions and licenses. The selected bidder to provide support existing Khanij Online as till the time Khanij Online 2.0 goes live. Selected bidder would be required to deploy team members onsite constructing the Lead Team as per the needs of the project. The brief scope of work is as follows:

i. Ensuring the continuity of Khanij Online application by complete takeover of application, infrastructure at SDC, in as-is condition along with all developments, enhancements, databases, source codes, user manual, SRS, Design Documents, integrations and all other components required to run the system effectively without any interruption

ii. Customization and development of all change request during contract period without any additional cost

iii. Application Support and User Training

iv. System administration

v. The Service Provider shall generate additional reports and modify existing reports as per requirement of DGM/CHiPS

vi. Data back up and DR Setup

vii. Any changes in the workflow and core application framework

viii. Any new integration with other Department/Payment gateway/Meity/ Weighbridge / conveyor /other weighment instruments integration Application as per requirement (at no extra cost)

ix. Other API integration as per requirement (at no extra cost)

x. Testing on Periodic Basis

xi. Bugs / Issues fixing in the Application Software as well as operational problems

xii. Tuning and code changes for optimal performance

xiii. Enhancement/modification in modules as change in business rules

xiv. Data Validation/correction

xv. Helpdesk setup at L1 & L2 level and Technical Helpdesk will be setup for L3 & L4 level and Ticket resolution as per SLA

xvi. Any other work assigned by DGM/CHiPS related to the project

4.3 Work Stream 3: Setup HA and DR for existing Khanij Online

The selected bidder shall perform the detailed assessment of the existing infrastructure and propose setting up of HA and DR for existing Khanij Online on Cloud ensuring business continuity and performance. As part of the workstream, selected bidder is also responsible for provisioning necessary compute, storage, security and licenses etc. Proposed solution, methodology, procedures and documents must be submitted for review and approval by DGM/CHIPS prior to adoption. The solution shall have below function (including but not limited to):

i. High availability
ii. Redundancy for failover
iii. RPO and RTO as per SLA given in RFP
iv. Back up of all data
v. Disaster recovery at different location than Primary location
vi. Dedicated incremental storage space
vii. Auto up gradation of all license (if required)

4.4 Work Stream 4: Design, Development and Implementation of Khanij Online 2.0

With the increase in acceptability of the system by its stakeholders, there is also an increase in demand of quality of services. There are a few challenges / limitations in the current system that needs to be addressed to significantly improve the quality of delivery of services to the external as well as internal stakeholders. It is expected that the dynamic nature of requirements and operations will continue, and the selected bidder has to implement the solution that is flexible and configurable to meet such requirements. The application should be designed / re-designed to handle these changes with a quick turnaround from the time of communication of DGM/CHiPS's decision to the implementation in production. System should be designed to provide enhanced experience and value to the end-users through a revamp (improvements) of some of the current interfaces. The application software will be bi-lingual (Hindi & English) in nature and hence, the selected bidder shall ensure that all the supplied Hardware and Software are UNICODE compliant.

The scope of Khanij Online 2.0 will cover following new Modules along with core application:

i. Mines and Management System in Khanij Online (Core Application) with Establishment Module, Change Request Module, Integration with other departments, Banks, Weighing meters and other associated application
ii. Mobile App
iii. Desktop based application
iv. Mineral Vehicle Tracking System

A. Solution Design and Preparation of Software Requirements Specifications (SRS)

The selected bidder shall perform the detailed assessment of the functional requirements and design Khanij Online 2.0 solution using robust and proven software and hardware technologies like Service Oriented Architecture (SOA) and open industry standards. The solution architecture should be built on sound architectural principles enabling fault-tolerance, high performance, and scalability both on the software and infrastructure levels. Further, in addition to the enhancements specified in the RFP, the Selected Bidder is also responsible for implementing the additional modifications / enhancements suggested and approved by DGM/CHiPS during the duration of the contract to meet the evolving business requirements. The Selected bidder shall conduct a detailed requirement gathering exercise to elaborate the functional requirements prior the design and implementation.

As part of the preparation of SRS/Gap report the selected bidder shall be responsible for preparing and submitting detailed requirement specification documents as per IEEE or equivalent standards which meets all the Business, Functional and Technical requirements of the departments concerned. The SI shall prepare the SRS documents and have it reviewed and approved by DGM/CHiPS.

The SI is required to update the FRS/SRS as and when any enhancements/ modifications are made to the Khanij Online 2.0 application till the duration of the Contract.

B. Development of Khanij Online 2.0 and User Acceptance Test (UAT)

The selected bidder shall perform the software development, configuration, customization, testing and implementation of the end-to-end application for Khanij Online 2.0. The selected bidder shall setup and deploy the application software as per the requirements. The selected bidder shall design the testing strategy and plan including traceability matrix, test cases and conduct testing of various components of the software developed/customized duly incorporating scope for the VTS. The selected bidder shall ensure that the application system should have the ability to generate periodic reports for parameters required from time to time by DGM or any other stakeholder as decided by DGM.

The selected System Integrator will ensure local office in Raipur for ensuring development environment for selected team as mentioned in RFP. SI will have to depute its team in Raipur and will not be permitted take the work offshore/out of Raipur. This setup will be operational till the time ICCC is up and running, post which all the development environment and activities will be carried out from ICCC only.

The Selected Bidder will be implementing the entire project in phase wise manner. The project will be implemented in two phases across the state followed by the operation and maintenance period of 4 years.

a) **Phase I:** Pre- Implementation

- Preparation & Submission of detailed Project Plan
- Submission of System Study Report (SRS) /GAP Report for all modules - Mines and Mineral Management System, Vehicle Tracking System, Mobile App and Desktop based application and sign-off from DGM/CHiPS.

b) **Phase II: Implementation for Stage 1 (Major Mineral)**

- Customization/Development of Application as per SRS for Major Mineral
- Software Testing and customization as per requirement/feedback
- The System Integrator will provide proof of concept for vehicle tracking system & desktop based application, wherein DGM/CHiPS will first hand verify the integration of various AIS 140 devices that are empaneled with the transport authority of CG and are up and running with the designed system by the System Integrator, also System Integrator will provide proof of concept for desktop application so that DGM/CHiPS can verify the functionality and operability of desktop application in an offline environment.
- User Acceptance Testing of the system to the satisfaction of Competent Authority (DGM/CHiPS)

c) **Phase III: Implementation for Stage 2 (Minor Mineral)**

- Customization /Development of Application as per SRS/regulations/policy defined for Minor Mineral
- Software Testing and customization as per requirement/feedback
- The System Integrator will provide proof of concept for vehicle tracking system & desktop-based application. Herein DGM/CHiPS will first hand verify the integration of various AIS 140 devices that are empaneled with the transport authority of CG and are up and running with the designed system by the System Integrator.
- System Integrator will provide proof of concept for desktop application so that DGM/CHiPS can verify the functionality and operability of desktop application in an offline environment.
- It is to be noted that policy/regulation defined for Minor Minerals with respect to Vehicle Tracking System and Desktop based application where there are issues of internet connectivity, may or may not be in concurrence with the policy/regulation for major minerals, hence the System Integrator will work as directed by DGM/CHiPS as per the, then prevalent rules/regulations/policies/guidelines/act as the case may be
- User Acceptance Testing of the system to the satisfaction of Competent Authority (DGM/CHiPS)

C. Integration with other department/applications

Application Service integration offer many benefits over distributed computing architectures. Services integration gives most important benefit to establish secure communication channels

between two applications. It gives freedom to the individual applications, to exchange the data by themselves. Service integration works on component-based model of application development. It can also make easy to deploy legacy code as a Web Services and it works on standard Internet technologies with secured environment. By using web services, the website performance may increase.

Initial identified integrations (including but not limited to) are -

- Railway
- Commercial Tax
- MTS Portal developed by IBM
- CSEB portal
- Open Data Portal
- Neighboring State Application etc
- Private Weigh bridges, Conveyor belt, new Check Post etc as they case may be
- Any other integration as per DGM/ CHiPS requirement

D. Documentation

The SI shall create and maintain all project documents that shall be passed on to DGM/CHiPS as deliverables as per the agreed project timelines. The System Integrator shall prepare all necessary documentation for the project and provide them to DGM/CHiPS or its designated Consultant for review, approval, record, reference etc. as required. Any other document(s) deemed necessary for implementation, operations and maintenance of the hardware and network equipment's and the overall system.

Project documents include but are not limited to the following:

i. Detailed Project Plan

ii. Detailed System Study Report

iii. Software Requirement Specification (SRS) study and the document containing detailed requirement capture and analysis including functional requirement, Interface Specifications, application security requirements (Functional Requirement Specification (FRS), Process Flow, Work Flow)

iv. ER diagrams and other data modelling documents

v. Data dictionary and data definitions

vi. Requirements Traceability Matrix

vii. Complete Source Code with documentation

viii. Test cases (including Unit Test and User Acceptance Test) and result testing documentation (including details of defects/bugs/errors and their resolution).

ix. User Training plan

x. Manuals – Systems Administration Manuals, User Manuals, Installation Manuals, Operational Manuals, Maintenance & Support Manuals, and Stake-holder reference Manuals.

xi. Periodic Status and Review Reports.

xii. Exit Plan

xiii. Application component design including component deployment views, control flows, etc.

xiv. LLD documents

xv. Application flows and logic.

xvi. GUI design (screen design, navigation, etc.).

xvii. Requirements Traceability Matrix

xviii. Change Management and Capacity Building Plans.

xix. Inspection and testing procedures manual including QA Policy, procedures for the software/hardware equipment's.

xx. Any other document(s) deemed necessary for implementation, operation and maintenance of the hardware and network equipment and the overall system.

xxi. Backup Policy & Security Policy

xxii. Change Management and Capacity Building Plans

xxiii. SLA and Performance Monitoring Plan

xxiv. Design of real-time tools for monitoring e-Transaction volumes and for generating real-time MIS

xxv. Issue Logs

xxvi. Load Testing Report

xxvii. Security Testing and Certificate

xxviii. Any Other document deemed necessary ore relevant

Competent Authority shall review the project documents developed by Selected Bidder. Any issues/gaps identified by the Competent Authority, in any of the above areas, shall be addressed to the complete satisfaction DGM/CHiPS.

The System shall permit the latest versions of the application and source code to be deposited with the CHiPS /DGM, with appropriate logs maintained for each change.

E. Hosting of Application on Cloud

The system Integrator shall perform the detailed assessment of the existing hosting infrastructure and propose a best suited solution & service on virtual private cloud for Khanij Online 2.0. Proposed solution shall be with CHiPS/ MeitY empaneled cloud service provider. All data pertaining to this project must reside within India. The solution shall have below high-level features, but not limited to:

i. There should be high availability

ii. Data backup and Disaster recovery at different location than Primary location

iii. Dedicated Firewall

iv. Dedicated Bandwidth considering the constant pings from all onboarded vehicles in Khanij Online 2.0

v. Auto upgradation of all license (if required)

vi. Cloud Infrastructure will be managed by SI for complete project period

vii. Self Service provisioning Portal with API for automated provisioning

viii. MIS and Reporting Services

Selected bidder shall be responsible for design, provisioning of IT infrastructure and setup of Cloud. The SI shall also ensure that the application should be portable to another Cloud Service Provider (lift and shift) without any changes to application code.

i. The selected bidder shall be responsible for provisioning required compute infrastructure (server/virtual machines), storage, security and services.

ii. Provision of necessary compute and storage infrastructure on the cloud including the underlying software licenses to host the application suite

iii. Provision of bandwidth link required for migration of the data to the new cloud setup by the SI

iv. The SI shall be responsible for providing required support during migration of the solution on the Cloud infrastructure.

v. Develop migration roadmap, identifying the constraints and inhibitors to cloud migration

vi. Submit migration plan and related documentation

vii. SI will prepare a detailed risk management plan

viii. SI to provision for Development / Test environment on Cloud

ix. Support in Migration of all data from existing infrastructure

x. The SI will be required to provide support for updates, upgrades, security patches etc. for software licenses. The SI shall ensure enterprise level support or equivalent for software licenses, covering updates, security patches, issue resolution at software level, bug fixing etc. SI shall inform DGM for any updates/upgrades in the software licenses before making any upgrades on IT infrastructure provisioned on Cloud. These updates/upgrades would be tested by the application development teams on the existing application before applying and release of same in production. The SI shall be responsible for provisioning of Internet Bandwidth at both DC & DR and replication bandwidth between DC & DR.

xi. The SI shall be responsible for ensuring security of overall solution and infrastructure from any threats and vulnerabilities. The SI shall address ongoing needs of security management including, but not limited to, monitoring of various devices / tools such as firewall, intrusion prevention/ detection, content filtering and blocking, virus protection, event logging & correlation and vulnerability protection through implementation of proper patches and rules.

xii. The SI shall offer services from DR at the time of outages in the DC. The DC & DR should work in Active-Passive mode. The SI shall be responsible for provisioning of internet bandwidth for replication of data between the DC site and DR Site. The SLA for the replication of data will be attributed to the SI. The RPO and RTO shall be as per SLA given in this document.

xiii. Sharing Root Cause Analysis report for any downtime or unavailability of the cloud infrastructure

xiv. The SI will also be required to provide the following as services under the project: -

a. Routing, Web Application Firewall, Firewalls, Load Balancer, Bandwidth, Backup, Operations Management and Data Management

xv. Security & Data Privacy (Data & Network Security including Anti-Virus, Virtual Firewall, VPN, SSL, Log Analyzer, IPS, DDOS Protection)

xvi. Reports on security breach and security related incidents along with co-relation with events

xvii. The SI needs to provide a solution to automatically provision the infrastructure via Self Service Provisioning tool, provide metering and billing to provide service assurance for maintenance & operations activities. Detailed user level or user group level auditing, monitoring, metering, accounting etc.

xviii. The Cloud infrastructure and data must be maintained only at the location of the identified Cloud hosting site. Data can only be moved to other site in case of any emergency with prior approval of the DGM.

xix. The SI shall also allow application access of the Development, UAT and Production environment to the respective teams at DGM.

xx. SI is to provide VPN services for application access for enhancement, operations and maintenance.

In no case, SI shall host the application on Cloud of any CSP that is not empaneled with CHiPS/MeitY. During the Contract period, if the chosen CSP is no longer empaneled with MeitY, SI shall choose another MeitY empaneled CSP and switch the Hosting services at no additional cost to DGM/CHiPS. The SI shall be responsible for installation of all the software required for the successful hosting of the Khanij Online application and all ancillary in-scope software. The Cloud, where the newly developed system will be hosted should comply with the SLA requirements as provided in of RFP.

F. Cutover Strategy, Data Migration and Go-live

The selected SI has the responsibility of migration of the solution, underlying components, data, and all entities required to provide the services. The SI shall formulate a comprehensive cutover strategy, migration plan and submit to DGM/CHiPS for approval. Any comments or revisions proposed by DGM/CHiPS to ensure business continuity shall be incorporated into the migration plan by the selected SI.

4.5 Work Stream 5: Quality Certification Audit for Khanij Online 2.0

The primary goal of Acceptance Testing, Audit & Certification is to ensure that the system meets requirements, standards, and specifications as set out in this RFP and as needed to achieve the desired outcomes. The basic approach of this will be ensuring that the following are associated with clear and quantifiable metrics for accountability:

i. Application Functional Testing

ii. Security Testing including data security

iii. Performance Testing

iv. Vulnerability assessment including Network Architecture and Deployment review

v. Penetration Testing

vi. SLA Reporting System, Audit trails configuration and monitoring process

vii. IT Security Process Audit (in line with ISO 27001 standards)

The select bidder will be responsible for engaging STQC /Cert-in empaneled agencies to conduct the assessment/review for the system of existing Khanij online and Khanij Online 2.0. DGM/CHiPS shall have the right to audit and inspect all the procedures and systems relating to the provisioning of the services. If there is any change/addition in the application's functionality then the SI will have to obtain the STQC / Cert-in Certification for the changes/additions. Selected bidder will bear the auditing charges.

Selected bidder will be responsible for following audit

a. STQC certification for complete Khanij Online 2.0 application (including Vehicle tracking System, Mobile App, Desktop based Application, Cloud hosting). This shall be performed at least once before complete Go-live of Khanij Online 2.0, only by STQC and not Cert-In empaneled agencies.

b. STQC / Cert-in certification for Security, Vulnerability and Penetration testing for Khanij Online application (including Vehicle tracking System, Mobile App, Desktop based Application, Cloud hosting) to be performed every six months for Existing Khanij Online and Khanij Online 2.0 implementation. SI should ensure proper security testing of the application before deployment on production environment to eliminate all vulnerabilities.

4.6 Work Stream 6: Resource Deployment

i. SI shall provision adequate number of personnel, each responsible for a specific role within the project in each of the phases. SI must provide clear definition of the role and responsibility of each key personnel to be deployed as per the specific requirements

ii. SI shall deploy the development Team, Lead Team, Operation support Team, FMS & Helpdesk Team as mentioned in the RFP, apart from these, SI shall carry out own due diligence so as to deploy additional resources (onsite/offshore) to manage the timeline & Service levels.

iii. SI shall have a defined hierarchy and reporting structure for various teams that shall be part of the project.

iv. The names of the key personnel to be deployed on the project have to be proposed by the successful SI at the time of signing of the contract. DGM/CHiPS reserves the right to accept / reject any of the profiles proposed by the SI and ask for a replacement profile, at any time during the execution of the contract.

v. The proposed Key Personnel can be replaced only under exceptional circumstances. The SI shall put forward the profiles of personnel being proposed as replacements, which will be either equivalent or better than the ones being replaced. However, whether these profiles are better or equivalent to the ones being replaced will be decided by DGM/CHiPS. DGM/CHiPS will have the right to accept or reject these substitute profiles.

vi. The SI has to ensure at least four weeks of overlap period in such replacements. DGM will not be responsible for any knowledge transition to the replacement resource and any impact/escalation of cost because of replacement has to be incurred by the SI only.

While the below mentions only a limited number of key personnel in a phase wise manner, SI is required to engage appropriate number of additional resources for effective delivery of the project, within the timelines stated in the RFP.

a) Phase I – Transition and Handover of system from incumbent SI

SI to envisage team size and required experience required for transitioning of such a critical application. It may however be noted that key profiles forming the Lead team who have taken the handover will be continued throughout all the phases of contract like Project Managers, Domain expert, System cum Infra Admin, Senior Programmers etc.

b) Phase II – Operation & Maintenance of existing Khanij Online

- Operational Support Unit (OSU)

The SI to ensure availability of Operational Support Unit (OSU) from day one, for day to day activities, enhancements and tickets resolution at Helpdesk that is presently operational in existing Khanij Online. This would be in addition to Lead Team (SI team taking over handover as per norms laid down in RFP, which is constituted by Project Manager, Domain Expert, System cum Infra Admin, Senior Programmer) or any additional team member that SI visualizes as a necessity, to facilitate transitioning/hand holding/system designing/functioning/executing, as the case may be). Under no circumstances the current running Khanij Online Project would be hampered due to non-availability resources.

- Handholding Support as Facility Management Service (FMS)

SI will provide qualified and trained person for all District locations for complete contract period to provide handholding to the departmental staff in the District/Regional/ Check Post Weigh bridges/DGM Offices/ Other location of districts.

- Help Desk support cum call centre

SI will provide qualified and trained person for Help Desk cum call centre support executive at the Raipur location for complete contract period to attend the call from all stakeholders (leasse, licensee, end users, transporters, department officials etc.). The Selected Bidder will run this Help Desk call centre in 3 shifts with 2 resources in each shift, 24x7x365 days. DGM will provide required space, electricity, furniture and telephone lines to run the call center (Toll free number). SI to bear the cost of current Toll-Free number.

c) Phase III – Development of Khanij Online 2.0

The SI to evaluate team size at the time of project planning for Khanij Online 2.0. After evaluation the SI will inform DGM/CHiPS and get an approval as to the actual size of personnel/manpower planned, qualification and experience for design, development and implementation of Khanij Online 2.0.

d) Phase IV – Operations & Maintenance of Khanij Online 2.0

As new modules are added in the scope of Khanij Online 2.0, formation of OSU to be deployed will be changed for support to ensure ICCC support, VTS and other new modules. Helpdesk and FMS support will have to be continued. SI to provide necessary training to the support staff for new developed modules/enhancements made in the Khanij Online 2.0 mining applications. Lead team to continue its support.

4.7 Work Stream 7: Training and Capacity Building

Training and Capacity building is required to support the realization of DGM/CHiPS vision by developing required competencies and capacity. The overall training and capacity building plan shall include following but not limited to:

i. Training Planning
ii. Identify training objectives for various stakeholders
iii. Training calendar development
iv. Training needs assessment
v. Training execution / Implementation of training
vi. Training content
vii. Monitoring & evaluation of training

A. Training Planning:

- Training planning should involve but not limited to determining the training scope and approach for delivery of training associated with the overall project milestones. This should conclude with an agreed development and delivery approach to deliver the training requirements of the Khanij Online Project. This should ensure the delivery of quality system-based training and training materials.
- Focused sessions should be planned for finalizing the training materials and training schedule planning. A training schedule will be aligned to the project implementation milestones, module releases and operation needs of project. Module wise application (Khanij Online existing / 2.0) and enhancements training shall be provided by the SI for as per requirements of DGM.
- The details of the training category, approximate number of trainees for each category is to be assessed and provided by the SI. An individual trainee may be required to be trained several times for same or different training category. System integrator shall design and execute the training for following stakeholders:
  - Training to Staff at Head Quarter
  - Training to Staff at the regional and district offices
  - Training to lease (major & minor mineral), licensee, end user, transporter etc.
  - Train the trainers
- Training shall be at various project phases for all above stakeholders and any other application users as per the DGM / CHiPS requirement and SI shall be required to impart training for:
  - Project Go-live and rollout of Khanij Online 2.0
  - After deployment of major enhancements / cumulative multiple enhancements as per the DGM requirements
  - Refresher training throughout Khanij Online existing / 2.0 project
  - Training for new departmental and other onboarded application users
- SI shall plan for training sessions as per the project requirements. The schedule/ location/ Syllabus/ Training Manuals for the above Training sessions would be approved by DGM/CHiPS.

B. Training execution:

SI shall execute the training through multiple training delivery channels like Self learning, Classroom, Train the trainer approach etc. The SI shall plan / conduct training sessions as a part of capacity building training considering

- The Training Program would be extensive with imparting hands-on training so that system users (DGM and lessee, licensee, end users etc) gets trained on the application accessibility/ Hardware/ Software/ troubleshooting in such a manner that they are able to work independently on the system.
- Requisite mix of theory & practical operational sessions
- The trainings shall be conducted in English and Hindi.
- Maximum number of trainees per batch will be 30
- Adequate User Manual / training material to be provided

C. Training location and infrastructure:

- Training location at Head Quarter and district offices
- The infrastructure location and place, Internet connectivity etc. required for each Training Session would be provided by the DGM.
- Select SI shall be responsible for travelling, boarding and lodging expenses of the trainers and DGM/ CHiPS shall not be responsible for same.

D. Training Content and material:

- SI shall create digital training content in form of flash / video content (animated), discussion scripts, power point presentation, on screen help documents, user manual and any other relevant content as per upcoming future technologies.
- The selected Bidder would provide Printed Training Material & also On-line Help and an On-line Interactive Training module, which will be downloadable by the users for the Application Software.
- The Selected Bidder would also provide an Online help and an On-line Interactive Training module which can be downloaded by the users for Training on operation the application software.
- The training manual will be developed in Hindi and English and approved by DGM/ CHiPS.
- The material developed should be highly user friendly and should have update contact information pertaining to the local office, helpdesk support number and escalation point.
- All printed material should be colour copies with standard printing quality.
- SI must ensure that the training material developed are uploaded on the portal and can be accessed online.

E. Acceptance of Training:

Khanij Online application and module enhancements will require the user training, and this will be quarterly assessed for acceptance of the training. The trainees will give the training evaluation form in following format (Indicative).

Khanij Online Training Evaluation Form Date: Modules Name: Trainer's Name:			
SN	**Evaluation Criteria**	**Yes**	**No**
1	All functionalities of the module are covered?		
2	Features demo is given by the trainer		
3	Trainees used the features on the system		
4	The trainer appropriately addressed the queries of the trainees		
5	Training material was relevant		
Name of Trainee: Sign.			

- The training evaluation will be made based on following:
- Training effectiveness = Total Count of Yes x100 / (Total count of No+ Total Count of Yes)
- If Training effectiveness >= 70% then training is accepted.
- If the training effectiveness is < 70% then the SI need to impart the training again.
- Feedback form shall be applicable for both online and offline trainings.

4.8 Work Stream 8: Deployment of Integrated Command Control Centre

The control center is the hub or nerve center of a system. It is where data about the system is collected and processed and fused with other operational and control data to produce "information." The goal of this module is to identify some major factors and issues that should be considered in the planning, designing, operating and maintaining a control center.

There will be an Integrated Command Control Centre and the selected bidder shall be responsible for Site setup, design, procurement and establishment of IT infrastructure for the Integrated Command Control Centre (ICCC) at facility provided by DGM. The selected bidder will be responsible for providing control center infrastructure (Infrastructure ownership shall be of DGM) and its support for the contract period at a premise provided by DGM, to monitor the movement of mineral transporting vehicles.

Key Activities are -

SN	Activity Component	General Requirement
1	Site Setup	The SI will have to establish site with all required Civil work, Interior, electrical, mechanical, Furniture (Table, Chair, Cupboard, white board etc.), Access Control System, Physical Security Devices, UPS, hardware, software, network infrastructure including switches, routers and any other required accessories / equipment. Entire site

SN	Activity Component	General Requirement
		will be maintained by the SI throughout the contract period. SI shall deploy the adequate number of above items as per the proper functioning of ICCC site. This entire set-up shall part of the central control room established by the SI at DGM's premises. Only space and electricity charges shall be provided by the DGM.
2	Integrated Centralized Command Control Centre (ICCC)	The Centralized Command Centre cum Help Desk will be setup in the Raipur and will be operational 24*7. Minimum requirements for setting up ICCC should include Video wall with controller, Video Management software, Workstations / Computers (4 Nos.), Printer/Scanner, Access Control System, EPBX/ IVR, UPS/Generator and related accessories including network equipment. The vision of integrated Command Control Centre (ICCC) is to have an integrated view of all the field level equipment's (hand held devices) and mineral movement and monitor their operations remotely. ICCC would serve as the focal point to serve as a decision support engine for administrators in day to day operations as well as during exigency situations.
3	District Control Rooms (DCR)	All districts will have District Control Rooms in the respective District Mining offices with limited functionality available for district supervision and coordination with district patrolling vehicles. However, District office shall provide space, furniture, power backup, internet connectivity etc at District control room.
4	Standard Operating Procedures (SOPs)	SI to integrate and automate Standard Operating Procedures (SOPs) with the proposed solution All SOPs should be maintained in knowledge repository and need to be updated by system integrator as per changing scenario or amendment in processes from time to time.

SN	Activity Component	General Requirement
	Operational Support Unit (OSU)	SI would need to provision OSU (L2 support) to ensure seamless resolution of issues, faults, problem as per prescribed SLA for smooth operation of the system. OSU to be provided by SI for all 3 shifts. OSU will include minimum 3 Technical Helpdesk staff and 1 Supervisor in each shift. SI shall ensure that minimum OSU staff shall be present in technical helpdesk. Technical help desk shall be responsible for vehicle tracking support for DGM.
	24*7 Helpdesk	Establishment of a Helpdesk with EPBX/IVR to provide technical, training and Informational support to all the users through Toll free number, email etc which includes all level of support (L1 to L3) based on escalation and severity level. Proper SLAs will be defined to so that tickets are resolved in timely and efficient manner

Key- Use cases:

i. **Multiple Application Integrations at ICCC platform:** Integrated Command Control Centre (ICCC) consist software platform that can integrate either existing or future departmental applications and push, pull pertinent data from these systems and provide it on ICCC's dashboard for analysis, correlations and drawing actionable intelligence.

ii. **Customizable Centralized information Dashboard at ICCC:** Integrated Command Control Centre (ICCC) consist software platform to provide user specific, personized centralized information dashboard for their respective needs and show various performance indicators on an easy to navigate configurable & customizable GUI. The dashboard can show, push and pull key parameters and pertinent information on demand from all the other integrated IT applications, field devices and other applications.

iii. **Standard Operating Procedure (SOP) Management using ICCC:** ICCC software provides ability to write, configurable and customizable standard operating procedures through graphical, easy to use tooling interface. Standard Operating Procedures shall be defined by SI in consultation with DGM to finalize approved sets of actions considered to be the best practices for responding to a situation or carrying out an operation. The users will be able to edit SOP's including add, edit, delete activities and will be able to add comments or stop SOP prior completing.

iv. **Collaboration and communication using ICCC:** The ICCC provides various tools for users to communicate & collaborate in real time. The ICCC provides ability to converse virtually through the exchange of text, audio, and/or video-based information in real time with

one or more individuals within the emergency management community. The ICCC provides single web-based dashboard to send notifications to target audiences using multiple communication methods including voice-based notification on PSTN/Cellular, SMS & e-mail.

4.9 Work Stream 9: Operations & Management of Khanij Online 2.0

The Operations and Maintenance service for Khanij Online Project shall be a critical aspect in the Project. The selected bidder shall provide the Operations and Maintenance Services from the date of Go-Live of Khanij Online 2.0. The SI shall be responsible for end to end provision of O&M services including planning, delivery and execution of services. O&M of Khanij Online 2.0 will include all activities and SLA's of existing Khanij Online unless otherwise explicitly stated. Based on DGM's authorization and approval, SI should interact and coordinate as necessary for the requirement of the Khanij Online project with external entities such as banks/payment gateways / GPS providers etc. SI shall liaison with all necessary external agencies to accomplish the implementation and maintenance of the project.

SI shall ensure compliance with the SLAs in place for operations and maintenance. SI shall also be responsible to keep all the documents updated during the project period.

As part of the post implementation services, the Selected Bidder shall provide below support for the software, hardware, and other infrastructure provided as part of the project but not limited to. The Selected Bidder shall provide five (5) years of comprehensive AMC that includes:

i. Handholding Services
   - Centralized Command Control Centre from the Department designated premises.
   - Application functional support services
   - Hardware and Software maintenance and support services.

ii. Warranty support

iii. Annual Technical Support (ATS)

The services shall be rendered onsite. To provide the support for all Project locations across the State where the Application software, hardware, and other infrastructure will be rolled out. The Selected Bidder shall develop a work plan for the knowledge sharing as per scope defined in this RFP for use in future phases of the project.

A. Applications Support and Maintenance

Application support includes, but not limited to, production monitoring, troubleshooting and addressing the functionality/enhancements, availability and performance issues. SI shall keep the application software in good working order and perform upgrades to applications as requested by the DGM/CHiPS team. SI shall be responsible for managing applications through their entire lifecycle, including the design, testing, and improvement of applications that are part of the IT Services. The SI's responsibilities with respect to DGM's Application Management function are described as under:

i. Helpdesk support service will serve as a single point of contact for all ICT related incidents and service requests. The service will provide a Single Point of Contact (SPOC) and also the resolution of incidents.
ii. The service will be provided in both English and Hindi language.
iii. DGM/ CHiPS requires the Selected Bidder to provide helpdesk support services to track and route requests for service and to assist end users in answering questions and resolving problems related to the software application, project site infrastructure, and operating systems at all locations. It becomes the central collection point for contact and control of the problem, change, and service management processes. This includes both incident management and service request management.
iv. The Selected Bidder shall provide a second level of support for application and technical support at all locations across the DGM/ CHiPS where the software, hardware, and other infrastructure will be rolled out.
v. For all the services of DGM/ CHiPS within the scope of this RFP, The Selected Bidder shall provide the following integrated customer support and help.
vi. Establish 24x7 support facilities for reporting issues/ problems with the software, hardware and other infrastructure.
vii. The Selected Bidder shall provide functional support on the application components to the end users.
viii. The Selected Bidder shall also provide system administration, maintenance and management services, and IT security administration services.
ix. The Software Maintenance and Support Services shall be provided for all software procured and implemented by the Selected Bidder. The Selected Bidder shall render both on-site and offsite maintenance and support services to DGM/ CHiPS to all the designated locations. The Maintenance and Support Services will cover, all product upgrades, modifications, and enhancements.
x. Tuning of application, databases, third party software ‘s and any other components provided as part of the solution to optimize the performance.
xi. Perform changes, bug fixes, error resolutions, tickets resolution and enhancements that are incidental to proper and complete working of the application.
xii. Any changes to the application code that may be required because of patches to licensed software being used (if any)
xiii. Migrate all current functionality to the new / enhanced version, any future upgrades, modifications or enhancements.
xiv. Update and maintain all project documents
xv. The Selected Bidder shall formulate a distribution plan prior to rollout and distribute/install the configured and tested software as per the plan.
xvi. The Application Functional Support Services shall be provided for all software procured and implemented by the Selected Bidder. The Selected Bidder shall render both on-site maintenance and support services to DGM/ CHiPS from the development centre in the DGM/ CHiPS.
xvii. The Selected Bidder shall incorporate technological changes, and provide enhancements as per the requests made by DGM/ CHiPS. The Selected Bidder shall perform minor changes, bug fixes, error resolutions and minor enhancements that are incidental to proper and complete working on the application.

xviii. Routine functional changes that include user and access management, creating new report formats, and configuration of reports.

xix. The Selected Bidder shall provide user support in case of technical difficulties in the use of the software, answering procedural questions, providing recovery and backup information, and any other requirement that may be incidental/ancillary to the complete usage of the application.

xx. The Selected Bidder shall maintain access controls to protect and limit access to the authorized users.

xxi. User ID and group management services.

xxii. Maintain access controls to protect and limit access to the authorized end users of the application

xxiii. Configuration of new acts/sections, and any other configurable data entities in the system as required by DGM

xxiv. Release Management for the interim releases of the application

xxv. Facilitating ongoing integration with other external entities. SI should also make available to such agencies, all the data and industry-standard interfaces and integration touch points for integration with the Khanij Online existing and later 2.0 application.

xxvi. Implementing all patches and upgrades from CSP / OEMs ensuring customization done in the solution as per the DGM's requirements are applied. Technical upgrade of the installation to the new version, as and when required, shall be done by the SI. Any version upgrade of the software / tool / appliance by SI to be done after taking prior approval of DGM and after submitting impact assessment of such upgrade.

xxvii. Manage all changes on Khanij Online 2.0 portal including uploading of content as and when required by DGM.

xxviii. Routine functional changes that include user and access management, generating reports and configuration of reports. Some of the indicative changes include:

xxix. Introduction of new forms, new workflows or modification in existing workflow for existing services

xxx. Addition or modification of validations informs

xxxi. Modifications (addition of new fields, removal of fields, modification of levels of approval, processing logic, approval logic, addition of attachment requirement etc.) to forms

xxxii. Configuration changes to improve the performance & efficiency of the system

xxxiii. Addition of new roles for accessing existing services

xxxiv. The services shall include administrative support for user registration, creating and maintaining user profiles, granting user access and authorization, providing ongoing user password support, announcing and providing networking services for users and providing administrative support for print, file, directory and e-mail.

xxxv. The Selected Bidder will ensure proper audit law policy, user awareness policy, password policy, vulnerability scan, patch management policy, information security policy, antivirus policy, physical security policy, classification policy, backup policy, media handling policy, access control policy and other security policies and measures inconformity with provisions of IT act 2000 for successful completion of the project in consultation with Competent Authority

B. Cloud Services:

Cloud services are not limited to VMs / servers, storages, back up, security equipment, operating systems, database, enterprise management system, help desk system and other related IT infra, local infrastructure for ICCC required for running and operating the envisaged system. SI shall define, develop, implement and adhere to IT Service Management (ITSM) processes aligned to ITIL framework for all the IT Services defined and managed as part of this project. IT infrastructure support and maintenance of the following:

C. Warranty and AMC support requirements for client-side infrastructure:

SI shall provide ICCC and Helpdesk support to various DGM offices.

i. Where such a support for any component(s) is not available or ends during the contract period, the component(s) shall be replaced with latest available component(s) in the market with similar or better specifications at least 3 months before the end of support period. No components supplied should be end of life.

ii. No component supplied should have been introduced in the market more than 2 years back as on date of the replacement.

iii. SI shall submit the details to DGM and DGM's decision on the acceptability of the replacement will be binding on the SI.

iv. For the all the client-side infrastructure procured by the SI, the SI shall be responsible for:

- Configuration, installation and complete commissioning of the infrastructure and network
- Ensuring that the supplied equipment supports the intended system hardware, operating system and other software. Any problems encountered in the installation of the hardware/software because of hardware/software incompatibility shall be the responsibility of the SI.

v. Provide OEM warranty and comprehensive AMC support (after the expiry of warranty) for the entire contract period. The comprehensive AMC should include provision and replacement of all spares and parts, free of cost during the entire period.

vi. Warranty will be applicable from date of Installation to till selected bidder contract period. The Selected Bidder shall obtain product warranty and on-site free service warranty on all licensed software, computer hardware, peripherals and other equipment's supplied by selected bidder.

vii. The Selected Bidder shall provide the comprehensive manufacturer's warranty in respect of proper design, quality and workmanship of all hardware, equipment, accessories etc. covered by the RFP. The Selected Bidder must warrant all hardware, equipment, accessories, spare parts, software, etc. procured and implemented as per this RFP against any manufacturing defects during the warranty period.

viii. The Selected Bidder shall provide the performance warranty in respect of performance of the installed hardware and software to meet the performance requirements and service levels in the RFP.

ix. The Selected Bidder is responsible for sizing and procuring the necessary hardware and software licenses if any as per the performance requirements provided in the RFP. During the warranty period, the Selected Bidder shall replace or augment or procure higher-level new equipment or additional licenses at no additional cost to the DGM/ CHiPS in case the procured hardware or software is not adequate to meet the service levels.

x. Mean Time Between Failures (MTBF) - If during the contract period, any equipment has a hardware failure on four or more occasions in a period of less than three months or six times in a period of less than twelve months, it shall be replaced by equivalent or higher level new equipment by the Selected Bidder at no cost to the DGM/ CHiPS. However, if the new equipment supplied is priced lower than the price at which the original item was supplied, the differential cost would be refunded to the DGM/ CHiPS. For any delay in making available the replacement and repaired equipment's for inspection, delivery of equipment's or for commissioning of the systems or for acceptance tests / checks on per site basis, the DGM/ CHiPS reserves the right to charge a penalty.

xi. During the warranty period the Selected Bidder shall maintain the systems and repair / replace at the installed site, at no charge to the DGM/ CHiPS, all defective components that are brought to the Selected Bidder notice.

xii. The Selected Bidder shall as far as possible repair the equipment at site. Unserviceable equipment will be property of DGM/ CHiPS and will not be returned to the Selected Bidder.

xiii. The warranty would not become void, if DGM/ CHiPS buys, any other supplemental hardware from a third party and installs it within these machines under intimation to the Selected Bidder. However, the warranty will not apply to such supplemental hardware items installed.

xiv. The Selected Bidder shall carry out Preventive Maintenance (PM), including cleaning of interior and exterior, of all hardware and testing for virus, if any, and would maintain proper records at each site for such PM. Failure to carry out such PM will be a breach of warranty and the warranty period will be extended by the period of delay in PM.

xv. The Selected Bidder shall monitor warranties to check adherence to preventive and repair maintenance terms and conditions.

xvi. The Selected Bidder shall ensure that the warranty complies with the agreed Technical Standards, Security Requirements, Operating Procedures, and Recovery Procedures.

xvii. The Selected Bidder shall develop and maintain an inventory database to include the registered hardware warranties.

xviii. The Selected Bidder shall provide from time to time the Updates/Upgrades/New releases/New versions of the software and operating systems as required. The Selected Bidder would provide free upgrades, updates & patches of the software and tools to DGM/ CHiPS as and when released by the OEM.

xix. The Selected Bidder shall provide patches to the licensed software including the software, operating system, databases and other applications.

xx. Software License Management. The Selected Bidder shall provide for software license management and control. The Selected Bidder shall maintain data regarding entitlement for software upgrades, enhancements, refreshes, replacements, and maintenance.

D. Preventive Maintenance:

i. The selected bidder should define and indicate the Preventive maintenance schedule and procedure. Any special tools/ instruments/ equipment's required for carrying out the preventive and break down maintenance of the system offered should be clearly indicated and offered to DGM/CHiPS by the selected bidder at no extra cost.

ii. This activity shall be carried out at least once in every quarter in addition to the normal maintenance required.

E. Corrective Maintenance Services:

Troubleshooting of hardware problems for all the supplied equipment's and rectification of the same. Troubleshooting of OS and databases, etc. and provides solutions for the same. Documentation of problems, isolation, cause and rectification procedures for building a knowledge base for the known problems.

F. Configuration Management Services:

i. The Selected Bidder shall maintain a record of hardware as well as software and all other items supplied in this tender including the details of policies implemented on the servers, network, databases, web servers, etc.
ii. The Selected Bidder shall keep soft copies of the configurations of each of the devices mentioned above.
iii. The Selected Bidder shall ensure define change management procedures to ensure that no unwarranted changes are carried out on the equipment's. All the changes carried out by the Selected Bidder must be formally approved by the Department and recorded.
iv. The Selected Bidder shall do proper version management of these configurations as the configurations may be changed from time to time. This is required to ascertain changes made to these configurations at different stages as well as having functional configurations.
v. These configurations shall not be accessible in general except to Department and must be kept confidential under the authority of project manager or a lead administrator/manager.

G. The Selected Bidder Management Services:

i. The Selected Bidder shall coordinate with external SIs and FMS team of all the project locations for upkeep of equipment deployed to meet the SLA and shall liaison with various SIs/OEMS for related works, equipment & Services.

ii. The Selected Bidder would maintain a database of the various SIs and service providers, including SIs for hardware under warranty, service providers, etc. with details like contact person, telephone numbers, escalation matrix, response time and resolution time commitments etc.

iii. The Selected Bidder shall, if required escalate and log calls with SIs/OEM and service providers and coordinate with them to get the problems resolved.

H. Backup Management Services:

i. The selected bidder shall provide backup management services to conduct regular backups and restoration as required, of critical data and systems to achieve the required service level.

ii. The activities shall include:

- Backup of application, database and uploaded documents as per best industry standards.

- Monitoring and enhancement of the performance of scheduled backups, schedule regular testing of backups and ensure adherence to related retention policies.

- Ensuring prompt execution of on-demand backups of volumes, application, documents and database whenever required by DGM/CHiPS or in case of upgrades and configuration changes to the system.
- Real-time monitoring, log maintenance and reporting of backup status on a regular basis. Prompt problem resolution in case of failures in the backup processes.

I. Asset Management Services

i. The Selected Bidder shall be required to create a database of all IT assets like hardware, software, peripherals, etc., by recording information like configuration details, serial numbers, licensing agreements, warranty and AMC details, etc.

ii. Record installation and removal of any equipment from the network and inform Mineral Resources Department /DGM even if it is temporary.

iii. Create Software inventory with information such as Licenses, Version Numbers and Registration Details.

iv. Register all software procured by the Department in this bid document with respective OEMs.

v. Perform software license management and notify the Department on licensing contract renewal. Renewal cost to be borne by the selected bidder.

4.10 Module Wise Scope of Work

A. Khanij Online 2.0 with Establishment Module and Change request management Module

Since implementation existing Khanij Online has undergone numerous modifications and customization in alignment with statutory provisions and stakeholder requirements. The current system is effectively delivering services to both field offices and Head office users of DGM. The selected bidder shall develop and migrate the existing Khanij Online to the new Architecture of Khanij Online 2.0.

The Khanij Online 2.0 solution needs to be architected using robust and proven software and hardware technologies like Service - Oriented Architecture (SOA). The solution architecture should be built on sound architectural principles enabling fault-tolerance, high performance, and scalability both on the software and hardware levels. Software architecture must support web services standards including XML, SOAP, UDDI and WSDL. Software architecture must support appropriate load balancing for scalability and performance. Software architecture must support flexibility in adding/changing functionalities or applications in all versions like web, desktop and mobile app. All the versions of Khanij Online 2.0 should be developed in same database platform. Software architecture components should utilize the high availability, clustering, load balancing and disaster recovery features available in the proposed architecture to increase system performance, scalability and security features. Software architecture must support trace logging, error notification, issue resolution and exception handling.

The selected bidder will propose the architecture during design phase and the same needs to be approved by CHiPS/DGM.

Further, functionalities and capabilities and system enhancements shall form part of scope of work of SI, as defined under –

B. Establishment Module

i. Design & Develop an establishment module with workflow for leave and ACR management for DGM users.

ii. System shall have the employee master of DGM where all employees will be mapped to their respective reporting officer as well as their ACR authority

iii. System shall enable the user to apply for leave from the portal and mobile application both

iv. Leave request for the user shall enable the system to send notifying SMS to his reporting officer.

v. The system shall enable the authorized user to approve / reject the leave on web and mobile application both.

vi. The system shall notify the user about his / her leave being approved / rejected

vii. In case of leave, responsibilities/tickets are assigned to link officer and record of the same is maintained

viii. The system shall enable the authorized user to add / update the ACR for DGM staff

C. Change request management

The purpose of change control is to ensure the agility in Khanij Online 2.0 to embrace the business changes in hassle free manner. The objective is to structure the change request management procedure so that the changes are implemented smoothly.

Selected Bidder will develop the module to raise the change request from DGM/CHiPS. The process for raising change request and its approval workflow will be decided mutually.

The change request will be classified basis its severity and thereby impacting the priority of implementation. Broad criteria for establishing severity is provided in the table below–

Severity	Description
Normal	Cosmetic problem, usability improvement, unclear error messages; customer can live with the problem (default)
Expedited	Problem adversely affects product functioning, but a workaround is available; customer will be annoyed; serious usability impairment; problem blocks some testing
Critical	Product does not function at all or crashes; the wrong results are generated; further testing of the application is not possible
Emergency	Anything that requires a change to be made immediately, bypassing the change control process temporarily

i. The proposed Khanij Online 2.0 application should record and store all change request made by CHiPS/DGM. Change requests in respect of Project Implementation or Scope of

work will emanate from DGM/CHiPS. SI shall be required to study the change requested and submit the SRS as per agreed timelines for the change request to DGM/CHiPS. DGM/CHiPS will assess the SRS submitted by the SI and shall provide recommendations for changes (if any). Module should have below features –

ii. Configure change types, roles, statuses, and templates to manage your change cycle easily.

iii. Log changes from incidents and problems and track them at every step of the cycle.

iv. Configure automated workflows and notifications to improve visibility and communication for IT and business stakeholders.

v. Assign, measure, and analyze change metrics to continually improve your change management process.

vi. Break down changes into custom stages and assign these stages their own statuses.

vii. Associate predefined change templates to preconfigured workflows to instantly trigger a change upon submission.

viii. Make informed decisions to reduce unauthorized, failed, and emergency changes.

ix. Assess, prioritize, and schedule changes.

x. Publish announcements from within the change to communicate any planned downtime to end users.

xi. Create impact, roll out, and back out plans and implementation checklists.

xii. Refer to the change management module's schedule calendar to resolve any conflicts.

xiii. Configure systematic workflows for every stage right from submission to closure to ensure that nothing is missing.

xiv. Initiate projects from within a change or execute simple tasks to roll out the change depending on its complexity.

xv. Carry out a post implementation review to ensure that there are no further glitches.

D. Mobile App

Now days Mobile App has become a standard means for ease of delivery of information and services to perform day to day activities. As mining industries work in difficult terrain, so data updations through standard communication protocol is a challenge. Therefore, alternative solutions are to be designed so that access to information as well as updations of information is not dependent on internet.

The requirement is to develop a mobile application which would be an extended version of Khanij Online 2.0 and would be improvised by addition of other features over the period. This would in turn allow seamless operation of mining business activities. The platform for this application would be native Android and iOS based. 9. Mobile application should work as an extended module of Khanij Online 2.0 and it must work in online and offline mode both. When used in offline mode, it will synchronize the data with main portal of Khanij Online whenever it gets network coverage.

There would be several benefits of having the process easier and more widespread through mobile. The mobile application would –

i. Provide live access to details
ii. Help users to visualize and analyze the data more easily
iii. Provide anytime information to the stakeholders
iv. Save a great amount of time required through quick communication
v. Increase in productivity and transparency

The several features accessible through mobile application are as stated below. The detailed set of requirements and their functionality will be outlined in Requirement Gathering & Analysis phase of the project execution.

Proposed major features/activity not limited to:

i. Dashboard
ii. User Information System
iii. Department Pendency Information
iv. Verification of e-Transit Pass
v. Submission of cases of irregularities
vi. Submission of grievance
vii. Reporting and Statistics
viii. QR Code Based Paperless e-Transit Pass – All types of e-TP as QR code will also be delivered at vehicle driver's mobile phone. The SI need to provision for the cost of 3rd party API usage for delivering the QR code-based e-TP and it will not be paid by DGM as extra cost. Thus, the SI should implement the solution which can include the QR code as per business need.
ix. Application should interface with the MIS system through web-services with secured transaction.
x. Bulk message delivery to lessees/licensees/government officials.
xi. The application should be able to work both offline and online so that data can be updated in the central server when the connectivity is available.
xii. Few of the modules might use the native functionalities of the mobile device like SMS, Contacts. The mobile application should be able to work at places where there is no GPRS connectivity. Provision should be made to publish native application at the respective market places.
xiii. Enable the vehicle driver in navigation and DGM in tracking the vehicle, report the vehicle breakdown.
xiv. The Mobile App should enable the inspector to upload the inspection report.
xv. The Mobile App should enable the users to apply for leave, leave approval and receive notification on leaves applied by reporting staff and approved leave.

E. Desktop App

Mining operations are generally carried away in remote areas where internet access is really a challenge. To overcome the connectivity issue, selected bidder will also develop as desktop-based application, which should enable the specified business transactions as per the scope defined by DGM/ CHiPS in offline mode in case of un-availability of internet and then later on

whenever connected to internet, should update the data to the Khanij Online. The application will be used by all users for generation of e-Transit Pass seamlessly.

The application may have below indicative major modules not limited to:

i. Configuration Module
ii. Master Module
iii. e-TP Module
iv. MIS Report Module

This application should enable two ways data exchange between desktop application as well as Khanij Online 2.0. Thus, the desktop applications should have facility to store data internally in encrypted format and will be in continuous sync mode with main online application with internet. In case of unavailability of internet, the data will be sync once internet is available or exchange data with Khanij Online portal using data storage media. The data in storage device should be encrypted and secured. Data exchange using storage media shall be ensured by the selected bidder as per direction given by DGM/CHiPS. The application must be designed in such a way that it should work in client server architecture also.

F. Vehicle Tracking System

Mineral carrying vehicle equipped with Vehicle Tracking Device (VTD) shall be track and trace through the centralized platform throughout the route after Trip generation from the system. Real time location of the vehicle shall be positioned using VTD Information. The solution shall be scalable to integrate multiple OEM/Makes & Models of the VTDs.

Vehicle Tracking System should be scalable, compatible & allow for any types of standard AIS 140 device to integrate multiple OEM/Makes & Models of the VTDs. However, DGM may allow only Chhattisgarh Transport department (CGTD) empaneled VLT devices for the project. CGTD has currently empaneled 19 AIS 140 compliant VLT manufactures, which is subject to change as per the CGTD requirements. The software shall provide controls to integrate the new vehicle tracking device model by developing the interface for integrating the protocol of new device vendor.

System should allow authorized users to map the device with vehicle number online. After mapping and device activation, vehicle shall be instantaneously available for visualization. System integrator shall be responsible for VLT configuration for proper functioning of system, if required.

Vehicle tracking system (VTS) shall depend upon transit pass generation. Vehicle moves from source to destination via interim locations (if any) after issuance of transit pass.

Khanij Online 2.0 portal shall have all required information for vehicle tracking system. The indicative process of trip generation is mentioned below. DGM may define and change the process at any point of point based on the business needs. System should be configurable to adopt the changes.

i. **Trip Creation:**

- VTS shall create trip immediately after generation of transit pass. System shall identify the on-time trip creation or delayed trip creation through creation flag.

- VTS system shall check the geo-coordinates of vehicle and mark the vehicle in green flag, if vehicle is found in the geo-fence of trip source. Else it is marked as red flag.

ii. **Ongoing Trip:** VLT device shall continuously sent the location data to central server. Based on the live location data, system shall display the vehicle movement on the map. In case, non-availability of network in vehicle, VLT / GPS device shall store the vehicle coordinates and shall transmit the history packets after availability of network.

iii. **Trip End:** System shall be configurable to end the trip based on one or more parameters like entering or exiting the geofence area of destination and TP received at destination etc.

iv. **Vehicle breakdown**: In case of vehicle breakdown, Purchaser, transporter or Receiver can apply for change in vehicle. Change in vehicle number needs approval from competent authority of source district. Provision to display details of new vehicle should be available on TP. Similarly, system shall show the trip against breakdown vehicle in different color code.

Major features are as stated below. The detailed set of requirements and their functionality will be outlined in Requirement Gathering & Analysis phase of the project execution -

a) General Requirement

i. The proposed route of the vehicle, as per the location details mentioned in the e-Transit Pass generated at mining location, and the actual route followed by the vehicle shall be monitored and tracked using GPS navigation technology

ii. The proposed application platform shall be capable to scale up to 1, 50,000 or more devices. Necessary software architecture shall be submitted as part of solution.

iii. The solution shall be scalable to integrate different OEM / makes of the devices (AIS140 approved). Solution to be integrated with IRNSS compatible devices.

iv. System should be able to integrate and merge the data received from the existing system, ICCC and Mobile App. Khanij Online 2.0 will be single login for all functionalities.

v. The software shall enable control centre management staff in quick decision-making capability, which shall be achieved by providing graphical tools for visualization.

vi. System shall have capability to create client specific and general business rules like unauthorized stoppage, deviation from routes, speed etc.

vii. The software shall enable authority to drill and analyze information and online data in a multi-dimensional manner.

viii. Comprehensive analysis and reporting capabilities are expected to be part of the application delivery which matches the world standard capabilities of systems.

ix. The software should have capability to have a multi-screen-based tracking system, so as to enable tracking staff to quickly analyze activities and have a better insight into operational data of all activities within the system

x. System shall have capability to manage and monitor the access to the system and its various modules

xi. System shall have Automated event logging with time stamps (e.g. system logs, audit trails, error logging etc.).

xii. System shall have Facility for users to manage database masters covering various entities such as states, cities, vehicle owners, users, stakeholders etc.

xiii. System shall have Master Data Management of Route, vehicle Stoppages, POI Management etc.

xiv. Creation of Geo Fences and landmarks should be very simple and easy

b) Geotagging & Geofencing

System integrator shall provide facility to capture / update the geo-coordinates / geofence of various location at time of location creation in the system.

System integrator shall be responsible for capturing the geo-location (geo tagging) of all source, destination, end users, washery etc. In case any purchaser is outside the Chhattisgarh, the exit point of Chhattisgarh shall be marked as purchaser state exit point.

SI shall be responsible for configuration of optimal routes (multiple) and geo fencing for movement of minerals from Source to Intermediary locations and further movement of minerals from intermediary locations to destinations. The configuration shall be dynamic in nature and will be changed based on the inputs from fields.
System shall provide at least following functionalities but not limited to:

i. System shall track the un-authorized entries or Geo-Fence Violations of Vehicle/Machine into a specified area and same will be recorded into Central System
ii. The system shall provide real-time visibility of Vehicle density at Mining, stockyard and Parking areas
iii. The Vehicle Tracking application will provide maps to support the functionality, comprised of a selection of individually selectable theme layers.
iv. The mapping platform should allow different mapping profiles. Different layers and details should be visible for different access level. For Example: General Users will be able to view consumer map. Internal users will be able to view other layers such as stations, streets names, water features, parks, major buildings etc.
v. The map engine should support tiling catching to provide faster response. The layers and data details like forest, river, feature details should be available and selectable.
vi. The VTS application software will allow users to view the map, including a selectable combination of the source map layers and different layers, at various user-defined zoom levels.
vii. System should be allowing geo-tagging of locations and display as a selectable layer.

c) Provision of Maps:

SI shall be responsible to provide map (along with all required licenses) with map data as selectable layers with their names superimposed (on selection) on a map of minimum 1:10000 scale (Adoption of high-resolution satellite image if required). SI shall ensure that narrow roads of mining areas should be visible on map. SI shall deploy the higher resolution maps for smooth operations, if required. SI shall provide minimum following map layers

i. Geographical Boundaries

- State
- Region
- District
- Block / Tahsil
- City
- Mining areas

ii. May have to update the boundaries if new administrative entities are created by the government;
iii. Roads / streets with their names on mouse over: Roads including National Highways, State Highways, major District roads, village roads and other roads need to be displayed on the map.
iv. Additional layers on prominent landmarks like schools, petrol pumps, hospitals, banks, ATMs, Stations, water features, parks and major buildings etc. should also be displayed on the map.
v. All sources, destinations, check post, purchaser, lessee, end user, licensee and Prohibited areas as defined by the DGM officials etc. should be available on Map as selectable layer.

d) Live Vehicle/Real Time Tracking

i. System shall have Information like Device Id, TP no, Source, Destination, Mineral Details, Vehicle name, Model, Speed, Maximum Speed, Average Speed, Trip Time, Idle Time, Distance, Odometer and the time of Last Update On, Last Update etc.
ii. It shall show the current position of the selected Vehicle.
iii. This shall also show alerts like status of ignition, speed, Battery, Panic and Towing.
iv. Graphical Representation of the vehicle in distance Vs time chart and Speed Vs Time chart shall show in this module.
v. The application should have a feature to search/ show a group of vehicles on the map and also should allow searching/ showing of geo-fences, landmarks, addresses on the map, allowing it to be searched from a search bar on the map window
vi. The vehicle shall be tracked based on the route configured in the system for the origin destination pair as per Transit permit of that vehicle.
vii. The Bidder shall integrate the GIS based base map and map data provided by department. The Bidder should also integrate the routes and location Geofence from data created by department
viii. It should be able to show the tracking of vehicle while it is moving (movement) from one location to another.
ix. Maps shall have GIS Maps extension to allow plotting different mark-ups and indications on a map view using vehicle and spatial map layers and allow the user to zoom and pan freely through the map and be able to present heat map visualizations on GIS map data.
x. Whenever a vehicle crosses or enters a specified geo-fence e.g. a vehicle has entered / exited.
xi. Route deviation alerts- if vehicle deviate from the route assigned to the vehicle.
xii. System should have the capability to raise alerts for vehicle movement based on various conditions such as duration of stay outside the Geofence.
xiii. Whenever a vehicle deviates from a defined geo fence, where it is scheduled to operate such as a route-based geo fence from which vehicle stay out and then comes back (for monitoring the plying of vehicles on route-based mines vehicle).
xiv. Whenever a vehicle enters a prohibited geo fence.
xv. Whenever the vehicle moves out of his designated boundaries, system should have capability to generate the alert while the vehicle will always be visible on the ICCC and geolocation specific display and alerts as well.
xvi. Emergency/incident Management shall be handled through the system. In general, the strategies for emergency/incident management shall be developed at a broader organizational level and shall involve many stakeholders.

G. Dashboard Module:

i. The software should have capability give a quick and easy way to view overall Mines and Minerals Fleet performance live.
ii. Automatically update the parameters and filters of the displayed data when the user drills down through visual elements and update the other visual elements accordingly. Also, enable selection of filters through the visual elements and propagate selection to all visual elements in the dashboard.
iii. To provide the facility to device vendors for maintaining and managing the device inventory on vehicles and provide for complete history of device management.
iv. Provide capability to view a single vehicle or multiple vehicles on a map in real time. The multiple vehicles may be viewed based on category, type etc. (example given mines vehicle, make, city or user selection).
v. The Dashboard forms a part of the UI which shows all key performances and tracking indicators enables Control Centre Staff and Management Team of Client to take proactive decisions to manage Client operations in a highly efficient manner. The information can be viewed as a Table View or Map view option. Dashboard shall provide information about all running and idle vehicles with their current Status, Route wise, Area wise and Land mark wise vehicle filtration etc.
vi. The route replay module should have capable to replay the total trip details of particular vehicles on the Map for a particular day and time period as required.
vii. The software shall provide controls to view the entire sequence of reported locations from the beginning of the time period or to step through the sequence incrementally forwards or backwards.
viii. The system shall allow replay for a single vehicle, selected set of vehicles on the selected map view for selected time period.
ix. The system shall allow selection of any time period for the historical data.
x. Application shall display end-to-end location of the Vehicle travelled on the Route Replay.
xi. The route replay should also show the instances of any violations of the vehicle along the concerned route.

H. Report Module:

i. The Application shall generate various reporting options for the organizations like Day wise, Time wise, vehicle History, Various vehicle Alerts etc. for all vehicles available for future strategic decisions. Also, the fleet summary report shall be generated for a complete analysis of the fleet.
ii. All reports shall be generated with configurable time parameters, including as a minimum annual, monthly, weekly, daily, hourly and with user defined start-end date and time ranges
iii. Reporting software shall include the ability to generate graphs and charts based on criteria and format defined by the user
iv. The system shall have the ability to allow the user to generate reports based on predefined report templates or on adhoc basis
v. The system shall have the ability to provide a GUI with drag-and-drop functionality for creating custom formatted reports that include visual elements, objects, and formulas.
vi. Reports should have the ability to print.

vii. System shall allow users to capture and export the current display through electronic reports and in different printer-friendly formats, including, at a minimum, MS-Excel, PDF, and Web formats.
viii. System shall have the ability to display dashboards and reports using different visual elements including charts, maps, calendars, gauges, images, tables, visual and textual lists, and alerts as follows
ix. It should allow the user to drill down and search through the large amounts of data easily and quickly by time periods and other search criteria defined by the user. Also, provide user guidance for searching & filtering through data
x. Reports will be also customized as well as a dashboard will be designed as per DGM's requirements. Some indicative reports are:
    - Exception report when the vehicle moves out without TP i.e. It entered the geo-fenced boundary of mines but exited without e-TP being generated
    - Exception report when the TP's start and destination mismatches with GPS destination or route deviation. If that destination entered mismatches with the GPS destination or the vehicle does not enter the marked destination within the prescribed time limit, an exception report of all such vehicles is to be generated
    - Exception report when vehicle's GPS system is not working after TP is generated and vehicle is loaded with mineral

a) Fleet / Vehicle Information for transporters:

Transporter is a key system user responsible for transporting the minerals and they will need the access of their fleet to provide better services to the DGM as a part of mining operation in the state. Proposed Khanij Online 2.0 shall have provisions for the respective transporters for viewing the vehicle details pertaining to GPS enablement. Transporters will have the limited access (view only) to the system through which, they will be able to view their respective vehicles and will be restricted for viewing the details of others.

Transporter shall have the provision for viewing following information but not limited to:

i. Vehicles Details
    - Total registered vehicles with DGM
    - Vehicles enabled with VLT/GPS
    - Vehicles with active/faulty VLT/GPS
    - Vehicles whether on trip, running and idle etc.
    - Vehicles Usage report, insurance expiry, permit expiry etc.
ii. Vehicle Route Map
iii. Trip details for the respective vehicles.
iv. Live and route replay of vehicles for the assigned trips
v. Live location tracking of unassigned trip vehicles
vi. Details of vehicle breakdown / incident reported for the vehicle
vii. System generated alerts and notifications
viii. Real-time Dashboard and MIS Reports applicable to transporters

b) Vehicle Information for Lessee, Licensee and end users etc.:

Lessee, Licensee being a crucial player of entire mining operation shall also have provision to access the system pertaining to their respective jurisdiction. Lessee & Licensee & other associated end user are involved in transportation of minerals from source to destination.

The lessee & licensee & other associated end user shall have specific provisions in the system based on their roles & involvement in the system operation.

The lessee, licensee and other end user shall have the provision to access (only for the trip associated with users) the below function/ information but not limited to:

i. Details of on trip, running and idle vehicles
ii. Details of vehicles with faulty VLT / GPS
iii. Detailed Route map
iv. Live and route replay of vehicles for the assigned trips
v. Details of vehicle breakdown / incident reported for the vehicle
vi. System generated alerts and notifications
vii. Real-time Dashboard and MIS Reports applicable to users

I. Analytics

Existing Khanij Online has enabled online transactions like e-Transit Pass, e-Permit and Online payment of royalty etc. Since its launch, more than 3 million transactions are recorded which are expected to grow multi fold with Khanij Online 2.0. Since there is so much data out there, BI can help DGM to use existing data to decipher trends and patterns in the past and present to make better decisions for current operations. Thus, DGM wants to use this volume to data to monitor and improve its performance leveraging data analytics and business intelligence. DGM/CHiPS is planning to implement business analytics system for, storing, analyzing, and providing access to data to help users make better & informed business decisions. These analytics shall quantify performance. In this regard, each stakeholder shall have one's own dashboard to monitor their respective performance parameters as specified by DGM. In addition to that, DGM shall use this analytics platform for generating ad-hoc reports giving it deep insight about various business aspects.

Business analytics shall help DGM to develop more effective courses of action with the ability to identify patterns and anticipate what will occur and determine the best way to achieve or prevent the predicted outcome.

Following are the key requirements from the Business Analytics system:

i. BI system should have integration and deployment capabilities for web, applications, dashboards, business intelligence, workflow, event management, KPIs, monitoring and resource optimization
ii. It should take inputs from various sources to enable interactive reports for proactive monitoring & analytical prediction
iii. Generate management dashboards for different management levels
iv. Solution should have the capability of providing on-line information to facilitate tactical and operational decision-making
v. The system shall enable DGM with data visualization with line graphs, chart, column, trends, combo, tree-map and scatter etc.
vi. The system can be integrated with various data sources like database, Excel, CSV, JSON, XML, Web and SQL Analysis Services etc.
vii. System shall enable the users to access such reports on mobile also.

Following is the indicative list of matrices that need to be generated. This is an indicative list of interactive and drill down reports and it's not limited to given metrices and reports only.

- Mines wise production
- Grade wise mineral production
- Revenue collection
- Online collection
- Challan collection
- Other collections
- Lessee performance
- Licensee performance
- e-Permit
- e-Transit pass
- Route wise number of vehicle deviations
- Check post performance

J. Cloud Infrastructure

Key Technical and functional Requirements for the proposed Cloud Infrastructure is as follows:

i. The bidders need to submit the BOM for all cloud services they are provisioning in their technical proposal to cover the scope of work of this RFP.
ii. SI shall be responsible for hosting the existing Khanij Online and Khanij Online 2.0 on MeitY empaneled Cloud Service Providers (CSPs) only, which are empaneled as on the last date of bid submission.
iii. Cloud Service Providers shall be STQC Audit Compliant
iv. Cloud Service Providers shall be ISO 27001, ISO 20000 and ISO/IEC 27017:2015 certified
v. In no case, SI shall host the application on Cloud of any company which is not empaneled with MeitY and has a history of data loss and security breaches.
vi. During the Contract period, if the chosen CSP is no longer empaneled with MeitY, SI shall choose another MeitY empaneled CSP and switch the Cloud services at no additional cost to DGM / CHiPS.
vii. SI will be responsible for installation of all the software required for the successful hosting of the application. The Cloud, where the application will be hosted shall comply with the SLA requirements as provided in RFP Volume - I, shall have following capabilities:

a) **Scalability:** The configuration of the Cloud is expected to have adequate upgrade capability in terms of processors, RAM, disk storage etc. which shall be achievable with minimum disruptions to running system/ processes at no additional cost to the DGM. Also, for any software upgrades, updates, patches etc. released by the OEM, the Cloud shall be capable to implement the same seamlessly as and when required with no additional cost to DGM / CHiPS.

b) **Reliability:** The Cloud shall be reliable to comply with the SLA requirements provided in RFP Volume - I and there shall not be any outages. The Application servers shall always run in High Availability (Active-Active on load sharing basis) mode at the Primary site so that in case of any outage system shall automatically switch to the available servers.

c) **Security:** The Cloud shall have highest level of security features against both physical as well as cyber threats. It is critical to have a set of IT security management processes and tools to ensure complete cyber security of existing Khanij Online and Khanij Online 2.0 application. An IT security policy, framework and operational guidelines as per ISO 27001, SOC 2(Type-1, Type-2), ISO/IEC 27017:2015 and ISO 20000 be maintained by the SI and Cloud service provider (CSP) as an overall guideline to all forms of IT security – Physical, application, data, network and cloud.

d) **Backup:** Appropriate archiving system (i.e. SAN, optical backup equipment or better alternative etc.) to be available on Cloud. In the event of serious failure, backed up data must be restored in quickest possible time to ensure continuity of the services.

viii. The SI shall formulate an effective Back-up Strategy and Disaster Recovery Plan and take sign-off from DGM. SI shall be responsible for the implementation of approved Back-up and Disaster Recovery plan.

ix. To meet the SLA requirement for scope of work mentioned in the RFP, SI will be required to deploy additional infrastructure than what is being proposed without any additional cost to DGM.

x. The specification of the servers shall be designed to ensure high availability of servers. All the major servers shall be configured in such a way that there is no single point of failure. In case there is any requirement of application specific server at any point of time, the SI shall be required to provide the same also without any additional cost to DGM.

xi. SI shall provide sufficient capacity in terms of data processing, data storage and network bandwidth to handle the overall load and traffic coming to existing Khanij Online and Khanij Online 2.0 application without compromising the overall performance of the system.

xii. Appropriate redundancies shall be built in the Cloud as per standard industry practices. The cost of Cloud shall also include cost of Disaster Recovery (DR) site as well.

xiii. The SI shall also ensure that the cloud services shall be portable to another CSP (lift and shift) without any changes to hosting environment and additional cost to DGM. DGM retains the right to retrieve full copies of DGM Data residing and all other information at any time during the project period. DGM retains the right to change cloud service provider anytime during project period.

xiv. The Cloud service shall be provisioned with dedicated IP, dedicated TLS certificate.

xv. Minimum Requirements from Hosting Services, as follow:

a) Virtual Machines:

- The underlying processors shall be the latest by the processor OEM at the time of bidding.
- Self-service provisioning of multiple VMs concurrently either through a programmatic interface (i.e. API/CLI) or through a management console or Web Portal.
- VMs shall be customizable, i.e., ability to modify configuration settings for vCPUs and RAM
- Ability to automatically increase/scale the number of Instances/VMs during demand spikes to maintain performance (i.e. ‘scale-out’)

- Cloud service architecture shall be in such a way so as to avoid VM outages or downtime when the provider is performing any kind of hardware or service maintenance at the host level

b) Network Services:

i. DNS as Service: Highly available and scalable Cloud Domain Name System (DNS) web service with features like DNS Failover, DDOS Mitigation, Geo DNS, Latency Based Routing, Weighted Round Robin (WRR) functionality Private DNS for Cloud-based servers, access to management console. The service shall support internal domain names for intranet portals.

ii. IPSec VPN Connections: The remote access VPN solution shall enable users to access the application from outside the organization's network securely and seamlessly without requiring a dedicated client to be installed on the remote computer. The clientless web access (SSL VPN) solution must be able to:

- Provide support for multiple desktop and mobile platforms including Windows, \and Linux, mobile OS (Android and iOS) environments.
- Easily integrate with existing authentication services: LDAP, Active Directory for user authentication and authorization.
- Provide built-in support for two-factor authentication methods (such as SMS/email-based token etc.)
- Provide easy web-based management, role-based administration, detailed audit and logs for incident isolation and troubleshooting, and extensive filters and statistics per day, week and month.

c) Cloud Management, Monitoring and Compliance Services:

i. **Cloud Resource Monitoring:** System shall have the capability to monitor Cloud environment centrally, custom monitoring metrics, monitor and store logs, view graphs and statistics, set alarms, monitor and react to resource changes. Support monitoring of custom metrics generated by your applications and services and any log files your applications generate. Gain system-wide visibility into resource utilization, application performance, and operational health, using these insights to react intelligently and keep applications running smoothly.

ii. **Personal Health Dashboard:** System shall provide alerts and remediation guidance when CSP is experiencing events that may impact the customer. Personalized view into the performance and availability of the Cloud services underlying your Cloud resources.

iii. **Audit Trail:** Logs of all user activity within a CSP account including actions taken through the CSP's Management Console, CSP's Software Development Kits (SDKs), command line tools, and other CSP services. The recorded information includes the identity of the API caller, the time of the API call, the source IP address of the API caller, the request parameters, and the response elements returned by the Cloud service.

iv. **Governance and Compliance:** System shall have the capability to discover all of Cloud resources and view the configuration of each. It shall continuously monitor and record Cloud resource configurations and allows to automate the evaluation of recorded

configurations against desired configurations. Users shall receive notifications each time a configuration changes, as well as dig into the configuration history to perform incident analysis. System shall have the capability to obtain details of what a resource's configuration looked like at any point in the past. Also, system shall notify each configuration change so that users can process these notifications programmatically. SI shall also provide the real-time dashboard to DGM for monitoring Cloud utilization and other Cloud reports.

v. **Cloud Advisor:** System shall analyse the Cloud environment and provides best practice recommendations (or checks) in five categories: cost optimization, security, fault tolerance, performance, and service limits.

- SI and CSP shall ensure that the DGM Data is not tempered by any means.
- Commercial or any sort of use of DGM Data shall not be permissible except DGM and their authorized representative
- All the conditions stipulated in RFP & their related documents and agreement shall be followed by SI and CSP

4.11 Integrated Command Control Centre

A. Overall Scope of Work

i. It is proposed to have an Integrated Command Control Centre for effective monitoring of the mining operation & movement across the state.

ii. The selected SI shall be responsible for design, procurement & establishment of the control room with necessary facilities & infrastructure

iii. It is also proposed to have an entire office setup for the mining administration with facilities to accommodate all staff pertaining to the development of Khanij Online 2.0, helpdesk team, Core Team and the project management Team etc.

iv. The necessary civil infrastructure work like building plan, construction work, painting & renovation will be taken care by DGM.

v. Necessary interior work like celling, flooring, office room partitioning, for all office building sections except the Control room will be carried out by DGM

vi. The SI will have to plan for the establishment of the control room with all required Civil work, Interior, electrical, mechanical, Furniture (Table, Chair, Cupboard, white board etc.), Uninterrupted Power provisioning, IT Infrastructure components including monitoring, Network & Security components (Details of the components to be supplied as per the Bill of Quantity) and any other required accessories / equipment. Entire site will be maintained by the SI throughout the contract period.

vii. SI shall deploy the adequate number of items as per the proper functioning of ICCC site. This entire set-up shall part of the central control room established by the SI at DGM's premises. Only space and electricity charges shall be provided by the DGM. SI shall consider following for the site setup:

viii. The SI shall ensure functioning of all deployed components smoothly & collaboratively to run 24*7 basis. ICCC would serve as the focal point to serve as a decision support engine for administrators in day to day operations as well as during exigency situations.

ix. The necessary interior work for the control room will be the responsibility of the selected SI.

x. Office furniture for all sections in ICCC like Project Head room, Training room, SI Team room, conference room, core team room, control room with helpdesk shall be provided by the selected SI based on the requirement & specifications depicted below.

xi. End to end maintenance of the entire site pertaining to office security, facility management, housekeeping services will be under the responsibility of selected SI.

xii. Below sections clearly elaborate the scope of work for the selected SI pertaining to interior design, furniture set up, supply, installation & commissioning of IT & Non-IT components required for smooth operation of the ICCC.

B. ICCC Requirement- IT Components

- To process this data and sending the control command to the District, the process infrastructure machinery, a strong data processing and analyzing system, will be required along with human interface to intervene the process as and when required or of necessity from human angle of management.
- To work out a suitable centralized infrastructure for communication from these sensors, Hardware and software for data processing and storage, Hardware and software for data analysis and storage, secondary storage of data, integration of all the relevant data used in various interconnecting and inter-dependable processes, Hardware and software for monitoring the information and decision communication, it is felt necessary to have city's centralized Integrated Data Centre and Command & Control Room which can be used for all the citizen centric services/processes including their safety, protection and policing.
- The broad functional & technical requirements have been identified and have been provided in the below sections.

i. General Requirement-ICCC

a) There will be entirely a new office set up at the identified location by DGM/CHiPS for the establishment of Integrated Command & Control Centre comprising of Control room and other office sections.
b) The detailed segregation of office setup and requirement has been elaborated in the General Requirement for Non-IT sections.
c) All IT components will be collaborated in the control room to work comprehensively.
   - **Centralized Monitoring:** Centralized monitoring will be done at the control room; a Video Wall shall be installed in the control room for effective monitoring. The video wall will be a collection of multiple screens showing site videos and GIS monitors having alerts and facilities displayed at specific time intervals. The wall will be connected through Application / VTS Software It should be of professional grade (rear projection cubes), suitable for 24 X 7 X 365 operation and not the temporary arrangement of various screens joined through software systems.
   - **Control Platform:** The ICCC software should allow the users to view live or recorded video from resizable and movable windows (matrix) and perform video controls for video systems from workstations. Shall allow taking still image from live or recoded video, play, fast-forwarding, rewinding, pausing, exporting (for a specified time) and specifying time to play recorded video. The ICCC software shall have the capability to view video in matrix and multiple video formats. The ICCC software should further

enable operator to specify video windows to be displayed in matrix and have matrix settings to be saved per user. The software shall enable video snapshot to be taken and saved from any window pane in the matrix view. The software should allow alarms to be generated from any video pane and shall user to only view and control video for which they have been assigned permissions by the administrator. ICCC will be the nodal point of availability of all online data and information related to various current and future elements/applications and will be connected to other departmental network of services.

- **ICCC / Helpdesk Agent Equipment:** The System Integrator is responsible for providing all infrastructure elements for providing Helpdesk.
- **Desktops:** SI shall provide laptops / desktops, Telephone lines for Inbound and Outbound calls, Telephone number and communications equipment's (Telephone / Head phone) etc. for the helpdesk agents
- **Call logger and Reporting system:** The system should store all conversations between call Centre and caller along with the call logs. The voice calls should be stored with proper sequencing and nomenclature so that in future voice calls can be retrieved. The voice calls should be stored for a period of 6 months, after which the voice calls should be archived by the system and only the details of call shall be maintained.
- **Automatic Call Distributor (ACD):** ACD system shall be robust and have the following functionality:
  - Perform call distribution and routing to the agent on longest idle time basis
  - Skill Based Routing and other intelligent routing method
  - Queuing or holding the call for an agent if none is immediately available
  - Multilevel IVR capability
  - Keeping callers informed as to the status of the call and providing information to callers while they wait in queue
- **Computer Telephone Integration (CTI)**
  - The CTI functionality shall support relevant screen pop-ups on the agents' screen based on CLI (Caller Line Identity), ANI (Automatic number identification), DNIS (Dialed number identification sequence).
  - The CTI shall be suitably integrated with the CRM and other applications used by the successful SI to send/receive data which needs to be populated on agent screen.
- **Helpdesk Management (HM)**

  System Integrator shall integrate the Helpdesk Management with Khanij Online 2.0 and Incident management system. System should display the relevant information like customer details, previous incident / query raised and resolution status, call recordings based on caller number or registration number or any other identification details.
- **Reporting Capabilities:**
  - Queue analysis reports such as total number of calls, total talk time, average call time, Average speed of answer, abandoned call rate, average delay before abandon, average hold time, Call Chronology
  - Agent reports such as Login, Logout time, Idle time, Average speed of answer, average handling time, Number of Dropped Calls
- **District Control Rooms:** All districts will have District Control Rooms in the respective District Mining offices with limited functionality available for district

supervision and coordination with district patrolling vehicles. SI shall be responsible for setting up DCR with a screen for monitoring and navigation. However, DGM shall provide space, furniture, power backup, internet connectivity etc. at District control room.

- **Standard Operating Procedures (SOPs):** SI to ensure adoption of Standard Operating Procedures (SOPs) with the proposed solution. All SOPs should be maintained in knowledge repository and need to be updated by system integrator as per changing scenario or amendment in processes from time to time. The Standard operating procedures include the installation & commissioning standards, operational standards & guidelines, security standards and details of all components associated.
- **Multiple Application Integrations at ICCC platform**: Integrated Command Control Centre (ICCC) consist software platform that can integrate either existing or future departmental applications and push, pull pertinent data from these systems and provide it on ICCC's dashboard for analysis, correlations and drawing actionable intelligence.
- **Customizable Centralized information Dashboard at ICCC:** Integrated Command Control Centre (ICCC) consist software platform to provide user specific, personized centralized information dashboard for their respective needs and show various performance indicators on an easy to navigate configurable & customizable GUI. The dashboard can show, push and pull key parameters and pertinent information on demand from all the other integrated IT applications, field devices and other applications.
- **Standard Operating Procedure (SOP) Management using ICCC:** ICCC software provides ability to write, configurable and customizable standard operating procedures through graphical, easy to use tooling interface. Standard Operating Procedures shall be defined by SI in consultation with DGM to finalize approved sets of actions considered to be the best practices for responding to a situation or carrying out an operation. The users will be able to edit SOP's including add, edit, delete activities and will be able to add comments or stop SOP prior completing.
- **Collaboration and communication using ICCC:** The ICCC provides various tools for users to communicate & collaborate in real time. The ICCC provides ability to converse virtually through the exchange of text, audio, and/or video-based information in real time with one or more individuals within the emergency management community. The ICCC provides single web-based dashboard to send notifications to target audiences using multiple communication methods including voice-based notification on PSTN/Cellular, SMS & email.

ii. Functional & Technical Requirement

Below section depicts the detailed functional requirement & technical Specifications of the deployed components in the control room, other sections and district offices.

- The Khanij Online solution along with all its sub components will be able to generate data on its own.
- The ICCC should be able to define its own data model for the visualization.
- The solution should be implemented and compliant to Industry open standard applications that is customizable.
- The solution shall also provide an integrated user interface for all the solution elements implemented.

- The solution should provide operators and managers with a management dashboard that provides a real time status and is automatically updated when certain actions, incidents and resources have been assigned, pending, acknowledged, dispatched, implemented, and completed with clear identification code in compliance with Khanij Online Application.

C. Bill of Quantity of the IT Infrastructure Components

SN	Component	UoM	Quantity
1	ICCC Software/Platform and Integration with proposed Khanij Online 2.0 Application (with required Hardware if any)	Set	1
2	Video Wall Cubes, Full HD (1920 × 1080) Minimum 55” cube	Nos.	6(3*2)
3	Video Controller/ Management System (Wall Management Software & other Accessories)	Set	1
4	Network Router in HA	Set	2
5	Layer 3 Switch in HA	Set	2
6	Layer 2 Switch 48 Port	Nos.	4
7	Internet Firewall	Nos	2
8	End Point Protection	Nos.	40
9	Call Control System (IP PBX)	Set	1
10	Contact Centre	Set	1
11	IP Phone	Nos.	15
12	UTP Components for LAN Connection	Lot	1
13	Wi-Fi AP’s	Nos.	6
14	Wi -Fi Controller	Nos.	1
15	Online UPS 10 KVA in HA with battery bank for 1-hour backup	Nos.	2
16	Desktop Workstation	Nos.	6
17	Additional LED Screens for desktops with accessories	Nos.	10
18	Technical Helpdesk equipment (Headphone, Microphone etc.)	Set	6

SN	Component	UoM	Quantity
19	Laptop	Nos.	1
20	Multi-Function Printer (Colour with Scanner)	Nos.	2
21	Network Printer	Nos.	1
22	65" or Higher UHD Touch Screen TV for Conference Room	Nos.	1
23	55" or Higher UHD Touch Screen for Project Head Room	Nos.	1
24	Link Load Balancer	Nos.	1
25	Helpdesk Tools / Accessories (Telephone lines, PRI Lines, IVR, ACD, CRM, CTI, Ticket logger etc.)	Set	1 Lot
26	Screen for District Monitoring 32" HD LED with Accessories (keyboard and mouse etc.)	Nos.	28
27	Access Controls and Bio-Metric	Nos.	3
	Any other Hardware or Software required to meet the RFP requirement for the establishment of ICCC as per RFP	Lot	1 Lot

A. Functional Requirement - ICCC Platform

Bidder should submit compliance sheet along with technical proposal

SN	Detailed functionalities	Compliance Yes/No	Pg. No. of Tech. specs attached
1.	**General Requirement**		
1.1	**Deployment** - The proposed ICCC Platform should have been deployed in India successfully (SI/OEM should provide either copies of PO or provide undertaking stating that ICCC platform has been successfully installed in any previous projects)		
1.2	**Data integration platform**		
	- GIS capabilities of the ICCC Platform and Ability to plot various field devices on GIS maps with different layers. - Ability to have multiple GIS system in a single ICCC platform - Ability to plot various field devices on GIS maps with different layers - Demonstration of IoT and Non IoT used cases with video integrated Dashboard (Single dashboard with	-	-

SN	Detailed functionalities	Compliance Yes/No	Pg. No. of Tech. specs attached
	all data sources in one dashboard) – Either demo created or show any existing instances with all used cases together. - Demonstration of GUI of SOP Module, Ability to create, modify and invoke SOPs both Automatic invocation of SOPs and Operator initiated SOPs - Demonstration of Alerts, Notifications on ICCC Platform generated by Sub Systems - Demonstration of Alerts, Notifications on ICCC Platform generated by multiple different used cases i.e. facial recognition/ object detection, alert. - Capability of Integration of ICCC Platform to various government applications i.e. e-gov, emergency services such as law enforcement (such as Dial 100/ Dial 112 etc.) - ICCC Platform Integration Engine – Studio based integration interface and GUI to create and build integrations on the fly. (Demonstration of studio-based application interface) - Demonstration of the Functioning of the ICCC Platform, Video Surveillance and Video Analytics. - ICCC Platform's urban analytics platform – demo on pre-integrated analytics models (Any 5 Models) eg. Transport, Environment, etc. - The ICCC platform should have inbuilt Analytic capabilities and should provide the proof for the same		
1.3	**Distributed Architecture**		
	- The platform should support distributed deployment of functions (workflows & policies) across infrastructure with centralized management and control	-	-
1.4	**General Mandatory Requirement**		
	- Proposed Solution architecture should have combination of data normalization IOT Software and operation center software with below capabilities; OEM should be operational in India and application to be hosted in MietY empaneled Cloud Service Provider.	-	-
1.5	**Data Normalization capabilities**		
	- It is envisaged to implement multiple used cases over a period. It is envisaged that vehicle movement, Geofencing, Integration with Mining Tenement System and many other related used cases will be integrated into common integrated command and control application, and software will be capable to generate analytical reports from all integrated data/systems.	-	-

SN	Detailed functionalities	Compliance Yes/No	Pg. No. of Tech. specs attached
	- The platform shall also allow the manufacturers of the sensors to develop integrations themselves using APIs/SDKs without affecting the northbound applications and existing integration. - The platform shall be able to normalize the data coming from different devices of same type (i.e. different VTS devices, handheld devices from different OEMs etc.) and provide secure access to that data using data API(s) to application developers. - The platform shall support distributed deployment of functions (workflows & policies) across network and compute infrastructure with centralized management and control.		
1.6	**GIS Map Support**		
	- System shall support Esri, map box, Open street and free available GIS as well etc.	-	-
1.7	**Platform Visualization**		
	- Platform must provide multiple options to visualize geo-spatial, operational and metrics data - Platform must provide various visual widgets like Maps, Graphs, KPI, Tables, Scorecards, etc. - Platform must provide end-users an ability to create dashboards and configure various widgets - Platform must provide end-users an ability to share the dashboards with other users of the system - Platform must provide an ability to create KPI's, Graphs and Maps from different sources of the data - Platform must provide an ability to prepare the data for visual analysis - Platform must provide an ability to slice and dice based on regions, time and other criteria for detailed visual analysis - Platform must provide ability to configure various geo-spatial data from different providers including but not limited to GIS systems	-	-
1.8	**Location engine**		
	- Map services and geospatial coordinates: provides the geographical coordinates of specific geo fenced location, roads, and city infrastructure, as well as unmapped facilities.	-	-
1.9	**Device engine**		
	- Aggregation and abstraction of sensors: provides aggregation of sensors from diverse sensor cloud. - Normalization of sensor data: organizes sensor data and assigns attributes based on relations; raw data removed and passed to data engine.	-	-

SN	Detailed functionalities	Compliance Yes/No	Pg. No. of Tech. specs attached
1.10	**Data and Analytics engine**		
	- Data archive and logging: stores data feeds from the device engine and external data sources. - Analytics: provides time-shifted or offline analytics on the archived data. - Reporting: delivers reports based on events triggered by device engine data and external notifications.	-	-
1.11	**Authentication, Authorization**		
	- System shall support standard Authentication, Authorization Performs.	-	-
1.12	**API Repository / API Guide**		
	- Normalized APIs shall be available for the listed domains (VTS device, Environment, Handheld device etc.) to monitor, control sensor and/or actuators functionality to enable app developers to develop apps on the platform. For example: Environment APIs: Vendor agnostic APIs to control Environment functionality. - Platform OEM shall have published the normalized APIs in their website for the listed domains ((Parking, Traffic, Environment, Urban mobility etc.) to allow sensor vendors and app developers to develop their connectors / adaptors to the platform. - Cross collaboration APIs: Enabling contextual information and correlation across domains and verticals (Multiple vendor and Multi-sensor in future).	-	-
1.13	**Platform upgrade and maintenance**		
	- The OEM shall be able to securely access the platform remotely for platform updates / upgrades and maintenance for the given duration. - Platform shall be able to be deployed on a cloud for disaster recovery.	-	-
1.14	**Platform Functionality**		
	- API management and gateway: Provides secure API lifecycle, monitoring mechanism for available APIs. - User and subscription management: Provides different tier of user categorization, authentication, authorization, and services based on the subscriptions. - Application management: Provides role-based access view to applications. - The platform shall also be able to bring in other e-governance data as frames in the command and control centre dashboard. - All these data shall be rendered / visualized on the command and control centre dashboard.	-	-
1.15	**Integration capabilities**		

SN	Detailed functionalities	Compliance Yes/No	Pg. No. of Tech. specs attached
	- This platform is expected to integrate with Mining Tenement System layers so that applications can be developed on top of this platform independent of the technology that is used.	-	-
	- Integrate devices using their APIs into this platform. For example, DGM wishes to capture environment sensor data, this platform shall have the ability and provision to write adapters which interface with the environment sensors or management software of the environment sensors to collect data and alerts and notifications from the devices and their software managers. - The same logic and requirement apply to various other sensors, device embedded in connected vehicles etc. - Enables to define a standard data model for each of the services domains - Enables to write software adaptors based on the API(s) provided by device vendors and have the ability to control, monitor and collect the data from these IOT devices. - Provides API(s) to develop Operations applications for each of the domains. For example, environment sensor shall be able to develop management application based on the API(s) provided by the platform. This application shall also have the ability to access data from other domains like cameras/RFIDs based on the access control configured in the system. - Platform must be modular and should provide an ability to host various integration adapters - Platform should integrate with IT, OT, IoT, Video Analytics, VMS devices and applications - Platform must provide an ability for IOT devices to upload the data in Real-time into the platform - Platform must be providing a web-based studio to develop, test and host adapters connecting various sources data like sensors, applications, open-data, e-gov applications to the ICCC platform - Adapter enablement must be based on drag & drag and shouldn't involve any coding - Adapter deployment must be hot-deploying and shouldn't be any reconfiguration and down time required - Adapter studio must have capability to consume data from multiple sources with different communications such as web services, Web Sockets, FTP, Fileserver, MQTT, real-time streams - Adapter studio must support various formats like JSON, XML, CSV, TSV	-	-

SN	Detailed functionalities	Compliance Yes/No	Pg. No. of Tech. specs attached
	- Adapter studio must support various data formats such as JSON, XML, CSV, TSV - Adapter studio should have various standard authentication mechanisms and support vendor specific security authentication mechanisms - Adapter studio must be able to impute, cleanse and transform data at attribute level - Adapter studio must support development of an adapter that is capable of aggregating data from multiple sources - Integration Platform must push and pull data from various sources. The push and pull frequency should be configurable - Integration Platform must cache the data for faster performance - Platform must have facility to export and import adapters - Platform must be able to push or pull requests or consume data in real time - Platform must be able to support multiple data types viz. hex, int, string, char, float - Platform must be able to do language translations		
1.16	**Policies and Events**		
	- System shall allow policy creation to set of rules that control the behavior of infrastructure items. Each policy shall a set of conditions that activate the behavior it provides. - System shall allow Default, Time-based, Event-based and Manual override polices creation. For example, an operator might enforce a "temporary deviation" policy manually to facilitate road repairs. - System shall provision to defines a set of conditions that can be used to trigger an event-based policy	-	-
1.17	**Notifications, Alerts and Alarms**		
	- System shall generate Notification, Alert and Alarm messages that shall be visible within the Dashboard/GIS Platform and the Enforcement Officer Mobile App if required. - All system messages (notifications, alerts and alarms) shall always visible from the Notifications view, which provides controls that operator can use to sort and filter the messages that it displays. - Systems shall deliver message to a set of subscribers. The Notification service shall support min two types of notification methods – Email notification and Short Messaging Service (SMS) notification.	-	-
1.18	**Users and roles**		

SN	Detailed functionalities	Compliance Yes/No	Pg. No. of Tech. specs attached
	- Users access the perform various tasks, such as adding new locations, configuring new devices, managing adapters, and so on. However, not all users can perform all tasks. Each user shall be associated with one or more roles and each role is assigned a certain set of permissions. - These roles and permissions define the tasks that a user can perform. Additionally, system shall assign one or more locations to each role so that the user can perform tasks at the assigned locations only. - Roles and permissions define the tasks that a user can perform, such as adding users, viewing location details, exporting devices, generating reports, and so on. Each user shall be associated with one or more roles and each role has an assigned set of permissions. - The platform shall allow different roles to be created and assign those roles to different access control policies. - System shall support LDAP to be used as an additional data store for user management and authentication.	-	-
1.19	**Data Security**		
	- The access to data shall be highly secure and efficient. - Access to the platform API(s) shall be secured using API keys. - Software shall support security standards: OAuth 2.0, HTTPS over SSL or equivalent security standards help protect the data across all domains.	-	-
1.20	**Global Market Presence & Support System**		
	- Suppliers shall develop offerings that meet the growing interest in Internet of Things (IoT) applications, big data solutions, and the transformation approaches.	-	-
1.21	**Events & Standard Operating Procedures**		
	- Command & Control Centre shall provide for authoring and invoking un-limited number of configurable and customizable standard operating procedures through graphical, easy to use tooling interface. - Standard Operating Procedures shall be established, approved sets of actions considered to be the best practices for responding to a situation or carrying out an Operations. - The users shall be able to edit the SOP, including adding, editing, or deleting the activities.	-	-

SN	Detailed functionalities	Compliance Yes/No	Pg. No. of Tech. specs attached
	- The users shall be able to also add comments to or stop the SOP (prior to completion). - There shall be provision for automatically logging the actions, changes, and commentary for the SOP and its activities, so that an electronic record is available for after-action review. - Platform must be able to create SOP workflows - Workflow must support both automated and manual activities (tasks) and each of the activity should be configurable - The SOP Tool shall have capability to define the following activity types: - Manual Activity - An activity that is done manually by the owner and provide details in the description field. - If-Then-Else Activity - A conditional activity that allows branching based on specific criteria. Either enter or select values for Then and Else. - Notification Activity - An activity that displays a notification window that contains an email template for the activity owner to complete, and then sends an email notification. - SOP Activity - An activity that launches another standard operating procedure. - Platform should support simple and complex event processing in real time - Platform must have a studio to create event processing templates - Platform must be able to raise events based on thresholds - Platform must be able to raise events based on conditions happening in a time window - Platform must raise events (Complex Event Processing) based on one or more events - Platform must map SOP workflows with event - Platform should provide an ability to request an approval before SOP workflow is executed - Platform should provide an ability to create and manage distribution lists for emails, SMS.		
1.22	**Analytics**		
	- Analytics Engine shall be an artificial intelligence-based analytics platform module to maximize business value through advanced machine learning capabilities. The machine learning capabilities aid in automating policies that result in better asset and infrastructure management. - The solution shall be flexible to integrate with other department/government software applications.	-	-

SN	Detailed functionalities	Compliance Yes/No	Pg. No. of Tech. specs attached
	- Analytics Engine module shall have below intelligence capabilities; ✓ Advanced Predictive Analytics shall be part of the solution. ✓ The solution shall be deep learning based ✓ The solution should support supervised, semi-supervised or unsupervised learning ✓ The solution shall be able to predict insights consuming data from different domains ✓ The solution shall have predictions with confidence level of at least > 90% ✓ The solution shall be able to predict and integrate with other solutions helping in driving operational policies creation. ✓ The solution shall be robust, secure and scalable. ✓ The solution shall have a visualization platform to view historic analytics - The application shall enable the customers to discover, compare, and correlate data across heterogeneous data sources to unravel the patterns that are previously hidden. At a broader level, when you work with the application, system do the following tasks: ✓ Connect to a variety of data sources ✓ Analyze the result set ✓ Visualize the results ✓ Predict outcomes - Analytics Engine shall support multiple Data Sources. Min below standard data sources shall be supported – CSV, TSV, MS Excel , NOSQL, RDBMS - Analytics Engine shall provide analysis of data from a selected data source(s). - Analysis enables to define arithmetic and aggregation Operations that result in the desired output. - Analytics engine shall provide capability to check analysis with multiple predictive algorithms. - The Platform must be able to do change-over-time predictive geo spatial analytics - The Platform must be able to do predictive analysis of elevation data with outcomes during disasters - The platform must be able to provide actionable insights - The platform must provide pre-built outcome models for rapid deployment with minimal changes		

SN	Detailed functionalities	Compliance Yes/No	Pg. No. of Tech. specs attached
	- The platform must have capability to do textual, geo spatial analytics - The platform must be able to predict data anomalies in sensor data - The platform must be able to impute values and make predictions - The platform must be able to provide site suitability analytics - The platform must be able to make predictions with IT, IoT and OT data - The platform must be able to consume data from across domains and provide a single insightful outcome - Platform must be able to provide suitability analysis - The platform shall have capability to provide access to real time data and historical data from various connected devices for reporting. - The platform must provide a NLU based user interface for reporting - System shall allow dashboard to generate reports and have provision to add reports in favorites list. - Platform must have the capability to create self-service reports with drag and drop functionality - Reports Engine shall provide visualizations dashboard. - In the visualization workspace it shall allow to change visual attributes of a graph. - User shall not be allowed to alter the graph/visualization definition. - In the visualizations workspace, user shall able to do the following Operations: ✓ Change the graph/visualization type ✓ Print the graph ✓ Export the graph ✓ Drill down on the value ranges ✓ Toggle and change the axis labels ✓ Integrate with other 3rd party applications seamlessly - Reports Engine shall support multiple Data Sources. Min below standard data sources shall be supported – CSV, TSV, MS Excel , NOSQL, RDBMS - System shall allow export the report into min following formats: a) XML/JSON b) Excel c) PDF d) CSV		

SN	Detailed functionalities	Compliance Yes/No	Pg. No. of Tech. specs attached
1.23	**Video Display and integration capabilities**		
	- Integrates with existing cameras and new cameras. Shall support multiple video sources from multiple locations. Platform shall have no limitation in displaying the number of CCTV video sources. - Integrate and assess inputs from different sources such as CCTV, Video Analytics, and sensors further to assist with actionable intelligence.	-	-
1.24	- **Technical support center**		
	- ICCC Software OEM shall have 24x7x365 technical assistance support center (TASC) in India. - TASC shall provide online website and phone number to register service request, service request can be raised by SI and customer.	-	-
1.25	**ICCC Operations**		
	- The solution shall be implemented and compliant to industry open standard commercial-off-the-shelf (COTS) applications that are customizable. - The solution shall integrate with GIS and map information and be able to dynamically update information on the GIS maps to show status of resources. - The solution shall also provide an integrated user interface for all the smart elements implemented. - The solution shall provide operators and managers with a management dashboard that provides a real time status and is automatically updated when certain actions, incidents and resources have been assigned, pending, acknowledged, dispatched, implemented, and completed. The above attributes shall be colour coded. - The solution shall provide the “day to day Operations”, “Common Operating Picture” and situational awareness to the centre and participating agencies during these modes of Operations. - It shall improve scalability for large and geographically distributed environments. - It shall provide complete view of sensors, facilities, e-governance/ERP, video streams and alarms in an easy-to-use and intuitive GIS-enabled graphical interface with a powerful workflow and business logic engine. - It shall provide a uniform, coherent, user-friendly and standardized interface. - It shall provide possibility to connect to workstations and accessible via web browser. - The dashboard content and layout shall be configurable and information displayed on these	-	-

SN	Detailed functionalities	Compliance Yes/No	Pg. No. of Tech. specs attached
	dashboards shall be filtered by the role of the person viewing dashboard. - The solution shall allow creation of hierarchy of incidents and be able to present the same in the form of a tree structure for analysis purposes. - The solution shall be available via a VPN as a web-based interface or a thin-client interface. - It shall be possible to combine the different views onto a single screen or a multi-monitor workstation. - The solution shall maintain a comprehensive and easy to understand audit trail of read and write actions performed on the system. - The solution shall provide ability to extract data in desired formats for publishing and interfacing purposes. - The solution shall provide ability to attach documents and other artifacts to incidents and other entities. - The solution is required to issue, log, track, manage and report on all activities underway during these modes of Operations: ✓ anticipation of incident ✓ incident or crisis ✓ recovery ✓ incident simulation		
1.26	**API & Interface Security**		
	- The access to data shall be highly secure and efficient. - Access to the platform API(s) shall be secured using API keys. - Software shall support security standards: OAuth 2.0, HTTPS over SSL, and key management help protect the data across all domains. - Shall support security features built for many of its components by using HTTPS, TLS for all its public facing API implementations. For deployment where CCC Software API(s) exposed to application eco system, API Management, API security features and API Key management functions are required. - The platform should be based on open API for various data & IOT providers to integrate with platform - The platform should also publish API to consume the data from the smart city platform - The platform should be providing an ability to restrict access to certain API - The platform should provide API documentation for public access - The platform should provide an ability to view access logs, API usage metrics	-	-

SN	Detailed functionalities	Compliance Yes/No	Pg. No. of Tech. specs attached
1.27	**Communication Platform**		
	- The proposed Communication Platform should streamline communications and enhances productivity with integrated presence, Chat, voice and video, desktop sharing, UHF/ VHF Communication and conferencing capabilities. The System must be capable of calling between operator, UHF/ VHF, VoIP and PSTN or mobile network. - The system should have capabilities of achieving collaboration between any users of control room. the system should have capabilities enabling HD Video meetings between ICCC Team and other departments like Transport, Environment, Forest, Fire, Ambulance, Police, Traffic, etc.	-	-
1.28	**ICCC operator communication tool**		
	- Ability to bring multiple stake holders on to a common voice conference call as a standard operating procedure in response to event - Ability to bring in multiple stake holders automatically into a common collaboration platform like chat rooms in response to a SOP defined to handle a particular event - The platform should allow stakeholders to share content relevant to the issue in the Chat Rooms - Ability to bring multiple stake holders on a Common Video Conference Call and share content on the call - Details specification is mentioned below in “unified communication client” section	-	-
1.29	**ICCC Framework**		
	- ICCC software should be suggested as cloud hosted model and OEM should provide operate and subscription along with SLA for the cloud hosted portion - Video Processing engine should be deployed locally and should be integrated with ICCC in cloud hosted model - ICCC software should be pre-hosted already in MietY empaneled CSP and should already be operational in India and already serving some India customers. This will enable faster roll out of services - ICCC Software should also have separate Integration engine for other integration of IT and non IOT as well and should have option to host in cloud or on prem	-	-
1.30	**Developer Program tools**	-	-
	- Sensor platform OEM shall provide online Developer Program tools that help produce new	-	-

SN	Detailed functionalities	Compliance Yes/No	Pg. No. of Tech. specs attached
	applications, and/or use solution APIs to enhance or manage existing solution free of cost.		
1.31	**Data plan Functionalities**	-	-
	- Live data and visual feed from diverse sensors connected to the platform.	-	-
1.32	**Responder Mobile App**	-	-
	- Platform should provide a responder mobile app for the field staff to view real time events, manage their tasks, assign tasks, report incidents and collaborate with back-office and other field officers to address a SOP task - Responder mobile application should only display events and tasks based on pre-configurable access rules based on department and region - Responder mobile application should support escalation hierarchy of the tasks or events are not redressed with-in a defined SLA - Responder mobile application should provide an ability to track field officers - Responder mobile application should provide collaboration with the app for field officers and other staff to coordinate - Responder mobile application should be available on iOS and Android latest versions	-	-

B. Technical Specifications of IT Components

2. Technical Specifications – Video Wall with Controller

SN	Parameters	Features	Compliance (Yes/No)	Pg. No. of Tech. specs attached
2. Video Wall Cubes (Minimum 55" each) with controller (3*2)				
Make Offered				
Model Offered				
2.1	Screen Size	55" or above		
2.2	Panel Technology	IPS		
2.3	Back Light Type	Back Lit LED Direct		
2.4	Aspect Ratio	16:09		
2.5	Native Resolution	1,920 X 1,080 (FHD)		

SN	Parameters	Features	Compliance (Yes/No)	Pg. No. of Tech. specs attached
2. Video Wall Cubes (Minimum 55" each) with controller (3*2)				
2.6	Brightness	700nit or Higher		
2.7	Contrast Ratio (DY/N/S)	100,000:1		
2.8	Uniformity	91% or more		
2.9	Viewing Angle (H x V)	178 X 178		
2.10	Color Depth	1.07Billion (10 bit) or better		
2.11	Response Time	8ms (G to G) or lesser		
2.12	Lifetime (Typ.)	Min 60,000Hrs (Typ.) or high		
2.13	Operation Hours	24Hrs		
2.14	Orientation	Portrait & Landscape		
2.15	Minimum Inputs ports	HDMI -1, DP-1,DVI-D-1,USB-1,RJ45(LAN-1),IR in-1		
2.16	Minimum Output ports	DP -1, RJ45(LAN-1)-1		
2.17	Bezel to Bezel (Gap)	0.88 mm or less (Even Bezel from all side)		
2.19	Operation Humidity	10 % to 80 %		
2.20	Power Supply	100-240V~, 50/60Hz		
2.21	Power Consumption (Typ).	170 Watts or less		
2.22	CERTIFICATION's	Safety-UL, EMC-FCC Class A, Energy Star 7.0, BIS		
2.23	Installation	SITC installation with Push Pull Bracket for Easy Maintenance		

3. Technical Specifications – Video Management System

SN	Parameters	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
3. Video Wall Cubes controller (3*2)				
Make Offered				
Model Offered				
3.1	Controller OEM	The OEM should be local office in India for support. Manufacturer's authorization is mandatory.		
3.2	Display controller	Video wall controller to Drive 12 displays in matrix combination		
3.3	Chassis	19" industrial Rack mount with Max 4U size		
3.4	Operating System Platform	Windows 10 Professional 64 bit OR Server 19		
3.5	Processor options	Min Xeon Octacore		

SN	Parameters	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
3.6	RAM	Std. 32 GB DDR3, higher on request		
3.7	Hard Disk	Std.: 500 GB, can be upgraded on request		
3.8	Networking	Dual-port Gigabit Ethernet Controller inbuilt		
3.9		Supports Add on copper/ optical fibre adapters		
3.10	Output supported	Display Port or HDMI outputs or DVI for min 10 displays		
3.11	Inputs Supported	HDMI/DVI/DP - 4 Nos or through Encoders		
3.12	Decoding format	H.264, MPEG2-TS, MPEG2-Part2		
3.13	RAID	RAID 1 support		
3.14	Power Supply	(1+1) Redundant hot swappable min 700W		
3.15	Switches	Power On/Off and System Reset		
3.16	Monitoring options	CPU, FAN, Temperature		
3.17	Voltage	100-240V @ 50/60 Hz		
3.18	Scalability	Display multiple source windows in any size, anywhere on the wall		
Wall management Software				
3.19	Client & Server based Architecture	Should supports Multi client/Console control the Wall layouts		
3.20	Scaling and display	Software enable user to display, multiple sources up to any size and anywhere on the display wall.		
3.21	Remote Control	Wall can be control from Remote PC through LAN		
3.22	Layout Management	Should support for Video, RGB, DVI,, Internet Explorer, Desktop Application and Remote Desktop Monitoring Layouts		
3.23	Scenarios	Software should able to Save and Load desktop layouts from Local or remote machines		
3.24	Layout Scheduler	All the Layouts can be scheduled as per user convenience		
		Software should support auto launch of Layouts according to specified time event by user		

SN	Parameters	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
3.25	Multi View	Supports multiple view of portions or regions of Desktop, Multiple Application Can view from single desktop simultaneously		
3.26	Short cut Keys	Support		
3.27	Control operator workstations	Software should able to Support		
3.28	Multiple concurrent client users	Software should able to Support		
3.29	Control functions	The system should have the capabilities of interacting (Monitoring & Control) with various applications on different network through the single Operator Workstation. It shall be possible to launch layouts, change layouts in real time using physical hot keys on smart multifunctional operator keyboard with touch Screen.		
3.30	Controller Interface Type	Multifunctional keyboard with an integrated touch LCD screen provides virtually unlimited functionality and an intuitive user interface		
3.31	Interface Main Function	With just a single multifunctional keyboard and mouse, it is possible to access multiple workstations, other sources and/or large screens, all without loss of performance.		
3.32	Display Unit	Integrated, touch-sensitive 10.1” LCD		
3.33	Resolution	1280 x 800 pixels at 60 Hz		
3.34	Colour depth	24 bit (RGB888) or better		
3.35	Contrast ratio	500:01:00		
3.36	Brightness:	320 cd/m2		
3.37	Visible angle	170°(Horizontal& vertical)		
	Keyboard Switches			
3.38	Type	Industrial Grade		
3.39	Contacts	High-quality alloy for rugged operation		
3.40	Action	Pressure point click		
3.41	Pressure force	50 ± 20 cN		
3.42	Lifetime	minimum 20 million actuations		
3.43	Speakers	2 x 8-watt RMS at 8 Ω		

SN	Parameters	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
3.44	Network connections	1 x RJ45 1000 BASE-T Ethernet with PoE+.		
3.45	Audio	2 x 3.5” jack line stereo 48 KHz 16 bit and		
		microphone stereo		

4. Technical Specifications – Network Router

SN	Specification	Compliance (Yes/ No)	Pg. No. of Tech. specs attached
4. Router			
Make Offered			
Model Offered			
4.1	The Router should support modular architecture, multi-core Processor, internal redundant field replaceable power supply (from Day1). The Router Should have capabilities of seamless field upgrade/replacement (without interrupting running processes and services) for all modular interfaces.		
4.2	Router have a physical separation between control and data planes.		
4.3	Router should have 4 x 1G SFP/Base-T (combo or dedicated) port and additional 2*10G SFP+ Port loaded with SR module from day 1.		
4.4	The Router should have at least 3 or more empty slot for interfaces like Channelized E1/T1, Serial V.35, G.703, LTE, Gigabit and 10G Ethernet modules.		
4.5	Router should have minimum 8 GB of on-board/inbuilt DRAM/RAM for data plane + control plane processes and 8 GB Flash from Day 1. Should support expandability up to 16 GB DRAM and 16 GB Flash.		
4.6	IKEv1, L2TP, IKEv2, GRE and IPSEC from day 1. The proposed solution should serve the GRE encryption for traffic from any location to other location on demand (dynamically established) and should able to create GRE tunnel.		
4.7	The router should support 1.6 Gbps of IPSEC Bandwidth		
4.8	Router should support IGMP v1/v2/v3 and PIM multicast routing		
4.9	Router should support static Routes, OSPFv2, OSPFv3, BGP4, MBGP, BFD, Policy based routing, IPv4 and IPv6 tunneling from Day 1		
4.10	The Router should support Zone Based Firewall feature or an external appliance for the same functionality can be provided.		
4.11	Router should Support Traffic Optimization feature built in the router operating system or an external appliance for		

SN	Specification	Compliance (Yes/ No)	Pg. No. of Tech. specs attached
4. Router			
	the same functionality can be provided.		
4.12	Shall have 802.1p class of service and marking, classification, policing and shaping.		
4.13	Router should support AAA using RADIUS, TACACS+, SSHv2, SNMPv2c, SNMPv3 and NTP		
4.14	Should have extensive support for IP SLA and best path selection for metrics like delay, latency, jitter, packet loss to assure business-critical IP applications from Day1.		
4.15	Router should support monitoring of network traffic with application level insight with deep packet visibility into web traffic, RTP-Based VoIP traffic.		
4.16	Router should have traffic load balancing capability on dual WAN Links based on based on advanced criteria, such as reachability, delay, loss, jitter and bandwidth utilization.		
4.17	Router shall conform to UL 60950 or IEC 60950 or CSA 60950 or EN 60950 Standards for Safety requirements of Information Technology Equipment.		
4.18	Router shall conform to EN 55022 Class A/B or CISPR22 Class A/B or CE Class A/B or FCC Class A/B Standards for EMC (Electro Magnetic Compatibility) requirements.		
4.19	Router/Router's Operating System should be tested and certified for EAL 3/NDPP or above under Common Criteria Certification		
4.20	Router should be IPv6 Certified/IPv6 logo ready		

5. Technical Specifications – Network Switch (L3)

SN	Specification	Compliance (Yes/No)	Pg No. of Specs attached
5.	**L3 Switch**		
Make Offered			
Model Offered			
5.1.	- Switch architecture should be Fixed Form factor & should work in redundancy (1+1)		
5.2.	- Support in line hot insertion and removal of different parts like modules/power supplies/fan tray etc.		
5.3.	- Static routing, RIP, PIM, OSPF, VXLAN, VRF, VRRP, PBR, BGP, MP-BGP, MPLS, VXLAN, VRF, QoS, 802.1x, IPv4v6 ACLs and MACsec-256		
5.4.	- Should have support for hot swappable internal redundant power supply and hot swappable redundant FAN		
5.5.	- Switch should have wire-speed, non-blocking and distributed forwarding on all the ports.		

SN	Specification	Compliance (Yes/No)	Pg No. of Specs attached
5.	**L3 Switch**		
5.6.	- Switch should have minimum of 48 x 1/10 SFP28 interface populated with 12 SR optics and 4 x 40 G QSFP populated with required DAC cables		
5.7.	- Switch should have 8 GB ram and 8 GB Flash with 24 MB buffer		
5.8.	- Switch should support min 32K MAC addresses and min 500 active VLANs.		
5.9.	- EAL3 or NDPP certified		
5.10.	- Switch and optics should be from the same OEM		

6. Technical Specifications – L2 Access Switch 48 Port

SN	Specification	Compliance (Yes/No)	Pg. No. of Specs attached
6.	**L2 Access Switch 48 Port**		
Make Offered			
Model Offered			
6.1.	- Switch architecture should be Fixed Form factor& stackable based		
6.2.	- 19" Rack Mountable stackable switch with support for stacking minimum 4 switches into a single stack		
6.3.	- Static routing, RIP, PIM, OSPF, VXLAN, VRF, VRRP, PBR, QoS, 802.1x, IPv4v6 ACLs and MACsec-128		
6.4.	- Should have support for internal redundant power supply		
6.5.	- Switch should have wire-speed, non-blocking and distributed forwarding on all the ports.		
6.6.	- Switch should have minimum of 48 x 10/100/1000 POE+ RJ45 interface and 4 x 1G SFP+ populated with 4x SR optics from day 1		
6.7.	- Should have minimum stacking bandwidth of 56 Gbps or more		
6.8.	- Switch should have 2 GB ram and 2 GB Flash with 6 MB buffer		
6.9.	- Switch should support min 16K MAC addresses and min 500active VLANs.		
6.10.	- EAL3 or NDPP certified		

7. Technical Specifications – Internet Firewall

SN	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
7. Internet Firewall			
Make Offered			
Model Offered			
7.1	The appliance based security platform should provide firewall, AVC and IPS functionality in a single appliance from day one		
7.2	The appliance should support at least 6* 10G SFP+ ports from Day one and should have 2 empty slot for network module for future enhancement. Required module should support 2 * 40G ports in future		
7.3	The appliance hardware should be a multicore CPU architecture with a hardened 64-bit operating system to support higher memory		
7.4	Proposed Firewall should not be proprietary ASIC based in nature & should be open architecture to protect & scale against dynamic latest security threats.		
7.5	The appliance hardware should be a multicore CPU architecture with a hardened 64 bit operating system to support higher memory (minimum 64 GB from day one)		
7.6	Should support 5 Gbps of NGFW (FW, AVC, IPS/TPS, AV/APT) real- world / production performance		
7.7	Firewall should support at least 15,000,000 concurrent sessions with application visibility turned on		
7.8	Firewall should have integrated redundant hot-swappable power supply		
7.9	Firewall should have integrated redundant hot-swappable fan tray & modules		
7.10	Firewall should not consume more than 1 RU of rack space		
7.11	Firewall should support Active-Standby, Active-Active / Clustering, high availability solution should be able to increase overall throughput along with concurrent connections.		
7.12	Firewall should support creating access-rules with IPv4 & IPv6 objects, user/groups, application, geo-location, url, zones, VLAN, etc.		
7.13	Firewall should support manual NAT and Auto-NAT, static NAT, dynamic NAT, dynamic PAT		
7.14	Firewall should support Nat66 (IPv6-to-IPv6) & Nat44 (IPv4-to-IPv4) functionality.		
7.15	Should support Static, RIP, OSPF, OSPFv3 and BGP, BGPv6		
7.16	Should support Multicast protocols like IGMP, PIM, etc.		
7.17	Should support capability to integrate with other security solutions to receive contextual information like security group tags/names		

SN	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
7.18	Should have the capability of passively gathering information about virtual machine traffic, network hosts and their activities, such as operating system, services, open ports, client applications, and vulnerabilities, to assist with multiple activities, such as intrusion event data correlation, elimination of false positives, and policy compliance.		
7.19	Solution must be capable of passively gathering details unique to mobile devices traffic to identify a wide variety of mobile operating systems, mobile applications and associated mobile device hardware.		
7.20	Should support more than 3000 (excluding custom application signatures) distinct application signature as application detection mechanism to optimize security effectiveness. Solution should be able to combine these applications into 40 categories or more		
7.21	Should be capable of dynamically tuning IDS/IPS sensors (e.g., selecting rules, configuring policies, updating policies, etc.) with minimal human intervention.		
7.22	Should support more than 25,000 (excluding custom signatures) IPS signatures or more		
7.23	Should support be able to create correlation rule leveraging multiple rules/events		
7.24	Should be capable of automatically providing the appropriate inspections and protections for traffic sent over non-standard communications ports.		
7.25	Should be able to link Active Directory and/or LDAP usernames to IP addresses related to suspected security events.		
7.26	Should be capable of detecting and blocking IPv6 attacks.		
7.27	Should support the capability to quarantine end point by integrating with existing security solution like Network Admission Control		
7.28	Solution should support full-featured NBA capability to detect threats emerging from inside the network. This includes the ability to establish ―normall‖ traffic baselines through flow analysis techniques (e.g., NetFlow) and the ability to detect deviations from normal baselines.		
7.29	The solution must provide IP reputation feed that comprised of several regularly updated collections of poor reputation of IP addresses determined by the proposed security vendor		
7.30	Solution should support IP reputation intelligence feeds from third party and custom lists of IP addresses including a global blacklist		
7.31	Should support DNS threat intelligence feeds to protect against threats		

SN	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
7.32	Should support Behavioral DoS (Behavioral Denial of Service) Protection to defend against zero-day network-flood attacks, detect traffic anomalies and prevent zero-day, unknown, flood attacks by identifying the footprint of the anomalous traffic. Network-flood protection should include: • TCP floods—which include SYN Flood, TCP Fin + ACK Flood, TCP Reset Flood, TCP SYN + ACK Flood, and TCP Fragmentation Flood • UDP flood • ICMP flood • IGMP flood		
7.33	Should support Automatic Real Time Signature generation based on Rate Variant, Rate Invariant algorithms & Challenge Response Mechanisms; within 20 seconds, without human intervention.		
7.34	Should support Zero day DNS flood protection with (Challenge Response mechanism like RFC check, Active Challenge, Passive challenge) and Automatic real time signature creation		
7.35	Should support the capability of providing network-based detection of malware by checking the disposition of unknown files using SHA-256 file-hash or signature (update to be provided in 300 seconds) as they transit the network and capability to do dynamic analysis on-premise on purpose built-appliance		
7.36	Solution shall have capability to analyze and block TCP/UDP protocol to identify attacks and malware communications. At minimum, the following protocols are supported for real-time inspection, blocking and control of download files: HTTP, SMTP, POP3, IMAP, NetBIOS- SSN and FTP. Malware analysis capabilities should be capable of executing MS Office Documents, Portable Documents, Archive Files, Multimedia Files and executable binaries or more in a virtual environment in cloud		
7.37	Proposed solution shall have required subscription like Threat Intelligence or equivalent for proper functioning		
7.38	The Appliance OEM must have its own threat intelligence analysis centre and should use the global footprint of security deployments for more comprehensive network protection.		
7.39	The detection engine should support capability of detecting and preventing a wide variety of threats (e.g., network probes/reconnaissance, VoIP attacks, buffer overflows, P2P attacks, etc.)		
7.40	Should be able to identify attacks based on Geo-location and define policy to block on the basis of Geo-location		
7.41	The detection engine should support the capability of detecting variants of known threats, as well as new threats		
7.42	The detection engine must incorporate multiple approaches for detecting threats, including at a minimum exploit-based signatures, vulnerability-based rules, protocol anomaly detection, and behavioral anomaly detection techniques.		

SN	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
7.43	Should support Open based Application ID for access to community resources and ability to easily customize security to address new and specific threats and applications quickly		
7.44	The management platform must be accessible via a web-based interface and ideally with no need for additional client software		
7.45	The management platform must be a dedicated OEM appliance and VM running on server will not be accepted		
7.46	The management appliance should have 2 x 1G port and integrated redundant power supply from day one		
7.47	The management platform must be able to store record of 15000 user or more		
7.48	The management platform must provide a highly customizable dashboard.		
7.49	The management platform must domain multi-domain management		
7.50	The management platform must provide centralized logging and reporting functionality		
7.51	The management platform must be capable of integrating third party vulnerability information into threat policy adjustment routines and automated tuning workflows		
7.52	The management platform must be capable of role-based administration, enabling different sets of views and configuration capabilities for different administrators subsequent to their authentication.		
7.53	Should support troubleshooting techniques like Packet tracer and capture		
7.54	Should support REST API for monitoring and config programmability		
7.55	The management platform must provide multiple report output types or formats, such as PDF, HTML, and CSV.		
7.56	The management platform must support multiple mechanisms for issuing alerts (e.g., SNMP, e-mail, SYSLOG).		
7.57	The centralized management platform must not have any limit in terms of handling logs per day		
7.58	The management platform must provide built-in robust reporting capabilities, including a selection of pre-defined reports and the ability for complete customization and generation of new reports.		
7.59	The management platform support running on-demand and scheduled reports		
7.60	The management platform must risk reports like advanced malware, attacks and network		
7.61	The management platform must include an integration mechanism, preferably in the form of open APIs and/or standard interfaces, to enable events and log data to be shared with external network and security management applications, such as Security Information and Event Managers (SIEMs), and log management tools.		

8. Technical Specifications – End Point Protection

8. Technical Specification: Endpoint Protection			
SN	**Technical Compliances**	**Compliance (Yes/No)**	**Pg. No. of Tech. specs attached**
8.1	The bidder shall propose dedicated endpoint-based solution to protect systems Advanced Targeted Attacks and APT's		
8.2	The proposed solution shall work on both signatures based and a signature-less mechanism to stop threats via a single agent on the endpoint.		
8.3	The proposed solution shall work as an independent module without relying on other endpoint and network systems for its functionality		
8.4	The proposed solution shall utilize layered and defense in depth approach, wherein the solution cannot be of the same make as existing endpoint AV		
8.5	The proposed endpoint solution should support detecting of all malware types, both known and unknown. The movement of all known and unknown malware should be tracked and reported across the endpoints.		
8.6	The proposed endpoint solution should be able to support continuous and root cause analysis to help in triaging of security incidents.		
8.7	Security vendor should have a dedicated research organization that is focus on vulnerability research and should actively contribute to discoveries of new vulnerabilities exploited in the wild.		
8.8	Software footprint should be small and must support interactive and/or silent install		
8.9	Endpoint software should be easy to deploy and support (not limited to) deployment through 3rd party systems management tools		
8.10	Root cause analysis on a suspected machine should include the following capability:		
	- Sequential and chronological trace of events with details including host, username, IP, client application involved		
	- Details should highlight which file/process/services that affected		
8.11	Proposed endpoint software should support malware tracking and provide visualization at the network level: systems and users affected, patient zero, and method/point of entry.		
8.12	Proposed system should support continuous and persistent monitoring of files to detect polymorphic and time bound malware whenever they start turning bad and shall not be only an on-demand scan mechanism		
8.13	Proposed endpoint software should be capable to block CnC communications and dropper activity and contain the spread of malware		
8.14	Remediation at endpoints for incident response		

8. Technical Specification: Endpoint Protection			
SN	**Technical Compliances**	**Compliance (Yes/No)**	**Pg. No. of Tech. specs attached**
	should include (and not limited to):		
	- Track and capture files on suspected machine with option for lookups on suspected devices		
	- Block of files / process / services that are showing malicious behaviors		
	- Dropper detection and blocking of downloads via URL / sites		
	- Submit suspected malicious files for further analysis		
8.15	The proposed solution shall have the capability to quarantine the malicious application/program/file automatically without quarantining the entire user machine from network which would affect business productivity of the user		
8.16	The proposed solution shall have the capability to work with Indicators of Compromise (IOC's)		
8.17	The proposed solution shall provide the capability to write/upload custom IOC's		
8.18	Endpoint shall be capable of identifying fileless malware and memory-based attacks.		
8.19	The solution shall be capable of working in Windows, Windows Server, Mac, Linux Red hat & CentOS operating systems.		
8.20	The proposed solution shall be a continuous analysis agent that constantly monitors all system and file activity rather than being an on-demand agent that is triggered only when there is a event		
8.21	The proposed solution should record all file and process activity, not just malicious detections and display them on a time axis.		
8.22	The proposed solution should be able to provide endpoint activity details for the last 30 days.		
8.23	The proposed Endpoint APT solution shall not transmit files automatically across the network from the endpoint to any network component unless done so manually by the administrator as this would clog the network bandwidth		
8.24	The proposed endpoint Solution must block Memory attacks penetrate via endpoints and malware evades security defenses by exploiting vulnerabilities in applications and operating system processes.		
8.25	The proposed endpoint solution must support System Process Protection adds protection for memory attacks against Windows system processes.		
8.26	The proposed endpoint solution must Support macOS, Linux (Redhat and CentOS), Windows operating systems.		

8. Technical Specification: Endpoint Protection			
SN	**Technical Compliances**	**Compliance (Yes/No)**	**Pg. No. of Tech. specs attached**
8.27	The proposed endpoint solution must have Exploit protection - for protecting certain popular applications like MS Word, Excel, PowerPoint, Internet Explorer, Firefox, Chrome, Adobe Reader and others from attacks loading malwares that directly into the memory of these processes.		
8.28	The proposed endpoint solution must have update Server for signature updates for offline engine .		
8.29	The proposed endpoint solution provides real-time detection and blocking of abnormal behavior of a running program on the endpoint, for example, behaviors associated with ransomware.		
8.30	The proposed endpoint solution must have Custom Detections capability to serve the goal of delivering robust control to the security administrator by allowing to define custom signatures and enforce blacklists		
8.31	The proposed endpoint solution must have Endpoint IOCs which can help in incident response for scanning post-compromise indicators across multiple computers, can be imported from open IOC-based files that are written to trigger on file properties		
8.32	The proposed endpoint solution must have inbuilt capability to help network operations teams and incident responders to understand threats in their environment		
8.33	The proposed endpoint solution must have capability to Combines all of the threat intelligence available from the Endpoint solution into one place.		
8.34	The proposed endpoint solution must have inbuilt tool which will help in reducing complexity from a growing suite of security tools, help identify malicious observables, and speed up incident response.		
8.35	The solution should be capable of isolating/quarantining the endpoint from the network.		

9. Technical Specifications – Call Control System

SN	**Specifications**	**Compliance (Yes/No)**	**Pg. No. of Tech. specs attached**
9. Call Control System			
Make Offered			
Model Offered			
9.1	The IP telephony system should be a converged communication System with ability to run analog and IP on the same platform using same software load		

SN	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
	based on server and Gateway architecture		
9.2	The single IP PBX system should be scalable to support up to 200 stations (any mix/percentage of Analog/IP) to achieve the future capacity		
9.3	The system should be based on server gateway architecture with external server running on Linux OS. No card based processor systems should be quoted		
9.4	The voice network architecture and call control functionality should be based on SIP		
9.5	The call control system should be fully redundant solution with no single point of failure & should provide 1:1 redundancy.		
9.6	The communication server and gateway should support IP V6 from day one so as to be future proof		
9.7	The entire solution (IP PBX, its hardware, IP Phones, Voice Gateway) should be from a single OEM		
9.8	Support for call-processing and call-control		
9.9	Should support signaling standards/Protocols – SIP, MGCP, H.323, Q.Sig		
9.10	Voice Codec support - G.711, G.729, G.729ab, g.722, ILBC		
9.11	The System should have GUI support web based management console		
9.12	Security		
9.13	The protection of signaling connections over IP by means of authentication, Integrity and encryption should be carried out using TLS		
9.14	System should support MLPP feature		
9.15	Proposed system should support SRTP for media encryption and signaling encryption by TLS		
9.16	Secure HTTP support for Call Server Administration, Serviceability, User Pages, and Call Detail Record Analysis and Reporting Tool. Should support Secure Sockets Layer (SSL) for directory		
9.17	The administrator logging on to the call control server needs to authenticate by suitable mechanism such as User Login Information and Passwords/ Radius Server		
9.18	Voice gateway to be provided with 1 PRI card scalable to 3 PRI in future for PSTN (PRI) line termination.		

10. Technical Specifications – Contact Centre

SN	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
10. Contact Centre			
Make			
Model			
Functional Requirement			
10.1	For up to 10 agents		
10.2	Automatic call distribution		
10.3	Automatic identification of incoming number based on landline and mobile number mapping		
10.4	Call recording mapped to incident tickets		
10.5	Customizable agent and supervisor desktop layout		
10.6	Inbound and outbound capability		
10.7	Call control		
10.8	Multisession web chat		
10.9	Email		
10.10	Live data reporting gadgets		
10.11	Phonebook		
10.12	Multiline support		
10.13	Speed dial in IP phones		
	Automatic Call Distribution (ACD):		
10.13	Should be highly available with hot standby and seamless failover in case of main server failure. There should not be any downtime of Contact Center in case of single server failure.		
10.14	Should support skill based routing and it should be possible to put all the agents in to a single skill group and different skill groups		
10.15	ACD support routing of incoming calls based upon caller input to menus, real-time queue statistics, time of day, day of week, ANI, dialed number etc.		
10.16	ACD should support call routing based on longest available agent, circular agent selection algorithms.		
10.17	ACD should support the playing of customizable queuing announcements based upon the skill group that the call is being queued to, including announcements related to position in queue and expected delay.		
10.18	Agents should be able to chat with other Agents or supervisor from the Agent desktop software		
10.19	Supervisor should be able to see the real-time status of agents, supervisors should be able to make agent ready or logout from the supervisor desktop		
10.20	Should support Queuing of calls and playing different prompts depending on the type of call and time in the queue.		
10.21	In future if required, the ACD should support active and standby server mode, where the server can be put in		

SN	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
10. Contact Centre			
	DC and DR. In case of Main server in the Data center fail the standby server in DR should take over seamlessly. ACD solution should support placing of Main and Stand by server in DC and DR respectively.		
	Interactive Voice Response (IVR):		
10.22	IVR should play welcome messages to callers Prompts to press and collect DTMF digits		
10.23	IVR should be able to integrate with backend database for self-service, as and when required.		
10.24	GUI based tool to be provided for designing the IVR and ACD call flow.		
10.25	IVR should support Voice XML for ASR, TTS, and DTMF call flows		
10.26	IVR should be able to Read data from HTTP and XML Pages		
10.27	IVR should be able to run outbound campaigns.		
	Reporting:		
10.28	System to provide report of IVR Application Performance Analysis, Call by Call details for all the calls, Traffic analysis reports etc		
10.29	Reporting platform to support Agent level reports, Agent login, logout report, report on agent state changes		
10.30	Queue reports, Abandon call reports all the reports should be summary, tabular and detailed report format to be available for the agents.		
10.31	Reporting platform to support custom reports using a combination of the Crystal Reports Developer's Toolkit and SQL stored procedures.		
10.32	Users of the Historical Reports should be able to perform the following functions View, print, and save reports. Sort and filter reports, Send scheduled reports to a file or to a printer. Export reports in a variety of formats, including PDF, RTF, XML, and CSV.		
	E-mail:		
10.33	Administrator should be able to assign one or more email addresses to a single Queue.		
10.34	Email routing support integration with Microsoft Exchange 2003 or Microsoft Exchange e2007 or 2010.		
10.35	Agents should be able to automatically resume of e-mail processing on voice disconnect.		
10.36	Agent should be able to save email draft response and resume at a later time.		

11. Technical Specifications – IP Phone

SN	Specifications		Compliance (Yes/No)	Pg. No. of Tech. specs attached
11. IP Phone				
Make				
Model				
11.1	Display	2 line or more, Monochrome display for viewing features like messages, directory		
11.2	Integral switch	10/100 mbps for a direct connection to a 10/100BASE-T Ethernet network through an RJ-45 interface		
11.3	Speaker Phone	Yes		
11.4	Headset	Wired, Cushion Padded Dual Ear-Speaker, Noise Cancelling headset with mouthpiece microphone, port compatibility with IP Phone		
11.5	VoIP Protocol	SIP V2		
11.6	POE	IEEE 802.3af or better and AC Power Adapter (Option)		
11.7	Supported Protocols	SNMP, DHCP, DNS		
11.8	Codecs	G.711, G.722, G.729 including handset and speakerphone		
11.9	Speaker Phone	Full duplex speaker phone with echo cancellation, Speaker on/off button, microphone mute		
11.10	Volume control	Easy decibel level adjustment for speaker phone, handset and ringer		
11.11	Phonebook/ address book	Minimum 100 contacts		
11.12	Call Logs	Access to missed, received, and placed calls. (Minimum 20 overall)		
11.13	Clock	Time and Date on display		
11.14	Ringer	Selectable Ringer tone		

SN	Specifications		Compliance (Yes/No)	Pg. No. of Tech. specs attached
11. IP Phone				
11.15	Directory Access	LDAP standard directory		
11.16	QoS	QoS mechanism through 802.1p/q		

12. Technical Specifications – UTP Components for LAN Connection

SN	Specification	Compliance (Yes/No)	Pg.No. of Tech. Specs attached
12	**UTP Components for LAN Connection**		
Make Offered			
Model Offered			
	- All UTP Components should be from the same OEM		
12.1	**UTP CAT6 Cable**		
	Features		
	- Four pair Unshielded Twisted Pair Category 6, TIA/EIA 568-C.2 (1 Gigabit)		
	- Cable should be CM rated		
	- Performance Characteristics should be tested with 600MHz.		
	- 23 AWG copper cable with integral cross member pair separator and LSZH (Low smoke zero halogen) sheath		
	- Shall support network line speed up to 1Gbps		
	- ETL verified to TIA/EIA 568- C.2 (1Gigabit) Cat 6 or physical & Electrical specifications/standards		
	- Length printed on the outer jacket of the cable after every meter		
	- Fire Rating: IEC 60332-1		
12.2	**Information/Outlets (I/O)**		
	- TIA/EIA-568-C.2 Component Compliant (1Gigabit) standard or higher		
	- Surface mount box with single RJ45 socket to terminate UTP CAT 6 Cable		
	- Gold plated contact surface		
	- I/O Should have integrated Spring-Loaded Shutter for dust protection.		
	- Provision of labelling icons and strips		
12.3	**24 Port Patch Panel**		
	- Should Be made of cold rolled steel, in 24 port configurations.		
	- Have port identification numbers on the front of the panel.		

SN	Specification	Compliance (Yes/No)	Pg.No. of Tech. Specs attached
12	**UTP Components for LAN Connection**		
	- Each port / jack on the panel should be individually removable on field from the panel with spring loaded shutter for dust protection		
	- The Cat-6 transmission performance follows the ANSI/TIA/EIA 568C.2 standard		
12.4	**Patch Cord (1Mtr & 3Mtr)**		
	- Length: 1 Meter and 3 Meter		
	- Four pair 24 AWG Copper Cable with integral cross member pair, and factory moulded RJ-45 plugs at both ends, LSZH sheath		
	- ISO/IEC 11801:2002, TIA568-C.2 Cat 6 for physical & Electrical specifications /standards or higher		
12.5	**Network Rack- 42 U**		
	- Should be with increased depth of minimum 800 mm for effective network and power cable management		
	- The rack should have Floor mount provisions		
	- Cabinet built should be of Aluminum extruded profile metal finish.		
	- Rack should have horizontal cable/wire manager with accessories		
	- Should have front glass door with proper lock system		

13. Technical Specifications – Wireless Access Point

SN	Minimum Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
13.	**Wireless Access point**		
Make offered:			
Model offered:			
13.1	Access Point radio should be minimum 4x4 MIMO with 4 spatial streams, should support aggregate throughput of 2 Gbps		
13.2	Access Point should be 802.11ac Wave 2 ready from day one		
13.3	AP should have 1x10/100/1000 Ge POE LAN port and additional 1x10/100/1000 Ge LAN Port for Aggregation		
13.4	802.11 a/b/g/n/ac functionality certified by the Wi-Fi alliance.		
13.5	Access point should support 802.11ac beamforming for 802.11ac.		
13.6	The access point should be capable of performing security scanning and serving clients on the same radio.		

SN	Minimum Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
13.	**Wireless Access point**		
13.7	Access point should support 802.3af/at POE standard.		
13.8	Access point should have option of external power adaptor as well.		
13.9	Access point should have console port.		
13.10	Must support Proactive Key Caching and/or other methods for Fast Secure Roaming.		
13.11	Must operate as a sensor for wireless IPS		

14. Technical Specifications – Wi-Fi Controller

SN	Minimum Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
14.	**Wi Fi Controller**		
Make offered:			
Model offered:			
14.1	Must be compliant with IEEE CAPWAP or equivalent for controller-based WLANs.		
14.2	Should have at least 4 x 1 Gigabit Ethernet interface.		
14.3	Should support both centralized as well as distributed traffic forwarding architecture with L3 roaming support from day 1. Should have IPv6 ready from day one.		
14.4	Controller should have hot-swappable redundant power supplies.		
14.5	Controller should be capable of supporting both 1G on same Network I/O ports		
14.6	WLC should support Hotspot 2.0 (pass-point).		
14.7	Should provide visibility to Network airtime in order to set the airtime policy enforcement		
14.8	Must be able to restrict the number of logins per user.		
14.9	Should support SNMPv3, SSHv2 and SSL for secure management.		
14.10	Should support encrypted mechanism to securely upload/download software image to and from Wireless controller.		
14.11	Should support AP grouping to enable administrator to easily apply AP-based or radio-based configurations to all the APs in the same group		

SN	Minimum Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
14.	**Wi Fi Controller**		
14.12	Should support selective firmware upgrade APs, typically to a group of APs minimize the impact of up-gradation		
14.13	Should have a suitable serial console port.		
14.14	Should support visibility and control based on the type of applications		
14.15	The controller failover shall not trigger client de-authentication		

15. Technical Specifications – 10KVA Online UPS

SN	Specifications	Requirement	Compliance (Yes/ No)	Pg.No. of Tech. Specs attached
15	**10 KVA Online UPS**			
Make Offered				
Model Offered				
15.1	Capacity (in kVA / kW)	10kVA/10kW 1-Phase Input / 1-Phase Output		
	Technology and Capability			
15.2	Online Double Conversion	True Online configuration with double conversion UPS & Zero transfer time.		
15.3	DSP Based System **(Mandatory)**	DSP based control with advanced technology.		
15.4	Wide Input voltage Range	Wide Input voltage range from (100 ~ 280VAC)		
15.5	Auto Restart & Battery Independent	Auto restart capability with the Independent battery bank operation of the UPS.		
15.6	Designed Power Factor 1 **(Mandatory)**	UPS should be designed at Rated PF of 1 i.e. 10kVA/10kW UPS rating.		
15.7	Generator & Cold start compatibility	Generator compatibility with cold start and AC start features.		
15.8	Fully Rated Power (kVA=kW) **(Mandatory)**	Fully rated power (kVA=kW) for maximum power availability.		
15.9	N+X Upto 4 Systems **(Mandatory)**	Possibility of enhancing UPS capacity / redundancy by operating UPS in N+X Parallel. Redundant Configuration up to 4 units.		

SN	Specifications	Requirement	Compliance (Yes/ No)	Pg.No. of Tech. Specs attached
15.10	PFC & Inverter Based Technology	UPS should have topology for both PFC (power factor correction) &inverter based technology.		
	Input			
15.11	Input facility -Phases / Wires	Single-Phase / 2-Wire &Gnd (1Phase & Neutral + Ground)		
15.12	Nominal Voltage	200/208/220/230/240 VAC		
15.13	Nominal Voltage Range	200/208 (de-rating to 90%) : 100VAC~280 VAC 220/230/240 : 100Vac~280 VAC		
15.14	Nominal Input Frequency	50/60Hz ± 10Hz (Auto Selectable)		
15.15	Input Frequency Range	40 to 70 Hz		
15.16	Input Power Factor	> 0.99(full load)		
15.17	Generator Compatibility	Compatibility to genset supply required		
15.18	Input Protection	Should be provided at the input of the UPS suitable for the full rated capacity of the UPS.		
	Output			
15.19	Nominal Output voltage	200/208/220/230/240 VAC		
15.20	Output Voltage Regulation	± 1% for linear load		
15.21	Nominal Output Frequency	50/60Hz ±0.05 Hz		
15.22	Output Frequency Regulation	± 0.1Hz		
15.23	Output Wave Form	Pure sine wave		
15.24	Output Voltage Distortion (THD)	< 3% for linear load.		
15.25	Crest Factor	3:1 On Full Load (Minimum)		
15.26	Output Short circuit Protection	Electronic Protection		
	Efficiency (At Nominal Voltage & Resistive Load up to kW rating of UPS)			
15.27	Overall Efficiency (AC to AC) - Online (Double Conversion)	Up to 95% (on 100% load)		
15.28	ECO Mode Efficiency	98%		
	Overload			
15.29	Inverter Overload capacity	<105%for Continuous,<105~<125for 2Min,<125~<150for 30Sec		

SN	Specifications	Requirement	Compliance (Yes/ No)	Pg.No. of Tech. Specs attached
	Display Panel (In-build LC Display &LED)			
15.31	**Measurements** (On LCD)	Input: Voltage &Frequency, Bypass: Voltage &Frequency, Output: Voltage, frequency, Kilowatt &kVA, Battery: Remaining time & Battery Level Indicator, Load Percentage & Load Level Indicator, Ambient temperature.		
15.32	**Indications** (LED)	Green & Red (For output & Fault)		
	Alarms			
15.33	Audible Alarms	Replace Battery, Overload warning & shutdown, HighTemp, Low Battery, High Temp warning & shutdown		
	Battery Backup / Battery Bank & Charger			
15.34	Backup Required	60 Minutes		
15.35	Battery Bank Voltage	240 VDC **Setable from (192-264 VDC)**		
15.36	Batteries Type	Sealed Maintenance Free (SMF) - 12V Cells, VRLA, AGM		
15.37	Battery Makes	Amara Raja / Exide / HBL / Amco / Rocket		
15.38	Number of Battery Banks	Single Bank system.		
15.39	Battery recharge time (After complete discharge) to 90% capacity	8 -10 hour to 90%		
15.40	Battery Housing (Vendor to provide the GA drawings of the offered Battery Rack)	Should be compact and space saving **MS steel open racks** complete with interconnectors		
15.41	Battery End Cell Voltage	1.75 V/cell		
	Interfaces			
15.42	Serial Communication RS232 Port **(Mandatory)**	RS232 Port should be provided as standard in the UPS.		
15.43	USB port available **(Mandatory)**	However there should be provision for USB port also in the UPS.		
15.44	REPO port available **(Mandatory)**	However there should be provision for REPO port also in the UPS.		

SN	Specifications	Requirement	Compliance (Yes/ No)	Pg.No. of Tech. Specs attached
15.45	**Restart / Testing Capability**			
15.46	Automatic Restart	UPS should start up automatically on mains resumption after battery low shutdown		
15.47	Self-Diagnosis	UPS should be capable to carry out self test of Rectifier / Charger /Battery & Inverter module during start-up		
	Physical			
15.48	Normal Operating Temperature	0 to 40 deg C		
15.49	Storage Temperature	-15 to 50 deg C		
15.50	Operating Humidity	5% ~ 95%RH (No Condensing)		
15.51	Operating Altitude	0-1000m		
15.52	Type of Cooling	Forced Air		
15.53	Noise Level should reduce with Load **(Mandatory)**	< 50 dbA at 1 meter distance		
15.54	Form Factor	Tower mountable		
15.55	Dimension (w x d x h) in mm	190x390x325mm		
15.56	Reliability	MTBF greater than 100000 hours		
	Certifications			
15.57	Manufacturer	**QMS:** As per ISO 9001: 2008 **EMS:** As per ISO 14001: 2004		

16. Technical Specifications – Desktop

SN	Component	Description	Compliance (Yes/No)	Pg. No. of Tech. specs attached
16	**Desktop**			
Make Offered				
Model Offered				
16.1	Processor	9th Generation Intel Core i5 9500 or better, with 6 core, 9MB cache 3.0GHz		
16.2	Chipset	Latest Generation business class Chipset (B360/H370/Q370/B365) compatible with the above processor.		
16.3	Motherboard	Motherboard make from the same Desktop OEM (OEM logo must be		

SN	Component	Description	Compliance (Yes/No)	Pg. No. of Tech. specs attached
		embossed in the motherboard)		
16.4	Memory	Minimum 8 GB with support for expansion up to 32 GB or higher.		
16.5	RAM Type	DDR4 with 2666 MHz or higher.		
16.6	DIMMs & Expansion Slots	2 DIMM slots or higher, minimum 2 PCIe series expansion slots and 2 x M.2 slots.		
16.7	Monitor / Display	Minimum 21.5” FHD TFT monitor with minimum 1 x VGA & 1 x HDMI port		
16.8	Hard Disk Capacity	At least one single disk of Min 1 TB with 7200 rpm or higher.		
16.9	Graphics	Integrated Graphics (UHD / 4K).		
16.10	Network	10/100/1000 on-board integrated Network Port.		
16.11	USB / HDMI / VGA Ports	Integrated USB Port : Minimum 8 nos. (Min 4 nos. of 3.1 Gen-1), out of 8 Nos minimum 4 in front, 4 in back and should be easily accessible.		
		Integrated HDMI Port : Minimum 1 no; Should be easily accessible.		
		Integrated VGA & Display Port : Minimum 1 no each ; Should be easily accessible.		
16.12	Audio	Integrated Audio controller with Internal speaker		
16.13	Cabinet	Tool less chassis with 10 litters or lesser in volume		
16.14	SMPS	Minimum 200 W or above. Should be capable of supporting fully configured PC.		
16.15	Production Unit, Certification and Compliance	FCC , UL , TCO and EPEAT certification for both monitor and desktop , Microsoft Windows 10 Professional and Ubuntu Certification for the quoted desktop model		
16.16	Operating system	Microsoft Windows 10 Professional 64 Bit , with		

SN	Component	Description	Compliance (Yes/No)	Pg. No. of Tech. specs attached
		latest Service Pack Preloaded License, . Systems Hardware driver should be available in OEM website against the offered model		
16.17	**Security**	Hardware based TPM 2.0 , chassis Intrusion switch / Intrusion Sensor with chassis physical security cable lock slot.		

17. Technical Specifications – FHD LED Monitor for Desktop (Additional for Same OEM)

SN	Description	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
17. Additional FHD TFT Monitor for desktops				
17.1	**Panel size**	21.5”		
17.2	**Brief Description**	21.5" IPS FHD Borderless VGA + HDMI + DP + USB Hub (4+1) + Audio Out + LTPS		

18. Technical Specifications – Laptop

Sl No.	Parameter	Minimum Technical Specification	Compliance (Yes/No)	Pg. No. of Tech. specs attached
18	**i7 Laptop for Project Leader**			
Make Offered				
Model Offered				
18.1	Processor	Minimum Intel® Core™ i7-8565UProcessor or higher		
18.2	Mother board / Chipset security features	Integrated with processor .TPM 2.0 (hardware based) and Integrated hardware Diagnostic tool in BIOS		
18.3	RAM	Minimum 8 GB (1x 8GB) DDR4 Memory		
18.4	RAM upgradability and Slots	Minimum 2 nos. DDR4 Memory slots supporting up to 32 GB or higher		
18.5	HDD	Minimum 1 TB SATA or higher		
18.6	Communication & I/O Ports (Integrated in the laptop motherboard)	Minimum 4 USB ports out of which 2 No USB 3.1 and One USB Type C 3.1 Gen1 , 1x HDMI , 1 x VGA, RJ-45, SD Memory card reader, Universal Audio port Jack, security Lock slot.		
18.7	Keyboard &	Full size Backlit Keyboard with		

Sl No.	Parameter	Minimum Technical Specification	Compliance (Yes/No)	Pg. No. of Tech. specs attached
	Mouse	touchpad		
18.8	Camera	Minimum Integrated HD Webcam with integrated microphones.		
18.9	Graphics	Integrated Intel HD Graphics		
18.10	sound card	Intel High Definition Audio with Integrated stereo sound.		
18.11	Display	14.0" FHD Anti-Glare, LCD display , touch screen		
18.12	Battery Type	Minimum 4 hrs. back up		
18.13	Weight	Not more than 2.00 Kg.		
18.14	Wireless &	Minimum Integrated Intel Dual Band Wireless (supporting 802.11a/b/g/n and ac) network and Bluetooth v 5.0 or higher.		
18.15	Power and supply	External AC adapter of same OEM make		
18.16	Operating Systems	Microsoft Windows 10 Professional 64 Bit , with latest Service Pack Preloaded License, . Systems Hardware driver should be available in OEM website against the offered model		
18.17	Certifications (for the quoted model)	For OEM: ISO 14001:2004 For the quoted Model :UL,FCC ,Energy Star 6.0/BIS ; EPEAT India, quoted model ROHS , Windows Operating system, Ubuntu Linux & MIL 810 Std. Certification		
18.18	Carry Case (same OEM make)	Standard Good Quality Carrying Case (Standard or Backpack with OEM Logo)		

19. Technical Specifications – Multi Function Printer

SN	Item Name	Features	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
19	**Multifunction Printer**				
Make Offered					
Model Offered					
19.1	Printer Type		Print ,Scan, Copy , Fax With ADF		
19.2	Printing	Printing Technology	Precision Core Heat -Free Technology		
19.3		Print Direction	Bi-directional Printing , Uni -directional Printing		
19.4		Print Speed	Up to 24 ipm /24ipm Simplex (Black/ Colour)		
19.5			Up to 15 ipm/15 ipm Duplex (Black/Colour)		

SN	Item Name	Features	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
19.6		Automatic 2 sided Printing	Yes (Up to A4)		
19.7	Copying	Copy Speed (A4)	Up to 22 ipm/22ipm Simplex (Black/Colour)		
19.8		Copy Quality	Text , Text & Image , Text & Image (Best),Photo		
19.9		Maximum Copy Resolution	600X1200dpi		
19.10		Maximum Copy Size	A4, Letter		
19.11	Scanning	Scanner type	Flatbed Colour Image Scanner		
19.12		Optical Resolution	1200X2400dpi		
19.13		Scan Speed Flatbed/ADF (Simplex)/ADF Duplex	5.0sec/30ppm/ 60ipm (Monochrome) 5.0sec/30ppm/60ipm		
19.14		Paper Capacity	50 Pages		
19.15	Card Slot/USB Host	USB Host	USB Host (Scan to Memory Device/Storage Function)		
19.16		Type of Direct Printing	USB Memory		
19.17	Interface	USB	USB 2.0		
19.18		Network	Ethernet ,Wi-Fi , IEEE 802.11g/n ,Wi-Fi Direct		
19.19		Security Function	Limit Access Function, Pin No. Certification LDAP Address Book , IP Address ,Panel Admin Mode		
19.20	Mobile &Cloud Printing		Mobile Printing and other feature required		
19.21	Control Panel	LCD Screen	4.3" TFT Colour Touch LCD		
19.22	Printer Software	Operating System compatibility	Windows XP /Vista /7 /8/8.1/10, Windows Server 2003 /2008 /2012 /2016 ,Mac OS		

20. Technical Specifications – Network Printer

SN	Parameter	Minimum Technical Specification	Compliance (Yes/No)	Pg. No. of Tech. specs attached
20	**Network Printer for ICCC**			
Make Offered				

SN	Parameter	Minimum Technical Specification	Compliance (Yes/No)	Pg. No. of Tech. specs attached
Model Offered				
20.1	Configuration/Scanner	Desktop, digital		
20.2	Technology	Laser		
20.3	Print Per minute/Copy Per Minute-A4	50		
20.4	Warm-up Time	Maximum 20 Sec		
20.5	Std Paper Source(s)	Dual drawer		
20.6	Std Paper Capacity	500/500 sheets		
20.7	Bypass capacity	150-sheets		
20.8	Max Paper Sources	5		
20.9	Max Paper Capacity	7000+ sheets		
20.10	Max Original Size	A3		
20.11	Output Size (Min/Max)	A6/SRA3		
20.12	Copy Resolution	600 x 600 dpi		
20.13	Memory (Std)	4-GB RAM or Higher		
20.14	HDD(Std)	320GB		
20.15	Duplex	Auto		
20.16	Document Feeder	DSPF		
20.17	Document Feeder Capacity	270 or Higher		
Control Panel Color touch screen Required				
20.18	Message Display	Yes		
20.19	Help Key	Yes		
	Features			
20.20	Automatic Features	AES, AMS, APS, AS, ATS		
20.21	Book Copy	Required		
20.22	Booklet Mode	Std		
20.23	Copy Control	1,000		
20.24	Covers	Std		
20.25	Timer	Yes		
20.26	2-in-1	Std		
20.27	XY Zoom	Yes		
20.28	Zoom Range	25 to 400 (1%)		
20.29	Other Features	ID card copy; priority print; custom box; job box; removable memory box		
Supplies/ Maintenance				
20.31	**Toner Yield**	**Minimum 35000**		
20.32	**Drum Yield**	**Minimum 600000**		

SN	Parameter	Minimum Technical Specification	Compliance (Yes/No)	Pg. No. of Tech. specs attached
Printer Specifications				
20.33	Speed(A4)	50 ppm		
20.34	First-Page-Out Time	Maximum 5 sec		
20.35	Max Print Area	297 x 450		
20.36	Print from USB	Yes (JPEG, PDF, TIFF, XPS)		
20.37	Enhanced Resolution	4800 x 1200 dpi		
20.38	Unenhanced Resolution	1200 x 1200 dpi		
20.39	Std/Max Printer Memory	Shared		
20.40	Processor/Bits/MHz	Minimum 1.2 GHz or Higher		
20.41	Other	PDF Direct Print supports banner printing up to 12" x 48"/305 mm x 1,220 mm via bypass tray		

21. Technical Specifications – 65” UHD Touch Screen TV (Conference Room)

SN	Features	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
21.	**65" or Higher UHD Touch Screen TV for Conference Room**			
Make Offered				
Model Offered				
21.1	Screen Size	65" or Higher		
21.2	Native Resolution	3840 x 2160 (UHD)		
21.3	Brightness	350cd/m2 or Higher		
21.4	Contrast Ratio	1,100:1		
21.5	Viewing Angle (H x V)	178 x 178		
21.6	Surface Treatment	Hard coating, Anti-glare treatment of the front polarizer		
21.7	Input ports	HDMI-3,USB(3.0)-3,USB-(2,0)-2,OPS Slot-1,RGB-1,LAN-1		
21.8	Output Ports	HDMI/DP-1,Audio-1		
21.9	External Control	Rs-232		
21.10	Built in Touch type	IR spread		
21.11	Accuracy	2mm or less		
21.12	Interface	USB 2.0		
21.13	Protection Glass Thickness	4T (Anti-Glare)		
21.14	Operating System Support	Windows 7/8/10/WindowsXP/Linux/ Mac/Android (WindowsXP/Linux/Mac Support one point touch)		

SN	Features	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
21.	**65" or Higher UHD Touch Screen TV for Conference Room**			
21.15	Multi touch point	Min 20 Points or Higher		
21.16	Embedded Interactive White Board Software	PC Less Interactive White Board mode feature for teaching		
21.17	Interactive Features	Writing, Pen, Palm Erasor , Save, Screen Capture, Storage, Tool Bar, Air Class etc.		
21.18	Built in OS	Android 8.0/Windows10		
21.19	Built is SOC	Quadcore Processor, 3GB DDR,16GB Storage		
21.20	Media share	Screen Share/Mira cast to Connect TAB/Mobile, Web Browser		
21.21	Power Supply	100-240V~, 50/60Hz		
21.22	Power Consumption (Typ.)	250 W or less		
21.23	Built in Audio Power	22W(12W x 2)		
21.24	STANDARD(CERTIFICATION)	UL,BIS,FCC,ROHS		
21.25	Accessory	Remote Controller(include battery 2ea), Power Cord, QSG, Regulation Book, Touch Pen(2)		
21.26	Installation	Wall mount		

22. Technical Specifications – UHD Touch Screen TV (Project Head)

SN	Features	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
22.	**55" or Higher UHD Touch Screen TV for Project Head Room**			
Make Offered				
Model Offered				
22.1	Screen Size	55" or Higher		
22.2	Native Resolution	3840 x 2160 (UHD)		
22.3	Brightness	350cd/m2 or Higher		
22.4	Contrast Ratio	1,100:1		
22.5	Viewing Angle(H x V)	178 x 178		
22.6	Surface Treatment	Hard coating, Anti-glare treatment of the front polarizer		
22.7	Input ports	HDMI-3,USB(3.0)-3,USB-(2,0)-2,OPS Slot-1,RGB-1,LAN-1		
22.8	Output Ports	HDMI/DP-1,Audio-1		

SN	Features	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
22.	**55" or Higher UHD Touch Screen TV for Project Head Room**			
22.9	External Control	Rs-232		
22.10	Built in Touch type	IR spread		
22.11	Accuracy	2mm or less		
22.12	Interface	USB 2.0		
22.13	Protection Glass Thickness	4T (Anti-Glare)		
22.14	Operating System Support	Windows 7/8/10/WindowsXP/Linux/ Mac/Android (WindowsXP/Linux/Mac Support one point touch)		
22.15	Multi touch point	Min 20 Points or Higher		
22.16	Embedded Interactive White Board Software	PC Less Interactive White Board mode feature for teaching		
22.17	Interactive Features	Writing, Pen, Palm Erasor, Save, Screen Capture, Storage, Tool Bar, Air Class etc		
22.18	Built in OS	Android 8.0/Windows10		
22.19	Built is SOC	Quadcore Processor, 3GB DDR,16GB Storage		
22.20	Media share	Screen Share/Mira cast to Connect TAB/Mobile, Web Browser		
22.21	Power Supply	100-240V~, 50/60Hz		
22.22	Power Consumption (Typ.)	250 W or less		
22.23	Built in Audio Power	22W(12W x 2)		
22.24	Accessory	Remote Controller(include battery 2ea), Power Cord, QSG, Regulation Book, Touch Pen(2)		
22.25	Installation	Wall mount		

23. Technical Specifications – Link Load Balancer

SN	Specifications	Compliance (Yes/ No)	Pg.No. of Tech. Specs attached
23	**Link Load Balancer**		
Make Offered			
Model Offered			
23.1	Link Load Balancer should be dedicated appliance based solution with 64 bit Speed Core Architecture & purpose built hardware for high performance and it should not be part of router or UTM solution.		
23.2	The appliance should have 8x1GbE copper ports		

SN	Specifications	Compliance (Yes/ No)	Pg.No. of Tech. Specs attached
23	**Link Load Balancer**		
23.3	Should have Minimum 8 Gbps Throughput and dual power supply from day one		
23.4	Proposed device should be proposed in high availability using standard VRRP features		
23.5	The device should support minimum 10 ISP links for load balancing and failover		
23.6	The solution should support Inbound and Outbound Link load balancing algorithms like round robin, Weighted round robin, shortest response, hash ip, target proximity and dynamic detect.		
23.7	OEM should be from Top 4 vendors in terms of revenue and market share as per the latest India IDC quarterly report for ADC category for last two years.		
23.8	It should support advance functions Authoritative name sever, DNS proxy/DNS NAT, full DNS server with DNSEC, DNS DDOS, application load balancing from day one. It should be capable of handling complete Full DNS bind records including A,MX, AAAA, CNAME, PTR, SOA etc.		
23.9	the solution should support Stateful session failover with N+1 clustering support when deployed in HA mode. The solution should support USB based FFO cable to synchronize configuration at boot time of HA		
23.10	The solution should support single system image i.e. same Virtual-IP should be active in both devices at same time to support higher performance scalability.		

24. Technical Specifications – Access Control & Biometric

SN	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
24. Access Controls and Bio-Metric			
Make Offered			
Model Offered			
	- This standard includes capture and storage specifications of face images for human visual inspection and verification - Should have features to capture card-based authentication - Characteristics of Face Image capturing device - Specifications of Digital Face Image & Face Photograph Specifications intended only for human visual inspection and verification - Scene requirements of the Biometric Authentication		

SN	Specifications	Compliance (Yes/No)	Pg. No. of Tech. specs attached
24. Access Controls and Bio-Metric			
	- face images, keeping in view a future possibility of computer-based face recognition - Provision for storing, archiving, and transmitting the information of image within a CBEFF header data structure.		

25. Technical Specifications – 32" LED Screens for District Monitoring

SN	Features	Specifications	Compliance (Yes/ No)	Pg. No. of Tech. specs attached
25. 32" LED Screens for District Monitoring with Key Board & Mouse				
Make Offered				
Model Offered				
25.1	Display Size	32 inches or above		
25.2	LED Panel Technology	IPS Panel		
25.3	Native Resolution	1980 X 1080 (FHD)		
25.4	Brightness	Minimum 400 cd/m2 or above		
25.5	Contrast Ratio	Minimum 1000:1.		
25.6	Dynamic CR	450,000:1.		
25.7	Viewing Angle(H x V)	178 x 178		
25.8	Response Time	8 ms or better		
25.9	Surface Treatment	Hard coating, Anti-glare treatment		
25.10	Operation Hours	24Hr grade		
25.11	Life of LED	Minimum 50,000 Hour or high		
25.12	Orientation	Portrait & Landscape compatibility		
	Connectivity			
	Input			
25.13	Digital	HDMI-2, DP-1, DVI-D-1		
25.14	Audio In	Required		
25.15	External Control	RS232C, RJ45, IR Receiver, Pixel Sensor		
25.16	USB(USB3.0)	1 or more		
25.17	**Output ports**	DP, Audio, External Speaker Out		
25.19	Speakers	10W x 2 or High		

SN	Features	Specifications	Compliance (Yes/ No)	Pg. No. of Tech. specs attached
25. 32" LED Screens for District Monitoring with Key Board & Mouse				
25.20	**Important Features**	Temperature Sensor, Auto Brightness Sensor, Internal Memory (8GB or high), Wi-Fi built-in (802.11n), PIP/PBP for multi display viewing , Miracast/Screen Sharing, Built in Quad Core Media Player with open source licensed OS like MAC, Windows, WEB OS		
	Power Consumption			
25.21	**Standard Certifications**	UL, FCC Class A, BIS, Energy Star - 6 star		

C. Design Consideration

i. The project includes designing, engineering, supply & installation of 24X7 Integrated Command & Control Centre and other office set up pertaining to control room

ii. As the Entire set up is a significant place, it is imperative that it is designed properly in terms of Aesthetics, Ergonomics and Functionality. Various aspects should be considered while designing office area to create ideal work place, considering physiological aspects such as line of sight.

iii. Satisfactory environmental conditions for operator personnel. Including noise, air flow, temperature and humidity, and precautionary measure under uncontrolled conditions (like fire) beyond acceptable limits.

iv. Adequate space for personnel and equipment for the movements and activities they are required to perform during operation and maintenance, under both normal and emergency conditions.

v. Adequate illumination for the performance of operation, control, maintenance and training.

vi. The control room shall be built as per the criteria of "Human Factor Engineering" to improvise the efficiency utilization of the operators and provide them Fatigue free working environment.

vii. It should
- Ensure maximum standard of safety.
- Allow Flexibility
- Minimize maintenance
- Improve operator's efficiency & alertness.

viii. Designing, manufacturing, testing, integration etc., all complete, preparation of the related drawings, documents, etc. of the control room shall be in the SI's scope.

ix. The office design shall confirm the requirements & specifications of this bid document.

x. In broad, the scope of work and supply shall consist of the following parts
- Interior Design, engineering for the control room.
- All related services for supply, installation, testing.
- Spares & Documentation
- Maintenance and warranty throughout project duration

xi. General Considerations

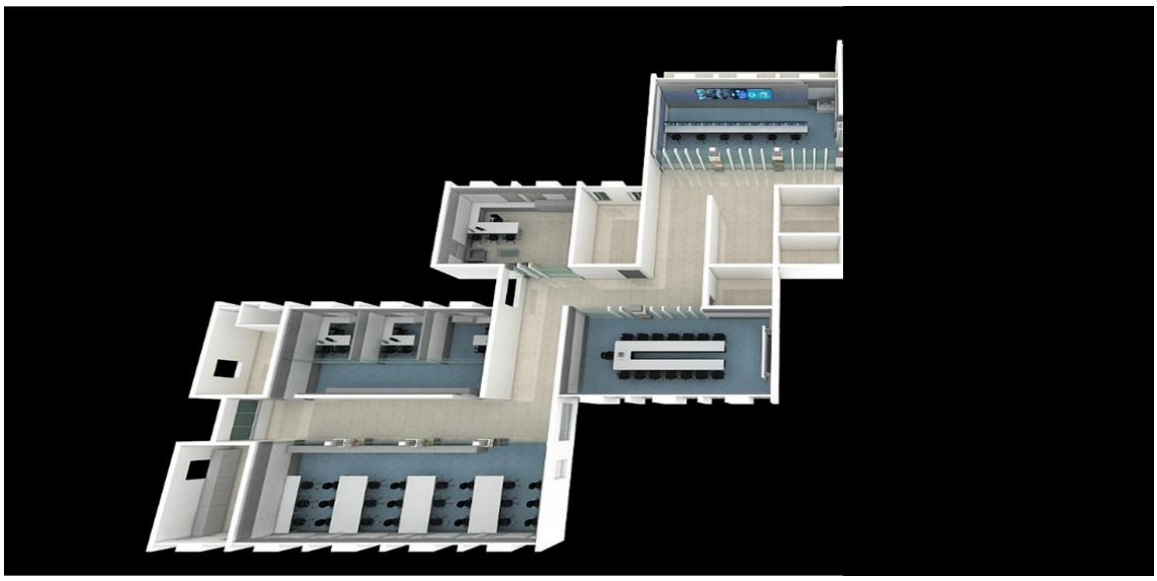
- The tentative control room area shall be provided to the selected SI to develop the various options.
- Supply of the product catalogue, technical proposals including but not limited to drawings, documentation colour pallets, for the complete solution.
- Commissioning & warranty spares (SI shall utilize these spares of all the equipment that may be required during commissioning & warranty period separately).
- SI shall be responsible for safety and security of the installed items till commissioning and final acceptance by DGM (before start of warranty period).
- Quality assurance & commissioning of the complete system at site to the complete satisfaction of the DGM/ CHiPS.

xii. SI shall be responsible for furnishing the following

- **ICCC and Technical helpdesk Team:** SI shall be responsible for establishment of ICCC and Technical helpdesk team area with all required equipment for at least 6-member team.

D. Building Layout

The Layout of the proposed site is shown below:



3D Design of proposed Integrated Command & Control Centre

Approximate Dimensions of ICCC Rooms				
SN	**Room Ref No as per Building Lay Out**	**Name of the Room**	**Approximate Dimensions (All in Ft.)**	**Responsibility for Office Interior Work**
1	Room No 1	Control Room	49.33 X 19.33	Selected SI
2	Room No 2	Core Team Room	29.33 X 19.33	DGM
3	Room No 3	Meeting Room	29.33X 19.33	DGM
4	Room No 4	Project Head Room	19.33 X 19.33	DGM
5	Room No 5	SI Team Room	29.33 X 19.33	DGM

i. **Ergonomic Design:** ICCC site should be ergonomically designed and should follow Control Centre Ergonomics Standards (ISO 11064-X: 2013) or later. The physical infrastructure (table, chair, equipment etc.) provided by the System Integrator should be in accordance with the Human factors and ergonomics. The successful SI shall ensure the compliance and work towards getting the Control Centre certified for ergonomics standards.

ii. **Cabling at ICCC Site:** Entire cabling at the control Centre shall be rat protective and insulated. The successful SIs shall ensure that proper earthing and cooling requirements are met at control Centre.

iii. **Internet Connectivity:** The ICCC shall have dedicated connectivity for display/monitoring of real time vehicle data at centralized command Centre, call logging and any other operational requirements of ICCC. The SI should size the internet connectivity considering overall load, integration points and number of vehicles to be tracked. The SI should also provision for redundant internet connectivity for failover situations.

iv. **Physical Security at control Centre:** Physical security at control Centre shall be maintained using access control device / biometric based authentication. The devices should be capable of connecting to computer systems and provide role-based authentication at various locations. The card based/biometric attendance system will be equipped for all users at ICCC site. This will ensure the authenticated entry for the users and will restrict outside users to enter the ICCC set up. The card-based access system will also have provision for additional cards for further requirement. The entire physical security system will be set up based on user authentication and room wise security provisions.

v. Control Centre should be equipped with relevant signages. The signages should be easy to read and highlighted in case of any disaster to guide control room staff to safety. The entire control Centre should be based on modular design and should easily be transferable to a new location with minimum effort and cost.

E. Interior work for the Control room

The System Integrator has to supply, commission all Non-IT components as required for setting up of the ICCC, the components include furniture, office partitions etc.SI shall supply & commission office furniture for all sections of ICCC as already mentioned in the above sections. The detailed quantity of the furniture along with Technical specifications has been mentioned below.

SI shall be responsible for the entire interior work for the Control Room. The Activity includes the following.

i. Supply & commissioning of Acoustic metal paneling (Control Room)

a) Supply of Factory-made removable type self-inter-lockable metal panels with front sheet of Preformed Textured Hot dip galvanized sheet with rigid polyvinylchloride (PVC) film on one side and on the other side a coating to avoid rust (sheet thickness 0.6mm & PVC Coating at least 0.11mm).
b) The back cover of the panel shall be made up of 0.6mm thick CRCA/GI sheet of approved Colour.
c) The paneling design shall comprise of specially designed combination of perforated and non-perforated panels through CNC laser Cutting, bending & punching.
d) Panels shall be designed to achieve shape and design as per the design
e) Certified design feature of Modular wall Paneling tile having secure locking arrangement for equidistant mounting.
f) Locking arrangement shall enable easy replacement without using any tool
g) The feature shall provide easy flexibility of locking all tiles in one column through gravity.
h) Structure shall be made from modular, heavy duty powder coated frame (minimum sheet thickness 1mm) and shall allow uninterrupted flow of wires/cable/tubes of maximum diameter 25mm.
i) Structure shall be securely connected from wall, roof and floor.
j) Thickness of Paneling- Overall system thickness for paneling shall be 60mm to 90mm.

ii. Supply & commissioning of Acoustic Metal partition

a) Supply of Textured Hot dip galvanized sheet with rigid polyvinylchloride (PVC) film on one side and on the other side a coating to avoid rust (sheet thickness 0.6mm & PVC Coating at least 0.11mm).

b) The back cover of the panel shall be made up of 0.6mm thick CRCA / GI sheet of approved colour.
c) The partition design shall comprise of specially designed combination of perforated and non-perforated panels through CNC laser Cutting, bending & punching. Panels shall be designed to achieve shape and design.
d) In partition, the metal panels shall be done on either side of the section/grid work.
e) Structure shall be made from modular, heavy duty powder coated CRCA frame (minimum sheet thickness 1mm) and shall allow uninterrupted flow of wires/cable/tubes of maximum diameter 25mm.
f) Structure shall be securely connected from wall, roof and floor. It shall be made up of minimum 1mm thick vertical slotted rolled C sections (Upright) and horizontal rolled 'C' connectors.
g) Grid of desired dimension shall be formed by Vertical and horizontal sections having 20 to 50mm pitch.
h) Thickness of Partition- Overall system thickness for partition shall be 70mm to 120mm.

iii. Glass Partition

a) Full height glass partitions walls shall be made of 12mm toughened glass with frame-less structure.
b) Proper structure shall be made to ensure the fixing of glass from RCC slab above false ceiling and holding channels on flooring.
c) Straight and vertical structural members shall not be visible.
d) Glass shall be fitted on extrusion with tool less technology and having a provision for replacing glass with perforated sheet/acoustic tile by removing the glass.
e) The nature of installation shall be replaceable, expandable and flexible to cater the future expansion/technical up-gradation.

iv. Supply & commissioning of tempered free Glass doors

a) Supply of 12mm thick frameless tempered clear glass Double door: - Size: - 1500mm X 2400mm
b) With door spring and locking arrangements and both way handle and patch fittings.
c) Tempered glass should be formed by heating glass to the softening point in a horizontal tempering stove, and then quickly cooling it.
d) Other Properties include:
   - Safety (tempered): when broken, it spits into tiny harmless pieces
   - Strong intensity: heat-strengthened glass is approximately twice as strong as annealed glass of
   - the same thickness, and tempered glass is about 4 times
   - Outstanding performance in resisting thermal stress and wind-load
   - Tempered glass cannot be cut, drill hole and other further processed

v. Designer metal false ceiling

a) The ceiling panels should be made up of combination of perforated and non-perforated panels to achieve strength and acoustics.
b) These tiles should be bent through CNC, machine punched & laser

c) Cut to achieve perfect accuracy.
d) Structure (main runner) should be made from heavy duty powder coated modular steel frame (minimum sheet thickness 0.8mm).
e) It should be securely grouted from roof with help of anchor fastener and GI threaded rods.
f) Metal modular false ceiling should have Noise absorption coefficient features.
g) The proposed ceiling tiles should be tested and certified as Class A.
h) Dual layer snap-fit ceiling.
i) These panels shall be interconnected to form alternate series at perforated & non-perforated ceiling tiles.
j) The ceiling panels shall be made up of combination of perforated and non-perforated panels to achieve strength and acoustics.
k) These tiles shall be bend through CNC, machine punched & laser Cut to achieve perfect accuracy.
l) Supply & commissioning of Plain Calcium Silicate Acoustic Boards for false ceiling with 08mm Approx. thick, Structure for underside of suspended grid formed of GI perimeter channels.
m) Wood screws and metal expansion raw plugs for fixing with wall. Plastic emulsion paint of approved make and shade for finishing surface of Calcium Silicate Boards.

vi. Supply & commissioning of LED Ceiling lights

a) The SI should provide LED office General Lighting Solutions offering best quality energy saving and maintenance free lighting operation.
b) Slim design which is suitable for recessed mounted application for
c) office Spaces.
d) Suitable for Grid Ceiling.
e) Technical Specifications like
   - Light source: LED
   - Lumen output: 2800 – 3500
   - Light color: 3000K - 6500K
   - Power consumption: 29 to 38 W
   - Input Voltage Range (V) - 150 - 270
   - Color: White
   - Lifetime: 25000 burning hrs. (At L70)

vii. Venetian Blinds for Windows

a) Best quality Windows Blinds System with extruded aluminum headrail finished in silver anodized.
b) Operation of louvers by cord for traverse and chain for rotation.

viii. Vitrified Flooring

a) Fully vitrified, minimum 8mm thick non-porous, homogenous, abrasion resistant of approved Colour
b) shall be laid over concrete floor with laying compound
c) Total thickness of the flooring shall be 40mm thick including the thickness of the tiles, under bed.
d) Tiles will be laid with 2 mm gap using spacers and gap will be filled with black Colour epoxy latictere.

ix. Supply of Wires, Switches & Conduits for ceiling lights

a) Wires for ceiling lights inter looping and switches will be provided, consisting of PVC insulated copper conductor stranded flexible wires of 1100 volts grade of insulation, in metallic conduits, PVC/ metallic conduits.
b) Minimum size of copper conductor shall be 1.5 sq. mm for lighting and 2.5 sq. mm for power. color of wires shall be Red/Yellow/Blue (or as per Local Standards) for the all single phases, Black for neutral and Green for earthing.

x. Minor civil work (Whenever required)

a) The Selected SI has to do minor civil work in the control room if required
b) The civil work may include wall paining, building customization & repairing etc.
c) The selected SI shall do the necessary interior customization work if required during the office furniture set up.
d) The selected SI shall also maintain the control room pertaining to civil work & interior designing etc.

xi. Supply & commissioning of office furniture for ICCC

a) The Selected SI has to supply office furniture for the entire ICCC setup.
b) The selected SI shall commission the office furniture in the identified rooms and do minor civil work in the control room if required
c) The selected SI shall maintain the furniture and do necessary repairing for any defect/ damage occurred to the office furniture.

Note: the detailed quantity of office furniture to be procured & supplied is depicted in the below sections.

F. Functional Requirement- Non-IT Components

i. The ICCC solution shall conform to high standard of engineering, meeting the specified codes, standards and designs.
ii. It shall be capable of performing 24X7 operations under the specified environmental condition.
iii. The Details of each components and design document should be submitted along with the technical bid.
iv. The ICCC Structure should be made of heavy duty Extruded Vertical and Horizontal Aluminum profiles of HE9WP grade.
v. The product used should be trademark registration certificate issued by Government of India for the console proposed in this tender. Trademark registration certificate to be submitted along with the technical bid.
vi. A weld free system shall be proposed to allow future extension and expansion
vii. Interconnecting joints shall not be visible.
viii. The structure shall allow easy assembly of Hinged Shutters, Slat wall, Gland Plate, Monitor arms in extremely rigid manner.
ix. The structure should be tested and certified for Seismic Zone 5 earthquake vibrations with monitor mounted on monitor arms of the console.
x. Bill of Materials for Office Furniture for ICCC

G. Bill of Material & Technical Requirement- Non-IT Components

Bill of Materials for Office Furniture			
Sl No	**Description**	**Unit**	**Qty**
	Office Furniture		
1	**Modular Control Desk**		
	- **Table Top:** The material of the working surface should be minimum 25 mm thick MDF with High Pressure scratch resistant Laminate. - **Structure:** Made of heavy duty Extruded Vertical and Horizontal Aluminum profiles., The Extrusions shall be duly powder coated with 40+ micron over all surfaces. All sheet metal parts must be finished with a durable, black, electrostatic powder coating. Trademark registration certificate to be submitted along with the technical, Slat wall, Gland Plate, Monitor arms in extremely rigid manner. - **Front Edge:** High density Poly Urethane Foam moulded on industrial grade aluminum core to form minimum 50mm deep tapered edge to be installed on worktop. The edge shall be mechanically replaceable case of damage or wear without opening or removing the worktop. - **Slat Wall:** Should be made of approximately 2mm thick Extruded Aluminum - **Monitor Arm: -** Design feature of monitor arm assembly shall have auto lock, push & remove feature for quick release of mounts and modular arm extensions for ease in maintenance and fixing of monitor by one technician. - **Shutters & Side legs:** Front, back shutters shall be 18 mm laminated MDF Board with premium finish, side legs shall be 25 mm of the same finish. - **Approximate Dimension:** 1200mm(W) X 1000mm(D) X 750mm(H)	**Nos**	**6**
2	**Modular Workstation for SI Team**		
	- Desktop made of 25mm Laminated MDF Board. - Structure: Made of heavy duty Extruded Vertical and Horizontal - Aluminum profiles of HE9WP grade. The Extrusions shall be duly powder coated with 40+ micron over all surfaces. - All sheet metal parts must be finished with a durable, black, electrostatic powder coating. - Back Sheet: Sheet with Powder Coated Finish. - Slat Wall shall be made of approx. 2mm thick Extruded Aluminum - With Pedestal and Side Privacy Panel of 5mm thick toughened Glass. - PDU with MCB - 1 Nos, RJ-11, - 1 Nos., RJ 45 - 1 Nos. - Approx. Dimension: 750mm (H) X 1200mm (W) X 700mm (D).	**Nos**	**24**
3	**Printer Table**		

Bill of Materials for Office Furniture			
Sl No	**Description**	**Unit**	**Qty**
	- Table top made up of 25mm MDF Board. - Structure: Aluminum with powder coated finish. - Side & back Sheet: MS sheet with powder coated finish. - Approx. Dimension: 750mm (H) X 900mm (W) X 1000mm (D).	**Nos**	**2**
4	**Conference Room Table (14 +1 Pax)**		
	- Table Top: The material of the working surface should be minimum 25mm - thick MDF with 2mm thick PVC edge banding tape. - Gable End: made up of 18mm thick MDF Board with 2mm thick PVC edge banding tape. - Modesty Panel: made up of 18mm thick MDF Board with 2mm thick PVC - edge banding tape. - With Cable Runner and Cable Riser - Each modular section shall be provided Access Flap - Each Flap shall have Switch & Socket - 2 Nos, RJ 11- 1 Nos & RJ 45 - 1 nos. - Approx. Dimension: 750mm (H) X 4950mm (W) X 2100mm (D).	**Nos**	**1**
5	**Medium Height Storage**		
	- Top: - made up of 25mm thick MDF Board with 2mm thick PVC edge Banding tape. - Shutter: - made up of 18mm thick MDF Board with 2mm thick PVC edge Banding tape. - Remaining Structure: made up of CRCA Powder Coated Finish. - Approx. Dimensions: 900mm(W) X 450mm(D) X 1200mm(H)	**Nos**	**25**
6	**Manager Table for Core Team**		
	- Table top made up of 25mm thick Prelaminated MDF - Board with 2mm thick PVC edge banding tape. - Leg: Ergonomically designed and matching with the open office concept. - The leg shall be made of rectangular MS pipes 75X25 with approved finish. - Supports: Pipe shall be made up of 1.6mm thick 40 x 40mm CRCA Laser cut components, powder coated with the matching shade/color/finish. - Connector: Pipe and leg are interconnected with connector specially designed for connecting different dimension pipe. Powder coated. - Modesty Panel: Shall be made up of CRCA Sheet. - Side and Back Runner: made up of 18mm thick Prelaminated MDF Board with 2mm thick PVC edge banding tape. - Accessories: Flap - Electrical Details: Switch & Socket - 2 Nos, RJ 11- 1 Nos & RJ 45 - 1 nos. - Approx. Dimensions: Table Top: 1500mm(W) X 750mm(D) X 750mm(H), Side Runner: 900mm(W) X 450mm(D) X	**Nos**	**3**

Bill of Materials for Office Furniture			
Sl No	**Description**	**Unit**	**Qty**
	750mm(H) & Back Runner: 1500mm(W) X 450mm(D) X 750mm(H)		
7	**Manager Table for Project Head**		
	- Work Surface: Table top made up of 25mm thick Prelaminated MDF Board with 2mm thick PVC edge banding tape. - Leg: Ergonomically designed and matching with the open office concept. - The leg shall be made out of rectangular MS pipes 75X25 with approved finish. - Supports: Pipe shall be made up of 1.6mm thick 40 x 40mm CRCA Laser cut components, powder coated with the matching shade/color/finish. - Connector: Pipe and leg are interconnected with connector specially designed for connecting different dimension pipe. Powder coated. - Modesty Panel: Shall be made up of CRCA Sheet. - Side Runner: made up of 18mm thick Prelaminated MDF Board with 2mm thick PVC edge banding tape. - Accessories: Flap - Electrical Details: Switch & Socket - 2 Nos. , RJ 11- 1 Nos. & RJ 45 - 1 nos. - Approx. Dimensions: Table Top: 2100mm(W) X 750mm(D) X 750mm(H), Side Runner: 1200mm(W) X 450mm(D) X 750mm(H), Back Runner: 2100mm(W) X 450mm(D) X 750mm(H)	**Nos**	**1**
8	**Operator Chair**		
	- Black Frame. - Back in Mesh, Seat in Fabric. - 2D headrest with Height & Angle Adjustment. - Synchron Control Mechanism with Seat Height Back Recline for 4 positions lock control & Tilt tension Adjustment. - Height Adjustable Backrest with Unique Comfortable - Lumbar Support. - Height Adjustable Armrest with Black PU-Pad. - 340mm Nylon Base. - 100mm Class 3 Gas Lift with 60mm Nylon casters.	**Nos**	**62**
12	**Project Head Chair**		
	- High Back Chair - PP Arms - Nylon Base - Synchro Knee Tilt - Gas Lift - Seat Back Net Tapestry	**Nos**	**1**
13	**Visitor Sofa**		

Bill of Materials for Office Furniture			
Sl No	**Description**	**Unit**	**Qty**
	- 3-Seater Sofa: Sofa with Wooden Frame, SS Legs, - Leatherite Tapestry - Size (in mm) - 1950 (L); 760 (D); 750 (H)	**Nos**	**3**
14	**Center Table**		
	- Center Table: Oval - Chrome Plated Pipe Frame, - Toughened Glass Top - 12mm Thick 2' x 2'	**Nos**	**2**

H. Office Support Staff Services at ICCC

SI shall provide facility management services on 24x7 basis and shall be responsible for providing all required equipment and materials required for Office Support. The SI shall provide the uniforms and Photo Identity Cards to the staff deployed by them at ICCC site.
The SI shall be responsible for the following at ICCC site:

i. Security and Front Desk Service:

SI shall provide one security staff (3 shifts) at ICCC site. Security staff shall be responsible for

a) Keeping a watch over persons visiting the ICCC site.
b) Maintaining the visitor register
c) Monitoring & authorizing entrance and departure of visitors and other persons to guard against theft and maintain security of premises.
d) Reporting to the Authority for any irregularity such as equipment or property damage, theft, presence of unauthorized persons or unusual occurrences.
e) Warning all staff for any rule infractions or violations and apprehend or evict violators from premises when necessary.
f) Preventing passage of prohibited articles into restricted areas.
g) Performing other related tasks as & when required.

ii. Housekeeping Services:

SI shall provide one housekeeping staff (3 shifts) at ICCC site. Housekeeping staff shall be responsible for

a) Sweeping and wet mopping of the entire ICCC site with disinfectants.
b) Cleaning of furniture (like working Tables, Chairs, etc.), glass doors, glass windows at in the ICCC premises every day.
c) Collecting garbage and dumping the same at designated place.
d) Cleaning of all toilets with disinfectants every day at periodical intervals.
e) Periodic cleaning of ceilings to prevent formation of cobwebs.
f) Cleaning of fans, tube lights, etc. at regular intervals.
g) Special intensive cleaning before and after meetings / workshops/ conferences/ functions.
h) Performing other related tasks as & when required.
i) SI shall provide all necessary materials including tools, equipment, disinfectant, cleaning agents and consumables of required quality and quantity needed for proper execution of the cleaning and housekeeping service.

iii. Deployment of Office Attendant:

SI shall provide one office attendant (3 shifts) at ICCC site. Office attendant shall be responsible for

a) Opening and closing of Office Rooms
b) Maintenance of Stationery and consumables
c) Arranging refreshment / water etc.
d) Collection and distribution of courier / post of general nature among the Officers.
e) Shifting of office equipment, as and when required.
f) Performing other related tasks as and when required.

iv. Transport Facility:

SI shall provide a dedicated car (with driver) for the SI's project team for project related local travel requirements at Raipur or any other location within the state. SI shall be responsible for all capital and recurring expenses of the car.

SI shall ensure that

a) Vehicle is in good running condition. Upholstery, décor, matting, paint, lights and all other accessories of the vehicle should be in excellent condition.
b) Car shall be available on 24x7 basis
c) Suitable replacement is provided in case of breakdown of the vehicle

4.12 Non-Functional Requirement

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

SN	Parameter	Requirement
1	Performance	As Khanij online 2.0 is an enhancement of existing Khanij Online application, all enhancements should comply with defined SLAs.
2	Scalability	System should be able to handle the increase load as the user base is expected to increase. The system provides for horizontal scalability in such a manner that a new server can be added (or removed) dynamically, as and when required in future, without disturbing the normal functioning of production system
3	Availability	The system shall provide 24 X 7 availability and comply with SLA
4	Reliability	Khanij Online 2.0 Portal must be a reliable system with consistent behaviour in terms of quality, availability, scalability, and performance. System should be able to handle the unavailability of any service. If the service is “core” to the use case an outage message can be displayed. If the service is “non-core” then the transaction should be able to be completed. Exception handling needs to be built into all components so that all exceptions and errors are trapped and handled properly. Error information should include enough details to accurately describe and debug the problem. All data that is accepted from the end-user or sent in via HTTPS request will be validated on the server before it is used in processing to ensure that the data type and ranges are appropriate.
5	Manageability	Khanij Online 2.0 Portal is required to cater to stakeholders across the state accessing it from multiple points and through multiple channels. Hence the manageability of this system is essential to ensure effective monitoring and timely resolution of any issues surrounding performance, availability and security.
6	Usability	The application and user interface should be user friendly and any new user who is not tech-savy must be able to easily use functionalities offered by the system. Error messages or pop ups must be helpful to an extent that user can take next action and does not experience too much of discomfort.

SN	Parameter	Requirement
		User interface must be simple yet user-friendly, and the workflow should be intuitive so that user can complete their work with least time and effort.
7	Acceptance Testing, Audit & Certification	The primary goal of acceptance testing, audit and certification is to ensure that the Khanij Online 2.0 system meets requirements, standards, and specifications as set out in this document and as needed to achieve desired outcomes. This assessment shall be done by STQC / Cert-in as per the scope of work and selected bidder will bear the third-party auditing charges.
8	Technical Solution Architecture Requirements	Khanij Online 2.0 solution needs to be architected using robust and proven software and technology. Minimum requirement for Khanij Online 2.0 software is Service - Oriented Architecture (SOA) and open industry standards. The solution architecture should be built on sound architectural principles enabling fault-tolerance, high performance, and scalability both on the software and infrastructure levels.
9	Software Architecture Requirements	Software architecture must support web services standards including XML, SOAP, UDDI and WSDL Software architecture must support appropriate load balancing for scalability and performance Software architecture must support flexibility in adding functionalities or applications. Software architecture components should utilize the high availability, clustering, and load balancing features available in the proposed infrastructure architecture to increase system performance and scalability features. Software architecture must support trace logging, error notification, issue resolution and exception handling.
10	Infrastructure Architecture Requirements	Infrastructure architecture at cloud must provide high availability redundancy and high availability capabilities as well as disaster recovery at the hardware level. All servers and systems must be configured with no single point of failure. Hardware architecture should be capable of consolidating several applications / workloads in a number of servers as required. Servers must be placed within proper security infrastructure for the Solution. The technical solution architecture for Khanij Online 2.0 should be sound and complete with high performance, redundancy, and scalability.

SN	Parameter	Requirement
11	Development, Testing, Staging, and Production Requirements	Appropriate development, test, and staging environments should be provided and explained how they are related to production environment. This must be supported by explanations on how the development, test, and staging environment support the implementation activities of Khanij Online 2.0 Solution. Development and test environment should include configuration management capabilities and tools for system configuration, versioning scheme, documentation, change control processes and procedures to manage deployment of solution deployment. The test, development, and staging environment should include required workstations, desktops/laptops, and tools appropriate to support development, testing, and staging, and deployment tasks. The development, test, and staging hardware environments must include similar operating systems, software components, products, and tools to those of production environment. The development, test, and staging environments should be independent logically and physically from the production environment and of each other. The development environment should be used for development and should be configured to allow access for developer's workstations. The staging environment should be used for functional and user acceptance testing, stress testing, and performance benchmarking. The test environment should be used as a testing environment of Khanij Online 2.0. The test environment should be a scaled-down configuration of the production environment.
12	Security	A secure solution should be provided at the hardware infrastructure level, software level, and access level. Authentication, Authorization & Access Control (User ID & Password and Digital Signature at all user level) security mechanisms should be implemented to enable secure login and authorized access to portal information and services. Confidentiality of sensitive information and data of users and portal information should be ensured. Appropriate mechanisms, protocols, and algorithms necessary to protect sensitive and confirmation data and information both during communication and storage should be implemented.

SN	Parameter	Requirement
		SI is responsible for SSL certificate.
13	Monitoring and Management Requirements	The Khanij Online 2.0 solution should provide monitoring and management of the entire Solution including all software components and application. The monitoring and management should monitor health of software and hardware infrastructure running the Khanij Online 2.0 solution covering operating system, database, software components, applications, servers, and other related software and hardware components. It should provide proactive monitoring, alerting and reporting.
14	Performance and Scalability Requirements	The design of the Khanij Online 2.0 solution should be scalable to handle increasing number of users. The solution should provide measurable and acceptable performance requirements for users, for different connectivity bandwidths. The solution should provide optimal and high-performance Portal Solution satisfying response time for slow Internet connections and different browsers.
15	Implementation Requirements	The selected bidder will be required to deploy manpower and other project resources as per the terms & conditions of the Contract. The selected bidder will be required to work closely with the CHiPS/DGM and perform detailed functional requirements and analysis of Khanij Online 2.0 solution to confirm and document functional / system requirement specifications for the portal and its applications to fulfil its objectives. The selected bidder will be expected to carry the complete implementation and deployment of the Khanij Online 2.0 within the timelines specified in the RFP. The selected bidder is expected to develop, test, stage, and deploy all functional modules of the Khanij Online 2.0 software and any hardware components of technical & functional requirements.
16	Operations Requirements	The selected bidder is expected to provide the following in support of Khanij Online 2.0 operations: Selected bidder shall provide procedure documentation for all operations procedures, and SLA"s (based on ITIL best practices) for all the hardware and applications provided including backup procedures, system update procedures, security procedures, failure recovery procedures, upgrade procedures, remote access procedures, user manual, SOP"s, etc. All such procedures and documents must be submitted for review and approval by the DGM/CHIPS prior to

SN	Parameter	Requirement
		adoption. Such documentation shall be updated by the during the project term by the bidder as and when required along with the necessary approval. Selected bidder will be required to provide DGM/CHIPS with weekly statistics reports on the various services provided to users a mechanism as well as track and log all related statistical reports on the various delivery channels and access patterns. Selected bidder will be required to provide DGM/CHIPS with weekly portal performance reports showing health of system operations. Selected bidder will be required to provide DGM/CHIPS with Helpdesk for recording all day to day problems and other technical incidents occur during the O&M phase. This shall also record the resolution of such incidents & problems. Selected bidder will be required to commit to Service Level Agreements (SLAs) that show, among other metrics, appropriate escalation procedures and guarantee corrective actions within a pre-determined time. Selected bidder is required to respond to required levels of accuracy, quality, completeness, timeliness, responsiveness, cost-effectiveness, productivity and user satisfaction that are equal to or higher than the SLA system requirements.
17	Quality Assurance & Acceptance Requirements	Selected bidder is required to develop and implement quality assurance processes and procedures to ensure that the Khanij Online 2.0 development and operations are performed to meet the quality standards that are relevant to each area in all project phases. Selected bidder is required to use various tools and techniques that can make tests run easily and the results are automatically measured. In this way, testing tools provide a more cost- effective and efficient solution than their manual counterparts. Plus, they minimize the risk of human error during testing. In order to ensure that such a QA mechanism is effective and acceptance of Khanij Online 2.0, the following tests are required for acceptance: Unit Testing: Basic validation of developed components by developers. Functional / Internal Integration Testing: Validation of developed components against functional requirements and design specifications. System Testing: Validation of both functional and technical requirements for the integrated Solution. This could include external integration if required or it can be separated into testing phases. UAT: User Acceptance

SN	Parameter	Requirement
		Testing (UAT) validation of the Portal Solution and assurance that it meets both functional and technical requirements Stress and Performance Testing: Load testing enabling understanding of performance and behaviour of Portal Solution under large number of users and high-load conditions. Selected bidder is required to describe their QA and testing approaches and procedures as well as testing tools for conducting various tests in support of the acceptance of the Portal Solution. Selected bidder is expected to follow CMMi level 3 or above processes. Selected bidder is required to describe their QA and testing approaches and procedures as well as testing tools for conducting various tests in support of the acceptance of the Portal Solution.
18	Mobile Application Platform Capability	Khanij Online 2.0 applications and services including all appropriate channels and development of corresponding mobile applications to the Khanij Online 2.0 applications and services leveraging the Mobile Service Delivery Gateway (MSDG) and Mobile App Store. Application platform should support the following smart phone mobile OS (Android & iOS) Support the target packaging components like (Mobile Website, Native App, Web App and Application Development, Eclipse tooling platforms) Support the ability to write code once and deploy on multiple mobile operating systems Support integration with native device API Support utilization of all native device features Support development of applications in a common programming language Support integration with mobile vendor SDKs for app development and testing Support HTML5, CSS3, JS features for smartphone devices Support common protocol adapters for connection to back office systems (i.e. HTTP, HTTPS, SOAP, XML for format) Support JSON to XML or provide XHTML message transformations

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

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

Selected bidder shall prepare System Requirement Specifications (SRS) and obtain a formal sign-off before proceeding development of the solution.

4.13 Design Principles and Guidelines

Design principles are set of general rules and guidelines for facilitating reference architecture to support in establishing indicative drivers to define the functional and technological requirements of Khanij Online 2.0 software solution components. The principles identified for Khanij Online 2.0 system have been discussed below:

Principle	Description
Achieve the minimum viable product	The SI shall ensure the current functionalities of existing Khanij Online system efficiently working after migrating the application to the cloud on Lift and Shift basis and then further enhancements to Khanij Online 2.0 while maintaining the business continuity.

Principle	Description
Service oriented architecture	Given the continuously evolving and changing functional landscape of Khanij Online 2.0 system, wherein updates and rollouts would be very frequent. Hence, SI shall implement a service-oriented architecture for enhancements in Khanij Online system and bring in the desired aspects of availability, scalability and agility
Leverage the existing technology stack	System to be enhanced using existing technology stack to the extent possible
High Availability, Performance and Security	The system should have high availability with scalability, performance and secure with storage data encryption
Open standards-based solution	The solution shall be based on open standards to maximize the interoperability between software components, data and document formats. This principle shall ensure the following fundamentals: Software components to interoperate through open protocols Data exchange to occur between various software components and data stores through open protocols/ standards
Virtualization	It is envisaged that the solution should implement virtualization for compute, storage and network. The virtualization solution should have capabilities to manage, monitor and maintain the health of the virtualized nodes.

Adherence to guidelines and standards:

Open Standards - Khanij Online 2.0 system must be designed open standards, to the extent feasible and in line with overall system requirements set out in this RFP, in order to provide for good interoperability with multiple platforms and avoid any technology or technology provider lock-in.

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

Solution Component/ application/ System	Standards
Accessibility	Accessibility - Web Content Accessibility Guidelines (WCAG) 2.0

Solution Component/ application/ System	Standards
HTML	HTML5.0 CSS 3.0
Mobile	W3C
Web portal	GIGW W3C JSR
Email	Multipurpose Internet Mail Extension (MIME)
Business processes Management	BPEL BPMN 2.0
Data exchange and interoperability	SOAP WSDL 2.0 ebXML XSLT 2.0 SAML SSL 3.0
Data modelling and management	UML, XML, JSON

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

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

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

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

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

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

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

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

vii. Any other standards deemed necessary

4.14 Security

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

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

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

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

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

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

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

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

- ISO 27001
- Information security standards framework and guidelines standards under e-Governance standards (http://egovstandards.gov.in)

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

h) The proposed solution should support the below Integration security standards:
- Authentication
- Authorization
- Encryption
- Secure Conversation
- Non-repudiation
- SOAP/ XML Firewalls
- Security standards support
- WS-Security 1.0
- WS-Trust 1.2
- WS-Secure Conversations 1.2
- WS-Basic Security Profile

i) The proposed solution should a multi-layered detailed security system covering the overall solution needs having the following features:
- Layers of firewall
- Network IPs
- Enterprise-wide Antivirus solution
- Information and incident management solution for complete DGM/CHiPS landscape
- Two factor authentications for all administrators i.e. system administrators, network administrators, database administrators.

j) Audit Log Analysis

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

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

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

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

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

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

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

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

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

t) The proposed solution should be able to monitor the IP and MAC ID address of the system from where a request is received.

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

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

    - Pharming
    - Trojan
    - Domains (old/new) like Chhattisgarh Khanij Online, Government of Chhattisgarh etc.

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

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

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

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

aa) The proposed solution should have a Business Continuity Plan and a Disaster Recovery Plan prepared and implemented by the selected bidder before commencement of the operations. Robust backup procedures to be established for the same.

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

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

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

ee) Passwords must be encrypted using MD5 hash algorithm or equivalent (selected bidder must provide details).

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

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

4.15 Business Continuity Plan:

The SI shall define a Business Continuity Plan (BCP) with the objective to assist impacted areas in ensuring that critical business functions are maintained, restored, or augmented to meet the business continuity and business resumption plans.

With the defined command structure, the Business Continuity team will lead BCP activities to:

- Facilitate the acquisition of and access to essential recovery resources, including business records related to authorized manual transactions
- Identify the BCP leading team including members from DGM and SI both
- Coordinate with the DGM Offices, IT Team, Application Users (Lessee, Licensee, End Users etc.) and the impacted area to restore business functions and review technology requirements.
- Assist impacted stakeholders with the restoring and resuming of normal operations.

The BCP shall define the mission critical services and processes and procedures to ensure they can be continued and / or recovered when normal operations are not viable. For the purposes of this plan and all associated procedures, checklists and forms, an event is defined as any planned or unplanned situation that disrupts the normal operations of the

DGM. The BCP describes the procedures for continuity or, if needed, contingencies for the recovery of services at an alternate location.

a) Activation of BCP:

In an event that disrupts normal operations and impacts essential operations supported by Khanij Online existing / 2.0 enabled services, the necessary measures shall be be taken to prepare and pre-position resources to ensure continuity of mission critical services and processes.

b) Components of BCP:

The following will be the components of BCP.

- Identified Khanij Online existing / 2.0 enabled business critical services and processes like e-Permit, e-Transit Pass and Online payment, but not limited to that.
- Identified interdependence in delivering mission critical services, that rely on the given internal and external services
- Define the action plan for each critical business service failure
- Identify the risks related to Khanij Online existing / 2.0, its supporting IT infrastructure and potentially affected stakeholders
- Communication Procedure during down time
- Notifications and alerts
- Defined role and responsibility of BCP team members along with their contact details
- Define the recovery process

c) BCP Test & approval:

The BCP team shall test the plan by recreating the real-life scenario. On successful testing of BCP, DGM / CHiPS will approve the BCP.

d) BCP Update schedule:

Changing business needs of DGM and additional of new features in Khanij Online existing / 2.0 will affect the BCP. Thus, to ensure efficacy of the BCP it must be reviewed and updated periodically twice a year. The SI shall responsible for maintaining and carrying out the Update Schedule. Once updated, the Plan must be provided to all responsible parties.

e) BCP Exercise & Training Schedule:

The BCP team will periodically conduct mock exercise and train the stakeholders as per training plan. Such exercise and trainings should occur prior to the launch of required plan or any updated so that the lessons learned to be reflected in the update**.**

4.16 Project Management and Change Management

Khanij Online existing / 2.0 project needs to be well managed. The management of time, cost, scope, risk, communication, human resources, quality and integrations are important factors in a project. The SI shall deploy adequate project management skills to effectively manage the project.

The System Integrator shall address at the minimum the following:

- Construct a project plan schedule, activities, including milestones.
- Establish and measure resource assignments and responsibilities.
- Scope Management
- Time Management
- Quality Management
- Human Resource Management
- Communications Management
- Risk Management
- Coordinate and collaborate with various stakeholders including the DGM / CHiPS concerned, Lessee, Licensee, End Users etc.
- Measure project deadlines and performance objectives.
- Communicate the project plan to stakeholders with meaningful reports.
- Provide facility for detecting problems and inconsistencies in the plan.

Selected bidder is required to specify and describe the different phases and activities of the project. It is very important for the DGM/CHiPS that the selected bidder provide a quality implementation plan covering all aspects of the project. The plan shall clearly specify the start and end dates (relative to contract signing) of each of the project phases specifying key milestones allowing visibility of project progress. During the project implementation the System Integrator shall report DGM / CHiPS, on the following items

a. Weekly status reports and statistics. These reports would be required to be shared with either the DGM / CHiPS.
b. Results accomplished during the period.
c. Cumulative deviations to date from schedule of progress on milestones as specified in this RFP / with the agreed and finalized Project Plan
d. Corrective actions to be taken to return to planned schedule of progress
e. Proposed revision to planned schedule provided such revision is necessitated by reasons beyond the control of the SI
f. Other issues and outstanding problems, and actions proposed to be taken
g. Interventions which the SI expects to be made by the DGM / CHiPS and / or actions to be taken by the DGM / CHiPS before the next reporting period.

h. Scope Management to manage the scope and changes through a formal management and approval process.

i. Risk Management to identify and manage the risks that can hinder the project progress.

j. Selected bidder shall provide a comprehensive warranty that covers all components during entire contract period Khanij Online 2.0. The warranty should cover all materials, licenses, services, and support for both infrastructure and software. Selected bidder shall administer warranties with serial number and warranty period. During exit process and final acceptance by DGM/CHiPS, all OEM warranties will be transferred to the DGM/CHIPS at no additional charge. All warranty documentation (whether expired or not) will be delivered to CHIPS based on which final acceptance and project closure certificate will be issued to bidder.

k. Selected bidder is required to provide Premium Level warranty and support through the vendor for all infrastructure and software used for Khanij Online 2.0 which should be adhere to the SLA requirement of the RFP. Selected bidder‟ warranty must cover all equipment and work activities contained in the contract against all design, manufacturing, and environment faults during the contract period.

l. The date of manufacture or assembly of any equipment, parts or consumables, shall not be more than six months before delivery.

m. CHIPS/DGM has the right to require a replacement if the repair is deemed to be impractical.

n. Selected bidder ensures that replacement components shall be available for any failed component during the warranty period.

o. Selected bidder shall guarantee the availability of spare parts and technical assistance for all components (or appropriate alternatives) to ensure the equipment would run for at least five (5) years, without major changes, at the completion of final acceptance. Six months advance notice is required on any discontinued part(s) with a suggestion for alternatives.

p. Selected bidder is required to provide additional training if the satisfaction levels/ learning does not reach 80% in evaluation/feedback from trainees

q. The Khanij Online application & infrastructure being provisioned by the bidder shall be insured. The Goods supplied under the Contract shall be fully insured against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery for the entire project term.

r. Selected bidder is required to explain their warranty, maintenance procedures, and support to meet the terms and requirements outlined above.

s. Define IT Change Management process, Incident Management process – covering identification, response, escalation mechanisms.

t. The SI shall work closely with the DGM / CHiPS to update and maintain the Project Plan throughout the duration of the engagement. The project plan update should take

into account the experience of earlier implementation phases. All changes are to be reviewed and approved by the DGM / CHiPS or appointed representatives.

4.17 Change Management

This section describes about the change management Processes for DGM and its Offices. The change management process is the sequence of steps or activities that a change management team or project leader would follow to apply change management to a project or change. Based on the researches of the most effective and commonly applied change, most change management processes contain the following three phases:

a) **Phase 1:** Preparing for change (Preparation, assessment and strategy development).

b) **Phase 2:** Managing change (Detailed planning and change management

c) implementation).

d) **Phase 3:** Reinforcing change (Data gathering, corrective action, and recognition).

The Selected Bidder Need to implement below steps for Successful Change Management for DGM and its Offices-

- Change Management
- Readiness Assessments
- Communication and Communication Planning
- Coaching & Manager Training for Change Management
- Training and Training Development
- Sponsor ‘s Activities and Sponsor‘s Roadmaps
- Resistance Management
- Data Collection, Feedback Analysis and Corrective Action
- Celebrating and Recognizing Success

4.18 Exit Management

Under the SI Exit Management Plan, SI shall provide following minimum activities to incoming DGM / CHiPS / new SI or any other authorized person:

a) Provide control of all IT assets including hardware, software, licenses, warranty, source code, credentials and knowledge base

b) SI to ensure availability of all the documents/files/knowledgebase prior to exit in an updated complete manner with no lacuna or delay in maintaining such records

c) Transfer the knowledge to new SI or authorized representative with documents sharing, application demo, joint code review, credential sharing and explaining the prevailing IT policies and processes followed

d) Allowing new SI or authorized representative to shadow for specified period while continue to deal with reported issues directly

e) Support new SI or authorized representative in tackling reported issues during transition period as specified by DGM

f) Support new SI or authorized representative for a period as directed by DGM

Following is the summary of key tasks that the SI need to perform during transition period -

i. **Exit Management Plan:** The exit management plan may be suitably modified by the SI to cover all the aspects during the transition period and upon acceptance by DGM / CHiPS, will be implemented by the SI.

ii. **Transfer of Assets:** Transfer both IT and non-IT Assets acquired for the Khanij Online 2.0 project to the new SI or authorized representative. The list of assets shall cover those under the purview of SI as well as its subcontractors

iii. **Testing:** The SI shall ensure that the system being handed over is tested rigorously before being handed over to the new SI or authorized representative.

iv. **Close critical issues:** The SI shall close all critical open issues as on date of exit. All other open issues as on date of Exit shall be listed and provided to DGM / CHiPS.

v. **Risks:** All the risks during transition stage shall be properly documented by the SI and mitigation measures be planned in advance along with the new SI or authorized representative and recorded in the Exit Management Plan so as to ensure smooth transition without any service disruption.

vi. **Transfer of Agreements:** Arrange or provide support for Assignment / Transfer / Novation of Agreements with all the OEMs / contractors / sub-contractors who are being used by the SI in the execution of the Khanij Online 2.0 project.

vii. **Provision of Information:** Provide access to information reasonably required to define the current mode of operation associated with the provision of services and also access and copies of all information / data / documentation, prepared or maintained, pertaining to DGM, services rendered including but not limited to applications, Business and IT Operations, and other performance data.

viii. **Access Rights:** Provide reasonable rights of access to Khanij Online 2.0, Project Location and premises where assets are located. Provide access to its employees and facilities as reasonably required to understand the methods of delivery of the services employed by the SI and to assist appropriate knowledge transfer.

ix. **Personnel:** Provide a list of all employees (with job titles) of the SI dedicated to providing the services. To the extent that any Transfer Regulation does not apply to any employee of the SI, the SI shall not enforce or impose any contractual provision that would prevent any such employee from being hired by DGM or new SI or authorized representative in case an offer of employment or contract for services is made to such employee.

List of Deliverables For Exit Management

SI shall prepare the exit plan with timelines as per the requirements of the DGM / CHiPS. Indicative list of deliverables for exit management is mentioned below :

SN	Deliverable
1	System / Network credentials
2	IT Assets IT Asset list with OEM, location and access details Hardware Software Licenses Warranty
3	Up to date Knowledge base: Process Maps Functional Requirement Specification System Requirement Specifications (SRS) High Level Design Document Low Level Design Document ER Diagram Database Schema Logical and Physical Design of database Enhancement log Issues Log User Manuals Test cases SLA reports Risk Assessment Report Onsite project manpower details
4	Working and up to date Source Code
5	Back up data
6	Weekly Report on critical issues fixed during transition period
7	Modified code after fixing critical issue

4.19 Deliverables Sign-Off

Selected bidder, where requested, shall present, explain and provide detailed walkthrough of the deliverables to DGM/CHiPS or its nominated agencies and provide clarifications to their queries. The selected bidder may have to revise or enhance the documents listed as deliverable, signed off / approved by DGM/CHiPS, without any extra cost, provided that is required to bridge the information gap critical for the projects. The Enhancement Features signed off after successful UAT will be further changed as per Change Control Management module as given in the RFP.

All the responsibilities with respect to operations and maintenance of Khanij Online 2.0 processes will be the responsibility of the selected bidder. Any gap that is found in a deliverable with respect to the above, even after the sign-off, will have to be addressed by the selected bidder without any additional cost to DGM/CHiPS.

Payments will be released only on satisfactory acceptance of the deliverables for each Task as per Milestones in this RFP.

4.20 Project Timelines

The SI will perform all the functions and services necessary to accomplish the transition of the business operations under current Khanij Online existing from the current SI on or before the specified completion dates. SI will be responsible for the overall management of the transition in accordance with the transition plan and will work to ensure the transition is completed on schedule and to identify and resolve any problems encountered.

The selected SI will demonstrate to DGM / CHiPS reasonable satisfaction, prior to the completion of Transition Phase, that it is ready to take over the O&M of existing Khanij Online without the support of the incumbent SI. The incumbent SI will continue to maintain and support the existing application till the new Khanij Online application Go-Live.

For removal of all doubts, it is clearly stated that all activities that are part of scope of work for selected SI as performed by the existing SI, shall be within the scope of work for the new SI till Go-Live of Khanij Online 2.0.

For this purpose, the following implementation plan is envisaged:

T0 - Date of acceptance of Work Order/Agreement

T1 – Date of Site Handover

SN	Milestones	Timeline
1.	Date of LOI	T0
2.	Deployment and Availability of Manpower for transition on existing Khanij Online	T0+ 7 days
3.	Handover of application code and all documentation	T0 + 10 days
4.	Takeover of complete As-Is business operations from incumbent System Integrator and deployment of manpower for helpdesk, handholding at site	T0 + 30 days

SN	Milestones	Timeline
5.	Set up HA and DR for existing Khanij Online	T0 + 2 months
6.	Existing Khanij Online Application Maintenance, Resource Deployment with Cloud DC & DR hosting as per RFP	After Transition till Khanij Online 2.0 is declared Go-Live
7.	Requirement Gathering, Preparation & Submission of SRS of Khanij Online 2.0	T0 + 3 months
8.	User Acceptance Testing for Major Mineral -Design, development / enhancement of Khanij Online 2.0 including Mobile Application, Establishment Module, Change Control, Management Dashboard and Analytics, Integrations and all other functionalities as per SRS on staging environment	T0 + 6 Months
9.	Go-Live for Major Mineral functionality in production environment (Cloud), Cutover (Migration of data) from existing application to Khanij Online 2.0 and stabilization in Production environment	T0 + 7 Months
10.	User Acceptance Testing for Minor Mineral - Configuration and Policy mapping in application for Minor Mineral, Management Dashboard and Analytics in staging environment	T0 + 7 Months
11.	Go live for Minor Mineral functionality in production environment (Cloud), Minimum 5 mines to be onboarded	T0 + 8 Months
12.	Launch of Mobile App for all stakeholders in Android and iOS platform	T0 + 8 Months
13.	User Acceptance Testing for Vehicle Tracking System in Staging environment	T0 + 9 Months
14.	Configuration, pilot testing of VTS with all empaneled GPS devices (POC)	T0 + 10 Months
15.	Configuration, pilot testing of Desktop Application for minimum 5 mines with fluctuating and no internet (POC)	T0 + 11 Months

SN	Milestones	Timeline
16.	STQC / Cert-in certification for complete Khanij Online 2.0 application	T0 + 12 Months
17.	Complete Rollout & Cutover (Migration of data) from existing application to Khanij Online 2.0 - Go-Live Declaration and stabilization	T0 + 12months
18.	Operation &Maintenance of Khanij Online 2.0(Quarterly only after Khanij Online 2.0 is successfully declared Go-Live)	4 Years after Khanij Online 2.0 Go Live
19.	Training on Khanij Online 2.0	From UAT to Go Live
20.	Finalization / Approval of Site plan / layouts for ICCC	T1 + 10 days
21.	Physical Infrastructure such as civil, electrical, cabling, BMS, furniture setup of ICCC as per the plan	T1 + 2 months
22.	Supply of Equipment including Site Set up of Civil Infrastructure (Sr. No. 1 to 29 from Financial BoM Table for ICCC Set up)	T1 + 3 months
23.	Successful Installation And Commissioning Of ICCC Equipment (Sr. No.1 to 29)	T1 + 5 months
24.	ICCC Operation and Go live	T1 + 6 months
25.	AMC and Operation and Maintenance of ICCC (Quarterly after go-live of ICCC)	4.5 Years after Go Live of ICCC

5 STAFFING REQUIREMENT

The requirement of staff, for the entire time of the project i.e. from the time LOI is issued and starts the operations of the project up till the time frame of the entire contract, is defined and required as mentioned below.

The SI will ensure a “Lead Team” which will comprise of the following

- Project Manager – 1 Nos.
- Domain Expert – 1 Nos.
- System Cum Infra Administrator – 1 Nos.
- Senior Programmer – 2 Nos.

This Lead Team structure will be ensured by the SI for the entire contract period of the project. The Lead Team will be constituted and work for transition and handover of the project from the incumbent SI to take over of operations by the new SI. This means transition and safety of existing Khanij Online with required HA/DR for data safety and recovery, understanding of mode of operations and operating procedures. During transition if the SI feels that there is requirement of additional staff for ensuring effective and smooth transition, the SI to ramp up the team size accordingly at their own behest, keeping the DGM and nodal agency CHiPS informed of any such requirement. This would be necessary for the SI to also analyze that staffing is done so that O&M of existing Khanij Online is done seamlessly without any deterrent. The minimum size of O&M Team for deployment in existing Khanij Online is given as below along with their bare minimum qualification and experience, however, if required SI to ensure additional staff.

a) Team constitution of O& M of existing Khanij Online

- Lead team as mentioned above
- OSU(Supervisor) - 2 Nos
- FMS – 20 Nos
- Helpdesk (24*7, 3 shifts) – 6 Nos

i. The Lead Team will also coordinate development and designing of new scope of work as per the RFP in the Khanij Online 2.0 system at the same time ensuring the O&M of existing Khanij Online for its smooth and efficient functioning, as this system is already up and running and state is generating revenue from it.

ii. It is to be made clear that SI would assess the requirement of staff, technical or otherwise and appoint resources so that no design development work is delayed, and every deadline and schedules are met. So, it is made clear that minimum staffing requirement with Qualifications/Experience and other relevant details is given below is subject to bare minimum but not limited to what is mentioned here.

iii. In case of any change is roles/responsibilities of any of the mentioned positions, the SI and project manager shall give an advance intimation and take approval from DGM/CHiPS for any such change request. In case of new recruitment / replacement being taken by the SI, the profiles, experience and any other relevant data of the recruit

is subject to approval by DGM/CHiPS, without which no such recruitment/replacement will be entertained.

b) Team constitution of Operation & Maintenance of Khanij Online 2.0

- Lead team
- Additional 3 Senior Programmers for new modules developed such as – VTS, ICCC, Desktop Application etc. - 3 Nos
- Senior DBA – 1 Nos
- GIS Expert - 1 Nos
- BI Expert – 1 Nos
- Mobile App developer for Maintenance -1 No
- Software Tester - 1 Nos
- Senior Trainer/Content writer – 2 Nos
- OSU Supervisor for ICCC (24*7, 3 shifts, L3 support) - 3 Nos
- OSU/Technical Helpdesk for ICCC (24*7, 3 shifts, L2 support) – (3*3) +2 = 11 Nos
- FMS for Districts - 33
- Helpdesk for ICCC (24*7, 3 shifts, L1 support) – 6 Nos

c) Qualification and experience

Minimum qualification and experience required for manpower across all Phases is listed below

SN	Type of Manpower	Qualification	Minimum Work Experience	Responsibility (not limited to)
1	Project Manager - Technical	B.E. / B.Tech (in relevant stream) / MCA	Shall have at least 12 years of experience of handling similar large projects in IT Sector	The selected bidder will deploy dedicated project manager for the entire lifecycle of the project. The project manager will be a single point of contact (SPOC) for all activity and coordinate with DGM/ CHiPS. Shall be responsible for organizing, planning, directing, and coordinating the overall program effort Shall be responsible for allocating tasks to the team

SN	Type of Manpower	Qualification	Minimum Work Experience	Responsibility (not limited to)
				Shall review the quality of project deliverables to ensure compliance with the agreed quality measures and standards Shall participate in all project review meetings as required by DGM Shall be responsible for service delivery from 3rd party like CSP, OEM, Hardware provider etc.
2	Domain Expert	B.E. / B.Tech / MCA / MBA (or equivalent)	Total 7 years of experience, Minimum 3 years of experience in managing enterprise solutions/ERP in Mining regulations (State Government) domain	This is one of the most critical positions and it is imperative that SI provides a highly experienced and technically competent resource for this position Responsible for conceptualizing and designing solutions as per Central & State mining rules/policies and business rules/procedures To own the complete functional and domain related aspects of the system being developed / managed by the SI
3	System cum Infra Admin for Cloud/On Premise	B.E. / B.Tech (in relevant stream) / MCA	Minimum 7 years experience in managing large IT Infrastructure, System Administrator, Network	Shall be responsible for complete IT Infrastructure of mining department (on premise/cloud), Network Management, Backup services, OS Management, Database Management, IT Security Management, Storage Management, Hardware

SN	Type of Manpower	Qualification	Minimum Work Experience	Responsibility (not limited to)
			Administrator or similar role	and other services for delivery/continuity Shall be responsible for managing DC and DR and related aspects Shall be responsible to monitor the CSP's SLA and coordinate with CSP
4	Senior Programmer	B.E. / B.Tech (in relevant stream) / MCA	Minimum 8 year of experience in software development in web technologies, Experience in OOAD, Database design and development	Development of Application modules, integrations and enhancements as required by DGM/CHiPS The developers will fix all the technical issues reported by the users Shall be responsible for implementation of VTS solution Shall support in ICCC set up and ICCC and assist in its operations
5	Senior DBA	B.E. / B.Tech (in relevant stream) / MCA	Minimum 7 years of experience as DBA	Shall be responsible for database installation, backup, performance tuning Shall support the team in development and maintenance, performance management of the application
6	GIS	M. Sc. / M. Tech in Geo-informatics/ Geoscience/ Engineering or equivalent	Minimum 5 years of total experience in GIS domain and atleast one large scale GIS project wrt to	Responsible for handling live GIS tracking information received from mineral carrying vehicles Responsible for suggesting for route optimization on the basis

SN	Type of Manpower	Qualification	Minimum Work Experience	Responsibility (not limited to)
			Vehicle Tracking System	of available GIS information on the system
7	BI Expert	B.E. / B.Tech (in relevant stream) / MCA / MSc (Maths, Computers, Statistics)	Minimum 5 years of experience in Data Analytics and BI	Interpret data, analyze results using statistical techniques and provide ongoing reports Develop and implement databases, data collection systems, data analytics and other strategies that optimize statistical efficiency and quality Acquire data from primary or secondary data sources and maintain databases/data systems Develop MIS system for internal and external stakeholders Generate both periodic and ad hoc reports as needed
8	Mobile App Developer	B.E. / B.Tech (in relevant stream) / BCA / MCA (or equivalent)	Minimum 5 years mobile app development experience at Android / iOS platforms	Shall be responsible for development and maintenance of mobile app
9	Software Tester	B.E. / B.Tech (in relevant stream) / BCA / MCA (or equivalent)	Minimum 5 year experience in software testing	• Shall be responsible for preparing test script and test the application for new modules and other enhancements Shall be responsible to

SN	Type of Manpower	Qualification	Minimum Work Experience	Responsibility (not limited to)
				collaborate with business users for UAT
10	Senior Trainer/Content writer	B.E. / B.Tech / BCA / MCA /MBA or equivalent	Minimum 7 years experience in training and capacity building for Senior trainer and minimum 3 years of experience for the assisstant trainer	Shall be responsible for preparing the training plan as per needs Shall be responsible for preparing required training content Build and design an attractive/creative presentation/training material for its audience, writing, editing and proofreading text in both Hindi and English Shall impart training as per training plan and as required
11	OSU Supervisor for 3 shifts (L3)	B.E. / B.Tech (in relevant stream) / MCA	Minimum 7 year experience	Shall be responsible in leading the OSU team in shift Shall be responsible for generating the SLA compliance and other reports at OSU level Shall be responsible for root cause analysis
12	OSU/Technical Helpdesk (L2) for ICCC	B.E. / B.Tech (in relevant stream) / MCA	Minimum 5 year experience	Shall be working in 3 shifts (24x7) and shall be responsible to logging the tickets for users Resolve the issues as per SLA Identify the patterns for root cause analysis

SN	Type of Manpower	Qualification	Minimum Work Experience	Responsibility (not limited to)
13	FMS for Districts	B.E. / B.Tech (in relevant stream) / BCA / MCA (or equivalent)	Minimum 2 year experience	Shall be responsible for providing support/handholding to the users in the field/district offices Shall be responsible for raising the tickets for technical issues
14	Helpdesk (L1 - First Line Support)	Graduate in any discipline	Minimum 2 Years of Experience as call centre experience	Interacting with the stakeholders, understanding their problem, providing first level support and then creating a ticket against it

Qualification for all the positions will be accepted only from an accredited college / university. Degree through distance learning shall not be considered. In case candidature of any profile does not meet the above criteria, the SI can appoint a candidate only if Steering committee approves and deems fit such a candidate based on exposure and experience in the relevant stream.

Definition of L1, L2 and L3 support levels in ICCC

- **L1(Level 1):** First Line Support: Telephone helpdesk. This support level receives inbound requests through channels like phone, Web forms, email, chat, or other means based on the documented SOP.
- **L2 (Level 2):** Second Line Support. These technicians have more experience than L1 support technicians and manage incidents raised by the L1s or as agreed in documented SLA (Service Level Agreement) timelines. L2 technicians follow documented processes and workflows in SOPs
- **L3 (Level 3):** Third Line Support. L3 technical experts resolve issues that are typically difficult or subtle. L3 engineers participate in management, prioritization, minor enhancements, bug fixing, ticket closure etc.

6 SERVICE LEVEL AGREEMENTS

The purpose of this Service Level Agreement (hereinafter referred to as SLA) is to clearly define the levels of service which shall be provided by the System Integrator to DGM / CHiPS for the duration of this contract.

6.1 Implementation Service Levels (Liquidated Damages)

a) If SI fails to fulfil the project timelines as per milestones defined in RFP Vol 1, the Purchaser without prejudice to its other rights and remedies under the Contract, will deduct 0.5% per week or part thereof from the milestone payment defined in RFP Vol 2 and as per the final contract value.

b) Please refer to the table below for applicable penalty for implementation delays

SN	Milestones	Delivery Period (T0 - Date of acceptance of Work Order/Agreement)	Penalty
Khanij Online 1.0 (existing Khanij Online) Transition			
A	Takeover of complete As-Is business operations from incumbent System Integrator and deployment of manpower for helpdesk, handholding at site	T0 + 30 Days	Deduct 0.5% per week or part thereof from the milestone payment Maximum 10 weeks
B	Set up HA and DR in Cloud for existing Khanij Online and Migration of existing Khanij Online with security certificate	T0 + 2 Months	Deduct 0.5% per week or part thereof from the milestone payment Maximum 10 weeks

SLA Table 1 - Existing Khanij Online Transition

SN	Milestones	Delivery Period (T0 - Date of acceptance of Work Order/Agreement)	Penalty
Development and Implementation of Khanij Online 2.0			
A	Approval of SRS of Khanij Online 2.0	T0 + 3 Months	Deduct 0.5% per week or part thereof from the milestone payment Maximum 10 weeks

SN	Milestones	Delivery Period (T0 - Date of acceptance of Work Order/Agreement)	Penalty
B	User Acceptance Testing for Major Mineral -Design, development / enhancement of Khanij Online 2.0 including Mobile Application, Establishment Module, Change Control, Management Dashboard and Analytics, Integrations and all other functionalities as per SRS on staging environment	T0 + 6 Months	Deduct 0.5% per week or part thereof from the milestone payment Maximum 10 weeks
C	Go-Live for Major Mineral functionality in production environment (Cloud), Cutover (Migration of data) from existing to Khanij Online 2.0 and stabilization in Production environment	T0 + 7 Months	Deduct 0.5% per week or part thereof from the milestone payment Maximum 10 weeks
D	User Acceptance Testing for Minor Mineral - Configuration and Policy mapping in application for Minor Mineral, Management Dashboard and Analytics in staging environment	T0 + 7 Months	Deduct 0.5% per week or part thereof from the milestone payment Maximum 10 weeks
E	Go live for Minor Mineral functionality in production environment (Cloud), Minimum 5 mines to be onboarded	T0 + 8 Months	Deduct 0.5% per week or part thereof from the milestone payment Maximum 10 weeks
F	Launch of Mobile App for all stakeholders in Android and iOS platform	T0 + 8 Months	Deduct 0.5% per week or part thereof from the milestone payment Maximum 10 weeks
G	User Acceptance Testing for Vehicle Tracking System in Staging environment	T0 + 9 Months	Deduct 0.5% per week or part thereof from the milestone payment

SN	Milestones	Delivery Period (T0 - Date of acceptance of Work Order/Agreement)	Penalty
			Maximum 10 weeks
H	Configuration, pilot testing of VTS with all empanelled GPS devices (POC)	T0 + 10 Months	Deduct 0.5% per week or part thereof from the milestone payment
			Maximum 10 weeks
I	Configuration, pilot testing of Desktop Application for minimum 5 mines with fluctuating and no internet (POC)	T0 + 11 Months	Deduct 0.5% per week or part thereof from the milestone payment
			Maximum 10 weeks
J	STQC / Cert-in certification for complete Khanij Online 2.0 application	T0 + 12 Months	Deduct 0.5% per week or part thereof from the milestone payment
			Maximum 10 weeks

SLA Table 2 - Development and Implementation of Khanij Online 2.0

SN	Milestones	Delivery Period (T1 - Date of Site Handover)	Penalty
ICCC site setup of Khanij Online 2.0			
A	Supply of Equipment including Site Set up of Civil Infrastructure (Sr. No. 1 to 29 from Financial BoM Table - Establishment of Integrated Command & Control Centre for ICCC Set up)	T1 + 3 Months	Deduct 0.5% per week or part thereof from the milestone payment
			Maximum 10 weeks delay may be accepted
B	Successful Installation and Commissioning of ICCC Equipment (Sr. No. 1 to 29 from Financial BoM Table - Establishment of Integrated Command & Control Centre for ICCC Set up)	T1 + 5 Months	Deduct 0.5% per week or part thereof from the milestone payment
			Maximum 10 weeks delay may be accepted

SN	Milestones	Delivery Period (T1 - Date of Site Handover)	Penalty
C	On ICCC Operation and GO Live from (Sr. No. 1 to 29 from Financial BoM Table - Establishment of Integrated Command & Control Centre for ICCC Set up)	T1 + 6 Months	Deduct 0.5% per week or part thereof from the milestone payment Maximum 10 weeks delay may be accepted

SLA Table 3 - ICCC site of Khanij Online 2.0

Additionally, in case of delayed deployment of resources, following LD (Penalty) shall be applicable:

SN	Resource Type	Measurement Methodology	Liquidated Damages (Penalty)
A	Delay in Deployment of Lead Team Member	The provider to deploy Lead team resources as per the deployment schedule.	1% will be deducted from yearly quoted cost of resource for each instance per day from SI payment No payment will be made in the days a resource is absent.
B	Delay in Deployment of (O&M)	The provider to deploy (O&M) team as per the deployment schedule.	1% will be deducted from yearly quoted cost of resource for each instance per day from SI payment No payment will be made in the days a resource is absent.
C	Delay in Deployment of (OSU) /Technical Helpdesk resource	The provider to deploy (OSU) /Technical Helpdesk resources as per the deployment schedule.	1% will be deducted from yearly quoted cost of resource for each instance per day from SI payment. No payment will be made in the days a resource is absent.
D	Delay in Deployment of ICCC Helpdesk and FMS for districts Resources	The provider to deploy ICCC Helpdesk and FMS for districts resources as per the deployment schedule.	1% will be deducted from yearly quoted cost of resource for each instance per day from SI payment. No payment will be made in the days a resource is absent.

SLA Table 4 - Service level on delay in resource deployment

The total deduction shall not in any case exceed 10% of the contract value. Also, in case penalty exceeds 10% of the contract value or more than 10 weeks delay, DGM / CHiPS may take appropriate action.

The Purchaser may without prejudice to its right to effect recovery by any other method, deduct the amount of liquidated damages from any money belonging to SI in its hands (which includes the Purchaser's right to claim such amount against SI's Bank Guarantee) or which may become due to SI. Any such recovery or liquidated damages shall not in any way relieve SI from any of its obligations to complete the Work or from any other obligations and liabilities under the Contract.

Delay not attributable to SI shall be considered for exclusion for computing liquidated damages.

6.2 Post Implementation Service Level Agreement

This Section describes the service levels to be established for the Services offered by the SI to DGM / CHiPS. The SI shall monitor and maintain the stated service levels to provide quality service to DGM / CHiPS. Service Level Agreement (SLA) defines the quality and timeliness of service delivery during the Operations and Maintenance (O&M) phase of a project. SLA helps the DGM / CHiPS sustain the planned business outcomes from the solution deployed on a continued basis over a sustained period.

6.2.1 Purpose and Level of Agreement

a) The purpose of this SLA is to clearly define the service level standards in terms of Availability, Performance quality and Timelines to be provided by SI and further enforce it on SI. SLA in this project shall be in effect for the entire AMC period.

b) The SLA is designed to:

   i. Define unambiguously the service level standards expected from the SI and also ensure that the desired/ agreed level of services is rendered by the SI to DGM.

   ii. Motivate SI to ensure the service standards are up to the mark.

   iii. Draw the urgent attention of SI in case there is any issues in the service levels or service level falls below the agreed/desired level.

   iv. Provide a tool to DGM to measure and assess the service levels provided by SI.

   v. Avoid imposing penalty on SI without valid reason.

6.2.2 Definition

a. **"Scheduled Maintenance Time"** shall mean the time that the System is not in service due to a scheduled activity. Scheduled maintenance time is planned downtime with the prior permission of DGM / CHiPS. For the purpose of the project, planned downtime shall be allowed between 10 pm to 6 am on weekdays and on weekends only. The Scheduled Maintenance time within 10 hours a month as agreed shall not be considered for SLA Calculation.

b. **"Scheduled operation time"** means the scheduled operating hours of the System for the month. All scheduled maintenance time on the system would be deducted from the total operation time for the month to give the scheduled operation time. The total operation time

for the systems and applications within the Primary DC, DR, and critical client site infrastructure will be 24X7X365. The total operation time for the client site systems shall be the business hours of DGM.

c. **"System or Application downtime"** means accumulated time during which the System is totally inoperable within the Scheduled Operation Time but outside the scheduled maintenance time and measured from the time DGM and/or its employees and/or stakeholders log a call with the SI team of the failure, or the failure is recorded in the EMS Tool to the time when the System is returned to proper operation.

d. "**Availability**" means the percentage of time for which the services and facilities are available for conducting operations on the DGM system including application and associated infrastructure. Availability is defined as:

e. $\frac{\text{Scheduled Operation Time} - \text{System Downtime}}{\text{Scheduled Operation time}} x\ 100$

f. **"Incident**" refers to any event / abnormalities in the functioning of the Application / Infrastructure / Services that may lead to disruption in normal operations of Khanij Online (existing) / Khanij Online 2.0.

6.2.3 Enterprise Management System

For efficient management of the system, reporting, SLA monitoring and resolution of issues, SI shall deploy the Cloud based EMS or similar cloud-based web tool for

a. Application monitoring

b. Cloud Asset Management

c. Server Monitoring

d. Network Monitoring

e. Incident and SOP management

f. Helpdesk System

The proposed EMS or any other tool shall provide unified dashboard and single sign-on (SSO). The solution should be able to generate customised reports as per requirements of the department.

6.2.4 Post Implementation Service Level

a. Service levels shall be calculated on quarterly basis.

b. SI is expected to provide the following Service Levels. In case these Service Levels cannot be achieved at Service Levels defined in the tables below, it shall invoke the related penalties. Payments to the SI are linked to the compliance with the SLA metrics laid down in the Table below in this section of the RFP.

SN	Description	Measurement Methodology	Target	Penalty
Performance of Khanij Online (existing) on Cloud Infrastructure				
A	Availability of Services for users for existing Khanij Online	Measured as availability of end-to-end services that when executed, cover the underlying solution components (Existing Khanij Online application, Integrations and Cloud infrastructure, EMS or SLA monitoring tool etc.) The services should be available 24×7	Uptime >=99.75%	No Penalty
			Uptime >= 95% and < 99.75%	2% will be deducted from QGR for the downtime
			Uptime >= 90% and < 95%	5% will be deducted from QGR for the downtime
			Uptime < 90%	10% will be deducted from QGR for the downtime
B	Analysis, Evaluation and Implementation of Change Request	Measurement of time taken in analysing, evaluating and implementing the Change Request.	Change Requests should be completed within the time approved by DGM / CHiPS	For each instance, 0.5% will be deducted from QGR for each week (or part thereof) below target.
Performance of Kanji Online 2.0 Application on Cloud Infrastructure				
C	Availability of Services for users for Khanij Online 2.0	Measured as availability of end-to-end services that when executed, cover the underlying solution components (e.g. Khanij Online 2.0 application, Mobile App, VTS, Integration, Cloud, EMS or SLA monitoring tool, helpdesk etc.) The services should be available 24×7	Uptime >=99.75%	No Penalty
			Uptime >= 95% and < 99.75%	2% will be deducted from QGR for the downtime
			Uptime >= 90% and < 95%	5% will be deducted from QGR for the downtime
			Uptime < 90%	10% will be deducted from QGR for the downtime

SN	Description	Measurement Methodology	Target	Penalty
D	Request-Response Time of various forms used by users through portal	The time is the elapsed time between the time requests (submission of Form including attachments) is submitted and the time response (acknowledgement) is received back. Irrespective of the transaction type, Payment Gateway and any third party/ external agency transaction times will be subtracted from the total elapsed time. Measurement will be on real time transactions. The response time will be measured within the Cloud environment / Intranet between the first entry and last exit point. SI shall provide the request- response report.	>=99% of the transactions take less than or equal to 5 seconds	0.5% will be deducted from QGR for each percentage (or part thereof) below target
E	Analysis, Evaluation and Implementation of Change Request	Measurement of time taken in analysing, evaluating and implementing the Change Request.	Change Requests should be completed within the time approved by DGM / CHiPS	For each instance, 0.5% will be deducted from QGR for each week (or part thereof) below target.

SLA Table 5 - Existing Khanij Online Application and Cloud Infrastructure

SN	Description	Measurement Methodology	Target	Penalty
Responsiveness of Helpdesk				
A	Responsiveness of Helpdesk	Time for Initial response from helpdesk. i.e. time taken by caller waiting in queue to be attended by the helpdesk or acknowledgement / status update from helpdesk for issue raised through email or portal) Calls not picked up by helpdesk due to waiting in queue for more than 15 minutes shall be considered as noncompliance.	Initial Response <=15 Minutes	Rs 500 for each instance will be deducted from QGR
Resolution of tickets for Application & Infrastructure Components				
B	Resolution of tickets for Application & Infrastructure Components Tickets shall be categorised in Severity Level 1, 2	**Severity level 1:** This level of Tickets has highest impact on the system functioning and to be taken up on most priority basis.	Tickets should be resolved within 4 hours. .	For each instance, 5,000 will be deducted from QGR for every 4 hours (or part thereof) below target. In case similar issue is faced by multiple users, Rs. 10,000 will be deducted from QGR for every 4 hours (or part thereof) below target

SN	Description	Measurement Methodology	Target	Penalty
	and 3 and Tickets do not include suggestions or enhancements.	**Severity level 2:** This level of Tickets has a moderate impact on the system functioning and to be taken up on priority basis. .	Tickets should be resolved within 12 hours. .	For each instance, 5,000 will be deducted from QGR for every 12 hours (or part thereof) below target. In case similar issue is faced by multiple users, Rs. 10,000 will be deducted from QGR for every 12 hours (or part thereof) below target
		Severity level 3: This level of Tickets has a lowest impact on the system functioning and to be taken up on comparatively less priority basis than Severity Level 1 & 2	Tickets should be resolved within 48 hours.	For each instance, 5,000 will be deducted from QGR for every 48 hours (or part thereof) below target. In case similar issue is faced by multiple users, Rs. 10,000 will be deducted from QGR for every 48 hours (or part thereof) below target

Note*

a) Tickets logged by DGM user including tickets logged through call, e-mail and self-service portal.
b) DGM / CHiPS may define the issue category and resolution timelines for L1, L2 and L3 support, if required
c) Response / Resolution time is in calendar hours, i.e. regular full-day round-the-clock hours including weekly off and holidays.
d) Category of Tickets pertaining to the Severity levels shall be finalized during the engagement of SI and subsequent documentation shall be done during the finalization of the Standard Operating Procedure for the selected SI.
e) However, DGM/ CHiPS may decide and alter the severity levels for each component based on the need & impact on the system functioning

SLA Table 6 - Performance of Support

SN	Description	Measurement Methodology	Target	Penalty
Cloud Performance				
A	Recovery Time Objective (RTO)1.0 hours	Measured during the regular planned/ unplanned or Cloud Platform/ DR outage For planned, SI shall perform regular mock drill at least after DR setup and once every quarter and submit the report	RTO <= 1.0 hours	For each instance, 5% will be deducted from QGR for each hour (or part thereof) below target
B	Recovery Point Objective (RPO) 15 Mins	Measured during the regular planned/ unplanned or Cloud Platform/ DR outage SI shall perform regular mock drill at least after DR setup and once every quarter and submit the report.	RPO <= 15 mins	For each instance, 5% will be deducted from QGR for each 15 minutes (or part thereof) below target
Note: Cloud infrastructure and related tools uptime shall be governed by **SLA Table 5** - Existing Khanij Online Application and Cloud Infrastructure				

SLA Table 7: Performance of Disaster Recovery Site on Cloud

SN.	Description	Measurement Methodology	Target	Penalty
Availability of ICCC Infrastructure				
A	Internet and network availability at ICCC site and ICCC equipment	Measured as internet availability at entire ICCC site and ICCC equipment. This will include network cabling, routers, switches, internet firewall, LAN Connection with Accessories, Wi-Fi Controller, Wi-Fi AP's and Load Balancer for Internet Connectivity etc. The services should be available on 24×7.	Availability >=99.50%	0.5% will be deducted from QGR for each percentage (or part thereof) of downtime below target
* ICCC IT and Non-IT infrastructure shall be governed by SLA Table 6 - Performance of Support				

SLA Table 8 - Availability of ICCC Infrastructure

SN	Resource Type	Penalty for Unauthorised absence of Resources	Penalty for replacement of selected / deployed Resources
Service Level on Deployed Resources			
A	Lead Team Members	1% will be deducted from QGR for each instance per day from SI payment No payment will be made in the days a resource is absent.	Rs 1,00,000 for each instance will be deducted from SI payment.
B	Operations and Maintenance Team	1% will be deducted from QGR for each instance per day from SI payment No payment will be made in the days a resource is absent.	Rs 80,000 for each instance will be deducted from SI payment

SN	Resource Type	Penalty for Unauthorised absence of Resources	Penalty for replacement of selected / deployed Resources
C	Operational Support Unit (OSU) /Technical Helpdesk	1% will be deducted from QGR for each instance per day from SI payment No payment will be made in the days a resource is absent.	Rs 30,000 for each instance will be deducted from SI payment
D	ICCC Helpdesk and FMS for districts Resources	1% will be deducted from QGR for each instance per day from SI payment No payment will be made in the days a resource is absent.	Rs 15,000 for each instance will be deducted from SI payment below target.
E	Facility Management Resources - Security Staff	Rs 1000 per day for each instance will be deducted from SI payment. SI shall mandatorily provide replacement in case of leave. No payment will be made in the days a resource is absent.	Not Applicable
F	Office Support Staff (Housekeeping and Office attendant)	Rs 200 per day for each instance will be deducted from SI payment. No payment will be made in the days a resource is absent.	Not Applicable

Note:

a) Resources shall be allowed maximum 15 days of leave in year. However, SI shall ensure smooth project operations in absence of resources.

b) Holidays shall be applicable as per Chhattisgarh Government holiday list. Holidays shall not be applicable to team deployed for 24x 7 support.

c) Per day payment will be calculated by dividing man month rate by number of working days in that month

SLA Table 9 - Service Level on Deployed Resources

The Resource Type is described in the below table

SN	Resource Type	Resource Details
A	Lead Team	**For both existing Khanij Online and Khanij Online 2.0** - Project Manager – 1 No. - Domain Expert – 1 No. - System Cum Infra Administrator – 1 No. - Senior Programmer – 2 Nos.
B	Operations and Maintenance Team	**For existing Khanij Online** - OSU(Supervisor) - 2 Nos **For Khanij Online 2.0** - Senior Programmers - 3 Nos - Senior DBA – 1 No - GIS Expert - 1 No - BI Expert – 1 No - Mobile App developer for Maintenance -1 No - Software Tester - 1 No - Senior Trainer/Content writer – 2 Nos - OSU Supervisor for ICCC (24*7, 3 shifts, L3 support) - 3 Nos
C	Operational Support Unit (OSU) /Technical Helpdesk	**For Khanij Online 2.0** - OSU/Technical Helpdesk for ICCC (24*7, 3 shifts, L2 support) – (3*3) +2 = 11 Nos
D	ICCC Helpdesk and FMS for districts Resources	**For existing Khanij Online** - FMS – 20 Nos - Helpdesk (24*7, 3 shifts) – 6 Nos **For Khanij Online 2.0** - FMS for Districts – 33 - Helpdesk for ICCC (24*7, 3 shifts, L1 support) – 6 Nos
E	Office Support Staff	**For Khanij Online 2.0** - Security Staff 3 shifts (1*3) = 3 Nos - Housekeeping staff 3 shifts (1*3) = 3 Nos - Office attendant 3 shifts (1*3) = 3 Nos

SLA Table 10 – Resource type details

The total deduction shall not in any case exceed 10% of the contract value and not more than 20% of quarterly invoice.

6.2.5 Measuring & Monitoring

i. Reporting Procedures: The SI shall prepare the SLA compliance reports of each quarter in an agreed format by the 10th calendar day of subsequent month. The reports will include details of each incident reported to SI i.e. date and time of receiving call/ email/ request

through any other means which is being proposed, date and time of response/ acknowledgement email, date and time of resolution provided for the reported problem, name of the module/ functionality which not working up to the mark. The report shall also include total number of incidents reported, total number and % of compliance to the service levels, total number and % of non-compliance to the service level etc. The reports along with all the documentary proofs i.e. report from EMS about up and down time, response time etc., report from HMS with details of all the incident reported through phone call/ emails/ request through any other means which is being proposed, acknowledgement email/ communication, resolution email/ communication, user feedback (if any) etc. and will be submitted to DGM in hardcopy as well as softcopy format. However actual reporting mechanism, format and list of supporting documents will be discussed and finalized by the SI with DGM before entering into O&M phase.

ii. Monitoring and Auditing: Nodal officer of the DGM or its authorized representative (consultant appointed by DGM) will be responsible for monthly monitoring the performance of SI against the SLA parameters. The review/ audit report prepared based on the performance report, will form basis for any action relating to imposing penalty or breach of contract. Any such review/ audit can be scheduled as and when required. The results will be shared with the SI as soon as possible. DGM reserves the right to ask SI to provide performance report anytime during the contract period and to appoint a third-party auditor to validate the SLA.

iii. SI needs to perform RCA (Root Cause Analysis) for any disruption in the services from CSP and the system generated report shall be made available to DGM.

6.2.6 SLA Change Control

i. The present SLA has been worked out based on current business needs of DGM. However, as the system evolves over the time, the DGM's business needs also evolve over the course of the contract period. In view of this, a requirement of changing the SLA may also arise.

ii. Any request for change in the service levels provided during the term of this agreement shall be documented and negotiated in good faith by both parties. Either party can request for a change. Changes will be documented as an addendum to SLA and consequently the contract.

iii. If in case there is any confusion or conflict between Final RFP document and the Contract, the Contract and subsequent amendments, if any, shall prevail.

6.2.7 SLA Change Process

i. Both the parties may amend this SLA by mutual agreement in accordance.

ii. Changes can be proposed by either party.

iii. Normally the forum for negotiating SLA changes will be DGM's review meetings.

6.2.8 Version Control

All negotiated SLA changes will require changing the version control number. As appropriate, minor changes may be accumulated for periodic release (e.g. every quarter) or for release when a critical threshold of change has occurred.

6.2.9 Issue Management Process

This process provides an appropriate management structure for the orderly consideration and resolution of business and operational issues in the event that quick consensus is not reached between DGM and SI. It is expected that this pre-defined process will only be used on an exception basis if issues are not resolved at lower management levels.

i. Either DGM or SI may raise an issue by documenting the business or technical problem, which presents a reasonably objective summary of both points of view and identifies specific points of disagreement with possible solutions.

ii. DGM will determine which committee or executive level shall logically be involved in resolution.

iii. A meeting or conference call may be conducted to resolve the issue in a timely manner. The documented issues will be distributed to the participants at least 24 hours prior to the discussion if the issue is not an emergency requiring immediate attention.

iv. Management of DGM and SI will develop a temporary, if needed, and the permanent solution for the problem at hand. The SI will then communicate the resolution to all interested parties.

v. In the event a significant business issue is still unresolved, the arbitration procedures described in the Contract will be used.

6.2.10 Escalation Process

All issues would be raised to the Project Management team of SI, which is completely responsible for the day to day aspects of the implementation. The Project Management team shall classify the issues based on their severity level and resolve them within appropriate timelines.

If Project Management team is unable to resolve an issue, the issue would be escalated to the PMU with options/ risks detailed for decision. DGM will make decisions based on the options/ risks presented by the IT team.

In case one or both the parties are unsatisfied then the dispute will be resolved as specified in the Volume-III of this RFP.

Notwithstanding any dispute among DGM, OEM, SI or any other associate of whatsoever in nature, the SI shall ensure the Business Continuity

6.2.11 Risk & Cost Factor

In the event of termination of contract based on non-performance by the SI as per SLA, SI will be solely responsible for risk and cost factor thereon. In such cases DGM shall make the purchase of such Service(s) from elsewhere / alternative source at the risk and cost of the SI. Also, in case of abnormal delays (beyond the maximum late delivery period as per

Agreement) in completion of any service(s) which is a part of Schedule of Services or non-fulfilment of any other terms and conditions given in Agreement, DGM may cancel the Contract in full or part thereof, and may also make the purchase of such Service(s) from elsewhere / alternative source at the risk and cost of the SI. DGM will take all reasonable steps to get the Service(s) from alternate source at optimum cost. In no case, the liability of SI under this clause shall exceed additional 10% of the quoted price of the item(s) in Annexure XI in Vol II of the RFP.

6.2.12 Exclusion

The SI will be exempted from any non-compliance/delays/slippages on SLA parameters arising out of following reasons:

i. Delays not attributable to the SI

ii. Force Majeure